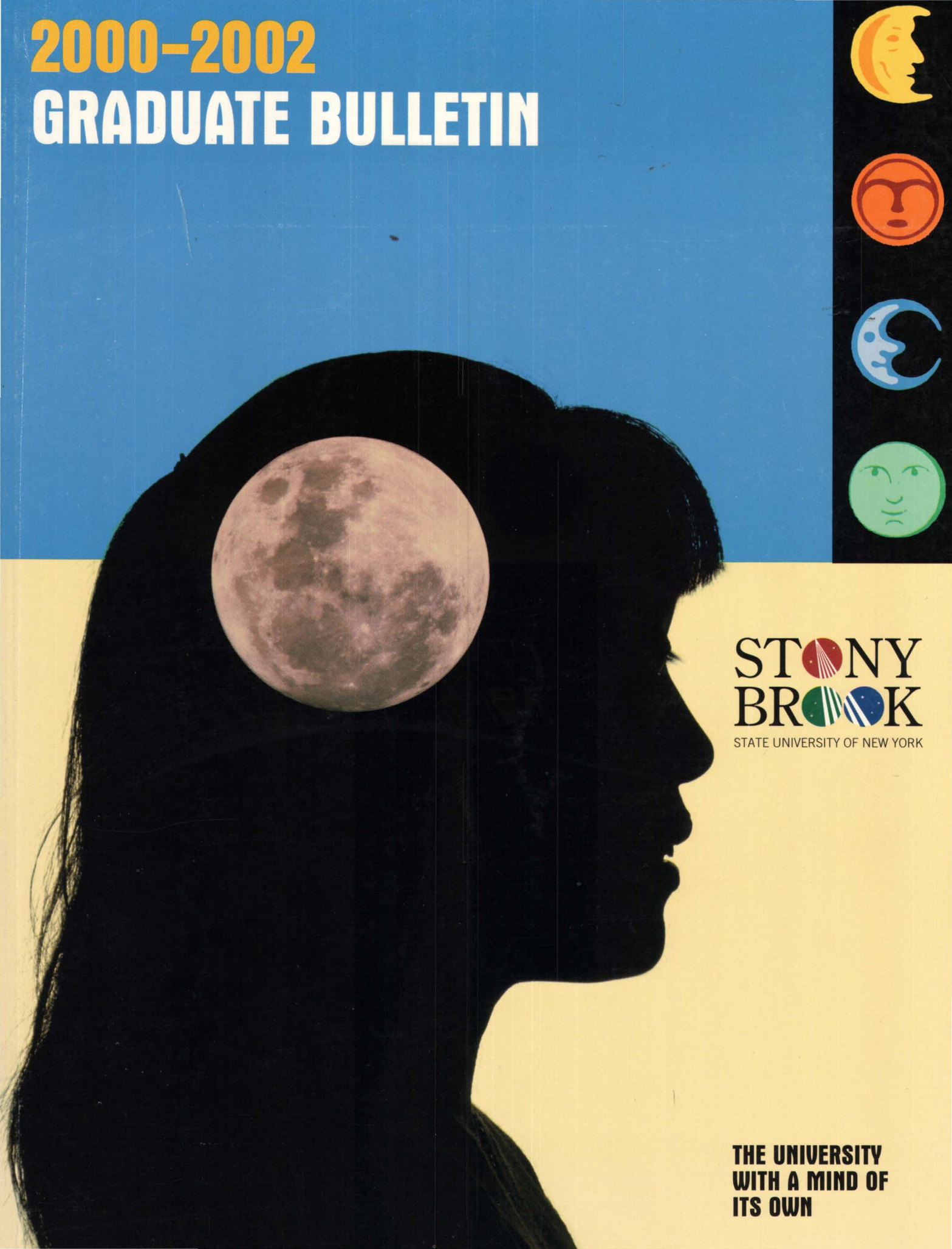
2000–2002
GRADUATE BULLETIN



STONY BROOK
STATE UNIVERSITY OF NEW YORK

THE UNIVERSITY WITH A MIND OF ITS OWN

STONY BROOK

STATE UNIVERSITY OF NEW YORK

2000-2002 Graduate Bulletin

Shirley Strum Kenny, President

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.

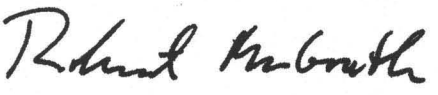
Your years in graduate school will also be a time to develop close relationships with faculty mentors as you learn the substance of your discipline and begin to contribute your own ideas to your areas of interest. Stony Brook encourages a diversity of intellectual interactions among students and faculty, 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.



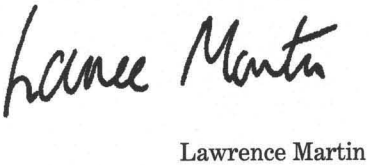
Robert McGrath

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

Table of Contents

An Introduction to the University at Stony Brook 5
Campus Resources and Student Services 15
Financial and Residential Information 23
Admission to Graduate Study 33
Academic Regulations and Procedures 37
Degree Requirements 43
Degrees and Advanced Graduate Certificates Awarded .49
Degree and Advanced Graduate Certificate Program Descriptions 53

Anatomical Sciences (HBA) 54
Anthropological Sciences (DPA) 57
Anthropology (ANT) 62
Applied Mathematics and Statistics (AMS) 66
Art (ARH, ARS) 74
Biochemistry and Structural Biology (BSB) 83
Biomedical Engineering (BME) 86
Business Administration (BUS) 90
Cellular and Developmental Biology (BCD) 98
Chemistry (CHE) 103
Comparative Literature (CLG) 110
Computer Science (CSE) 114
School of Dental Medicine 123
Ecology and Evolution (BEE) 124
Economics (ECO) 129
Electrical and Computer Engineering (ESE) 133
English (EGL) 141
French and Italian (FRN, ITL, DLF, DLI, DLL) 147
Genetics (BGE) 154
Geosciences 158
Germanic and Slavic Languages and Literatures (GER, SLV, DLG, DLL, DLR) 167
School of Health Technology and Management 173
Hispanic Languages and Literature (SPN, DLS, DLL) 174
History (HIS) 180
Linguistics (LIN, DLT, ESL) 185
W. Averell Harriman School of Management and Policy (MGT) .189
Marine Sciences Research Center (MAR, OCN) 198
Materials Science and Engineering (ESM) 208
Mathematics (MAT) 214
Mechanical Engineering (MEC) 219
School of Medicine 226
Molecular Biology and Biochemistry (BMO) 227
Molecular Microbiology (HBM) 231
Music (MUS) 235
Neurobiology and Behavior (BNB) 245
School of Nursing 249
Oral Biology and Pathology (HDO) 250
Pathology (HBP) 253
Pharmacological Sciences (HBH) 257
Philosophy (PHI) 261
Physics and Astronomy (PHY) 265
Physiology and Biophysics (HBY) 275
Political Science (POL) 280
School of Professional Development (SPD) 287
Liberal Studies 289
Professional Studies 289
Teaching (M.A.T.) 290
Advanced Graduate Certificates
Coaching 292
Educational Computing 292
Environmental/Occupational Health and Safety 292
Human Resource Management 292
Industrial Management 293
Information Systems Management 293
Operations Research 293
Software Engineering 293
Waste Management 293
School Administrator and Supervisor 294
School District Administrator 294
Psychology (PSY) 296
School of Social Welfare 302
Sociology (SOC) 306
Technology and Society (EST) 311
Theatre Arts (THR, DRM) 317
Women's Studies (WST) 322

Directories, Maps, Index 325
Directories 326
Directions and Maps 328
Index 330

Graduate Bulletin

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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 the University at Stony Brook 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 well 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
University at Stony Brook
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

The University at Stony Brook does not discriminate on the basis of race, religion, sex, color, national origin, age, disability, marital status, or status as a disabled or Vietnam-era 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 the State University at Stony Brook and you consider yourself to be the victim of illegal discrimination, you may file a grievance in writing with the Affirmative Action Office within 45 calendar days of the alleged discriminatory act. 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 State Division of Human Rights or Equal Employment Opportunity Commission.

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

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

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

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An Introduction to Stony Brook

Stony Brook Soars: An Overview

Stony Brook is a 1,100-acre universe where 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.

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. Stony Brook is classified by the Carnegie Foundation as a Type 1 research university—the highest distinction granted to fewer than 2 percent of all colleges and universities nationwide—reflecting Stony Brook's high volume of federally sponsored research, high percentage of doctoral students, and emphasis on scholarship.

Stony Brook has become a national model for education at a research university. A study published by Johns Hopkins University Press (*The Rise of American Research Universities*, by Hugh Graham and Nancy Diamond, 1997) placed Stony Brook among the top three public research universities in the country—second only to the University of California at Berkeley and tied for second with the University of California at Santa Barbara—in research per faculty member. Measuring such criteria as the number of fellowships awarded and the volume of articles published by our faculty in major scholarly journals, the study awarded Stony Brook high ratings in each of the major disciplinary categories. And University Hospital, Stony Brook's 504-bed critical care teaching hospital, has been ranked among the 15 best teaching hospitals in the nation.

Emphasis on Research

Our faculty and graduate students make major contributions to a wide range of research projects that have the potential to impact humanity. We play leadership roles in the international search for the top quark in particle physics, the molecular basis for genetic forms of diabetes, the cause of Lyme disease, and the psychological causes of domestic violence.

Stony Brook's partnership with government and industry plays a vital role in the economy of the metropolitan region. The University generated more than $11 million in royalties licensed to industry, edging out Harvard as 12th among colleges and universities nationwide in 1998. We are the only public university with two National Science Foundation Materials Research Science and Engineering Centers: one in Polymers at Engineered Interfaces and the other in Thermal Spray Research. Here, the study of plastics translates to engineering careers for our graduates and real-world solutions for the local and national business communities. In 1997, Stony Brook joined Batelle Memorial Institute to form Brookhaven Science Associates; the team was awarded the U.S. Department of Energy's contract to run the venerable Brookhaven National Laboratory. Located near our campus, the lab affords our 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 new and innovative Centers for Molecular Medicine and Biology Learning Laboratories, Marine Sciences Research Center, Institute for Theoretical Physics, Institute for Mathematical Sciences, Institute for Terrestrial and Planetary Atmospheres, High Technology Incubator, Center for High Pressure Geophysics, Center for Biotechnology, Howard Hughes Medical Institute, AIDS Education Resource Center, Humanities Institute, Latin American and Caribbean Studies Center, and Center for Regional Policy Studies, among others. 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. Under construction is the Charles B. Wang Asian American Cultural Center, a cultural and technological meeting-place for East and West.

Faculty Awards and Honors

Our outstanding faculty members are at the forefront of their disciplines and have an international reputation for scholarly achievement. Stony Brook faculty rank 12th nationwide among their academic colleagues on "citation impact"—the frequency with which their work is cited by other scientists. C.N. Yang, Einstein Professor of Physics and director of the Institute for Theoretical Physics, is a Nobel laureate in physics; his work established the basis for the modern quantum field theory. Professor of Anthropology Patricia Wright founded and currently oversees Madagascar's Ranomafana National Park and directs Stony Brook's Institute for the Conservation of Tropical Environments. She is a MacArthur Fellow, as are John Fleagle, Professor of Anatomical Sciences, and Paul Adams, Professor of Neurobiology and Behavior. John Milnor, Professor of Mathematics, is a winner of the prestigious Fields Medal. Also among our faculty are winners of the Pulitzer Prize, as well as Sloan, Fulbright, and Guggenheim fellows; and two professors in the Music Department have been nominated for Grammy awards. Additional national and international awards and honors received by our university researchers are too numerous to include here—please consult our Web site (*http://www.sunysb.edu*) for an up-to-date list.

With these credentials, Stony Brook is making its mark on the region—and on the world. Our 1,600-member faculty and our student body—more than 19,000 strong, including 6,434 graduate and professional students—make up a dedicated community where academic excellence thrives in an atmosphere of diversity. We invite you to pursue your own journey of innovation, discovery, and achievement.

Living in Stony Brook

The University is located on the North Shore of Long Island, 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 fields and woodlands, with the tranquil waters of 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. Next door 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 now open to the public for tours. The conveniences of the modern world are at hand as well—Stony Brook and nearby 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.

On campus, the Staller Center for the Arts is a fully equipped facility for education in music, theater, and fine arts. Presenting hundreds of plays, concerts, and special events every year, the Staller Center is recognized as the premiere performing arts center in Suffolk County. It includes the 1,100-seat Main Theater, a 400-seat recital hall, three experimental theaters, and a 4,700-square-foot art gallery.

For sports and fitness enthusiasts, the University has a 5,000-seat indoor Sports Complex. Plans are underway for the construction of an outdoor stadium for sporting events and concerts. The Student Activities Center houses the Eugene Weidman Wellness Center, which offers 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, we believe diversity is a necessity for intellectual excellence. Since a third of our graduate enrollees are African-American, Latino, Native American, and international students, our university is a place where cultures converge for the mutual enrichment of all.

The Campus

Campus refurbishment efforts, such as a fountain on the academic mall and outdoor landscaping, have enhanced the University environment. Bicycle paths, an apple orchard, park benches, a duck pond, and spacious plazas complement more than 120 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, the newly opened 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.

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, and the Long Island High Technology Incubator, which opened in 1992 and houses start-up companies in biotechnology and other high-tech fields.

Encircling the academic buildings are six residential quadrangles. The quads 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 240-unit 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.

Students

Stony Brook's enrollment is 19,125 students. Graduate students number 6,434 (3,043 full time, 3,391 part time) while undergraduate students number 12,691 (11,418 full time, 1,273 part time). Graduate students come from most states in the nation and from some 75 countries of the world. Diversity is a byword at Stony Brook, where 31 percent of graduate students hail from other countries and 30 percent of the total student body are members of historically underrepresented groups.

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 1,682 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 17 students.

Eminent faculty members include Einstein 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; University Professor John H. Marburger in Physics and Electrical Engineering, former president of the University at Stony Brook and current director of Brookhaven National Laboratory; Distinguished Professors James Glimm, Robert Sokal, and Armen Zemanian in Applied Mathematics and Statistics; Reginald Tewarson in Biomedical Engineering; Benjamin Chu and Iwao Ojima in Chemistry; Louis W. Ripa, Jr. in Children's Dentistry; Theodosios Pavlidis in Computer Science; Robert Sokal in Ecology and Evolution; Donald Weidner in Geosciences; Robert Cess in the Marine Sciences Research Center; H. Blaine Lawson, Jr., Dusa McDuff,

John Milnor, and Dennis Sullivan in Mathematics; Lorne Mendell in Neurobiology and Behavior; Edward Reich in Pharmacological Sciences; Don Ihde in Philosophy; Gerald E. Brown, Paul Grannis, Janos Kirz, and Philip Solomon in Physics; K. Daniel O'Leary and Howard Rachlin in Psychology; and Felix T. Rapaport in Surgery; Distinguished Professors Emeriti Thomas Flanagan and Louis Simpson in English; Charles Rosen in Music; and Lewis Coser in Sociology; Distinguished Teaching Professors Alan Tucker in Applied Mathematics and Statistics; Elof Carlson in Biochemistry and Cell Biology; Barbara Elling in Germanic and Slavic Languages and Literatures; Shi Ming Hu in Social Sciences Interdisciplinary; Norman Goodman and Judith Tanur in Sociology; and Jonathan F. Levy in Theatre Arts; Distinguished Teaching Professors Emeriti Homer Goldberg in English and John Truxal in Technology and Society; Distinguished Service Professors Velio Marsocci in Electrical Engineering; Robert Liebermann in Geosciences; Robert Cess in the Marine Sciences Research Center; Irwin Kra in Mathematics; Sidney Gelber in Philosophy; Harold Metcalf and Peter Paul in Physics; Norman Goodman in Sociology; and Lester Paldy in Technology and Society; and Distinguished Service Professors Emeriti, J.R. Schubel, former dean and director of the Marine Sciences Research Center; Marvin Kuschner, former dean of the School of Medicine; and John Gagnon in Sociology.

Stony Brook's distinguished faculty is also proud to include 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 various 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 and Continuing Studies. 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: Anthropology, Art, Biochemistry and Cell Biology, Chemistry, Comparative Studies, Geosciences, Ecology and Evolution, Economics, English, European Languages and Literatures, Hispanic Languages and Literature, History, Linguistics, Mathematics, Music, Neurobiology and Behavior, Philosophy, Physics and Astronomy, Political Science, Psychology, Sociology, and Theatre Arts.

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

English, Hispanic Languages and Literature, Music, and Philosophy offer the Ph.D., as does Comparative Literature within the Ph.D. English. European Languages offers M.A. degrees in French, Italian, German, and Russian. The Art department 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 (which includes programs in Astronomy and Geological Sciences), 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 dean of the College of Arts and Sciences is Paul Armstrong, who is located in the Melville Library, Room E 3320, (631) 632-6991.

College of Engineering and Applied Sciences

The College of Engineering and Applied Sciences consists of eight academic units: Departments of Applied Mathematics and Statistics, Computer Science, Electrical and Computer Engineering, Materials Science and Engineering, Mechanical Engineering, Technology and Society, W. Averell Harriman School for Management and Policy, and the Bioengineering Program. 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/program 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/program 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

The Health Sciences Center 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 approximately 2,000 students and conduct programs of research, service, and continuing professional education. Professional, technical, and laboratory resources support the academic activities of the students and faculty. The Health Sciences schools share instructional space and multidisciplinary laboratories in addition to the support services of the Health Sciences Center Library and the Coller Learning Center, the Division of Laboratory Animal Resources, Media Services, and the Office of Student Services. The Health Sciences Center also houses a bookstore and food service area for the convenience of its students and faculty. 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.

University Hospital and Medical Center is the major teaching facility for the educational programs of the Health Sciences Center. University Hospital and Medical Center 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, University Hospital has utilized the very latest in medical knowledge and technologies to meet the special needs of its patients. The Medical Center has developed a network of community-based outpatient and primary care centers. Recently, HCIA, the nation's leading health-care benchmarking firm, named University Hospital among the nation's 15 best major teaching hospitals. In 1998, it was in the prestigious "100 Top Hospitals: Clinical Benchmarks for Success" database established by HCIA.

Through subspecialties, the School of Medicine's 17 clinical departments offer consultation and care using a full array of specialized diagnostic and treatment techniques. To better serve its patients, the 504-bed hospital was reorganized into five semi-autonomous hospitals: Heart Hospital, Medical Hospital, Mental Health Hospital, Surgical Hospital, and Womens and Childrens Hospital. The hospital is the only tertiary care 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 the only public hospital in Suffolk County, 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. University Hospital and Medical Center is seeking designation as an NCI Comprehensive Cancer Center. The hospital also houses a cardiac diagnostic center, a sleep disorders laboratory, and a Lyme disease center. It further serves as the region's burn center and directs the state-designated AIDS center. Adults and children with a variety of chronic conditions such as diabetes, cystic fibrosis, and multiple sclerosis receive specialized care and advanced services.

University Hospital cares for and treats more than 600,000 patients a year through its ambulatory care programs. In 1999, it had more than 27,000 inpatient discharges. The Emergency Room receives more than 43,000 visits annually. The hospital provides training for more than 550 residents in 50 approved specialty programs (including subspecialties) and the general practice/dental medicine program.

Opened in October 1987, the Long Island State Veterans Home serves New York State veterans who require skilled nursing care. Operated by the Health Sciences Center, it is located on the University campus, one-half mile east of University Hospital.

At present, more than 2,500 skilled professionals from the Long Island region have faculty appointments and participate in the Health Sciences Center's five schools. All Health Sciences Center students, as part of their clinical training or fieldwork, work for a specific time with some of the Long Island health and welfare agencies. The schools offer continuing education for many health professions. The Health Sciences Center also sponsors conferences, workshops, and lectures for the general community.

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. Interested students can review each school's academic program online, *www.uhmc.sunysb.edu.* Exceptions to this generalization 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.

The *Health Sciences Center Bulletin* can be obtained by contacting the Health Sciences Center Office of Student Services, (631) 444-2111, or 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 SUNY's only master's degree program in marine environmental sciences and its only Ph.D. program in coastal oceanography.

School of Professional Development

The School of Professional Development's (SPD) Division of Graduate Studies offers graduate credit programs for part-time and full-time students. SPD offers the University's

largest part-time graduate program, the Master of Arts in Liberal Studies. Other degrees include the Master of Arts in Teaching (M.A.T.) in Biology, Chemistry, English, French, German, Italian, Physics, Russian, and Social Studies; and the Master of Professional Studies in Human Resource Management and Waste Management.

Students can also receive a number of advanced graduate certificates through SPD. Programs include those in coaching, educational computing, environmental/occupational health and safety, human resource management, industrial management, information systems management, operations research, school administration and supervision, school district administration, software engineering, and waste management.

The School of Professional Development'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. The Center for Corporate Education and Training offers courses on-site, online, and on campus. These courses address individual career goals and to complement, where appropriate, many of the University's credit and degree programs.

For an SPD Bulletin or additional information on the School of Professional Development, call or write the SPD Office, N-201 Ward Melville Social and Behavioral Sciences Building, University at Stony Brook, Stony Brook, NY 11794-4310; (631) 632-7050. You can visit SPD on the Web, *www.sunysb.edu/spd/*.

Research

The State University of New York at Stony Brook is a university center, and, as such, has research and scholarly activity among its major missions. At Stony Brook, one of the primary activities is graduate and postgraduate education, with which scholarly effort is closely coupled. Faculty members are expected to seek external support for these activities insofar as such funding is available and required; research and other scholarly activities are part of the faculty obligation whether sponsored or not. A substantial proportion of graduate students are supported as employees on externally funded projects. Some receive fellowship or traineeship support from such sources. In 1966, the Board of Trustees of SUNY adopted a policy that requires the unrestricted public dissemination of the conduct, progress, and results of research or research-related programs. This policy prohibits classified research, regardless of the source of support.

In 1998-99, Stony Brook generated more than $112 million in annual research activity from sources outside Long Island. More than 1,900 sponsored projects are actively being pursued, including scientific studies and scholarly activities in the arts and humanities, training programs, public service activities, educational support, and library support. Many departments and programs prepare detailed brochures describing their research and activities.

The Office of the Vice President for Research has responsibility for both programmatic and fiscal aspects of research and other sponsored projects on the campus. The office has a development sector that provides information about opportunities for funding. The office also coordinates the activities of committees that deal with special features of research, such as ethical and safety considerations. The Campus Office of Technology Transfer, under the Office of the Vice President for Research, coordinates the technology transfer activities of the campus, including the filing of patents. Students are urged to discuss with the Campus Director of Transfer Technology any agreements involving research activities in which they are named, or which they may be asked to execute with external organizations.

The Office of Research Services (ORS) reports to the Vice President for Research. ORS reviews proposals of external sponsors for consistency with federal, state, campus, and sponsored regulations; monitors external grant expenditures; and provides reports on sponsored activities to administrative and departmental offices. ORS is part of the Research Foundation of SUNY.

All campus projects that involve human or animal subjects, whether they are conducted as part of a research program or in conjunction with course activities (including graduate research), must receive prior review and approval by the campus-wide Committee on Research Involving Human Subjects (CORIHS) or the Institutional Animal Core and Use Committee (IACUC). If such prior approval has not been obtained for degree-related work, delays may occur in the awarding of a graduate degree. Questions regarding human subjects should be addressed to the Office of the Vice President for Research.

All projects requiring the use of animals, recombinant DNA, radioactive materials or ionizing radiation, or lasers require prior review and approval by the appropriate University committees. Questions relating to these areas should be addressed to the University Coordinator for Research Compliance.

The campus offices that deal with research and scholarly effort recognize the importance of these activities to the University. They stand ready to help and advise on most aspects of these essential missions.

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 Disease Assistance Center; Arms Control and Peace Studies Center; Bach Aria Festival and Institute; Barbados Eye Study; Center for the Analysis and Synthesis of Macromolecules; Center for Assessing Health Services; Center for Behavioral Neuroscience; Center for Biotechnology; Center for Excellence and Innovation in Education; Center for Health Policy and Management; Center for Italian Studies; Center for Medicine in Contemporary Society; Center for Photographic Images of Medicine and Health Care; Center for Regional Policy Studies; Center for Religious Studies; Center for Science, Mathematics, and Technology Education; Developmental Disabilities Institute; Economic Research Bureau; and Empire State College.

Other campus-based institutes and laboratories include the Howard Hughes Medical Institute in Neurobiology, Humanities Institute, Institute for Advanced Studies of World Religions, Institute for Atmospheric Studies, Institute for Cell and Developmental Biology, Institute for

Decision Sciences, Institute for Interface Phenomena, Institute for Mathematical Modeling, Institute for Mathematical Sciences, Institute for Medicine in Contemporary Society, Institute for Mental Health Research, Institute for Pattern Recognition, Institute for Social Analysis, Institute for Technology Policy and Development, Institute for Terrestrial and Planetary Atmospheres, Institute for Theoretical Physics, Laboratory for Arthritis and Related Diseases, Laboratory for Behavioral Research, Laboratory for Experimental Mechanics Research, Laboratory for Image Analysis, Laboratory for Personal Computers in Education, Laboratory for Political Research, Long Island Leadership Institute, Long Island Library Resources Council, and the Long Island Regional Advisory Council on Higher Education.

Stony Brook also houses the Lyme Disease Center, New York Sea Grant Institute, Nuclear Structure Laboratory, Poetry Center, Research Center for Health Promotion/Disease Prevention, Sleep Disorders Center, Small Business Development Center, Stony Brook Radiation Laboratory, Sudden Infant Death Syndrome Regional Center for Eastern New York State, Taproot Workshops, Inc., Transplantation Society, and the Waste Management Institute.

Academic Journals

Academic publications edited or published at the University include *Advances in Learning and Behavioral Disabilities; Art Criticism; Biological Psychiatry; Circuits, Systems, and Signal Processing; Continental Philosophy; Developmental Review; Dow Jones Irwin Business and Investment Almanac; Evolution; Evolutionary Anthropology; Forum Italicum; Gastrointestinal Radiology; Gradiva; Heat Transfer—Japanese Research; Humanities Series in Contemporary Studies in Philosophy; Humanities Series in Philosophy and Literary Theory; International Association of Philosophy and Literature; Journal of College Science Teaching; Journal of Educational Technology Systems; Journal of Histotechnology; Journal of Human Evolution; Journal of Urban Analysis and Public Management; Long Island Historical Journal; Materials Science and Engineering; Minnesota Review; Philosopher's Annual; The Physics Teacher; Previews of Heat and Mass Transfer; Quarterly Review of Biology; Quintessence of Dental Technology; Romantic Movement Bibliography; Slavic and Eastern European Arts; Snark; Stony Brook Bulletin for Theory and Criticism; SUNY Series in Aesthetics; Taproot; Thermal Spray Technology; Transplantation Proceedings;* and *Victorian Literature and Culture.*

Campus-Community Ties

As the public university center for the bicounty-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 almost 12,000 full- or part-time employees. It is estimated that the University generates approximately $2.5 billion annually in direct and indirect economic impact on the region. 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.

Stony Brook is the only major research university on Long Island, one of the nation's largest and most vital suburban regions, with a population larger than that of ten states. 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.

The Long Island High Technology Incubator, a non-profit corporation established to provide a nurturing setting for start-up businesses, is located on campus. The facility is home to 24 companies in the 72,000-square-foot building; seven more companies reside in available space in campus facilities, and six others are in the highly successful "Incubator Without Walls" program. 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 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. A fully equipped neonatal intensive care unit provides the only tertiary care services for premature and newborn infants in Suffolk County. Obstetrical services also include antepartum care and a perinatal outreach education program.

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, Inc., 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.

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, and it is estimated that hundreds of thousands of persons annually attend these events or visit the campus to take advantage of other facilities and services.

Student Life

A wide variety of lectures, seminars, concerts, exhibits, theatrical performances, movies, and sporting events are scheduled regularly during the academic year. Some recent well-known speakers at Stony Brook have included activist and author Angela Davis, Surgeon General David Satcher, New York Nicks Head Coach Jeff Van Gundy, best-selling author E.L. Doctorow, and First Lady Hillary Rodham Clinton.

Art galleries in the Staller Center, the Melville Library, and the Stony Brook Union offer regularly changing exhibitions of works by on- and off-campus artists. The Museum of Long Island Natural Sciences, located in the Earth and Space Sciences Building, houses a continuous showing of dioramas depicting natural Long Island scenes, as well as special temporary exhibits. An average of five films are shown weekly on campus, including vintage and current productions; admission is usually free for students.

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, the University at Stony Brook's Staller Center became Long Island's only arts facility to offer professional music, dance, theatre, fine art, and film "the art of the twentieth century."

The center's professional performance season opens in October and includes a score of live professional events and an eclectic schedule of films throughout the year. World class artists and ensembles such as the Alvin Ailey Dance Company, Midori, and Ben Vereen appear on the Staller Center stages alongside other internationally renowned musicians, dancers, actors, and actresses. The Broadway 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."

The Staller Center presents events produced by the University at Stony Brook's departments of Theatre, Music, and Art. Gifted students and guest artists perform under the direction of USB faculty, Artists-in-Residence, and guest artists.

From July through early August, the Staller Center presents Summer Serenades, a Saturday evening concert series and a film series.

Athletics

The University at Stony Brook athletic program has taken itself on a long and difficult journey, which culminated in fall 1999 with its arrival to NCAA Division I. The process of achieving Division I status was set forth in 1988 when Stony Brook upgraded its lacrosse and women's soccer programs to Division I. The athletic department fields ten men's and nine women's intercollegiate athletic teams, which compete in the Eastern College Athletic Lacrosse Conference, the New England Conference in Football, and the Atlantic Soccer Conference for men's soccer, while all others compete as NCAA Division I Independent.

Student Publications

The student newspaper, the *Statesman*, is published weekly during the academic year with a circulation of 10,000 on campus and in the local community. Other student publications include the *Stony Brook Press*; *Blackworld*, a newspaper focusing primarily on news of interest to the black community on campus; *Stony Brook Shelanu*, a monthly Jewish newspaper; *Soundings* and *Snark*, two literary magazines; and *Specula*, the campus yearbook.

Other Student Organizations

Campus ministries serve student religious concerns through the Interfaith Center, offering regularly scheduled Jewish, Catholic, Protestant, Muslim, and Unitarian Universalist 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. The Catholic ministry offers religious and social services and activities in a Catholic "parish" atmosphere for the campus community. The Protestant Campus Ministry represents six Protestant denominations, which include Episcopal, United Methodist, Reformed, Presbyterian, Lutheran, and United Church of Christ). This ministry provides worship services, counseling, retreats, and programs on social and ethical issues. The Jewish Life Hillel Foundation offers religious, social, and cultural services as well as personal counseling for students and faculty. It is the umbrella organization for all the Jewish activities at Stony Brook. Regular worship services, study, and counseling are offered by the Southern Baptist Campus Ministry and the Islamic Society of North America (Muslim Student Association). The campus Ministry offers programs and counseling as well as transportation to the local Unitarian Universalist Fellowship. The Interfaith Center is located in Humanities 153-167. The phone number is 632-6565.

The International Student Organization addresses student interests in various cultural traditions, as do other groups including the Asian Student Association, Club India, African Student Union, Latin American Student Organization, and Caribbean Association.

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 printed in the Student Conduct Code brochure, which is available in the Office of the Vice President for Student Affairs, 348 Administration Building.

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 contact the Director of Judicial Affairs, 347 Administration Building, 632-6705.

Parking and Traffic

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. The detailed regulations and appeal procedures are available in the Traffic Office, 192 Administration Building.

All graduate students who operate a car on campus are required to secure a parking permit, available at the Traffic Office.

Planned Assembly and Demonstrations

All groups using University buildings and grounds for planned assembly and demonstrations should submit a Facility/Space Use Request Form to register their activities.

Student Conduct Code

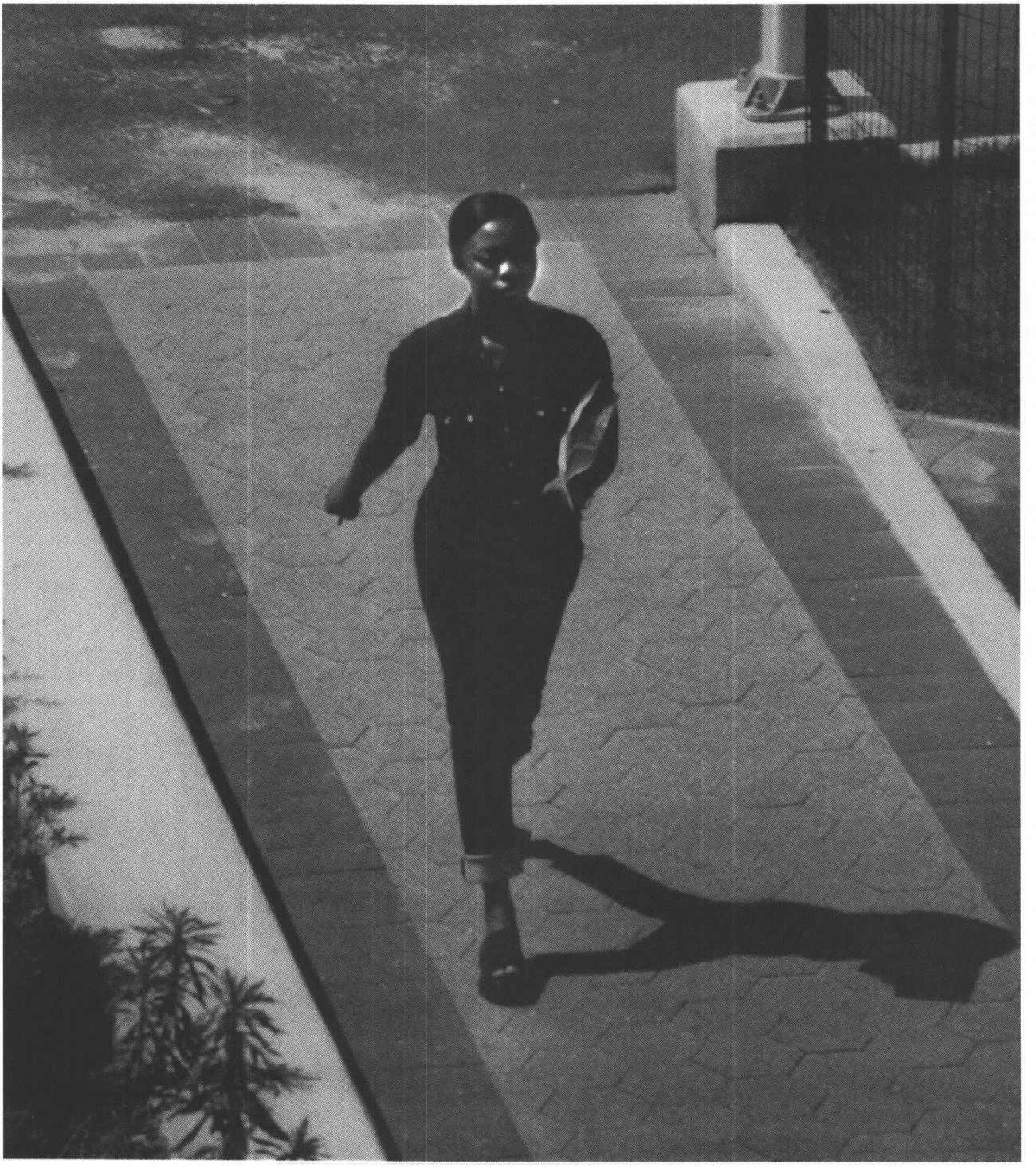
As a document, the University Student Conduct Code defines acceptable community behavior. For a resident student, it translates into respect for your neighbors and their property. It prohibits tampering with fire safety equipment, i.e., fire alarms, fire extinguishers, fire bells, etc. It includes respecting 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 632-6705.

Works of sculpture are displayed on the Stony Brook Campus. Photo by Glenn Jochum

Campus Resources and Student Services



Athletic Facilities

The west wing of the Indoor Sports Complex, next to the Stony Brook Union, opened in the fall of 1990. Connected to the existing gymnasium, the 105,000-square-foot complex seats 4,100 for basketball and volleyball and 5,000 for lectures, concerts, and other special events. The facility houses a four-lane, six-sprint-lane track (177 meters in distance), six glass back-walled squash courts, locker rooms, six team rooms, and a training room. Attractive lobbies, offices, and two concession stands complete the facility.

The existing gymnasium, now the east wing of the Indoor Sports Complex, opened in 1964. The gymnasium features seating for 1,800 for basketball and volleyball; a six-lane, 25-yard pool; eight racquetball courts; one Universal weight room; a dance studio and exercise room; and three multipurpose courts for volleyball, badminton, or indoor soccer, available when not in use for competition. The gymnasium, along with the new structure, provides an expansive, self-contained athletic complex, constituting Long Island's premier college sports facility, second in size only to Nassau Coliseum.

Outdoor facilities extend over 25 acres and include Seawolves Field, the home of football and lacrosse; six tennis courts; a six-lane, 400-meter track; four single-wall handball/paddleball courts; and fields for varsity soccer, baseball, and softball. The intramural fields are used for softball, touch football, soccer, beach volleyball, and many other sports.

The new complex serves as the center for physical education as well as for intercollegiate and intramural athletics for the University, and addresses the recreational, educational, and entertainment needs of the University community. Special events include track and basketball championships, trade shows, and concerts, as well as sports clinics. Under construction is a 7,500-seat stadium to host Division I sports.

Most facilities may be used for recreational purposes when they are not scheduled for classes, intramural or intercollegiate events, or special events. Current schedules of recreation hours may be obtained in the Indoor Sports Complex. Hours are subject to change depending on availability of staff. The Indoor Sports Complex is open seven days a week from 7 a.m. to 11 p.m. It is closed on all major holidays. For further information, call (631) 632-7200.

Bookstores

The University Bookstore is operated under the direction of the Faculty Student Association. Located on the ground level of the Frank Melville Library (opposite the Stony Brook Union), it stocks a wide selection of new and used textbooks, reference and tradebooks, supplies, imprinted clothing, and gifts. The bookstore also carries an assortment of greeting cards, health and beauty aids, electronics, backpacks, general reading books, and magazines. Art and engineering supplies are stocked in addition to the regular stationery items.

Textbooks are priced according to the manufacturer's list price. Shop early to obtain any available used books and avoid the rush at the beginning of the semester. If you select the wrong textbook or drop a course within 15 calendar days of the start of classes, the textbook may be returned for a full refund or exchange provided that the book is unused, and in new, salable condition. A receipt is required for all returns and exchanges. Unused textbooks in new, salable condition may also be returned during the University's add/drop period with a valid drop form and receipt.

The University Bookstore's tradebook department carries many reference and technical titles that relate to the various academic programs available at the University, as well as a wide selection of general reading books and magazines. Titles not in stock can be special ordered at no additional cost; a minimal deposit is required.

Regular Hours of Operation:
Monday 8:15 a.m.-6 p.m.
Tuesday 8:15 a.m.-7 p.m.
Wednesday/Thursday
8:15 a.m.-6 p.m.
Friday 8:15 a.m.-5 p.m.
Saturday 10 a.m.-4 p.m.

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

For more information, call the University Bookstore at 632-6550.

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 stocks textbooks, supplies, and an extensive selection of health science, professional, trade, and reference books. Special orders are an essential part of the store's customer service, a top priority for Matthew's. Customers have easy access to the hundreds of thousands of medical reference titles available through the store's special order service.

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 p.m.
Friday 8:30 a.m.-5 p.m.
Saturday 10 a.m.-2 p.m.

For more information, call the HSC Bookstore at 444-3685.

Career Center

The Career Center, a member of the Student Affairs family, assists students with all types of career decision-making and planning concerns while providing forums for students to interact with potential employers visiting campus to offer formal interviews or participate in job/internship fairs. Individual and group consultation provides opportunities for students to learn job-search strategies such as how to write effective résumés or interview successfully, and to conduct critical self-examination through counseling, testing, and workshops, as it relates to future professional involvement and achievement. Students can access the Center's Web site at *http://www.sunysb.edu/career*, which has valuable job-search links such as Jobtrak, and are invited to visit the Career Center, located near the foot of the Zebra Path walkway, the Melville Library, Room W-0550. The Center is open on Monday and Wednesday though Friday from 8:30 a.m. to 5 p.m. and on Tuesday from 8:30 a.m. to 7 p.m. Call 632-6810 for an appointment or walk in to look at career information and job listings.

Child Care

The University has on-campus child care services for approximately 100 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 an individual. 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. Child Care Services is expanding to a new center, which will open in early spring 2001. This facility will house 160 children and will include a kindergarten, before and after care, and a summer camp. For further information or an application, call the Child Care Office at 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 the Internet over a T3 (45 MB) connection. A T1 link also connects the campus to the SUNY intranet. 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 246-2000. For additional information about networking services please refer to the campus home page (*http://www.sunysb.edu*) under "For Students, Division of Information Technology," or call 632-6120.

IBM 9762, Sun E5000, and Sun E450 computer systems 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 Xerox Docuprint and 4650 printers. Information about computer accounts may be obtained by contacting the Computer Accounts Office at 632-8011.

Client Support Services are available. For further information call 632-9800.

General computing resources are available to students through Instructional Computing, with offices in S1460 Frank Melville, Jr. Memorial Library (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 (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 in the use of 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, and psychiatric services for all students, including students matriculated in the School of Professional Development. 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 programs for personal growth and enrichment to students, staff, and faculty, and consultation 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 8 a.m.-5 p.m., Monday, Wednesday, Thursday, and Friday, and on Tuesday 8 a.m.-6 p.m. During the summer, intersession, and spring recess, it is open 8 a.m.-4 p.m., Monday-Friday.

Appointments for an initial visit are made on a same-day or next-day basis by calling 632-6720. In emergency situations, students will be seen right away without a scheduled appointment. Any student needing a disability-related accommodation should call the Counseling Center at 632-6720.

For mental health emergencies after hours and on weekends, students should call Public Safety (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 751-7500 or the University Response Hotline at 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. All counseling is confidential except in situations where there is a threat or danger to life. See the Center's Web site at *www.sunysb.edu/stuaff/counsel/*.

Disabled Student Services/ ADA Office

Disabled Student Services (DSS) coordinates advocacy and support services for students with disabilities. These services assist integrating individual needs with the resources available at the University to eliminate physical or programmatic barriers and to ensure an accessible academic environment.

Students are responsible for identifying and documenting their disabilities through the DSS Office. DSS staff then implement the academic adjustments or reasonable accommodations necessary to support individual academic programs. Students with disabilities receive assistance with special housing and on-campus transportation; recruitment of readers, interpreters, and note-takers; University procedures and requirements; test accommodations; and counseling. *All information and documentation of disabilities is confidential.*

A Learning Disabilities Specialist is available for referral for diagnostic testing and educational programming to meet accommodation needs, and to provide in-service training to the University community. A Supported Education Program offering individual counseling and group sessions is available for students with psychological disabilities. Special equipment available for student use on short-term loan includes wheelchairs, tape recorders, elevator keys, and an FM amplification system. Also available are temporary handicapped parking permits, the use of a computer, a reading machine, and other equipment in the Melville Library. The office also advises Students Toward an Accessible Campus (STAC), a social and community service club for students with and without disabilities.

The 1992 Americans with Disabilities Act (ADA) requires that individuals with disabilities be afforded equal opportunities in areas of public services and programs, employment, transportation, and communications. In compliance with the ADA's definition of disabilities, the University makes concerted efforts to provide students and employees with

reasonable accommodations and access to services and programs.

Individuals who anticipate requiring assistance should contact the DSS/ADA Office as early as possible to allow time for implementing recommended services. The office is located in 133 Humanities Building, or call (631) 632-6748/6749; VOICE/TDD is available. You can also access the Web site (*www.naples.cc.sunysb.edu/OSA/disbled.nsf*).

Graduate Student Organization

The Graduate Student Organization (GSO) is the duly elected representative body for graduate student governance on campus. All graduate students, 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 six 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 program 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 *News & Views* is a monthly newspaper reporting on policies and events of interest to graduate students.

"The Spot," the graduate student lounge run by the GSO (located on the second floor of the Fannie Brice Theater), features live music from campus and local alternative, blues, folk and jazz bands. It serves a variety of reasonable priced beverages (including imported beers), and offers billiards, darts, and a relaxed atmosphere for graduate students. "The Spot" is open from 8:00 p.m. - 2:30 a.m., Wednesday through Saturday. There is no cover charge for graduate students.

Intensive English Center

E-5320 Melville Library
SUNY Stony Brook
Stony Brook, NY 11794-3390
Phone: (631) 632-7031
Fax: (631) 632-6544
http://www.sunysb.edu/iec

The Intensive English Center (IEC) program is composed of full-time non-credit courses and workshops in English serving the campus community of international students, as well as the community at large. Students are enrolled for semester-long (fall and spring) instruction in English at proficiency levels ranging from elementary through pre-academic advanced. Students are placed in appropriate levels by means of comprehensive diagnostic examinations in the beginning of each semester. 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 weekly grammar and conversation workshops. Elective courses include TOEFL Preparation, American History and Culture, and Business English. IEC courses are taught by professional instructors holding advanced degrees.

During the summer, the IEC offers two four-week intensive programs supplemented by a planned program of cultural and recreation activities. Students receive a minimum of 20 hours of classroom language instruction each week, plus visits to places of interest in the New York metropolitan area.

The IEC welcomes graduate students who desire to improve their English proficiency or to satisfy the Graduate School English proficiency requirements.

Courses in the IEC program are open to anyone seeking instruction to improve their English proficiency for social or academic reasons. 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 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 *http://www.grad.sunysb.edu.*

Libraries

The Stony Brook campus houses a number of libraries to meet the information needs of students and faculty. The Frank Melville, Jr. Memorial Library, the main library building, provides both an intellectual and physical focal point for the campus and is among the largest academic libraries in the nation. Within the architecturally distinctive Melville building are collections serving the social sciences, humanities, and fine arts. These collections are particularly strong in English, Western European and Latin American literature, as well as in modern Western and Latin American history. Special departments in the library provide ready access to current periodicals, government documents, maps, microforms, music, and legal materials. Other facilities of note are a music listening center and a variety of study spaces. The full range of library services, including open stack privileges and electronic resources, are available to all students.

There are five science libraries. Four

of these—Chemistry; Computer Science; Marine and Atmospheric Sciences; and Mathematics, Physics, Astronomy are located in departmental buildings. The Science and Engineering Library, housing collections in engineering, biology, and geosciences, is located in the Melville Library. A Health Sciences Library is located in the Health Sciences Center. Collectively, the University libraries contain more than two million bound volumes and three million publications in microformat. Numerous abstracting, indexing, and full-text electronic resources are also available.

Other library facilities of note are the Senator Jacob K. Javits Collection of private papers and memorabilia and the William Butler Yeats archives.

During the academic year, the library is generally open Monday through Thursday, 8:30 a.m. to midnight; Friday, 8:30 a.m. to 8 p.m.; Saturday, 10 a.m. to 6 p.m.; and Sunday, noon to midnight. During intersession and other vacation periods, hours are generally Monday through Friday, 8:30 a.m. to 5 p.m., and closed weekends. The library is usually closed on major holidays when classes are not held.

Note: Library hours are subject to change. Students are urged to check the posted hours of operation at the various libraries, as well as at the main library. Up-to-date information on library hours is available by calling the Library Information Line (631) 632-7160. The library Web site address can be accessed at *www.sunysb.edu/library/*.

Off-Campus Housing Service

The Off-Campus Housing Service, located in room 104, Administration Building, 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. We are open Monday to Friday, 10 a.m. to 3 p.m. Call 632-6770 or visit our Web site with an online, interactive database at *http://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, comfortable, receptive place to turn, for instance, if a student is having trouble getting through a bureaucratic maze or needs help resolving a dispute with someone or in solving a problem. 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 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 114, Humanities Building. Hours are 9 a.m. to 5 p.m. Monday through Friday. Walk-in visits are possible, but scheduled appointments are recommended. The phone number is 632-9200.

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 six meeting rooms, a 330-seat auditorium, a video arcade, an information center, a crafts center, an art gallery, and an ATM machine.

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.

Weekends at Stony Brook are filled with concerts, plays, movies, speakers, sporting events, and parties. Past events have included Billy Joel, Eddie Murphy, Bob Dylan, and George Carlin, to name a few. Craft fairs and cross-cultural exhibits have a strong following, as does "Stony Brew," the Thursday evening coffeehouse with live entertainment.

Union Crafts Center

The Union has a well-equipped arts and leisure workshop center on the lower level of the Stony Brook Union Building. Facilities include a complete ceramics studio, wheels, kilns, work tables, damp closets, glaze materials, and tools. The photography studio has black and white enlargers, a print dryer, a dry mount press, storage light tables, and more. The fiber arts studio has 25 floor looms and many small table looms for special classes. Beginning and advanced classes are offered. Although workshop schedules change every semester, the following classes have been very popular over the years: basketry, ceramics, drawing, painting, clay sculpture, and weaving. There are also special leisure programs in kayaking, wine appreciation, bartending, and defensive driving. Art workshops are offered for children on Saturday mornings and in the summer. In addition to the classes, membership in the Crafts Center is available to anyone who understands the use of the studio's equipment or to anyone who takes a course. As a member, you may use the facilities any time the studio is open, provided it doesn't interfere with a class. Call (631) 632-6820 for current classes.

The Downtown Arcade (Faculty/ Staff Association)

Located on the lower level of the Stony Brook Union, the Arcade has just been renovated to provide a relaxing environment for pool, video games, and video renting. The most recent addition is a 55-foot television screen to watch all of your favorite sports programs. Video rentals require a student or staff ID and cost $3. There are more than 700 movies available, and you can rent one video and get one free (free rental is good only at time of paid rental). The Downtown Arcade is open Monday through Saturday from noon until midnight. Campus organizations are welcome to hold group activities or fundraisers here, but keep in mind that reservations are requested for group activities. For more information, contact the Faculty Student Association at 632-9804.

FSA is the campus auxiliary service organization. Located in Room 282, FSA operates many services including check cashing, vending, recreation areas, food services, the meal plan office, a convenience store, flea markets, and several eating places including the main cafeteria, the Union Station Deli, and the End

of the Bridge Restaurant and Pub.

The Department of Student Union and Activities is located in Room 266 of the Union; call 632-6820 for further information.

Hours of Operation

During the Fall and Spring semesters the Stony Brook Union is open Monday through Wednesday, 8 a.m. to 1 a.m.; Thursday, 8 a.m. to 2 a.m.; Friday, 8 a.m. to 3 a.m.; Saturday, 10 a.m. to 3 a.m.; and Sunday, 10 a.m. to 11:30 p.m. During recesses and intersession it is open Monday through Friday, 8 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 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 an 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 the Seawolves Market 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; Polity Print Shop; a ticket office; several lounges; the Eugene Weidman Wellness Center; and administrative offices, including the Dean of Students Suite, Commuter Student Services, Student Activities, Reservations, and Facilities/Operations. Currently, the Student Activities Center is in the process of expanding. By the end of 2001 there will be additional lounges, two large multi-purpose rooms for between 400-700 people, an expanded Wellness Center, an art gallery, and a few more offices for Student Activities program planning.

The Eugene Weidman Wellness Center

The Wellness Center is located on the lower level of the Student Activities Center. Wellness is the integration of body, mind, and spirit—the appreciation that everything done, thought, felt, and believed has an impact on the state of your health. The Wellness Center has a fitness area with aerobic fitness equipment and an adjoining wooden-floored, mirrored dance studio that is used for classes and workshops. The Wellness Center works in conjunction with other campus departments to offer students, faculty, and staff opportunities to develop a healthy lifestyle. To this end the Center offers seminars and hands-on workshops on the dimensions of wellness: physical, emotional, intellectual, environmental, cultural, occupational, spiritual, and social. We also offer classes in Kardio Karate/Kick Boxing, Tai-Chi Ch'uan, Yoga, Full Body Massage, Multi-Cultural Dance, Hawaiian Dance, Body Sculpting, Step Aerobics, and Massage. Please call 632-6850 for class and seminar information.

Student Activities

The Office of Student Activities plans, creates, and supports co-curricular programs on campus. Staff assist with the planning of campus events such as the opening of school activities, Alumni Homecoming Weekend, craft shows, Chillfest, Ultimate Spring Blast, and several others. Student Activities advisors help students with programming, event resources, facilities reservations, and leadership skills. The Office promotes the Senior Leadership Awards, coordinates the selection of the Senior Speaker for Commencement, provides crafts, wellness, and leisure programs, as well as opportunities to become involved with clubs, organizations, and student media. The Activities Office is located on the second floor of the Student Activities Center and can be reached by calling (631) 632-9392.

The Dean of Students Office

Student advocacy, co-curricular development, and counseling are among the main components of this office, located in the Student Activities Center, Suite 131. The Dean oversees Commuter Student Services, Student Activities, and Facilities Operations for the Student Activities Center and Stony Brook Union. The Office is involved with policy development, conflict resolution, fundraising, public relations, special events, award ceremonies, campus outreach, publicity, promotions, and program development.

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 component 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 a.m. to noon and 1 p.m. to 5:30 p.m. during the semester; 8 a.m. to noon and 1 p.m. to 4 p.m. in the summer and intersession. In an emergency, students may use the Emergency Department of University Hospital on a fee-for-service basis. Adequate health insurance is important 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 by appointment.

For students who are not GAs, TAs, or RAs covered by GSEU or Research Foundation insurance, the University strongly recommends a voluntary health insurance plan. Extensive medical assistance not available at the Health Service may cause financial difficulty. Information about insurance is available in the Infirmary Building. For further information call 632-6054.

Study Abroad

The Office of Study Abroad and International Programs administers overseas programs at a variety of international universities. These programs allow graduate sudents from a number of disciplines to study and to conduct research overseas. The Study Abroad Office is working to expand these international programs, many of which are exchange programs that also bring students from other countries to the Stony Brook campus.

For more information, call (631) 632-7030 or visit the office in E5340 Melville Library.

Veterans Affairs

The Veterans Affairs Office, part of the Office of the Vice President for Student Affairs, offers assistance in applying for educational benefits and completing and forwarding forms and supporting documents for eligible veterans and dependents. In addition to serving as liaison between these students and Veterans

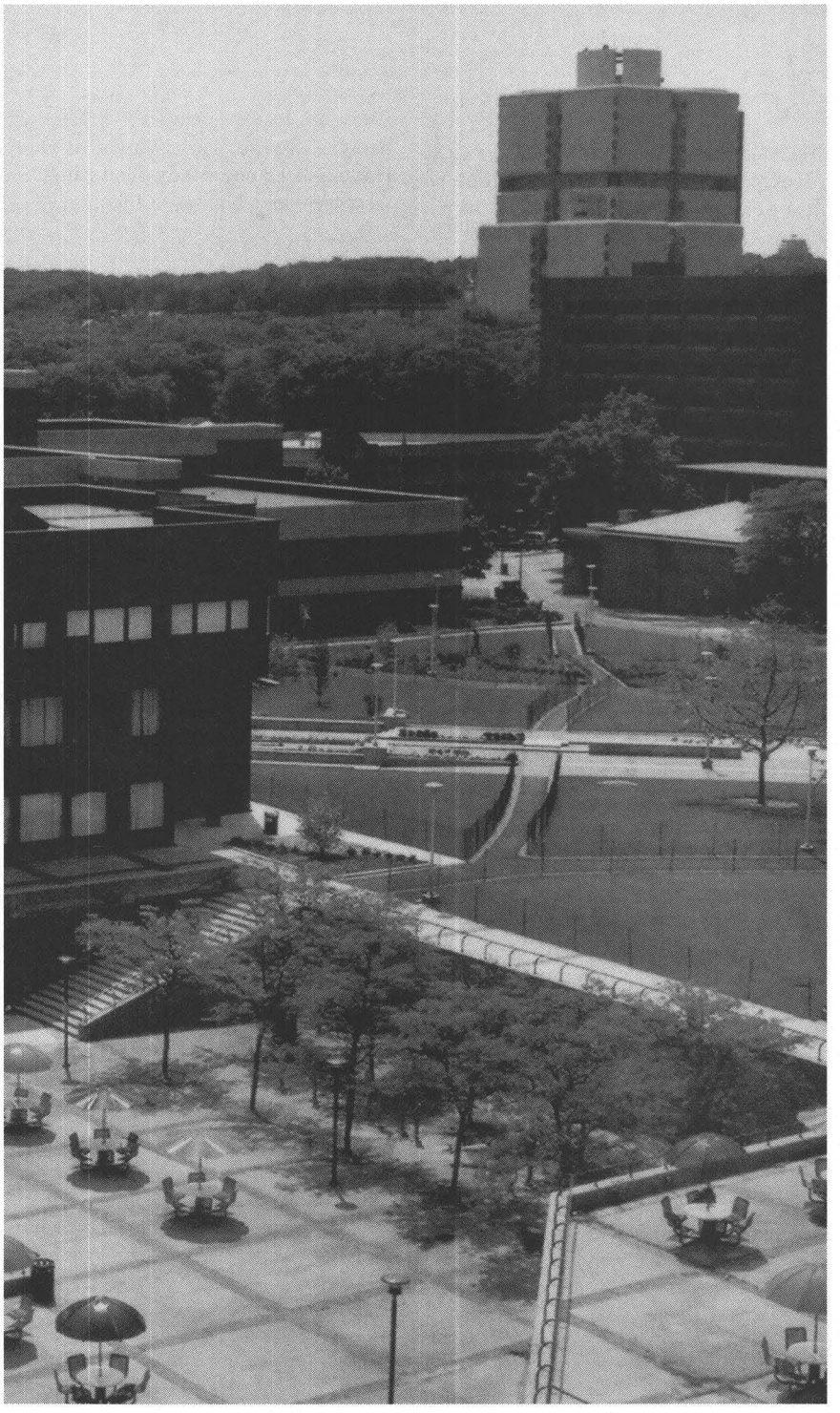
Administration, the office provides certification and tuition deferment services. The office is located in Room 348, Administration Building. For additional information or to make an appointment for one-to-one assistance, please call 632-6700. Please visit the Web site: *http://www.sunysb.edu/stuaff/vets/*.

Writing Center

The Writing Center is a tutoring program that provides free, individual help with writing to all members of the Stony Brook University community. Our clients include both faculty and students, and the writing projects on which we work range from freshman composition essays to post-doctoral grant proposals. Our tutors are trained in all aspects of writing and will address a broad range of writing issues (e.g., getting started, organization, grammar, punctuation, English as a second language, and listening to the finished product, to name a few). Two things we do not do are proofread and copyedit.

The Writing Center offers three types of tutoring sessions: (1) standing appointments (weekly sessions at the same time with the same tutor); (2) short-term appointments (up to two weeks in advance); and (3) drop-in sessions (although we cannot guarantee that a tutor will be available when you drop in). All tutoring sessions are 50 minutes long.

Please call (631) 632-7405 for our current schedule and an appointment. (Appointments are recommended.) We are conveniently located in Humanities 198.



STALLER CENTER FOR THE ARTS

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. All fees and charges are subject to change without notice.

Application Fee $50

Tuition

Full-Time Graduate Students
G1 or G3—12 credits

First Semester	
N.Y. State resident	$2,550.00
Non-resident	4,208.00
Second Semester	
N.Y. State resident	$2,550.00
Non-resident	4,208.00
Academic Year	
N.Y. State resident	$5,100.00
Non-resident	8,416.00

Full-Time Graduate Students
G2 or G4—9 credits

First Semester	
N.Y. State resident	$1,917.00
Non-resident	3,159.00
Second Semester	
N.Y. State resident	$1,917.00
Non-resident	3,159.00
Academic Year	
N.Y. State resident	$3,834.00
Non-resident	6,318.00

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

N.Y. State resident	$213.00 *per semester credit hour*
Non-resident	$351.00 *per semester credit hour*

Full-Time Professional (Medical, Dental) Students

First Semester	
N.Y. State resident	$5,420.00
Non-resident	10,970.00
Second Semester	
N.Y. State resident	$5,420.00
Non-resident	10,970.00
Academic Year	
N.Y. State resident	$10,840.00
Non-resident	21,940.00

Activity Fee

First Semester	
Full-time graduate student (except professional)	$18.50
Part-time graduate student	5.00
Dental student	37.50
Second Semester	
Full-time graduate student (except professional)	$18.50
Part-time graduate student	4.85
Dental student	37.50
Academic Year	
Full-time graduate student (except professional)	$37.00
Part-time graduate student	9.85
Dental student	75.00

Comprehensive Fee

Fall Semester	
Full-time graduate student	$287.50/term
composed of:	
College Fee	12.50/term
Infirmary Fee	75.00/term
Transportation Fee	40.00/term
Technology Fee	100.00/term
Part-time graduate student composed of:	
College Fee	$.85 per credit
Infirmary Fee	7.50 per credit
Transportation Fee	4.00 per credit
Technology Fee	10.00 per credit
Spring Semester	
Full-time graduate student	$287.50/term
composed of:	
College Fee	12.50/term
Infirmary Fee	75.00/term
Transportation Fee	40.00/term
Technology Fee	100.00/term
Part-time graduate student composed of:	
College Fee	.85 per credit
Infirmary Fee	7.50 per credit
Transportation Fee	4.00 per credit
Technology Fee	10.00 per credit

Lost Identification Card	**$10.00**
Late Registration Fee	**$30.00**
Transcript Fee	**$5.00 each**
Returned Check Fee	**$20.00**
Late Payment Fee	**$30.00/up to $90.00**
Add/Drop Fee	**$15.00**
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 Student Accounts 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 SUNY at Stony Brook. 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. If paying by credit card, you may access our Automated Telephone System at (631) 632-1100 (option #4) with a touch-

tone phone to charge tuition and fees to VISA, Mastercard, Discover, and American Express. Any payment 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 University 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 telephone

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 Office of Student Accounts offers the Time Option Payment Plan, which allows for the payment of your student account on a monthly basis throughout the semester or academic year. This plan is not a loan, so there is no credit check, and 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 User's 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 Office of Student Accounts 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 2000
Liability Period from:

Registration Withdrawals during:

	Tuition	Fees
before 9/11/00	0%	0%
9/12/00 - 9/18/00	30%	100%
9/19/00 - 9/25/00	50%	100%
9/26/00 - 10/02/00	70%	100%
after 10/03/00	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 Office of Student Accounts.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

Request to cancel housing and refund-related fees must be made in writing to Division of Campus Residences, Mendelsohn Quad, University at Stony Brook, Stony Brook NY 11794-4444.

Meal Plan

Meal plan refund requests must be made in writing to Faculty Student Association, Stony Brook Union, Room 282, University at Stony Brook, Stony Brook, NY 11794-3209.

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. Students living more than 60 miles away can also 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 letter describing the financial aid programs and amounts for which the student is eligible.

Estimated Student Expenses 2000-2001 (NY State Residents)

	Full time/On campus	Full time/Off Campus
Direct Costs:		
Tuition	$5,100	$5,100
Fees	492	492
Room	4,220	5,040
Board	2,400	2,560
Total Direct Costs:	$12,212	$13,192
Indirect Costs:		
Books	$750	$750
Transportation	500	2,080
Personal	1,000	1,000
Total Indirect Costs:	$2,250	$3,830
Total Cost:	$14,462	$17,022

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

Financial Aid Application Deadlines

Programs	Deadline to Apply
Federal Work Study	March 1*
Summer Federal Work Study	April 1*
Federal Perkins Loan	March 1*
Stafford Loan (Subsidized and Unsubsidized)	April 1
Summer Stafford Loan	April 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.

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 are defined as full tuition scholarships. 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 resi-

dent 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.

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. In fall 1999, a full assistantship had a minimum salary of $10,255 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 assistantships vary by discipline, but usually average $1,000-$1,500 more 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. In Fall 1999 a Graduate Council fellowship carried a stipend of $14,500 plus a full tuition scholarship.

Dorothy Pieper Merit Awards for Outstanding Entering Doctoral Students

Entering doctoral students who were 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 $2,000 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 1999 a Turner fellowship for a doctoral candidate carried a total stipend of $14,500 plus a full tuition scholarship. 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 is 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 a stipend of $4,400 for nine months and 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

National Science Foundation Graduate Fellowships

Fellowships are available in various fields. They are awarded directly by the

National Science Foundation (NSF). Applicants must be citizens or nationals of the United States. The closing date for applications is established by the NSF, usually late November or early December. For further information, write to the Graduate Research Fellowship Program, National Science Foundation, 4201 Wilson Boulevard, Room 907, Arlington, Virginia 22230.

Veterans Educational Benefits

Students who are eligible for veterans benefits should obtain an application form from the Veterans Affairs Office, Room 348, Administration Building, (631) 632-6700. Students are advised to contact the Veterans Affairs Office 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. The FWS coordinator will send students information on availability of positions, hourly wages, and procedures for securing employment.

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 $65,500, including undergraduate loans. The maximum rate of interest charged is 8.25 percent; the current rate is 6.92 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 letters from the Financial Aid Office. 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.

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.

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 left 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

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

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.

Graduate Tuition Waiver Program for Former EOP Students (GW)

The Graduate Tuition Waiver Program for Former EOP Students (GW) provides up to a full waiver of tuition to former EOP, SEEK, College Discovery, or HEOP students who are enrolled as full-time graduate students in a State University of New York graduate or first professional degree program. These waivers are funded by the State University of New York. For information, contact the Office of Financial Aid and Student Employment.

The minimum term award shall not be less than $100; the maximum award shall not exceed the difference between the tuition charge (plus the college fee) and the Tuition Assistance Program (TAP) or other award for tuition only.

Students must provide evidence of previous enrollment in an EOP, SEEK, College Discovery, or HEOP program.

External Support

The Graduate School maintains a database of external fellowship, scholarship, and post-doctoral funding opportunities and periodically provides announcements regarding applications criteria and deadlines. A variety of funding available to graduate students is awarded by non-governmental and non-institutional sources. There are private, public, and industrial scholarships, grants, internships, and loans. Funding is sometimes available for vocational rehabilitation. Also, many foreign governments offer scholarships to their students studying in the United States.

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 p.m. and Tuesday from 10 a.m. to 7 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*).

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

Residential Information

On-Campus Housing

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.

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. Applications will be distributed to all new students by their academic departments shortly after acceptance to the program. Space is limited and room assignments 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

The University Apartments at Stony Brook are composed of two separate apartment complexes: the Harry F. Chapin Apartments and the Arthur A. Schomburg Apartments. These are the only housing units on campus that provide apartment-style living and family housing. All apartments are fully furnished, and selected apartments have been partially adapted to accommodate individuals with a mobility-related impairment.

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. 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.

Schomburg consists of two residential buildings and a separate 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.)

Many of the residents of University apartments are from countries outside the United States. The 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
4. Undergraduate Health Sciences Center students

Apartment Rental Rates

Apartment rentals 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 1999-2000 are as follows (rent is expected to increase 3.5% for 2000-2001).

Chapin Apartments	
Chapin Four-bedroom	$406 per bedroom
Full one-bedroom	$752
Full large one-bedroom	$783
Full two-bedroom	$1,142
Two-bedroom,shared (each bedroom)	$571
Three-bedroom, shared	$265
A or C room shared	$265 per bed
B room shared	$249 per bed
Schomburg Apartments	
Full one-bedroom	$822
Four-bedroom, shared	$379 per bedroom

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 and modems are also available. 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 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 laundry rooms in Chapin, and to the Schomburg office, from which it is distributed to residents' mailboxes by staff.

The Community Center and the 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 Office

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

The common price per month for a furnished room is $250 to $400. 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 $250 to $400 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 $400 to $650 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 $550 to $750 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 the Off-Campus Housing Service, located in room 104 of the Administration Building, or phone (631) 632-6770, Monday-Friday, 10 a.m. to 3 p.m.

Student Health Service

The Student Health Service, located on the first floor of the Infirmary Building, provides for the health needs of registered students. The Walk-In clinic, staffed by board-certified physicians, physician assistants, nurse practitioners, and nurses, offers treatment for a multitude of medical and minor surgical problems. Specialty services such as gynecology and dermatology are also available by appointment. Services at the Student Health Service are available throughout the year. All information is confidential.

The Health Service hours are Monday-Friday, 8 a.m.-noon and 1 p.m.-5:30 p.m. during the semester; 8 a.m.-noon and 1 p.m.-4 p.m. in the summer and intersession. In an emergency, students may use the Emergency Department of University Hospital on a fee-for-service basis. Adequate health insurance is important to help pay for such services. For more information, call the Student Health Service at (631) 632-6740.

Included in the graduate student comprehensive fee there is a mandatory component 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. A summer fee is charged to those registering for classes, an 800 course, or zero credits. A mandatory health and history form is required for full-time students before registering for classes in conjunction with a requirement of proof of immunization for measles, mumps, and rubella.

Student Health Insurance

There are three health insurance plans available to graduate students depending on employment and citizenship status. The Student Health Insurance Plan is available to U.S. citizens and permanent residents, both part- and full-time students. The International Student and Scholar Health Insurance Plan is mandatory for all students on non-immigrant visas, both part- and full-time. The Graduate Student Employee Union and Research Foundation Graduate Student Employee Health Plans are available for eligible students employed on teaching assistantships, graduate assistantships, and research assistantships.

Student Health Insurance Plan

This optional plan is tailored to the needs of Stony Brook students, both part- and full-time, U.S. citizens, or permanent residents. The plan covers a broad range of medical services, both on

and off campus, including hospitalization, physician visits, X-rays, diagnostic testing, surgery, emergency room, etc. Students select their own medical providers. Costs for 1999-2000 were $633, annual for students; costs for dependents ranged from $462-$2,695, 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 on August 16 or mid-January. Delayed payment may be made through educational loans/grants or on the Time Option Payment Plan, but enrollments must be made in a timely fashion. Complete information and enrollment materials are available at the Student Health Insurance Office, which is in the Student Health Service Building (West Campus); phone (631) 632-6054, Monday-Friday, 9 a.m.-4:30 p.m. (Benefits and premium costs are subject to change each year. Estimated premiums for 2000-01 are not available at this time.)

Graduate Student Employee Plans

Graduate student employees [teaching assistants (TAs) and graduate assistants (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 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 this health insurance plan, eligible RAs, GAs, and TAs must complete an enrollment form within 30 days of the 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. Waivers cannot be granted, even with a valid reason, after the end of the second week of classes. Waiver deadlines are strictly enforced and waivers must be applied for at the beginning of each academic year. Call the Student Health Insurance Office for more information, (631) 632-6376.

Eligible graduate student employees (TAs, GAs, and RAs) have insurance coverage through their employment provided they enroll in those plans. F-1 TAs and GAs must take the employee insurance. F-1 RAs may choose but must take either the employee or international student insurance. F-1 TAs, GAs, and RAs all must take the medical evacuation and repatriation coverage through the international student policy (1999-2000 cost was $45). J-1 stipend students must take the international student insurance policy, as the other policies do not meet Federal regulations; the cost of the international 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 stipend students must apply for a waiver from the mandatory international student insurance in order to remove the charge. Non-immigrant 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 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 $3,000 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 $4,000 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 vendor, but 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 1999-2000 was $504 for the academic year (August 15, 1999-

August 15, 2000). Fall semester only (August 15-January 15) was $210. Spring/Summer (January 15-August 15) was $294. Summer only (May 15-August 15) was $126. (Charges and coverage are subject to change each academic year. The estimates for 2000-01 are not available at this time.)

Other Expenses

Food

The University, through a food service contractor, provides several meal plan options. Resident students living in a meal plan building are required to be on one of the Resident Meal Plans. The cost of a Resident Meal Plan averages $1,200 per semester. Resident students who do not live in a meal plan building are required to pay a cooking fee of $208 per semester.

Commuter students or those Resident Students not living in a meal plan building may sign up for a Budget Meal Plan. This is a pre-paid, tax-exempt plan that may be opened with a minimum of $50.

For your convenience, there are a number of places to eat close to the Academic Buildings. The Student Activities Center Food Court is right in the center of the Academic Mall. Next to the Administration building, on the first floor of the Humanities Building, is the Humanities Café. A short walk from the Engineering Buildings, the Javits Center, the Computer Science Building, and the Life Sciences Building is Roth Food Court. And right on Center Drive is the Stony Brook Union, which houses the Deli, Stony Snacks, the Bleacher Club, Papa Joes, and, on the second floor, the End of the Bridge Restaurant.

There are three food service facilities located right in the Residence Quads. Close to Tabler and Roth Quads is the previously mentioned Roth Food Court; close to Roosevelt and Kelly Quads is Kelly Cafeteria; and close to Mendelsohn and H Quads is Campus Connection at H Quad.

Please refer to the Meal Plan Brochure for information on current meal plan and dining options. Visit our Web site at www.sunysb.edu/fsa/, or call the ID /Meal Plan Office at (631) 632-6517.

Travel

For a student residing on campus for nine months, the average estimated travel expense is $500. For a student residing off campus, the average estimated cost is $1,607 for a comparable period of time.

Admission to Graduate Study

Requirements for Admission

Applicants may be admitted to the Graduate School to pursue the advanced graduate certificate, the Master of Arts, Master of Business Administration, Master of Fine Arts, Master of Music, Master of Science, Doctor of Arts, Doctor of Musical Arts, or Doctor of Philosophy degree in a specific program. To be considered for admission by a graduate program, all students must complete and submit the following:

A. An official graduate application form.

B. Three letters of recommendation.

C. 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 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. Scores from the Graduate Record Examination (GRE) General Test (some programs also require an advanced area test).

E. A nonrefundable application fee of $50.

F. Proficiency in English for foreign students. A TOEFL score of 550 or its equivalent is required for a student whose first or native language is not English.

All accepted students are required by New York State law to file a completed health history and physical examination form 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.

To be admitted to the Graduate School an applicant must have the preparation and ability which, in the judgment of the program and the Graduate School, are sufficient to enable her or him to progress satisfactorily in the degree program in which a degree is sought. A U.S. equivalent bachelor's degree is required (for example, a four-year/120-credit hour) with a minimum overall grade point average of 2.75 on a 4.0 scale; the student must present evidence that such a degree will be awarded by the time he or she begins graduate work.

The undergraduate major will ordinarily be in a field related to the chosen field of graduate study with an average grade of B in coursework in the major and related areas.

Early application is suggested for students seeking financial support. 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 on a rolling basis. All documents should be on file by January 15 for Fall semester admission and by October 1 for Spring semester admission. Late applications will be accepted but will be considered only by programs where openings still exist.

Application materials may be obtained by contacting the appropriate program or printing the forms and instructions from the Web site at *www.grad.sunysb.edu.*

Waiver of Application Fee

All applicants are required to pay the application fee except:

A. Those students who reapply for admission within one academic year.

B. Those students who are U.S. citizens and have current documentation from a financial aid administrator or other appropriate college or university official substantiating that they are currently enrolled and that the payment of the application fee 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.

C. Currently enrolled students in a U.S. institution with an exceptionally high overall GPA may also be eligible for a waiver. To qualify a student must have an overall undergraduate GPA of 3.75 or better from a U.S. institution and must currently be enrolled as an undergraduate. The waiver request must be submitted with the application for admission, which must include official copies of all transcripts.

The Admission Process

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. All application materials should be sent to the program to which a student is applying.

Should a student wish to change programs following admission, he or she should contact the Graduate School to be advised on the procedure for doing so. International students currently enrolled at Stony Brook who desire to change their program must obtain approval of the International Student Advisor. For further instructions, contact the Graduate School.

If a student wishes to add a secondary program to their primary program of study, they must apply to the secondary program by submitting an application. They may only be accepted into a secondary program through a letter of offer from the department/program. Studying in a secondary program requires approval of the primary program, and final approval rests with the Graduate School. In addition, international students are required to obtain the permission of a foreign student advisor.

An offer of admission to graduate study at Stony Brook is for a specific semester. If, for good reason, the applicant is unable to enroll for the semester specified, he or she should request a deferment of admission from his or her primary department or program. If the request is granted by the program, the student will be sent a new offer of admission for the subsequent semester and the Graduate School will be notified accordingly. A student who does not enroll within 12 months of the first day of classes of the semester of the original offer of admission must submit a new application and a new application 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.

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 sending a written request to the major program. If the program approves the request, the readmission form is completed and approved by the program and submitted to the Graduate School. International students must have all leaves of absence approved by an International Student Advisor before submission to the Graduate School.

International students must also submit a new financial affidavit and be cleared by the International Student Advisor before the readmission process can be concluded. Students returning from withdrawn status must submit a $50 readmission fee, as well as a statement outlining their activities during the time they were not in attendance at Stony Brook. The program or the Graduate School may set specific requirements to be fulfilled by the readmitted student during the first year of readmission.

Conditional Admission

In exceptional cases where certain admission requirements are not met or the undergraduate preparation is inadequate, an applicant, if considered to have a reasonable probability of making satisfactory progress in graduate studies, may be admitted conditionally, and will be considered on probation. Program recommendation and Graduate School approval are required for conditional admission.

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

Graduate Record Examination

The Graduate Record Examination (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. Students who have taken the GRE should request the Educational Testing Service to forward their scores directly to the Graduate School (the Stony Brook code is 2548). Students who are admitted conditionally without the GRE must take the examination on the first testing date during the first semester of registration at Stony Brook. Failure to take the examination will prevent the student from registering for the next term. Scores must be received by the Graduate School before registration for the next semester.

For information concerning this examination, write to the Educational Testing Service, Princeton, New Jersey 08540, or P.O. Box 27896, Los Angeles, California 90027. Applications for the GRE are available in the Career Development Office, W-0550 Melville Library, or on the following Web site: *http://www.ets.org*. For computer-based testing, call 1-800-GRE-CALL.

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 for admission to the University as a non-matriculated graduate student. Such students may enroll in graduate courses through the School of Professional Development as non-degree students. Enrollment is limited to those courses for which the student can obtain permission from the instructor to register, taking into consideration the student's background and course enrollment limitations. If a non-degree student later wishes to pursue a graduate degree, this student will need to make a formal application for admission to the Graduate School and a degree program. For those students who are admitted into degree programs, a maximum of 12 graduate credits from non-degree graduate status can be transferred to matriculated graduate degree status at Stony Brook.

Transfer of Credit

Provided that they have not been used toward the satisfaction of any degree requirements here or at another institution, a combined maximum of 12 graduate credits may be transferred to the University at Stony Brook with the approval of the program and the Graduate School.

Transfer from Non-Matriculated Status

Students transferring from non-matriculated status are limited to a maximum of 12 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 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 her or his master's degree requirements. These credits must be from an institution that is authorized to grant graduate degrees by recognized accredited commissions. 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. Credits must clearly be graduate level. 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 actually B or better. Grades earned in transferred courses are not counted as part of the overall grade point average at Stony Brook. Work from one master's degree is not transferable to a second master's degree. A candidate for the doctoral degree may transfer those graduate credits that are allowed by the appropriate departmental committee.

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.

Admission of Undergraduates to Graduate Courses

Undergraduates of exceptional ability may be admitted to graduate courses upon request of the graduate program director and of the instructor to the dean of the Graduate School. Graduate courses taken while an undergraduate remain part of the undergraduate record, except for students in approved, combined five-year bachelor's/master's programs or for those who have already been accepted for graduate study at Stony Brook. Undergraduate students who have been admitted to the Graduate School at Stony Brook may request to apply a maximum of six graduate credits toward the graduate degree for courses taken after admis-

sion to the Graduate School. Credits approved for a graduate degree may not also be applied to the undergradate degree, except for students in an approved, combined bachelor's/master's program.

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 further information, please contact the specific department or program of interest.

Academic Level

Full-Time Students

Students admitted for full-time study to the Graduate School will usually register for either 9 or 12 or more credit hours per semester based on their academic level (see next paragraph). Responsibility for certifying the full-time status of graduate students rests with the Office of Records/Registrar. A graduate traineeship is considered part of the academic program; a student holding such an appointment will be expected to participate in supervised teaching and research. Students holding such appointments may be required to register for a teaching or research course as part of the required full-time registration.

Incoming full-time graduate students are classified as either G1, G2, G3, or G4 depending on the program to which they have been admitted and their previous graduate training. If a student has earned less than 24 graduate credits at another institution before being admitted, he or she will be classified as G1 in a master's program or G3 in a doctoral program. If a student has earned more than 24 graduate credits at another institution before being admitted, he or she will be classified as G2 in a master's program or G4 in a doctoral program. Students classified as G1 or G3 need to register for 12 or more credits per semester to maintain their full-time status. Students classified as G2 or G4 need only register for 9 credits to maintain full-time status. Once a G1 or G3 student has completed 24 credits of coursework (generally two semesters) at Stony Brook, his or her academic level is changed to G2 or G4, respectively. Students who complete the necessary requirements for the doctoral degree except for the writing of the dissertation are classified as G5 upon advancement to candidacy. G5 students should only register for one credit of dissertation research and will 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. If a student earned less than 24 graduate credits at another institution before being admitted, he or she will be classified as G1 in a master's program or G3 in a doctoral program. If a student has earned more than 24 credits before being admitted, he or she will be classified as G2 in a master's program or G4 in a doctoral program. Once a G1 or G3 student has completed 24 credits of coursework at Stony Brook, his or her academic level is changed to G2 or G4, respectively. Students who complete the necessary requirements for the doctoral degree except for the writing of the dissertation are classified as G5 upon advancement to candidacy. G5 students should only register for one credit of dissertation research and may be considered full-time.

International Students

English Proficiency

Students are expected to read, write, and speak English and comprehend the spoken language. Applicants whose first or native language is not English must demonstrate proficiency in English prior to matriculation. To be considered for admission an applicant must present a score of at least 550 (paper)/213 (computer) on the Test of English as a Foreign Language (TOEFL). Doctoral and master's students who wish to be considered for a teaching assistantship must have a TSE or SPEAK score of 55. These tests are given at centers throughout the world several times each year. Further information is available by contacting the Education Testing Service, Princeton, New Jersey 08540, USA, or the ETS Web site at *http://www.toefl.org*.

Admission to the Graduate School is contingent upon satisfactory fulfillment of the English proficiency requirement. Students who fail to meet the requirement cannot be admitted and must attend a session at the Intensive English Center and achieve satisfactory grades before they can be admitted to graduate study. Depending on his or her performance in the Intensive English Center and on the SPEAK test, the student will be either cleared or assigned to an ESL (English as Second Language) course. The cost of the SPEAK test is approximately the same as the TSE. In addition, all non-native English speakers will be required to pass a test of spoken English before being assigned to classroom instruction.

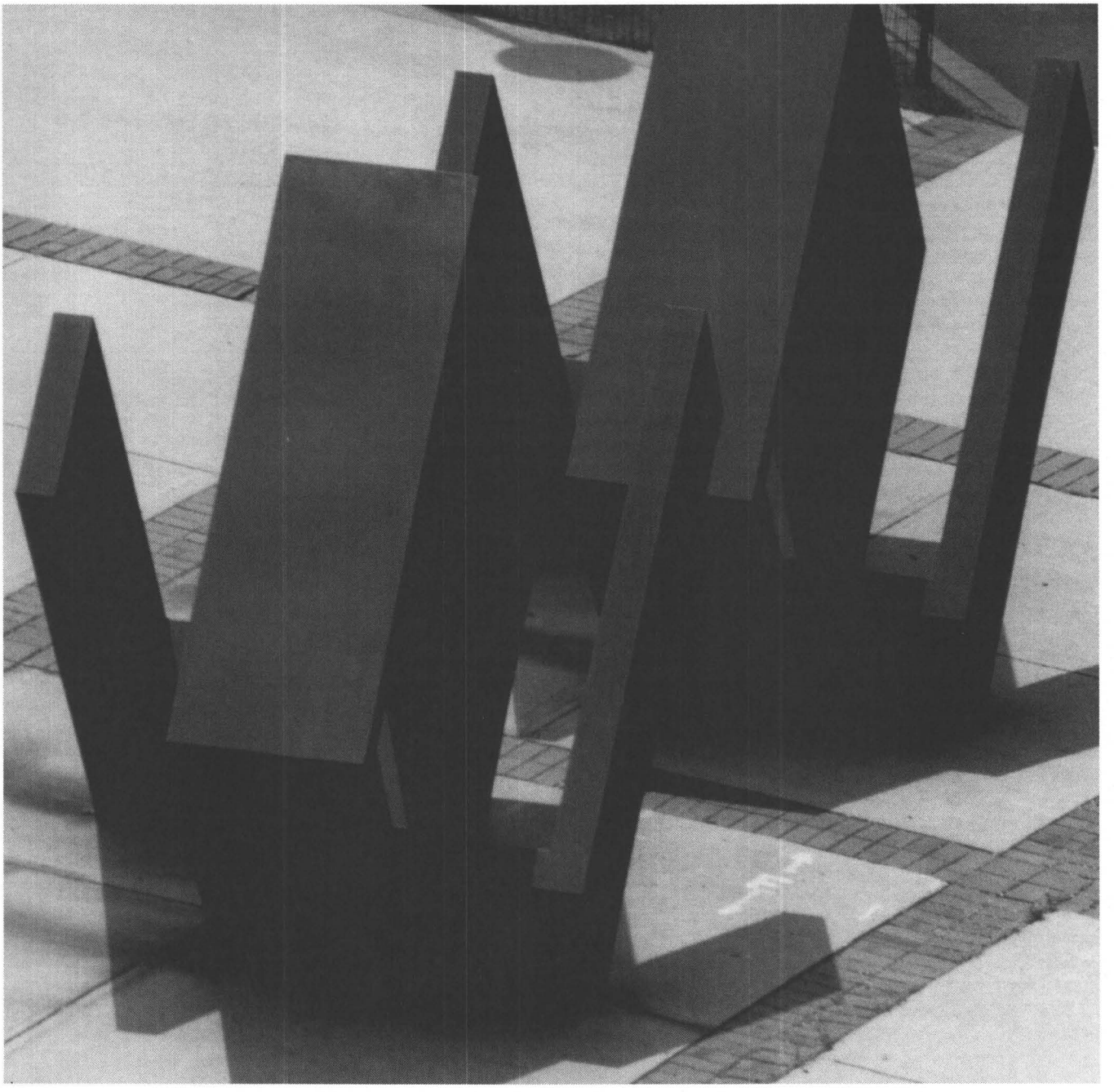
Financial Verification

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 SUSB 103R2 must be submitted for this purpose before immigration documents will be sent to the admitted students. (The form SUSB 103R2 is also available on the Web 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, but only if a student can show that he or she has reported to the original institution and then only with the appropriate clearance from the institutions concerned. International students on student visas must register as full-time students and maintain status according to U.S. regulations. Students are urged to contact International Student Services for complete information.

Academic Regulations and Procedures



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 stay abreast 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 the provost, ex officio; the dean of the Graduate School; two faculty members elected by the University Senate from each of the following groups: Arts and Humanities, Natural Sciences, Engineering Sciences, Social Sciences, Health Sciences; a member from the School of Professional Development; one faculty member of the library elected by the library faculty; one member elected by west campus non-teaching professionals; and two graduate student representatives 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 program committee on graduate students and 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.

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

Registration

All students who are enrolled in the Graduate School in any program and who have not been granted a leave of absence by the dean of the Graduate School must register each fall and spring for at least one graduate credit until all degree requirements have been met. Students who do not maintain matriculation will be considered to have withdrawn from the University. 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. Programs or individual faculty members do not have authority to waive these rules.

A student is not considered to be 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. All graduate students, whether in residence or in absentia, must maintain matriculated status by completing their registration during the regular times designated by the Office of Records/Registrar for graduate student registration. Students failing to register during the advance registration or final registration period may still register during the first 15 days of the semester, but will be charged a late registration fee of $30. Registration is not permitted after the end of the 15th day of classes. Students are responsible for making sure that they are registered on time. No exceptions will be made for late registration.

Course and Credit Enrollment

The majority of credits taken during any semester must apply towards a student's primary degree program. 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 go towards degree requirements in the program providing the scholarship. This means that a student who has a tuition scholarship for nine credits from their primary program must take nine credits of courses that apply to their primary program—not their secondary program—for each semester covered by the scholarship. If a student with a nine-credit tuition scholarship from their primary program wishes to take a course in his or her secondary program, it must be in addition to the nine credits already taken toward their primary program during the same semester. Failure to comply with these guidelines will result in the tuition scholarship being rescinded for that semester.

Maintaining Matriculated Status

All candidates for degrees register for at least one credit in thesis or dissertation research each semester (or summer term if they plan to graduate in August). This applies to all students except those who have been granted a leave of absence by the dean of the Graduate School.

To be eligible to receive a degree, a student must maintain matriculation for each semester prior to and including 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.

Course Changes

Graduate students may add or register for classes through day 15 of classes. Graduate students may drop classes through day 10 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. 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 $15 fee is paid.

Leave of Absence

Leaves may be granted for a maximum of one year at a time, renewable upon request for the second year. A student on academic probation may be granted a leave of absence only if he or she recognizes that re-enrollment is subject to conditions imposed by the Graduate School and her or his program. These conditions will be specified in writing at the time the leave is approved. The semesters in which a student is on an approved leave of absence do not count in the calculation of the time limit for the degree. In order to request a leave, the student must be registered or must have been registered for the preceding semester. Requests for leaves of absence should be made on the Request for a Leave of Absence Form (SUSB 1341) and submitted to the graduate program director. If the graduate program director approves the request for leave, approval is recommended to the dean of the Graduate School.

Military leave of absence will be granted for the duration of obligated service to students in good standing.

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

A student finding it necessary to withdraw from the University must submit a petition. Petitions are available in the program offices as well as in the Graduate School. This form must be approved by the appropriate offices indicated on the form and by the Graduate School. The effective date of withdrawal is the date upon which the completed withdrawal form is returned to the Office of Records/Registrar. The process of withdrawing from the University is a formal procedure which the student has the responsibility to initiate. Students may withdraw from the University up to the last day of classes; however, financial liability to the University still remains.

Students are urged to discuss all withdrawals with their graduate program director and with their academic advisor before such an action is taken. International students must discuss withdrawals with the international students advisor before such action is taken as it 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 his or her prospects of readmission to the Graduate School. Such students will be reported as having failed all courses.

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 who are 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 one year (12 months, two semesters) before the beginning of the semester in which they plan to defend their dissertation.

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, he or she should obtain an application from the director of her or his program 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 prerequisites for the courses 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. It should 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 the courses, the host institution will, on request, send a transcript to the University at Stony Brook.

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.

In addition, the following marks may be awarded at the end of the semester:

I (Incomplete): This is an interim grade. It may be 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 prepare 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 professors to establish how far in advance of the deadline work must be completed. If final grades are not reported to the Office of Records/Registrar by the specified dates, the grade of I will automatically be changed to I/F.

An instructor, at his or her discretion, may request an extension of the original Incomplete by written notification to the Registrar before the first day of classes. This request should be sent to the Office of Records/Registrar. 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, and will only be approved by the dean of the Graduate School for extraordinary reasons.

S (Satisfactory): 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 impracticable. S/U grades are not calculated as part of a student's cumulative or semester GPA. S/U graded courses will not affect overall cumulative average nor academic probation. This grade is not entered into GPA calculations.

U (Unsatisfactory): Indicates unsatisfactory work in those courses so designated by the program and approved by the Graduate Council, where the normal mode of evaluation is impracticable. This grade is not entered into GPA calculations.

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

R (Registered): Indicates attendance during the first semester in a yearlong course, the final grade for which will be assigned only 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 (whenever it turns out to have appeared as a result of an error in recording the registration information submitted by the student), or to the assignment of a grade.

Each student's permanent academic record must reflect a final grade or a withdrawal grade for each course in which he or she was 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. The entry of an I or no grade at all will automatically be calculated into the GPA as F until properly changed to a letter grade.

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 local (graduation) GPA. Probation will be imposed based on this local GPA. A student's official transcript will show all grades received, and the cumulative GPA also will reflect all grades. This option does not apply to variable or repetitive courses. Also, a passing grade earned for a course that was failed and retaken may be submitted unofficially for the F in calculating the local GPA. This option may be exercised for one F grade only.

Change of Grade

Grades appearing on a student's academic record may not be changed after one calendar year from the start of the 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 his or her graduation cannot be changed to any other grade subsequent to the graduation date. Grade changes that involve changing one grade to another, changing incomplete to a letter grade after the first day of classes, or changing 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 courses audited.

Academic Probation

When a student's cumulative graduate grade point average 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 graduate average 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. 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.

Programs may have additional requirements, and failure to meet them can result in academic probation. These are specified in program literature.

At the request of the new program, the record of a student who has changed her or his registered area of graduate studies may be treated as two separate records. 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.

A student enrolled part time who has accumulated six semester credits with a cumulative average below 3.0 will have two semesters or six credits (whichever is longer) to bring her or his cumulative GPA to 3.0.

A grade of "I" or "blank" is calculated as an "F" in determining eligibility for academic probation. This modification treats the grades in the same manner as they are dealt with on the undergraduate record. It creates an "eligible for notice" note on the grade report and will be used in the probation cycle.

Standards of Academic Conduct

The University expects all its 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 its 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 the appropriate authorities of the University. Students, in accepting admission, indicate their willingness to subscribe to and be governed by these rules and regulations and 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 can be found at *www.grad.sunysb.edu.*

Appeals and Grievance Procedures

A variety of appeals and grievance procedures are available at the University. These complement other means to address and resolve concerns of graduate students, such as the Graduate Student Organization, GSEU, the grad-

uate 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 first 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.

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 T-507, "Family Educational Rights and Privacy Act," contained in the Policy Manual of the University. 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 transcripts of their academic records at Stony Brook forwarded to another institution or agency, or to themselves for their own use, must submit their requests in writing at least two weeks before the transcripts are needed, except at the end-of-semester peak period when additional time should be allowed. If making requests by mail, address a letter to the Transcript Department, SUNY Stony Brook, P.O. Box 619, Stony Brook, NY 11790. Include (1) full name; (2) ID (social security) number; (3) complete current address; (4) dates of attendance at Stony Brook; (5) the exact name, office, institution, and complete address, including zip code, to which the transcript is to be sent; and (6) the required fee of $5 for each transcript. Make checks payable to SUNY at Stony Brook. If making the request in person, obtain a Transcript Request Form from the Office of Records/ Registrar in the Administration Building and follow the instructions on the form.

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 himself or herself, and must be made in writing. Students who have both an undergraduate and a graduate transcript and wish only one of them be sent should specify in their request. Partial transcripts of either the undergraduate or graduate academic records are not issued. When satisfying financial obligations, cash, bank check, or money order is accepted. Personal checks will take two weeks to clear before release of transcripts.

Equivalent Opportunity/ Religious Absences

Some students may be unable to attend classes on certain days because of religious beliefs. Section 224-a of the Educational Law provides that:

1. 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.

2. Any student in an institution of higher education who is unable, because of religious beliefs, to attend classes on a particular day or days shall, because of such absence on the particular day or days, be excused from any examination or any study or work requirements.

3. 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.

4. If classes, examinations, study, or work requirements are held on Friday after 4 p.m. or on 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.

5. 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.

6. Any student who is aggrieved by the alleged failure of any faculty or administrative officials 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.

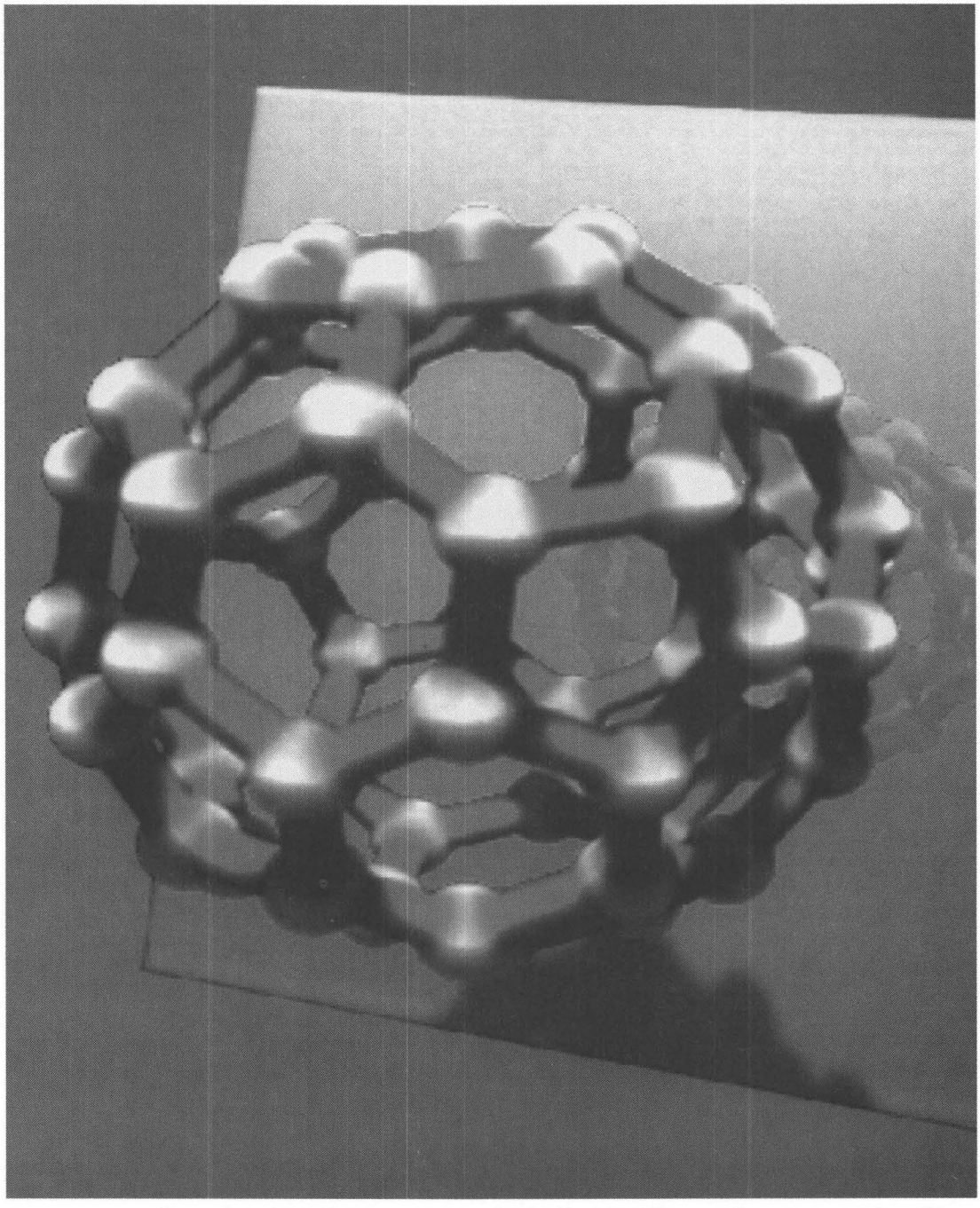
7. As used in this section, the term "institution of higher education" shall mean schools under the control of the Board of Trustees of the State University of New York, the Board of Higher Education of the City of New York, or any community college.

Academic Calendar

The State University at Stony Brook 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



A computer-generated image of a buckyball (C_{60}) created by doctoral student Frank Dachille as part of a graduate course in graphics.

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 significantly different too. We naturally expect 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 we expect graduate students 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. We demand the highest level of scholarly ethics from all members of our 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 if he or she lacks an appreciation of these values and a dedication to upholding them.

The degree requirements listed in this Bulletin are correct as of the press date, and apply to graduate students first matriculating in the academic years 2000-2001. The requirements in this section are the minimal ones mandated by the Graduate School; additional requirements may be set by the individual graduate programs. 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

The degrees of 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 considered to be strictly 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 communicate effectively with one's peers. As with all graduate degrees, appreciation of the ethical questions and adherence to the highest ethical standards of the discipline are required. The student's skills as a practitioner may be demonstrated by a variety of means, such as a comprehensive examination, a thesis, a colloquium, or a recital.

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 grade point average 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 studies may be treated as two separate records for the purposes of meeting degree requirements. The GPA for a new area of graduate studies may be calculated unofficially from the beginning of the semester in which the change became effective.

B. Language Proficiency

Although the Graduate School itself does not require proficiency in a foreign language for the master's degree, programs have 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 will take can be expected to differ by discipline. It might include making 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 from the Graduate School. Stony Brook does not allow multiple authorship of a thesis or dissertation.

E. Degree Application

Students must submit signed degree cards to the Graduate School 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 program granting their degree for at least one graduate credit in the semester in which the diploma is awarded.

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

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. 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 Arts in Liberal Studies Degree

This is a terminal, non-research degree offered by the School for Professional (SPD). Please 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 within his or her chosen field and has mastered an area of specialization, 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, and it should be presented with a 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 breadth and depth of the candidate's knowledge beyond the confines of his or her own research are 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. Other requirements may be set by the individual programs.

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 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 beginning of the semester in which the change became 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 the 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 or 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. A second repeat must be approved by the dean of the Graduate School.

D. Advancement to Candidacy

The 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 advance to candidacy one year (12 months, 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 from the Graduate School. Stony Brook does not allow multiple authorship of a dissertation.

F. 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.

G. Dissertation Defense

Examination of the dissertation involves a formal oral defense. It 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. The examination that follows the public defense may be either open to the public or closed, at the discretion of the Dissertation Examining Committee.

Approval of the dissertation defense will be indicated by the dissertation committee signatures on a committee approval form, which appears on page *ii* of the dissertation manuscript.

H. Teaching

At least one semester of practicum in teaching under supervision is required. The form this practicum will take can be expected to differ by discipline. It might include making seminar or class presentations, assisting in laboratories, or leading discussion sections. 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 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. Owing to the difference in the means by which this requirement can be satisfactorily met, program residence requirements may vary from the Graduate School norm and are described in the individual program requirements for the degree; the Graduate School regulation pertains unless otherwise specified.

J. Degree Application

The student must submit signed degree cards to the Graduate School in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

K. 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.

L. Registration

Degree candidates must be registered for at least one graduate credit in the semester in which the diploma is awarded.

M. Time Limit

The candidate must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses in the University of Stony Brook program in which he or she is to receive the degree. 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 a 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 listed 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 grade point average 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 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, with his or her major and minor advisors, a reading list to cover his or her individual specialties. This list must be submitted and approved one semester prior to taking the comprehensive examination.

G. Advancement to Candidacy
A student may be advanced to candidacy when 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 advance to candidacy one year (12 months, 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 from the Graduate School. The University at Stony Brook does not allow multiple authorship of a dissertation.

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.

Approval of the dissertation will be indicated by the doctoral committee signatures on a committee approval form, which appears on page ii of the dissertation manuscript.

J. 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. Owing to the difference in the means by which this requirement can be satisfactorily met, program residence requirements may vary from the Graduate School norm and are described in the individual program requirements for the degree; the Graduate School regulation pertains unless otherwise specified.

K. Degree Application
Students must submit signed degree cards to the Graduate School in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

L. 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.

M. Registration
Degree candidates must be registered for at least one graduate credit in the semester in which the diploma is awarded.

N. Time Limit
The candidate must satisfy all requirements for the D.A. degree within seven years after completing 24 credit hours of graduate courses in the University at Stony Brook program in which he or she is to receive the degree. 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. Courses 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 grade point average 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 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 itself 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.

D. Advancement to Candidacy
The student may be advanced to candidacy when all Graduate School and program requirements for the degree other than the doctoral recital 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 advance to candidacy one year (12 months, two semesters) before the beginning of the semester in which they plan to defend their dissertation.

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 official copy of the program and the doctoral examination prospectus 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 will take can be expected to differ by discipline. It might include making 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.

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. Owing to the difference in the means by which this requirement can be satisfactorily met, program residence requirements may vary from the Graduate School norm and are described in the individual program requirements for the degree; the Graduate School regulation pertains unless otherwise specified.

H. Degree Application
The student must submit signed degree cards to the Graduate School in accordance with published deadlines. If degree requirements are not met, students must reapply for any subsequent awarding periods.

I. 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.

J. Registration
Degree candidates must be registered for at least one graduate credit in the semester in which the diploma is awarded.

K. Time Limit
The candidate must satisfy all requirements for the D.M.A. degree within seven years after completing 24 credit hours of graduate courses in the University at Stony Brook graduate program in which he or she is to receive the degree. 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. It implies educational achievements well beyond those required for a regular master's degree, and its normal use will be to provide a qualification to students who have gone beyond the preliminary examination but for some reason have not been able to complete a Ph.D.

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., with two exceptions: submission and defense of the dissertation are not required and the time limit does not apply.

The M.Phil. is normally reserved for students who have advanced to candidacy in a Ph.D. program but are unable to complete the remaining requirements. Students must be advanced to candidacy for one full year before receiving an M.Phil.

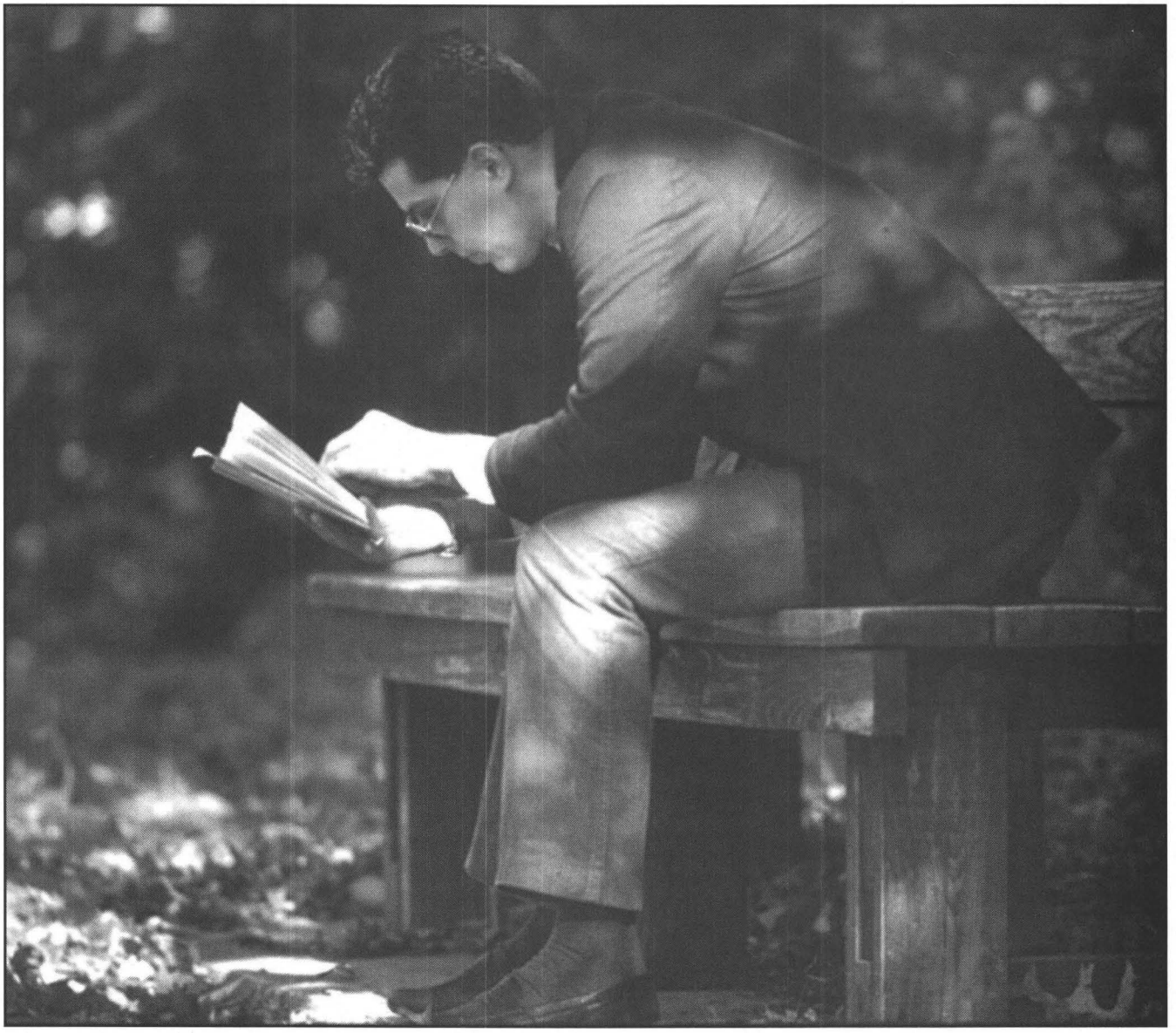
Award of Degree

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. Formal investiture, 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 titled Maintaining Matriculated Status, elsewhere in this Bulletin.

Waiver of Regulations

Specified requirements may be waived by the dean of the Graduate School in individual instances. A petition for such a waiver must be endorsed by the graduate program director, who shall append his or her reasons for believing that the 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

Stony Brook offers graduate degrees through a number of departments and programs. Graduate curricula at Stony Brook are grouped into two categories: *Program* refers to a graduate degree program approved and registered with the central administration of the State University of New York and the State Education Department. All graduate degrees are awarded in the name of the program. *Concentration* refers to the curriculum within the graduate program organized to focus on an area of special interest.

This list indicates the degrees offered by each program as well as the various concentrations possible within each degree program.

Note: 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.

Graduate Programs (Codes)	Concentrations/Graduate Studies
Anatomical Sciences (HBA)	
Ph.D. in Anatomical Sciences	
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*
Art (ARH, ARS)	
M.A. and Ph.D. in Art History and Criticism	
M.F.A. in Studio Art	
Ph.D. in Art History and Criticism	
Biochemistry and Structural Biology (BSB)	
Ph.D. in Biochemistry and Structural Biology	
Business Administration (BUS)	
M.B.A. and Executive M.B.A. in Technology Management	
Biomedical Engineering (BME)	
M.S. and Ph.D. in Biomedical Engineering	
Cellular and Developmental Biology (BCD)	
Ph.D. in Cellular and Developmental Biology	
Chemistry (CHE, TCH)	
M.A.T. in Chemistry 7-12	
M.S. in Chemistry	
Ph.D. in Chemistry	*Chemical Biology* *Chemical Physics* *Chemistry*
Coaching (GSP/CCH)	
Advanced Graduate Certificate in Coaching	
Comparative Literature (CLG)	
M.A. and Ph.D. in English	*Comparative Literature*
Computer Science (CSE)	
M.S. and Ph.D. in Computer Science	
Dental Medicine	
Advanced Graduate Certificate in Dental Medicine	*General Dentistry* *Orthodontics* *Periodontics*
D.D.S. in Dentistry	*Children's Dentistry* *Dental Health* *Oral and Maxillofacial Surgery* *Periodontics* *Restorative Dentistry*
Earth and Space Sciences (AST, ESS, GEO, GEO/HYDRO, TES)	
M.A.T. in Earth Science 7-12	
M.S. and Ph.D. in Earth Astronomy and Space Sciences	*Astronomy* *Astrophysics* *Planetary Sciences* *Geological Sciences* *Geophysics-Tectonics* *Hydrogeology* *Igneous and Metamorphic Petrology* *Isotopic and Experimental Geochemistry* *Sedimentary Geology and Low-Temperature Geochemistry*
Ecology and Evolution (BEE, BIO)	
M.A. in Biological Sciences	*Applied Ecology*
Ph.D. in Ecology and Evolution	
Economics (ECO)	
M.A. and Ph.D. in Economics	
Educational Computing	
Advanced Graduate Certificate in Educational Computing	
Electrical and Computer Engineering (ESE)	
M.S. and Ph.D. in Electrical Engineering	
English (EGL, TEN)	
M.A.T. in English 7-12	Creative Writing
M.A. and Ph.D. in English	Literature

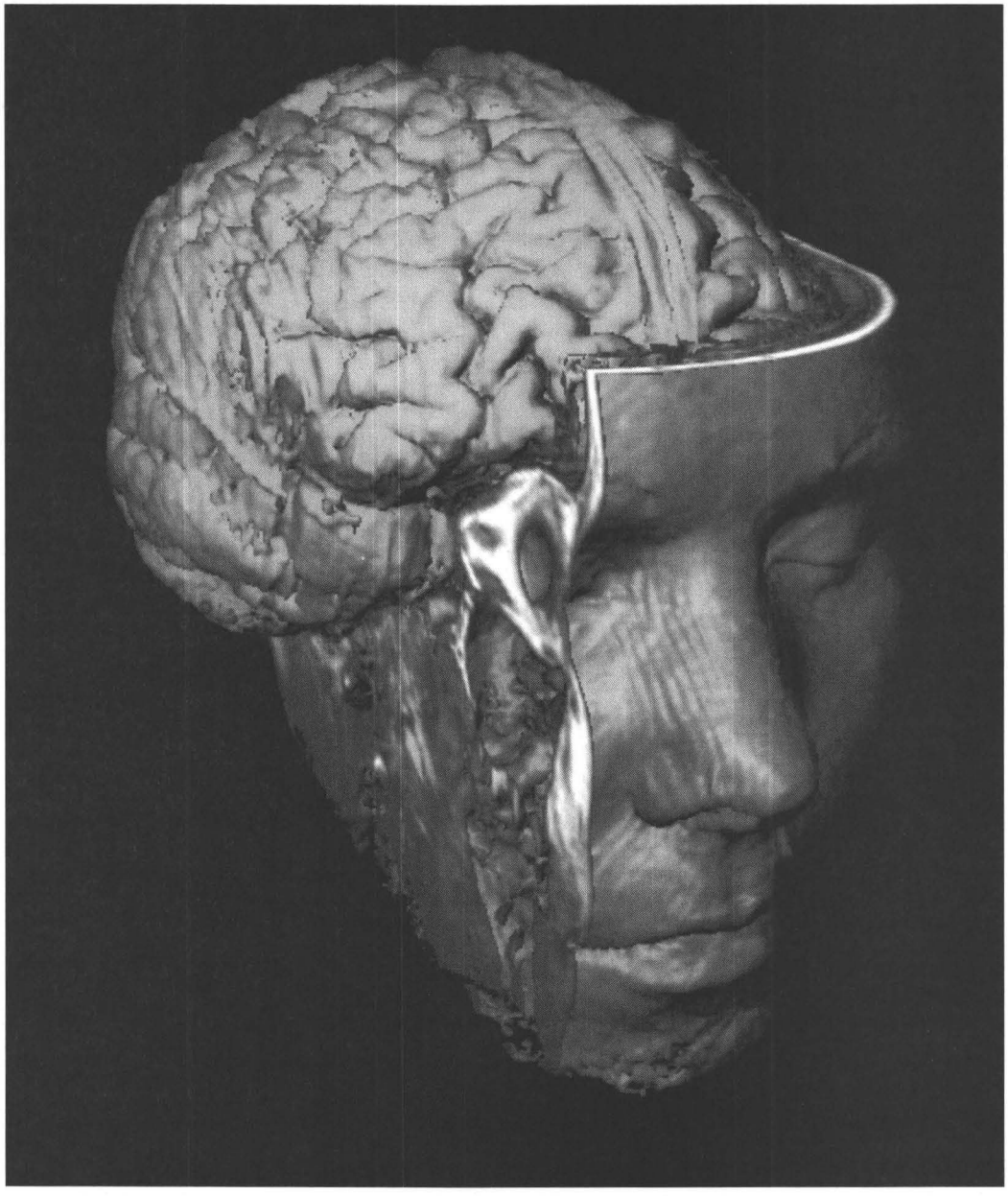
Graduate Programs (Codes)	Concentrations/Graduate Studies
Environmental/Occupational Health and Safety (GSP/EOH)	
Advanced Graduate Certificate in Environmental/Occupational Health and Safety	
French (FRN, DLF, TFR)	
M.A.T in French 7-12	*French*
M.A. in Romance Languages and Literatures	*French and Italian Languages*
	French and Italian Literatures
D.A. in Foreign Language Instruction	*French and Spanish*
Genetics (BGE)	
Ph.D. in Genetics	
Geosciences (GEO)	
M.S. and Ph.D. in Geosciences	
German (GER, DLG, TGR)	
M.A.T. in German 7-12	
M.A. in Germanic Languages and Literature	
D.A. in Foreign Language Instruction	
Health Technology and Management (MSHS)	
Advanced Graduate Certificate in Health Care Management in Community Health	
M.S. in Health Care Policy and Management	
Hispanic Languages and Literature (SPN, DLS)	
M.A. in Hispanic Languages and Literature	*Hispanic Linguistics*
M.A. in Romance Languages and Literatures	*Spanish/French*
	Spanish/Italian
D.A. in Foreign Language Instruction	
Ph.D. in Hispanic Languages and Literatures	
History (HIS, TSS)	
M.A.T. in Social Studies 7-12	
M.A. and Ph.D. in History	
Italian (ITL, DLI, TAL)	
M.A.T. in Italian 7-12	*Italian*
M.A.T. in Italian 7-12	*Italian and French Languages*
M.A. in Romance Languages and Literatures	*Italian and French Literatures*
D.A. in Foreign Language Instruction	*Italian and Spanish*
	Italian Language/ Linguistics
Labor/Management Studies (CES)	
M.P.S. in Labor/ Management Studies	
Liberal Studies (CED)	
M.A. in Liberal Studies	

Graduate Programs (Codes)	Concentrations/Graduate Studies
Linguistics (LIN, ESL, DLT)	
M.A. in Teaching English to Speakers of Other Languages (TESOL)	
M.A. and Ph.D. in Linguistics	
D.A. in Foreign Language Instruction	
Long Island Regional Studies (CAS)	
Advanced Graduate Certificate in Long Island Regional Studies	
Management and Policy (MGT)	
Advanced Graduate Certificate in Health Care Management	
Information Systems Management	*Business Management*
Human Resource Management	*Government Management*
	Nonprofit Management
	Technology Management
M.S. in Management and Policy	
Marine Sciences (MAR, OCN)	
M.S. in Marine Environmental Sciences	
	Atmospheric Sciences
Ph.D. in Coastal Oceanography	
	Coastal Oceanography
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 (ESC)	
M.S. in Mechanical Engineering	*Manufacturing*
Ph.D. in Mechanical Engineering	
	Mechanical Engineering
	Mechanical Design
	Solid Mechanics
	Thermal Sciences and Fluid Mechanics
Medicine	
M.D. in Medicine	
Molecular Biology and Biochemistry (BMO)	
Ph.D. in Molecular Biology and Biochemistry	
Molecular Microbiology (HBM)	
Ph.D. in Molecular Microbiology	
Music (MUS)	
M.A. and Ph.D. in Music	*Composition*
	Music History
	Music Theory
M.M. in Music	
D.M.A. in Music Performance	
Neurobiology and Behavior (BNB)	
Ph.D. in Neurobiology and Behavior	

Graduate Programs (Codes)	Concentrations/Graduate Studies
Nursing	
Advanced Graduate Certificate in	
Addictions Nursing	
Adult Health Practitioner	
Child Health Nurse Practitioner	
Mental Health Nurse Practitioner	
Neonatal Nurse Practitioner	
Nurse Midwifery	
Perinatal/Women's Health Practitioner	
M.S. in Adult Health: Primary, Acute, and Critical Care	
M.S. in Child Health Nursing	
M.S. in Gerontological Nursing	
M.S. in Immunohematology/ Blood Banking	
M.S. in Mental Health/ Psychiatric Nursing	
M.S. in Neonatal Nursing	
M.S. in Nurse Midwifery	
M.S. in Perinatal/Women's Health	
Oral Biology and Pathology (BHS, HDO)	
M.S. in Basic Health Sciences	
Oral Biology and Pathology	
Ph.D. in Oral Biology and Pathology	
Pathology (HBP)	
Ph.D. in Cellular and Molecular Pathology	
Pharmacological Sciences (HBH)	
Ph.D. in Molecular and Cellular Pharmacology	
Philosophy (PHI)	
M.A. in Philosophy	*Philosophical Perspectives*
Ph.D. in Philosophy	*Philosophy*
Physics and Astronomy (PHY, TPH)	
M.A.T. in Physics 7-12	*Astrophysics*
	Biophysics
	Chemical Physics
	Scientific Instrumentation
M.A. in Physics	
M.S. in Physics	
Ph.D. in Physics	
Physiology and Biophysics (HBY)	
Ph.D. in Physiology and Biophysics	
Political Science (POL)	
M.A. in Political Science	
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	
Ph.D. in Biopsychology	
Ph.D. in Clinical Psychology	
Ph.D. in Experimental Psychology	
Ph.D. in Social/Health Psychology	

Graduate Programs (Codes)	Concentrations/Graduate Studies
Russian Language and Literature (DLR, SLV, TRU)	
	Russian
M.A.T. in Russian 7-12	
M.A. in Slavic Languages and Literatures	
D.A. in Foreign Language Instruction	
School Administrator and Supervisor	
Advanced Graduate Certificate in School Administrator and Supervisor	
Slavic Languages and Literatures (SLV)	
M.A. in Slavic Languages and Literatures	
School District Administrator	
Advanced Graduate Certificate in School District Administrator	
Social Welfare (HWA, HWG, HWM, HWO, HWT)	
M.S.W. in Social Work	
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
	Industrial Management
Theatre Arts (DRM, THR)	
M.A. in Theatre	
M.F.A. in Dramaturgy	
Waste Management (CEY)	
Advanced Graduate Certificate in Waste Management Studies	
M.P.S. in Waste Management Studies	
Women's Studies (WNS)	
Advanced Graduate Certificate in Women's Studies	

Degree and Advanced Graduate Certificate Program Descriptions



Volume rendering of an MRI scan of a human head exposing the segmented brain.

Anatomical Sciences (HBA)

Chairperson: Jack T. Stern, Health Sciences Center T-8, Room 040 (631) 444-2350
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 and the Anthropology Department.

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, Argentina, 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 2.75 (B-) in all undergraduate coursework and 3.00 (B) in science and mathematics 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

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.

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.

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, University at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Assistant Professors

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

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

Ross, Callum F., Ph.D., 1993, Duke University: Primate skull evolution; craniofacial biomechanics; anthropoid origins; vertebrate paleontology.

Adjunct Faculty

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

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

Number of teaching, graduate, and research assistantships, fall 1999: 3

1) Joint appointment, Department of Anthropology

2) Joint appointment, Department of Physiology

3) Joint appointment, Department of Orthopaedics

Degree Requirements

M.S. Degree Requirements

Graduate Studies in Anatomical Sciences normally 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, passing a comprehensive examination, and/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
2. Graduate Seminar
3. Embryology

In addition, students are required to take four 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 Paleontology
6. Principles of Evolution
7. Biometry

The student will be required to write a formal essay on a topic approved by the graduate committee and submitted no later than six months after the preliminary examination. 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 in all elective courses.

B. Preliminary Examination

Upon completion of formal courses (normally, at the end of the second year of study, for M.D./Ph.D. students no later than in January of the year following their entry into the program), each student is given an oral preliminary examination. Depending on the area of concentration, the examination covers human anatomy, embryology, and either neuroanatomy, vertebrate evolution, or musculoskeletal biology.

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 a dissertation committee consisting of at least two additional members of the Department of Anatomical Sciences and one person from outside the department, school, or University. In consultation with this committee, the student prepares a thesis proposal. The dissertation proposal examination consists of an oral presentation of this proposal to the faculty as a whole, followed by an oral defense before the dissertation committee. This examination should occur no later than nine months after submission of the essay.

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 gross anatomy 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.
Prerequisite: Permission of instructor
Fall modules, 4 credits
P/F 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.
Prerequisite: Permission of instructor
Fall modules, 8 credits
P/F grading

HBA 536 Biological Clocks
A consideration of the temporal dimension of biological organization and of periodic phenomena that are a basic property of living systems. Topics include a survey of circadian rhythms; influence of light, temperature, and chemicals; use of the clock for adaptation to diurnal, tidal, and lunar cycles for direction finding (homing and orientation) and for day-length measurement (photoperiodism); chronopathology and chronopharmacology; aging and life cycle clocks; and possible molecular mechanisms of the clock. Crosslisted with BCD 536.

Prerequisite: Permission of instructor
Spring, 3 credits
ABCF grading

HBA 537 Physiology and Biochemistry of the Cell Cycle
An integrated view of the cell developmental cycle in prokaryotes and eukaryotes. Topics include cell cycle anatomy; measurements on fixed and living cells; kinetics of cell population growth; theory and methodology of batch, synchronized, and continuous cultures; general patterns of nucleic acid synthesis; regulation of enzyme activity during the cell cycle; temporal control of gene expression; development and function of cellular organelles during the cell cycle; and the control of cell division. Crosslisted with BCD 537.
Prerequisite: Permission of instructor
Fall, 3 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. Crosslisted with DPA 514.
Prerequisite: Permission of instructor
Fall, 8 credits
ABCF grading

HBA 550 Vertebrate Paleontology
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
Spring, alternate years, 4 credits
ABCF grading

HBA 560 Advanced Regional Anatomy
A course in advanced human gross anatomy for graduate students or advanced undergraduates in biology, anthropology, and other life sciences.
Prerequisite: Permission of instructor
Fall, summer, and spring, 3-8 credits
ABCF grading

HBA 563 Aspects of Animal Mechanics
An introduction to biomechanics. Covers free-body mechanics and kinetics as applied to vertebrate locomotion. Also covers scaling, stress and strain, and muscle physiology as these topics relate to adaptations of the musculoskeletal system. Crosslisted with DPA 563.
Prerequisites: Introductory physics and biology or permission of instructor
Spring, odd years, 2 credits
ABCF grading

HBA 564 Primate Evolution
The taxonomic relationships of primate evolutionary history as documented by the fossil record and structural and chemical evidence. Emphasis on primates prior to the origin of the human lineage. Laboratory included. Open to senior undergraduates. Crosslisted with DPA 564 and ANT 564.
Prerequisite: Permission of instructor
Spring, alternate years, 4 credits
ABCF grading

HBA 565 Human Evolution
Survey of the fossil record of human evolution from the later Tertiary through the Pleistocene. The course emphasizes the record of morphological evolution including evolution of the skull, teeth, and limbs. Topics include the ape-human furcation, radiation of the early hominids, the evolution of Homo erectus, Neanderthal man, later human ancestors, the evolution of the brain and intelligence, and bipedalism and other morphological complexes. The lectures and laboratories utilize extensive comparative anatomical material, fossil casts, and a slide collection. Crosslisted with DPA 565 and ANT 565.
Prerequisite: Permission of instructor
Fall, alternate 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. Crosslisted with DPA 566.
Prerequisite: Permission of instructor
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 will be utilized. Lecture/seminar series can be taken separately as HBA 581. Crosslisted with DPA 580 and DPA 581.
Prerequisite: Permission of instructor
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 will be placed on the origin of mammals and the origin, evolution, and anatomical diversity of modern and extinct orders of mammals. Crosslisted with DPA 581.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor
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. Crosslisted with DPA 582.
Prerequisites: HBA 564, previous course in human or vertebrate anatomy, and permission of instructor
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.
Prerequisite: Permission of instructor
Fall and spring, 1-6 credits each semester, repetitive
S/U grading

HBA 690 Graduate Seminar
Seminars by graduate students on current literature in the anatomical sciences.
Prerequisite: Permission of instructor
Fall and spring, 1 credit, repetitive
S/U grading

HBA 692 Advanced Topics in Anatomical Sciences Literature
Tutorial readings in anatomical sciences with periodic conferences, reports, and examinations arranged with the instructor.
Prerequisite: Permission of instructor
Fall and spring, 1-2 credits, repetitive
S/U grading

HBA 695 Practicum in Teaching
Practice instruction in the teaching of anatomical sciences carried out under faculty supervision.
Prerequisite: Permission of instructor
Fall and spring, 1-4 credits, repetitive
S/U grading

HBA 699 Dissertation Research
Original investigation under supervision of dissertation advisor and committee.
Prerequisite: Permission of dissertation advisor
Fall and spring, 1-9 credits, repetitive
S/U grading

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
Summer, no credit
S/U grading

Anthropological Sciences (DPA)

Director: Callum Ross, Health Sciences Center, T-08 (631) 444-6912
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, Africana Studies, Social Sciences, and Comparative Literature, as well as from the American Museum of Natural History. The goal of the IDPAS is to train students for careers in research and teaching in physical anthropology, archaeology, and cultural anthropology.

The first three semesters of the program are designed to provide fundamental background in the student's principal area of anthropological enquiry. 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 chimpanzees, gibbons, and New and Old World monkeys.

Also in the Department of Anatomical Sciences is a gait lab that includes equipment and facilities for force-plate analysis, high-speed cinematography, telemetered electromyography, and cineradiography. 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 fasculty currently maintain active sites in South America, Central Africa, and Madagascar and a new site is being developed in Thailand. The archaeology faculty have active field sites in Israel, Jordan, Long Island, Turkey, and South Africa. 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, and Spain. Students may be invited to participate in these projects.

Admission to the Ph.D. Program

Application procedures and requirements determined by the University at Stony Brook, 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, University at Stony Brook, 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. 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. Minimum score: 550.
D. Acceptance by the IDPAS and the Graduate School.

Faculty

Professors

Arens, W.[2], Ph.D., 1970, University of Virginia: Social anthropology; conservation; Africa and the Mediterranean.

Chittick, William C.[5], Ph.D., 1974, Tehran University, Iran: Comparative religious systems; Islam; Middle East.

Demes, Brigitte[1], Ph.D., 1982, University of Bochum, Federal Republic of Germany: Biomechanics; functional morphology; allometry; primates.

Fleagle, John[1], Ph.D., 1976, Harvard University: Primate and human evolution; primate behavior; functional morphology; growth and development.

Gilmore, David[2], Ph.D., 1975, University of Pennsylvania: Complex societies, stratification, and peasant culture; Europe; Mediterranean.

Grine, Frederick Edward[2], 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[2], D.Phil., 1972, Oxford University, England: Religion; Kinship; Southeast Asia.

Janson, Charles[3], Ph.D., 1985, University of Washington: Primate behavior and ecology; sociobiology; tropical ecology.

Jungers, William L.[1], Ph.D., 1976, University of Michigan: Primate and human evolution; functional morphology; biomechanics.

Krause, David W.[1], Ph.D., 1982, University of Michigan: Evolution, form, and function of mammalian dentition; evolutionary history and paleobiology of early mammals, particularly primates.

Larson, Susan[1], Ph.D., 1982, University of Wisconsin, Madison: Functional morphology; primates; biomechanics.

Martin, Lawrence[2], *Dean of the Graduate School. Ph.D.,* 1983, University of London, England: Hominoid evolution; enamel thickness; enamel microstructure and development.

Stern, Jack T., Jr.[1], Ph.D., 1969, University of Chicago: Functional morphology of primates; biomechanics of muscle.

Stone, Elizabeth C.[2], Ph.D., 1979, University of Chicago: Old World archaeology; state formation; ancient economy and society; Near East.

Wright, Patricia C.[2], Ph.D., 1985, City University of New York: Primate behavior and ecology; rainforest conservation; Madagascar.

Associate Professors

Bernstein, David J.[2], Ph.D., 1988, State University of New York at Binghamton: New World archaeology; paleoecology; coastal societies; subsistence studies.

Doran, Diane M.[2], Ph.D., 1989, University at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Frank, Barbara[8], Ph.D., 1988, Indiana University: African, Oceanic, and Mesoamerican art.

Marean, Curtis[2], Ph.D., 1990, University of California, Berkeley: Old World prehistory; paleoecology; hominid origins; zoo archaeology.

Shea, John J.[2], Ph.D., 1991, Harvard University: Old World paleolithic archaeology; lithic analysis; Near East; Europe; Africa.

Assistant Professors

Bahrani, Zainab[8], Ph.D., 1989, New York University: Mesopotamian art.

Borries, Carola[2], Ph.D., 1989, Georg-August University, Goettingen, Germany: Primate ecology and behavior, sociobiology; Asia.

Forester, Catherine A.[1], Ph.D., 1990, University of Pennsylvania: Evolution of dinosaurs; paleobiogeography; mesozoic faunas.

Khan, Aisha[4], Ph.D., 1995, City University of New York Graduate School: Race; ethnicity; social stratification; religion; political economy; diaspora studies; Caribbean; Latin America.

Koenig, Andreas[2], Ph.D., 1992, Georg-August University, Goettingen, Germany: Primate ecology and behavior; evolution of social behavior; Asia.

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.[6], Ph.D., 1998, University at Stony Brook: Sedimentary geochemistry; chronostratigraphy; geochronology.

Ross, Callum F.[1], *Graduate Program Director.* Ph.D., 1993, Duke University: Primate evolutionary morphology; craniofacial biomechanics; anthropoid origins; Cretaceous and Tertiary fossil record of Africa.

Ruf, Gregory A.[7], 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.

Number of teaching assistants, fall 1999: 19

Number of graduate fellows, fall 1999: 5

1) Anatomical Sciences

2) Anthropology

3) Ecology and Evolution

4) Africana Studies

5) Comparative Literature

6) Geosciences

7) Interdisciplinary Social Sciences

8) Art

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. At least two of these three courses will form the basis of the Qualifying Examination. Other required courses toward completion of study in Physical Anthropology include (a) BEE 551 Principles of Evolution, (b) BEE 552 Biometry, and (c) DPA 541 Human Evolutionary Anatomy. For students specializing in the area of Primate Ecology and Behavior, DPA/HBA 541 is optional, and one of the following three courses is also required: (a) BEE 550 Principles of Ecology, (b) BEE 585 Introduction to Ecological Research, or (c) 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) DPA 515 Theory and Method in Archaeology, (b) DPA 511 Prehistoric Hunter-Gathers, and (c) either DPA 512 Comparative Civilizations or DPA 513 Origins of Agriculture. Other courses required for completion of the archaeology program include (a) DPA 565 Human Evolution, (b) a graduate statistics course approved by the student's guidance committee, (c) DPA 527 Field Methods and Techniques (or an equivalent course, or field experience attained outside formal education, to be approved by the student's guidance committee), (d) two "methods" courses from among DPA 517 Lithic Technology, DPA 519 Archaeozoology, and any methods-based course approved by the student's guidance committee, and (e) either DPA 510 Topics in New World Archaeology, DPA 516 Topics in Old World Archaeology, or DPA 514 The Stone Age of Africa.

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 commit-

tee 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. Fieldwork or Other Dissertation Research

H. Written Dissertation and Defense

I. 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 University at Stony Brook department or program in which the candidate is to receive his or her degree.

Courses

DPA 501 Development of Anthropological Theory
Survey of the development of anthropological theory from the 19th century to the present. Crosslisted with ANT 501.
4 credits
ABCF grading

DPA 505 Anthropological Method
A course for advanced graduate students that examines the scientific foundations of anthropology, explanation, methods of research, analysis of data, and the preparation of research proposals. Fieldwork techniques include observation, recording, interviewing, texts, life histories, genealogies, and census. Crosslisted with ANT 505.
Prerequisite: One year of graduate study
3 credits
ABCF grading

DPA 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. Crosslisted with ANT 509.
3 credits, repetitive
S/U grading

DPA 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. Crosslisted with ANT 510.
Prerequisites: Graduate status; permission of instructor
3 credits
S/U grading

DPA 511 Prehistoric Hunter-Gatherers of the Old World
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. Crosslisted with ANT 511.
Prerequisite: Any other archaeology course
Spring, 3 credits
ABCF grading

DPA 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. Crosslisted with ANT 512.
Prerequisite: Graduate standing or permission of instructor
3 credits
ABCF grading

DPA 513 Origins of Agriculture
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." Crosslisted with ANT 513.
3 credits
ABCF grading

DPA 514 The Stone Age of Africa
This course provides a detailed examination of the evidence for the evolution of human behavior and biology on the African continent. The focus is on the way both early and modern hominids adapted to different habitats, and the course looks carefully at modern African environments and ecology as well as modern hunter-gatherer peoples. Crosslisted with ANT 514.
3 credits
ABCF grading

DPA 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. Crosslisted with ANT 515.
4 credits
ABCF grading

DPA 516 Research Seminar in Old World Archaeology
This course presents an in-depth analysis of some of the major problems that face archaeologists in the Old World. Emphasis is on the various theoretical models currently in use to explain these events by archaeologists. Topics might include the food-producing revolution in the Near East and Southeast Asia; the elaboration of the Neolithic way of life that led to the development of civilization; the nature of civilization in the Near East, the Indus Valley, etc.; or a discussion of the noncivilized Bronze Age cultures of Europe, Africa, and Asia. The specific topics may vary from year to year. Crosslisted with ANT 516.
3 credits, repetitive
S/U grading

DPA 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. Crosslisted with ANT 517.
Fall, 3 credits
ABCF grading

DPA 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 anatomically modern humans. Crosslisted with ANT 518.
3 credits
ABCF grading

DPA 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 archaeozoology and actualistic studies. Crosslisted with ANT 519.
3 credits
ABCF grading

DPA 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. Crosslisted with ANT 520.
4 credits
ABCF grading

DPA 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 (GIS). 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. Crosslisted with ANT 526.
Spring, 3 credits
ABCF grading

DPA 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. Crosslisted with ANT 527.
Prerequisite: Graduate standing or permission of instructor
3-9 credits
ABCF grading

DPA 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. Crosslisted with ANT 540.
3 credits, repetitive
ABCF grading

DPA 541 Evolutionary Anatomy
A lecture and laboratory course 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. Crosslisted with HBA 541.
Prerequisite: Permission of instructor
Fall, 7 credits
ABCF grading

DPA 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. Crosslisted with ANT 561.
3 credits
ABCF grading

DPA 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. Crosslisted with HBA 563.
Prerequisites: Introductory physics and biology or permission of instructor
Spring, odd years, 2 credits
ABCF grading

DPA 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. Crosslisted with ANT 564 and HBA 564.
Spring, even years, 4 credits
ABCF grading

DPA 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 exten-

sive cast and slide collections. Crosslisted with ANT 565 and HBA 565.
Fall, odd years, 4 credits
ABCF grading

DPA 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. Crosslisted with HBA 566.
Prerequisite: Permission of instructor
Fall, even years, 2 credits
ABCF grading

DPA 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. A research project involving the collection and analysis of behavioral data is required. Crosslisted with ANT 567.
Spring, odd years, 4 credits
ABCF grading

DPA 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. Crosslisted with HBA 580. Lecture/seminar series can be taken separately as DPA/HBA 581.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor
Spring, even years, 4 credits
ABCF grading

DPA 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. Crosslisted with HBA 581.
Prerequisites: Previous course in human or vertebrate anatomy and permission of instructor
Spring, even years, 2 credits
ABCF grading

DPA 582 Comparative Anatomy of Primates
The comparative anatomy of living primates. Laboratory dissection with emphasis on relating structural diversity to behavior and biomechanics. Crosslisted with HBA 582.
Prerequisites: HBA 364 and previous course in human or vertebrate anatomy and permission of instructor
Fall, 4 credits
ABCF grading

DPA 600 Practicum in Teaching
Variable and repetitive credit
S/U grading

DPA 602 Research Seminar in Anthropological Theory
Crosslisted with ANT 602.
Variable and repetitive credit
S/U grading

DPA 610 Individual Research
Research supervised by faculty. Students must have permission of instructor and enroll in appropriate section. Crosslisted with ANT 610.
Variable and repetitive credit
S/U grading

DPA 620 Research Seminar in Topical Problems
Crosslisted with ANT 620.
Variable and repetitive credit
S/U grading

DPA 630 Research Seminar in Physical Anthropology
Crosslisted with ANT 630.
Variable and repetitive credit
S/U grading

DPA 640 Research Seminar in Ethnography and Ethnology
Crosslisted with ANT 640.
Variable and repetitive credit
S/U grading

DPA 680 Special Seminar
Selected topics in cultural and social anthropology. Topics reflect current interests of faculty and graduate students. Crosslisted with ANT 680.
1-3 credits
S/U grading

DPA 699 Dissertation Research
1-9 credits, repetitive
S/U grading

DPA 800 Summer Research
Crosslisted with ANT 800.
No credit, repetitive
S/U grading

DPA 850 Summer Teaching
No credit, repetitive
S/U grading

Anthropology (ANT)

Chairperson: David Hicks, Ward Melville Social and Behavioral Sciences Building S-511 (631) 632-7610
Director of M.A. Program: John Shea, Ward Melville Social and Behavioral Sciences Building S-521 (631) 632-7627
Graduate Secretary: Jean Valenzuela-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 manages 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. 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. Minimum score: 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., 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, *Chairperson.* 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, University at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

Kennedy, Theodore R., Ph.D., 1974, Princeton University: African-American culture; complex societies; urban anthropology; family and kinship; Caribbean.

Marean, Curtis, Ph.D., 1990, University of California, Berkeley: African prehistory; paleoecology; hominid origins; archaeozoology.

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

Assistant Professors

Koenig, Andreas, Ph.D., 1992, University of Göttingen: 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. BEE 552 Biometry*	4
4. ANT 599 M.A. Thesis Research	6
5. Electives chosen from among ANT 510, 511, 512, 513, 514, 516, 517, 518, 519, 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. Crosslisted with CES 502.
Variable and repetitive credit

ANT 501 Development of Anthropological Theory
Survey of the development of anthropological theory from the 19th century to the present. Crosslisted with DPA 501.
4 credits
ABCF grading

ANT 505 Anthropological Methods
A course for advanced graduate students that examines the scientific foundations of anthropology, explanation, methods of research, analysis of data, and preparation of research proposals. Fieldwork techniques include observation, recording, interviewing, texts, life histories, genealogies, and census. Crosslisted with DPA 505.
Prerequisite: One year of graduate study
3 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. Crosslisted with DPA 509.
3 credits, repetitive
S/U grading

ANT 510 Research Seminar in New World Archaeology
The seminar emphasizes problems in research methods, culture history, technology, economy, ecology, and interpretation in the indigenous, pre-European New World. The comparative analysis of institutions within a developmental context is among the goals of the seminar. Crosslisted with DPA 510.
Prerequisites: Graduate status; permission of instructor
3 credits
S/U grading

ANT 511 Prehistoric Hunter-Gatherers of the Old World
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. Crosslisted with DPA 511.
Prerequisite: Any other archaeology course
Spring, 3 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 focuses on theories of the formation of complex societies and covers such topics as urbanization, demography, irrigation, craft specialization, militarism, and trade and exchange. Crosslisted with DPA 512.
Prerequisite: Graduate standing or permission of instructor
3 credits
ABCF grading

ANT 513 Origins of Agriculture
This course traces the history of anthropological thought on the origins of agriculture and assesses the evidence from the Old and New Worlds for this economic revolution. The course not only explores areas where early agriculture is evidenced, but also contrasts these areas with those where agriculture was a later development. Emphasis is on the environmental, technological, biological, social, and cultural processes associated with the "Neolithic Revolution." Crosslisted with DPA 513.
3 credits
ABCF grading

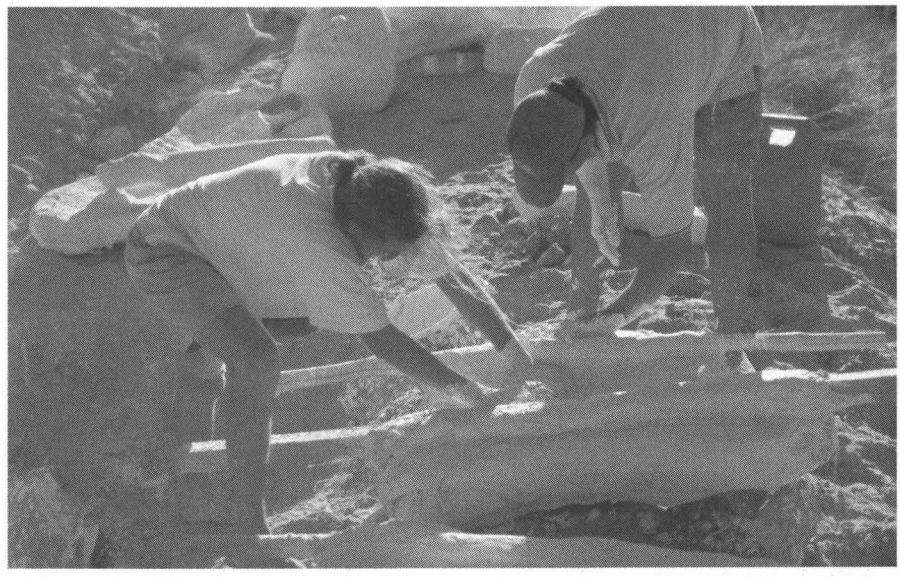
ANT 514 The Stone Age of Africa
This course provides a detailed examination of the evidence for the evolution of human behavior and biology on the African continent. The focus is on the way both early and modern hominids adapted to different habitats, and the course looks carefully at modern African environments and ecology as well as modern hunter-gatherer peoples. Crosslisted with DPA 514.
3 credits
ABCF grading

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. Crosslisted with DPA 515.
4 credits
ABCF grading

ANT 516 Research Seminar in Old World Archaeology
This course presents an in-depth analysis of some of the major problems that face archaeologists in the Old World. Emphasis is on the various theoretical models currently in use to explain these events by archaeologists. Topics might include the food-producing revolution in the Near East and Southeast Asia; the elaboration of the Neolithic way of life that led to the development of civilization; the nature of civilization in the Near East, the Indus Valley, etc.; or a discussion of the non-civilized Bronze Age cultures of Europe, Africa, and Asia. The specific topics may vary from year to year. Crosslisted with DPA 516.
3 credits, repetitive
S/U grading

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. Crosslisted with DPA 517.
Fall, 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 anatomically modern humans. Crosslisted with DPA 518.
3 credits
ABCF grading



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 archaeozoology and actualistic studies. Crosslisted with DPA 519.
3 credits
ABCF grading

ANT 520 Principles of Social and Cultural Anthropology
Concepts and principles of social and cultural anthropology; historical background, structure, function, social processes, transactions, culture, communication, continuity, change, and other 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. Crosslisted with DPA 520.
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. Crosslisted with DPA 526.
Spring, 3 credits

ANT 527 Field Methods and Techniques in Archaeology
This course 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. Crosslisted with DPA 527.
Prerequisite: Graduate standing or permission of instructor
Summer, 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. Crosslisted with DPA 540.
3 credits, repetitive
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. Crosslisted with DPA 561.
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. Crosslisted with DPA 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. Crosslisted with DPA 565.
Fall, odd 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 will be placed on sociobiological theory; life history strategies; morphological adaptations; comparisons of primate communities in Asia, Africa, Madagascar, and South America; and primate conservation. A research project involving the collection and analysis of behavioral data is required. Crosslisted with DPA 567.
Spring, odd years, 4 credits

ANT 599 Thesis Seminar
Fall, spring, summer, 3-6 credits
ABCF grading

ANT 602 Research Seminar in Anthropological Theory
Crosslisted with DPA 602.
Variable and repetitive credit
S/U grading

ANT 610 Individual Research
Research supervised by faculty. Students must have permission of instructor and enroll in appropriate section. Crosslisted with DPA 610.
Variable and repetitive credit
S/U grading

ANT 620 Research Seminar in Topical Problems
Crosslisted with DPA 620.
Variable and repetitive credit
S/U grading

ANT 630 Research Seminar in Physical Anthropology
Crosslisted with DPA 630.
Variable and repetitive credit
S/U grading

ANT 640 Research Seminar in Ethnography and Ethnology
Crosslisted with DPA 640.
Variable and repetitive credit
S/U grading

ANT 680 Special Seminar
Selected topics in cultural and social anthropology. Topics covered reflect current interests of faculty and graduate students. Crosslisted with DPA 680.
1-3 credits
S/U grading

ANT 800 Summer Research
Crosslisted with DPA 800.
No credit, repetitive
S/U grading

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, 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 2.75 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 3.0 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, University at Stony Brook, 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[5], Ph.D., 1972, University at Stony Brook: Application of statistics in social sciences; survey methodology.

Tucker, Alan[6], Ph.D., 1969, Stanford University: Graph theory; combinatorial algorithms.

Professors

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[2], Ph.D., 1975, Cornell University: Game theory; mathematical economics.

Feinberg, Eugene, Ph.D., 1979, Vilnius State University, U.S.S.R.: 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[8], Ph.D., 1959, Cornell University: Parallel computing; particle physics.

Plohr, Bradley, Ph.D., 1980, Princeton University: Conservation laws; computational fluid dynamics.

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.

Taksar, Michael, Ph.D., 1979, Cornell University: Stochastic models; diffusion theory.

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.

Arkin, Esther, Ph.D., 1986, Stanford University: Combinatorial optimization; network flows; computational geometry.

Badr, Hussein G.[7], Ph.D., 1980, Pennsylvania State University: Operating systems; computer system performance evaluation.

Finch, Stephen, Ph.D., 1974, Princeton University: Robust estimation and nonparametric statistics.

Grimson, Roger[4], Ph.D., 1969, Duke University: Biostatistics; combinatorics; epidemiologic methods; nonparametric methods; mathematical modeling.

Li, Xiaolin, Ph.D., 1987, Columbia University: Computational fluid dynamics; numerical analysis.

Skiena, Steven[7], Ph.D., 1988, University of Illinois: Combinatorial algorithms; computational geometry; data structures.

Zhang, Qiang, Ph.D., 1986, New York University: Computational fluid dynamics; turbulence.

Assistant Professors

Saltz, David, Ph.D., 1995, University at Stony Brook: Computatonal fluid dynamics; statistical physics.

Ye, Kenny, Ph.D., 1998, University of Michigan, Ann Arbor: Applied statistics; experimental design; random effect models.

Zhu, Wei, Ph.D., 1996, University of California, Los Angeles: Biostatistics; optimal experimental design; linear models; structural equation modeling.

Research Professor

Tangerman, Folkert, Ph.D., 1986, Boston University: Scientific computation; industrial mathematics.

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, University at Stony Brook: Visualization; computer graphics; computational geometry.

Number of teaching, graduate, and research assistants, fall 1999: 65

1) Department of Ecology and Evolution

2) Department of Economics

3) W. Averell Harriman School for Management and Policy

4) Department of Community and Preventive Medicine

5) Department of Sociology

6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974

7) Department of Computer Science

8) Brookhaven National Laboratory

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.

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 554 Queuing Theory 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 the fulfillment of the above requirements, the faculty of the graduate program 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.

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 of two areas of applied mathematics. The list of areas from which students may currently choose is as follows:

Differential Equations and Applied Analysis

Numerical Methods and Computing

Mathematical Programming

Applied Probability

Probability and Mathematical Statistics

Applied Statistics

Game Theory

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. Language Requirement

The student must demonstrate a reading ability in one of the following three languages: French, German, or Russian. Proficiency may be demonstrated in a number of ways; these methods are described in detail in the program *Graduate Student Handbook.*

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.*

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.
3 credits
ABCF grading

AMS 509 Applied Mathematical Methods II
Partial differential equations: Laplace's equation, Dirichlet principle, separation of variables, solutions of boundary value problems, wave equations, vibration of strings and membranes, Riemann's method, characteristics, shock waves, heat equation, and the Fourier transform. Approximation of functions: Interpolation by polynominals and splines, numerical integration and differentiation, variational principles, finite element and boundary integral equation techniques, and spectral methods.
Prerequisite: AMS 361 or equivalent
Spring, 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 517 Ordinary Differential Equations
This course deals with theory and properties of ordinary differential equations that are of importance in the application of this subject. Among the topics covered are solutions of singular equations, boundary value problems, the Green's function method, and eigenvalue problems.
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.
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. Both finite difference and finite element 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.
Prerequisite: Elementary programming
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. Crosslisted with MGT 540.
Corequisite: AMS 505
ABCF grading

AMS 541 Case Studies in Systems Analysis and Operations Research
This course presents one or more case studies of the use of applied mathematics in business or government. Case studies are drawn from topics such as manufacturing management, quality control, portfolio analysis, facility location, and manpower scheduling.
Prerequisite: Permission of instructor
3 credits
ABCF grading

AMS 542 Analysis of Algorithms
Models of computation and associated time and space measures for complexity of algorithms in the various models. Techniques for designing efficient algorithms, including choice of data structures, recursion, divide and conquer, and dynamic programming. Asymptotic behavior, lower bounds on complexity and correctness of algorithms for sorting, set manipulation, graph operations, matrix multiplication, fast Fourier transform, and pattern matching. Also covers nondeterminism, NP completeness, and intractability. Crosslisted with CSE 548.
Recommended: 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. Crosslisted with MGT 544.
Prerequisite: AMS 540
Spring, 3 credits
ABCF grading

AMS 545 Computational Geometry
A systematic development of the tools for designing and analyzing algorithms for geometric problems, such as convex hulls of point sets, Voronoi diagrams, arrangements, intersections of polygons and polyhedra, point location queries, shortest paths, visibility, and a variety of other problems that arise in robotics, facility location, manufacturing, and computer-aided design. Crosslisted with CSE 555.
Spring, 3 credits
ABCF grading

AMS 546 Network Flows
Theory of flows in capacity-constrained networks. Topics include maximum flow, feasibility criteria, scheduling problems, matching and covering problems, minimum-length paths, minimum-cost flows, and associated combinatorial problems. Crosslisted with MGT 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. Crosslisted with CSE 547.
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. Crosslisted with MGT 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. Crosslisted with ECO 604.
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. Crosslisted with CSE 529 and MGT 553.
Prerequisite: CSE 201 or equivalent; AMS 310 or 507 or equivalent; or permission of instructor
Spring, 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. Crosslisted with MGT 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. Crosslisted with ECO 605.
Prerequisite: AMS 552/ECO 604
Spring, 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. Crosslisted with MGT 556.
Prerequisite: AMS 550 or AMS 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. Crosslisted with MGT 558.
Prerequisites: AMS 504; AMS 507 or equivalent
Spring, 3 credits
ABCF grading

AMS 560 Geographic Information Systems
This course introduces an emerging sector of information technology: geographic information systems (GIS). The course focuses on basic concepts of geographic information systems and on their applications to marketing, real estate, logistics, transportation planning and dispatching and scheduling of service operations. Many of these applications use statistical and operations research techniques and concepts that are explained in the course. In addition to the lectures and textbook materials, students learn a particular GIS, discuss cases, and do projects. Crosslisted with MGT 564.
Prerequisites: AMS 102 and MAT 123
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. Crosslisted with GEO 564.
Prerequisite: AMS 526 or permission of instructor
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.
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.
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 585 Sampling Techniques
Properties of simple random sampling, application to estimating proportions and sample sizes that give predetermined accuracy. Stratified random samples, Neyman allocation. Ratio and regression estimates, accuracy and bias, systematic sampling, cluster sampling, and two-stage sampling.
Prerequisite: AMS 312 or equivalent
Fall, 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. Crosslisted with AMS 491.
Prerequisite: Permission of instructor
3 credits, repetitive
ABCF grading

AMS 592 Modern Mathematical Finance
Introduction to modern mathematical tools used in financial markets and financial engineering. Diffusion processes and stochastic calculus. Ito's formula. Portfolio analysis based on diffusion processes theory. Options and other contingent claims. No-arbitrage pricing. Black-Scholes formula. Hedging of derivative securities. Term structure of interest rate. Fitting the yield curves.
Prerequisite: AMS 569
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 Survival Analysis
Topics include basic life table construction, estimation of selected hazards models, and discussion of various problems associated with hazards models analysis. Helps students to prepare for the actuarial exam 160, Survival Models.
Prerequisite: Permission of instructor
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
Variable and repetitive credit
S/U grading

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 611 Theory of Partial Differential Equations and Their Applications
Theorem of Cauchy and Kowalesky; classification of partial differential equations in general; characteristics; potential theory and elliptic equations; hyperbolic equations and propagation of discontinuities; parabolic equations; various methods of solving partial differential equations; applications to problems in electromagnetics, solid mechanics, plasma physics.
Prerequisite: AMS 502
3 credits
ABCF grading

AMS 615 Nonlinear Differential Equations
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 by 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

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

AMS 690 Special Topics in Differential Equations and Applied Analysis
The course is designed for second- and third-year graduate students with a strong foundation in analysis who wish to pursue research in applied mathematics. Several topics may be taught concurrently in different sections.
Prerequisites: AMS 501, AMS 504
3 credits, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

AMS 698 Practicum in Teaching
Variable and repetitive credit
S/U grading

AMS 699 Dissertation Research
Variable and repetitive credit
S/U grading

Secrets (Visions of the Putti), Ceramic with glazes, lustres, acrylic paint, flocking, and glitter by Toby Buonagurio. Photo by Edgar Buonagurio.

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
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. Rather than being isolated at a special or autonomous art institute or school, the programs have the advantages of the traditional environment of a full-service university. Students have the opportunity to explore other fields in addition to art history and criticism or studio art. 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.

The number of full-time faculty in the Art department, which is within the College of Arts and Sciences, is average for American universities, but the department has been built with a strong emphasis on modern art; on critical, theoretical, and interdisciplinary interests; and on practical experience. From this point of view, its strengths and qualifications, as well as its programs, are exceptional. However, while the majority of the faculty are identified with these orientations, a regular complement of courses in other areas is offered. Indeed, the Art department sees its role as one of nurturing and guiding student development and of presenting all fields in their fullest breadth.

Degree Programs

M.A. in Art History and Criticism

The M.A. in Art History and Criticism is an integrated curriculum of art history, criticism, and theory. It offers the graduate student a unique opportunity for innovative study in art criticism and theory and traditional study in art history. It reflects the growing belief among leading scholars that the studies of art history and art criticism are inseparable, that the unity of art history and art criticism in the history of art is indisputable, and that the role of art criticism in the history of art is central, especially in the modern period. The goals of the program are the development of the critic-historian who can combine the various fields of art historical study–connoisseurship, iconography, period research, and the study of individual artists–with a critical consciousness and awareness of large intellectual issues involved in such study; 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 19th- and 20th-century and contemporary art. The M.A. in Art History and Criticism can also be considered a unique preparation for Ph.D. degrees in art history or other fields. The Department of Art offers graduate courses ranging from the art of ancient cultures through the art history and criticism of the present. Part-time study is in this degree program.

The M.F.A. in Studio Art

The M.F.A. is a flexible 60-credit terminal degree combining studio work, academic studies, and intellectual theory. The degree is especially suitable for students who plan professional involvement in the making of art either as artists, craftsmen, technicians, or art teachers. It may also be the degree of choice for those preparing for careers in arts administration, art education, or gallery and museum work.

The uniqueness of Stony Brook's M.F.A. program stems from the combination of its proximity to New York City, where the faculty have numerous professional ties, and its research university campus environment. Benefits of this combination are ample studio spaces, constant interface with New York's working art world, a choice of professional apprenticeships and internships, and the cooperation of critics and historians of the Art department's M.A. and Ph.D. in Art History and Criticism faculty, as well as of other departments and programs.

Although the degree requirements concentrate heavily on studio courses, the Art Department is part of a major academic and research institution; thus, a considerable portion of the M.F.A. program (21 of the 60 required credits) is devoted to teaching and nonstudio courses. 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.

Ph.D. in Art History and Criticism

The Ph.D. program is organized to allow students to pursue their areas of interest more intensively. The goals of the program are (1) the mastery of a major and minor subject area as traditionally understood, i.e., defined geographically and chronologically; (2) the study of 19th- and 20th-century and contemporary art which, with its multiplicity of styles and self-conscious theoretical orientation, requires a variety of perspectives; (3) the special study of the history of art criticism from ancient to modern times and the education of practicing art critics; and (4) the integration of other disciplines and critical consciousness with traditional fields of art historical study–connoisseurship, iconography, period research, and the study of individual artists. The main emphasis of the program is placed on the integration of analysis, criticism, history, and other disciplines into a single curriculum.

Credits for the Ph.D. will total 24 beyond the entering master's or the equivalent determined by the faculty. The 60 credits of combined M.A. and Ph.D. credits will be divided between a major and the minor field, the latter either in art history or an interdisciplinary minor. The interdisciplinary minor may be either of two types:

1.A general concentration in a time or place. Courses are to be chosen from offerings in various disciplines including literature, anthropology, philosophy, English, music, political science, history, sociology, history of science, economics, linguistics, psychology, and

technology and society. Courses should emphasize the subject area, its theory, methods, and interpretations.

2. A concentration in one of these non-art fields alone.

Students are not accepted into the Ph.D. program on a part-time basis.

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. 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 departmental graduate studies committee 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 for entrance into the M.F.A. program must submit with his or her graduate application 15 to 20 slides of work, of which at least four should demonstrate traditional drawing abilities, e.g., figure drawing, perspective, ability to produce finished rendering, etc. In addition, the applicant may be asked to forward original work for evaluation, and, where feasible, may be invited for a personal interview. The candidate for entrance into the M.F.A. program should have a minimum of 15 semester hours of credit in art history, theory, or criticism. Deficiencies in any of the above areas may be cause for deferment of entry into the M.F.A. program until the hours are made up–without credit toward the M.F.A. itself–before resubmission by the student for entrance to the program. Such deficiencies and exceptions are subject to evaluation by the graduate admissions committee in light of the entire application for entrance into the M.F.A. 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. The faculty artists' 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.

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

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.

Mirzoeff, Nicholas, Ph.D., 1990, Warwick University: Modern art and visual culture, history of photography.

Assistant Professors

Bahrani, Zainab, Ph.D., 1989, New York University: Ancient art history and criticism.

Dinkins, Stephanie, M.F.A., 1997, Maryland Institute College of Art: new media, photography.

Erickson, Christa, M.F.A., 1995, University of California, San Diego: Electronic installation, digital media, video art.

Monk, Daniel, M. Arch., 1984, Columbia University; Ph.D., 1994, Princeton University: Modern and contemporary architecture; criticism and theory.

Adjunct Faculty

Beatman, James, *Technical Specialist and Lecturer.* M.F.A., 1976, University of Massachusetts, Amherst: Sculpture.

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.

Part-Time Faculty

Leslie, Richard, *Adjunct Lecturer.* M.A. 1995, University at Stony Brook: 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, University at Stony Brook: Painting and drawing.

Weil, Marianne, M.F.A., 1986, School of Visual Arts: Sculpture and design.

Zapkus, Kes, *Visiting Artist.* M.F.A., 1963, Syracuse University: Painting and drawing.

Number of teaching, graduate, and research assistants, fall 2000: 21

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. ARH 502 History of 19th-Century Art Criticism and Theory (3 credits)

2. ARH 503 History of 20th-Century Art Criticism and Theory (3 credits)

3. ARH 546 Topics in 20th-Century Art (3 credits); ARH 549 may fulfill the 20th-century requirement when the material deals with 20th-century art.

4. ARH 540 Methodologies of Art History (3 credits), normally to be taken in the first semester of matriculation.

5. Two or three of the following, one of which must be a criticism course (6-9 credits):

ARH 501 History of Renaissance and Baroque Art Criticism and Theory (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 Baroque Art (3 credits)

ARH 545 Topics in 19th-Century Art (3 credits)

ARH 547 Topics in Non-Western Art (3 credits)

ARH 548 Museum Studies Seminar (3 credits)

ARH 549 Topics in American Art (3 credits)

ARH 550 Inquiries into Art Criticism and Theory (3 credits)

ARH 570 Issues in Architectural History and Criticism (3 credits)

6. Two or three electives in the humanities and/or social sciences (6-9 credits), to be chosen in consultation with a faculty advisor and with the approval of the graduate studies director. One of these must be in philosophy; others might be on relevant aspects of literary studies or criticism, history, musicology, sociology, anthropology, etc.

7. ARH 598 Thesis (up to 6 credits).

Note: A student who takes only two courses from group 5 must take three from group 6, and vice versa. Total credits from groups 5 and 6 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 (ARH 592)

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, courses offered through other departments (such as stage and costume design, film studies, and performance) 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 (literature, history, anthropology, philosophy, art history, etc.).

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.

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, computer scans, videos) of the exhibition and a written commentary which 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. exhibition.

E. Recommended Foreign Language

The department recommends, but does not require, proficiency in a foreign language, preferably French, German, or Italian.

F. 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 toward the degree, all other teaching by teaching assistants with stipends is part of their obligations under the stipend and is without academic credit.

G. 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. One semester of Graduate Drawing Studio (ARS 550) to be taken during the first year. This course may be counted toward either items 2 or 4 below, but not both.

2. Six graduate studio courses in an area of concentration (3 credits per course, total 18 credits).

3. Three graduate studio courses outside the area of concentration (3 credits per course, total 9 credits).

4. Three semesters of ARS 580 Visual Arts Seminar (3 credits per semester, total 9 credits) to be taken during the first four semesters of graduate study. Additional visual arts seminars are encouraged.

5. Three or four courses in graduate liberal arts, e.g., art history, languages, literature, philosophy, etc. (3 credits each course, total 9 or 12 credits).

6. Graduate Teaching Experience (see item F, above) (3-6 credits).

7. ARS 532 Thesis Project (up to 6 credits).

Requirements for the Ph.D. Degree in Art History and Criticism

A. Course Requirements

Generally, students will design their programs with concentrations in either (1) art criticism and theory or (2) interdisciplinary art history. The integration of ideas and approaches from other disciplines and the development of broader interests within art history are accomplished by means of both general and specific course requirements within and outside of the department, as listed below. The courses fall into three general categories: (1) art history, (2) art criticism, and (3) courses in other disciplines in the humanities and social sciences.

A student must achieve a 3.0 overall grade point average in all graduate courses taken at Stony Brook in order to receive a degree. The student will be required to complete successfully 60 credits of graduate work, as outlined in the list of categories and courses below. Within each of the categories, specific required courses are preceded by an *:

1. Eight of the following Art History Topics Courses (24 credits required):

*ARH 540 Methodologies in Art History (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 Baroque 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 Non-Western Art (3 credits)

ARH 548 Museum Studies Seminar (3 credits)

ARH 549 Topics in American Art (3 credits)

ARH 570 Issues in Architectural Theory (3 credits)

ARH 699 Directed Readings (Art or Architectural History) (3 credits)

2. Four of the following History,

Theory, and Criticism Courses (12 credits required):

ARH 501 History of Renaissance and Baroque Art Criticism and Theory (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 550 Inquiry in Art Criticism and Theory (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 [Criticism and Theory] (3 credits)

ARS 580 Visual Arts Seminar (3 credits)

3. Four electives in the humanities and/or social sciences (12 credits). One of these must be in philosophy. Others might be on relevant aspects of history, comparative studies, musicology, sociology, anthropology, etc.

4. *ARH 602 Practicum in Teaching (6 credits required). See (B) below.

5. The following is optional: ARH 699 Dissertation Preparation (3 credits). Credits for thesis preparation and research may be used to complete the total of 60 credits for the Ph.D.

B. Teaching Requirement (ARH 602)

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 500-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 necessary for advancement to candidacy. At the discretion of the candidate's advisor, mastery of a third language may be required if it is necessary to the student's projected area of research.

F. Qualifying (Preliminary) Examination

The Qualifying Examination should be taken no later than the end of the third year of coursework 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:

1. Contemporary
2. 20th-century American and European
3. American (1620-present)
4. 19th-century European (1760-1900)
5. Architectural History
6. Baroque (ca. 1600-1750)
7. Renaissance (ca. 1260-1600)
8. Medieval (ca. 400-1500)
9. Ancient (Greek, Roman, and Early Christian)
10. African

The specific format of the exam will vary according to student and major/minor area, but each exam will cover in some way (1) objects, (2) issues, and (3) bibliography. The Qualifying Exam committee, consisting of three members of the department faculty, is appointed by the Dean of the Graduate School upon the recommendation of the Graduate Studies Director in consultation with the student and the advisor.

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.

When all of these requirements have been completed satisfactorily, the department will recommend that the student be advanced to candidacy.

H. Dissertation

No later than the beginning of the seventh semester, 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. 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. Before final approval can be granted, the student must present the results of the dissertation research at the defense, an oral examination convened for that purpose by the department and open to interested faculty members and graduate students. All four readers of the dissertation must recommend acceptance of the dissertation before it can be approved by the Graduate School.

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.

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.
Fall, 3 credits
ABCF grading

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.
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.
Spring, 3 credits
ABCF grading

ARH 540 Methodologies of Art History
This course focuses primarily on three approaches to the history of art: (1) style and connoisseurship; (2) structuralism, semiology, and related symbolic theories; and (3) social history. Under (1), various methods of stylistic analysis–such as cyclical schema and period and regional schema–are examined both in relation to general theory and to particular kinds of art. Connoisseurship is considered as another aspect of the methodology of style. Under (2), there is a discussion of a variety of methods for investigating the nature of signs and symbols in art. In addition to structural-semiotic approaches, iconography and psychoanalytic methods are included in this section. Under (3), there is discussion of methods that treat the work of art and the artist as part of a larger social and political context. Consideration is given to both Marxist critiques of establishment history and practice, and to non-Marxist approaches.
Annually, 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).
Alternate years, 3 credits
ABCF grading

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.
Alternate years, 3 credits
ABCF grading

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.
Alternate years, 3 credits
ABCF grading

ARH 544 Topics in Baroque Art
Specific areas within 17th-century art are studied through lectures and seminar reports. Possible topics include the evolution of genre painting from its roots in the religious and moralizing images of the 16th century to scenes of Dutch social life in the 17th century; the iconography of 17th-century religious art, for instance, an exploration of the impact of the Council of Trent; and the oeuvre of major 17th-century artists such as Bernini and Velasquez.
Alternate years, 3 credits

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.
Alternate years, 3 credits
ABCF grading

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.
Alternate years, 3 credits
ABCF grading

ARH 547 Topics in Non-Western Art
This course examines various approaches to the appreciation and interpretation of non-Western (primarily African) art. Emphasis is on weighing the merits of different methodologies and developing a critical approach to the literature. Topics include formalism and style; social contexts and functional analyses; iconography, symbolism, and meaning; creativity, aesthetics, and the artist; reconstructing art histories; and issues surrounding the presentation of non-Western art in museum contexts.
Alternate years, 3 credits
ABCF grading

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.
3 credits
ABCF grading

ARH 549 Topics in American Art
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.)
Alternate years, 3 credits
ABCF grading

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.
Alternate years, 3 credits
ABCF grading

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.
3 credits
ABCF grading

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

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 student in M.A. or Ph.D. program in art history and criticism
Spring, 1-3 credits

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.
Fall and spring, 3 credits
ABCF grading

ARH 592 Practicum in Teaching
Instruction in the department under the supervision of 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 advanced students who have fulfilled most of their course requirements and for whom the proposed program of study cannot be organized within other existing course structures.
Fall and spring, 1-3 credits, variable and repetitive
ABCF grading

ARH 598 Thesis
Prerequisite: Completion of all degree requirements
Fall and spring, 1-3 credits, variable and repetitive
S/U grading

ARH 602 Teaching Practicum, Advanced
Instruction in the department by advanced graduate students under the supervision of faculty.
Prerequisite: Completion of ARH 592 or its equivalent
Fall and spring, 3 credits
S/U grading

ARH 690 Directed Readings for Doctoral Candidates
Fall and spring, variable and repetitive credit
ABCF grading

ARH 699 Dissertation Research
Fall and spring, variable and repetitive credit
S/U grading

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

ARS 525 Computer Imaging
An exploration of computer imaging at the graduate level, focusing on specific applications to the graduate student's objectives in the arts or sciences. Graduate students from other departments may take this course under their own department's appropriate number with their program's permission. Admission to the course is by permission of the instructor on interview. Some background in 2-D design, computer visuals, graphics, etc., is desirable.
Fall and spring, 3 credits
ABCF grading

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

ARS 531 Graduate Teaching Practicum
Supervised teaching practicum in undergraduate studio or studio/theory course.
Prerequisite: Accepted candidate for M.F.A.
Fall and spring, 1-3 credits
S/U grading

ARS 532 Thesis Project
Preparation of thesis under the program advisor.
Prerequisites: Accepted candidate for M.F.A., review board passed
Fall, spring, and summer, 1-3 credits (may be repeated once)
S/U grading

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
Fall and spring, 3 credits
ABCF grading

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
1 to 11/2 credits
ABCF grading

ARS 550 Graduate Drawing Studio
Graduate theory and practice of drawing; investigations of historical and contemporary concepts of drawing with concentration on individual development as an artist. Models, space for conceptual and environmental

works, and other wide-ranging facilities available.
Prerequisite: Accepted candidate for M.F.A. or permission of department
Fall and spring, 3 credits
ABCF grading

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

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

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 pourmolds; 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

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

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.
Fall and spring, 3 credits
ABCF grading

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: Permission of instructor
3 credits
ABCF grading

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: Janet Koenig, Life Sciences Building 350 (631) 632-8533

Degree awarded: Ph.D. in Molecular Biology and Biochemistry

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, The 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 and folding; cell entry by membrane-penetrating bacterial toxin proteins; role of cholesterol in membrane structure.

McLaughlin, Stuart[3], Ph.D., 1968, British Columbia: Calcium/phospholipid second messenger system.

Simon, Sanford R.[1], 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.

Sternglanz, Rolf[1], Ph.D., 1967, Harvard University: Chromatin structure and function; gene expression, histone acetyltransferases.

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: Membrane enzymes involved in glycosylation; yeast molecular genetics; fungal pathogenesis.

Deutsch, Dale[1], Ph.D., 1972, Purdue University: Marijuana; biochemistry and molecular neurobiology of the enzyme that hydrolyzes the endocannabinoids.

Haltiwanger, Robert[1], Ph.D., 1986, Duke University: Glycobiology: Biosynthesis, structure, and function of the carbohydrate modifications on proteins.

Miller, W. Todd[3], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Raleigh, Daniel P.[4], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Sampson, Nicole[4], Ph.D., 1990, University of California, Berkeley: Protein structure-function; mammalian fertilization.

Scarlata, Suzanne[2], Ph.D., 1984, University of Illinois: Structure/oligomerization of membrane proteins.

Thomsen, Gerald H.[1], Ph.D., 1988, Rockefeller University: Growth factors and signal transduction in early vertebrate development; T-box genes.

Tonge, Peter J.[4], 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.

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.

Holdener, Bernadette[1], Ph.D., 1990, University of Illinois: Genetic regulation of early mouse development; growth regulation and patterning; mesoderm induction and cardiac neural crest development.

Kisker, Caroline T.[2], Ph.D., 1994, Free University Berlin, Germany: Crystallographic and biochemical studies of DNA repair enzymes and molybdenum.

Schindelin, Hermann[1], Ph.D., 1994, Free University Berlin, Germany: Structure and function of enzymes involved in molybdenum cofactor biosynthesis and ubiquitin-dependent protein degradation; protein crystallography.

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

Flanagan, John[5], Ph.D., 1986, University of Tennessee: Mechanism of chaperone-assisted protein folding and degradation; protein-protein interactions.

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 2000: 5

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 (BSB 520)

2. Membrane Biochemistry (BSB 517)

3. Computational Methods in Biochemistry and Structural Biology (BSB 515)

4. Introduction to Structural Biology (BSB 512)

5. Cell Biology (BCD 656) or Molecular Genetics (BMO 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 two seminar courses: Student Research Seminars in Biochemistry and Structural Biology (BSB 603/604) and 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.

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 one semester.

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 506 Glycobiology
A seminar course in which the recent literature dealing with the role of glycoproteins and other types of glycoconjugates in biology and disease are discussed. Students are required to present and discuss recent research publications in selected topics dealing with glycobiology.
Prerequisite: Permission of instructor
Spring, alternate years, 2 credits
ABCF grading

BSB 509, 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, minimum 2 credits each semester, variable
ABCF grading

BSB 512 Introduction to Structural Biology
Theoretical principles and experimental methods used in the study of proteins and nucleic acids, e.g., optical spectroscopy, magnetic resonance, and diffraction.
Prerequisites: BSB 520; CHE 301 or 312
Spring, 2-3 credits
ABCF 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.
Fall, 1-3 credits
ABCF grading

BSB 520 Graduate Biochemistry I
Several topics in modern biochemistry are treated at an advanced level. Topics covered include protein structure, methods of peptide and protein analysis and purification, enzyme kinetics and mechanisms, and enzyme regulation.
Prerequisite: HBC 331
Fall, 3 credits
ABCF grading

BSB 521 Membrane Biochemistry
Examines the molecular architecture of membranes; the organization, functions, and assembly of lipids and proteins in biological membranes.
Prerequisite: Undergraduate biochemistry and permission of instructor
Fall, 1 credit
ABCF grading

BSB 580 Advanced Structural Biology
Advanced topics in X-ray crystallography and NMR spectroscopy.
Spring, 2 credits
ABCF grading

BSB 599 Research
Original investigation undertaken with the supervision of a faculty member.
Fall and spring, credit to be arranged
S/U grading

BSB 601, 602 Colloquium in Biochemistry and Structural Biology
A weekly series of talks and discussions by visiting scientists in which current research and thinking in various aspects of biochemistry and structural biology will be presented. This course is required of all students every semester in which they are registered in the Graduate Program in Biochemistry and Structural Biology, and attendance is mandatory. Visitors are welcome.
Fall and spring, 1 credit each semester
S/U grading

BSB 603, 604 Student Seminars in Biochemistry and Structural Biology
Seminars given by graduate students on the progress of their own thesis research. Required of all students every semester in which they are registered in the Graduate Program in Biochemistry and Structural Biology. Attendance is mandatory. Visitors are welcome.
Fall and spring, 1 credit each semester

BSB 699 Dissertation Research
Original investigations undertaken as part of the Ph.D. program under supervision of a research committee.
Prerequisite: Advancement to candidacy
Fall and spring, credit to be arranged
S/U grading

Biomedical Engineering (BME)

Director: Clinton T. Rubin, Psychology A, 3rd Floor (631) 632-2302
Graduate Program Director: Partap Khalsa, Health Sciences Center T18-030 (631) 444-2457
Administrative Secretary: Anne Marie Dusatko, Life Sciences, 130 (631) 632-2302

Degrees awarded: Advanced Graduate Certificate in Biomedical Engineering; 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 and Brookhaven National 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 which we might address, please do not hesitate to contact us directly.

The Graduate Program in Biomedical Engineering at the University at Stony Brook 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 Advanced Graduate Certificate and 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, the College of Arts and Sciences, the Health Sciences Center, as well as from the Brookhaven National Laboratory. These diverse faculty provide a spectrum of research opportunities. Breadth 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 the Biomedical Engineering Certificate Program or into a graduate degree (M.S. or Ph.D.) 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 Professors

Glimm, James, Ph.D., 1959, Columbia University: Use of supercomputers in the modeling of tissue function.

Kirz, Janos, Ph.D., 1963, University of California, Berkeley: Evaluation of biological substrates by X-ray microscopy.

Marsocci, Velio A., Ph.D., 1964, New York University: Biomedical electronics.

Tewarson, Reginald P., Ph.D., 1961, Boston University: Mathematical models of diffusion problems in biology and medicine.

Professors

Berndt, Christopher, Ph.D., 1980, Monash University: Modification of material surface properties through thermal spray coating; orthopaedic biomaterials.

Clark, Richard, M.D., 1971, University of Rochester: Tissue engineering in wound repair.

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

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.

Goligorsky, Michael S., M.D., 1970, Kiev Medical Institute, Russia; Ph.D., 1973, Kiev Medical Institute, Russia: Cell-substrate interactions.

Harrington, Donald, M.D., 1966, Marquette University: Real-fine medical image retrieval systems.

Hurst, Lawrence C., M.D., 1973, University of Vermont: Etiology of carpal tunnel syndrome; etiology of Dupuytren's contracture.

Jesty, Jolyon, Ph.D., 1975, Yale University: Control mechanisms of coagulation, experimental and theoretical analyses.

Jungers, William, Ph.D., 1976, University of Michigan: Functional, mechanical and ontogenetic aspects of musculoskeletal design in living and fossil primates.

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.

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

Luryi, Serge, Ph.D., 1978, University of Toronto: Solid state electronic devices for DNA mapping and screening.

McLeod, Kenneth J., Ph.D. 1986, Massachusetts Institute of Technology: Electromagnetic influences on cells and tissue adaptation.

Metcalf, Harold, Ph.D., 1967, Brown University: Precision spectroscopy of simple atoms and molecules.

Rafailovich, Miriam, Ph.D., 1980, University at Stony Brook: Polymeric liquids; phase transitions; thin film wetting phenomena; biopolymers.

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.

Shamash, Yacov A., *Dean, College of Engineering and Applied Sciences.* Ph.D., 1973, Imperial College of Science and Technology: Control systems; robotics.

Sokoloff, Leon, *Emeritus.* M.D., 1944, New York University: Arthritis; biomechanics of joint lubrication; aging in tissue culture.

Springer, Charles, Ph.D., 1967, Ohio State University: Biophysical chemistry; hyperfine shift nuclear magneticresonance studies.

Stern, Jack T., Ph.D., 1969, University of Chicago: Human muscle function in relation to athletic activity and orthopedics.

Taichman, Lorne, M.D., Ph.D., 1971, University of Wisconsin: Cutaneous gene therapy.

Associate Professors

Button, Terry, Ph.D., 1989, University at Buffalo: High-resolution computer-aided tomography.

Djuric, Petar, Ph.D., 1990, University of Rhode Island: Signal processing in biologic systems.

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.

Jacobsen, Chris, Ph.D., 1988, University at Stony Brook: X-ray microscopy and holography.

Liang, Jerome, Ph.D., 1987, City University of New York: Development of medical imaging hardware for single photon detection.

Rastegar, Jahangir, Ph.D., 1976, Stanford University: Robotics; biomechanics.

Reinstein, Lawrence E., Ph.D., 1974, Boston University: Neutron capture therapy; electronic portal imaging devices.

Skiena, Steven, Ph.D., 1988, University of Illinois: Computational geometry; biologic algorithms.

Wishnia, Arnold, Ph.D., 1957, New York University: Physical chemistry of biological macromolecules; nuclear magnetic resonance.

Assistant Professors

Bluestein, Daniel, Ph.D., 1992, Tel Aviv University, Israel: Dynamics of fluidflow and cellular transport through vessels.

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, University at Stony Brook: cDNA microarrays, functional genomics technologies; translational research.

Diaz, Aidnag, M.D., M.P.H., 1988, Columbia University: Boron neutron capture therapy.

Dilmanian, F. Avraham, Ph.D., 1980, Massachusetts Institute of Technology: Computed tomography; radiation therapy.

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: Biomechanics of skin; neural population mechanisms of interaction.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics, data visualization, medical imaging.

Otter, Mark W., Ph.D., 1987, University of Illinois: Cell morphology and dynamics, electrokinetic phenomena in skeletal tissues.

Qin, Yi-Xian, Ph.D., 1997, University at Stony Brook: Physical mechanisms involved in the control of tissue growth, healing, and homeostasis, especially bone adaptation influenced by mechanical environment.

Ross, Callum F., Ph.D., 1993, Duke University: Morphologic adaptation of the skeleton to functional loads.

Shorr, Robert, D.I.C., Ph.D., 1982, University of London Imperial College of Science and Technology, England: Commercial development of biotechnology ventures.

Subramanian, Sunder, M.S., 1984, Iowa State University: Health care information systems.

Research Faculty

Gatley, John, Ph.D., 1975, University of Newcastle-upon-Tyme, England: Medical radionuclide imaging.

Volkow, Nora, *Director of Nuclear Medicine, Brookhaven National Laboratory.* M.D., 1981, National University of Mexico, UNAM: Positron emission tomography; substance abuse; aging.

Adjunct Faculty

Frisch, Paul, *Director, Montefiore Hospital.* M.S., 1977, University at Stony Brook: Computer-aided diagnostics; management information systems.

Degree Requirements

Requirements for the Advanced Graduate Certificate

A minimum of 19 credit hours of graduate study are required to obtain the Advanced Graduate Certificate in Biomedical Engineering. Students must complete a four-course core sequence (BME 501, 502, 503, 504) as well as one semester of Biomedical Engineering seminar (BME 505 or 506). In addition, six credits of elective coursework in the area of technology policy and/or management are required. A minimum overall grade point average of 3.0 in the courses taken for this program is necessary to receive certification.

Requirements for the M.S. Degree

At least 30 graduate credits are required for the M.S. degree in Biomedical Engineering. Candidates must complete a four-course core sequence (BME 501, 502, 503, 504), two semesters of Biomedical Engineering seminar (BME 505 and 506), and six credits of elective coursework in the area of technology policy and/or management. For non-thesis students, the remaining 10 credit hours must be uti-

lized to complete elective coursework, up to six credits may be transferred from another graduate program. For thesis students, a minimum of six credits of research (BME 599) must be taken and a satisfactory thesis completed. An overall grade point average of 3.0 or higher, with grades of 3.0 or higher in each core course, is necessary to receive the M.S. degree.

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

The student must satisfy the stipulations of a plan of study which must be filed with the graduate program committee within six months of acceptance into the Ph.D. program. The study plan will include designation of the research laboratories through which the student will be rotating, anticipated coursework that will be undertaken, and the courses that will be taught to fulfill the teaching requirement. Modification may be made by the Examination Committee. An up-to-date plan must be filed with the graduate program committee each time a change is made.

D. Course Requirements

It is required that each graduate student completing a doctoral degree will have taught for at least one semester as either a teaching assistant or adjunct faculty, and received a passing grade (BME 698).

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. The defense should generally occur by the fourth semester of the Ph.D. program.

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 hours 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 which lie outside of their major, and which traverse multiple areas of biomedical engineering. BME 501 through 504 are required core courses in the Biomedical Engineering program.

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 an understanding of the critical role of non-linear dynamics, physical chemistry of adsorption and resorption 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 Engineering Principles in Medical Diagnostics
Course content is driven by fundamental engineering issues in physical diagnostics: (1) the physical interactions between tissues and diagnostic probes permitting signal acquisition, (2) acquisition and detection of the physiological signals from the body, and (3) analysis/computational steps that facilitate the use of diagnostic data.
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 Seminar Series in Biomedical Engineering
Seminars by internationally renowned scientist and engineers, including Stony Brook faculty, covering diverse issues in biomedical engineering. Topics related to the impact of technology on medicine are also addressed. Course will be based primarily on Journal discussions. Papers will be within the disciplines of the invited speakers and will be reviewed each week, with discussion on that topic with the students and faculty of PIBE. The goal of this course is to expose the PIBE students to the cutting edge of many diverse fields in biomedical engineering.
Fall (505) and spring (506), 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 599 Biomedical Engineering Research
This is a research course to be supervised by a faculty member of the Program in

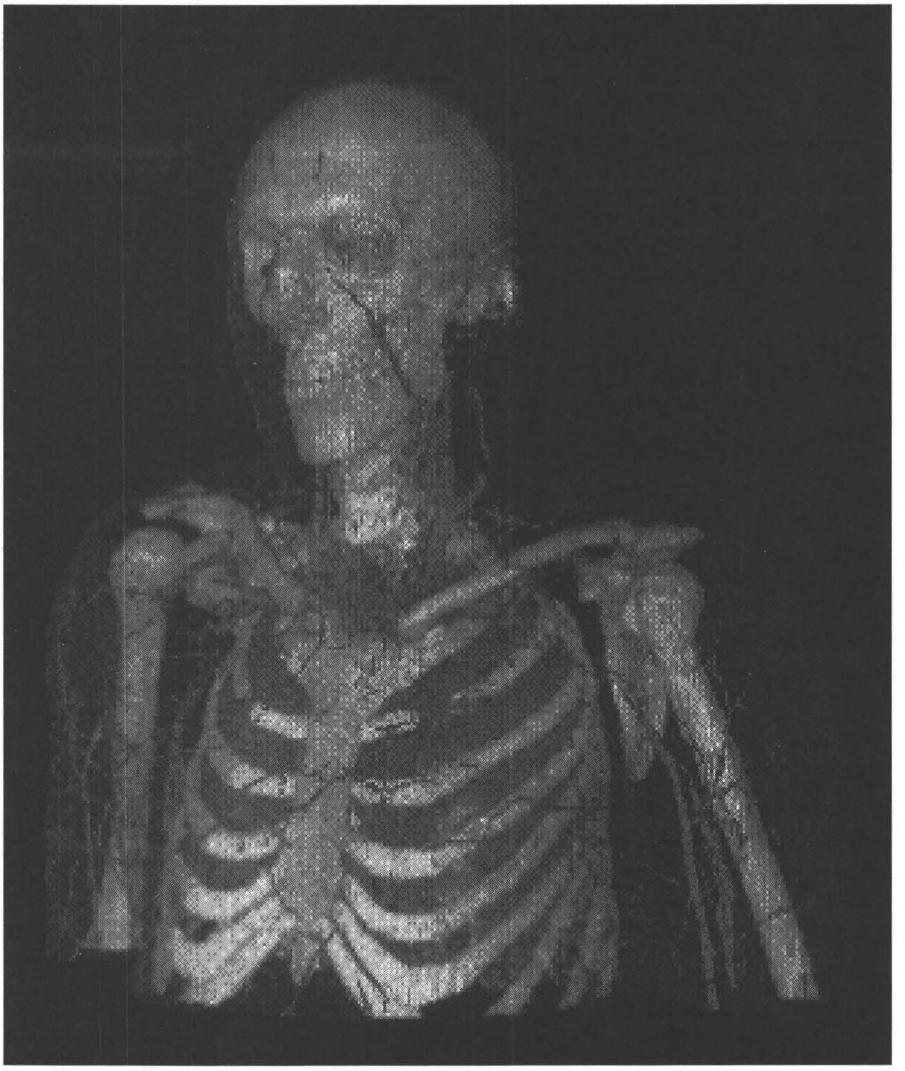
Biomedical Engineering. Students must have permission of instructor and enroll in appropriate section. Faculty to be identified by the student.
Fall and spring, variable repetitive credit
ABCF grading

BME 601 Cardiovascular Fluid Mechanics
This 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 a historical time line, beginning with the most basic models of arterial blood flow and proceeding to the most advanced theories related to physiological and pathological 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 course provides a broad overview of neural network theory and applications, with an emphasis on practical biomedical engineering problem solving using artificial neural networks. Lectures, homework assignments involving the use of computer simulations, and a project exploring a topic of interest in depth and requiring a written report and an oral presentation will be used to provide students with firsthand experience with neural network approaches to problem solving.
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.
Fall, 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 fields of haptics and robotic manipulations. Anatomy and electrophysiology of transducer cells and neurons starting at the fingertips and extending to the somatosensory cortex. Characteristics of external stimuli and their peripheral transformations. Relation of these topics to perceptual and/or behavioral responses. Quantitative analysis and modeling applied throughout. Comparisons with other sensorineural systems at all levels.
Spring, alternate years, 3 credits
ABCF grading



BME 606 Tissue Engineering
Issues in the engineering of tissues like skin, cartilage, bone, and organ systems are explored. Existing commercial products will be examined and cutting-edge technologies discussed. Constraints and limitations in scientific, technological, business, and ethics arenas are presented.
Fall, alternate years, 3 credits
ABCF grading

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, variable repetitive credit
ABCF grading

BME 699 Dissertation Research
Research to be supervised by a faculty member of the program. Students must have permission of instructor and enroll in appropriate section.
Fall and spring, variable repetitive credit
ABCF grading

Business Administration (BUS)

Dean: Yacov Shamash, 100 Engineering Building (631) 632-8380
Graduate Program Director: Kelvin W. Willoughby, 100 Engineering Building (631) 632-7192

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 the date of the first offering and other specific details: *http://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 is also 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.

Courses

BTM 501 Management Economics in a Global Environment

In today's world economy, information has become the central capital and a critical resource. It no longer matters where you are

if you are electronically connected with the buyers and sellers you do business with. The concept of a New York market or a London market is becoming antiquated as geography and location are no longer the keys to economic well being. Economic power is increasingly being transferred from nations to global networks whose participants span many countries. The course will introduce the theory and applications of microeconomics (cost and production theory, demand theory, market theory) and macroeconomics (gross output, income, employment, etc.) in this global perspective. The topics will also include economic determinants of a company's pricing, investment, and product decisions; market behavior including interactions with buyers, suppliers, and rivals; role of government; effects of social and legal forces; and domestic-versus-global economic strategies.
3 credits

BTM 502 Financial Management for Technology Managers
To succeed in the increasingly competitive global market, companies must know the costs of their entire economic chain and work with other members of the chain to manage costs and maximize yield. In this course, emphasis will be placed upon differentiating between costing what goes on inside the organization (managing the organization) and costing the entire economic chain or process (managing the organization and the supplier). The course contents will include nature and role of finance; capital structure and budgeting; traditional foundation of financial analysis (cash flow, ratio analysis, etc.); resource allocation analysis (ROI, payback period, cash flow, discounted present value, etc.); the measurement of total factor productivity (EVA or economic value added analysis and benchmarking); and company valuation.
3 credits

BTM 503 Data Analysis and Decision-Making in the Information Age
This course examines data analysis: the application of decision-making techniques to analyze problems involving technology. Areas of study include statistic principles, decision-making under uncertainty, decision-making in a passive versus active environment, sequential decisions, estimating payoffs, forecasting, and technology assessment. The course will also examine the role of technological devices as aids in decision-making. A treatment is given of the cognitive science and artificial intelligence, and visualization methods used in the structure and operation of some systems that support human decision-making.
3 credits

BTM 504 Management Accounting
This course is an introduction to methods for estimating and analyzing product costs and using cost information for product mix and pricing decisions in profit-directed organizations. Topics will also include valuation concepts and balance sheet; use of cost data in managerial decision-making, budgeting and control, and financial statement analysis; and performance evaluation of a business.
3 credits

BTM 505 Marketing Management of Technology-Based Products and Services
This course examines the complexities and risks associated with marketing of technology-based products and services in the global economy. The course contents include principles of marketing and technical selling of industrial products such as computers, semiconductors, software, machine tools, and other high-technology products. The concepts, analytical tools, and techniques applied to the development of marketing strategies including the product planning, buyers behavior, technical selling, advertising, pricing, and global market phenomena, will be discussed.
3 credits

BTM 506 Leadership, Team Effectiveness, and Practical Communications
This is a yearlong, written and oral course. The first semester is devoted to written communications and leadership, and the second semester to oral communications and team-effectiveness skills. The ability to communicate ideas clearly and effectively, especially technical ideas, is critical to success in managing the technology-driven company. Without appropriate leadership and effective teams, technology projects take longer to get to market. Both time and resources are wasted when confused, distorted writing and speaking obscure the information they are intended to convey. This course is designed to provide the students with the tools for making their reports, memorandums, and correspondence clear, comprehensible, and persuasive. Attention is given to technical presentations and to communicating in meetings. Leadership and team-building skills are provided in simulated business settings. The course will be taught by a team of faculty drawn from the various disciplines including business, English, linguistics, and sociology.
3 credits

BTM 507 Ethics in Management; Law and Intellectual Property
The ethics segment of this course starts with the discussions on problems of organizational life and the ethical principles that have already been adopted by the business persons based upon their religious, secular, and personal experience. The course includes the ethical framework for responsible management of investors, employees, customers, suppliers, and the external community as well as moral leadership, trust in organizations, and quality control. The other parts of the course deal with the basic legal principles applicable to the high-technology environment with an emphasis on those related to intellectual property. For full-time students this course will be offered on a yearlong basis, the first semester covering the ethics and the second semester emphasizing on law and intellectual property.
3 credits

BTM 511 Technological Innovations, Development, and Implementation
This course examines how technological innovations are created and converted into profitable products and services. Topics covered include competitive dynamics and coping with technological changes, process of innovation and creativity, multi-disciplinary nature of high-tech innovations, R&D project selection criteria, conversion and commercialization of innovation into products and service offerings, technology integration, management of information, organization and introduction of new products and services to the market place.
3 credits

BTM 512 Business Planning and Strategic Management
This course presents the principles and techniques of strategic planning by which an organization sets and implements its long-range direction. This includes the process of environmental scanning to identify the powerful emerging forces in an industry that represents opportunities and threats, benchmarking, self-assessment, development of feedback mechanisms to monitor the implementation and determine if corrective actions are required, as well as the process for encouraging strategic thinking at all levels in the organization. Students will also work in small groups to develop a business plan that is based on solving a problem whose parameters and inputs are drawn from the real world. The course concludes with presentations by each group to a panel of experts whose membership includes industry advisors. The panel will evaluate and critique each project plan.
3 credits

BTM 513 Project Management
Utilizing modern computer software tools, the student will learn how to manage a project in a high-technology environment. The course will cover such topics as principles and methods for planning and controlling a project including development of a project plan, resource planning and production scheduling (PERT/CPM), supplier integration, managing multi-player joint ventures, project monitoring and termination, etc. Emphasis will be on developing skills for managing inter-disciplinary projects and teams.
3 credits

BTM 514 Quality Management and Quality Assurance
This course will introduce students to the principles of total quality management and how to design a system for controlling the quality of products and services in an organization. Quality, quality systems, statistical process control, quality improvement methods, acceptance sampling, design-quality methods, and behavioral perspectives in managing for quality are covered. Process for prioritization and daily control as part of total quality management are emphasized. Baldridge Award, Deming Prize, and ISO criteria are examined to create a competitive enterprise.
3 credits

BTM 515 Human Resource Management in High-Tech Companies
This is an advanced course designed to examine new developments and professional concerns of human resource management in

high-technology companies. It focuses on contemporary and future organizations, identifies their characteristics, and explores the implication of managing and leading such an organization from a human resource management point of view. The course also examines the creation of the structures, team building, rewards and retention, career paths, education/retraining, and the cultures needed within the firm.
3 credits

BTM 521 and 522 Industrial Project I and II
This is a one-year course for full-time students, with 3 credits in the first semester and 3 credits in the second semester and the grade will be assigned at the end of the year. The student may be expected to devote a significant amount of summer time to this project. Each student will be required to solve a real world problem through the application and integration of the knowledge acquired from the program. The problem must be one related to the student's place of internship and must have the approval of the company. Each student will be required to make a presentation to a panel of experts including representatives from the student's company who will evaluate and critique the project.
6 credits

BTM 523 and 524 Industrial Project for Executives I and II
This sequence of industrial projects is specially designed for the Executive Program students. Each student will be required to solve a real-world problem through the application and integration of the knowledge acquired from the program. The problem must be one related to the student's place of employment and must have the approval of the employer. The two-year sequence allows students to pick a long-term project. Each student will be required to make a presentation to a panel of experts including representatives from the student's company who will evaluate and critique the project. This is a two-year course and the grade will be assigned at the end of each year.
3 credits

BTM 531 Cultural Issues in the Global Economy
The workforce today is not the homogeneous workforce of earlier generations. Especially in the information industry, the workforce is increasingly being made up of individuals from different countries each with their own set of customs and beliefs. The successful company is one that is knowledgeable about and sensitive to these different customs and is able to blend them into an efficient workforce. In addition to internationalization of the workforce, markets have also become global. Companies are increasingly becoming part of global networks of suppliers and manufacturers that provide goods and services to countries throughout the world. To be successful in this environment requires a good understanding of the different ways that business is conducted throughout the world. This course is an introduction to the cultural aspects of the non-homogeneous workforce and global business. Case studies and special lectures by invited speakers will be presented.
3 credits

BTM 532 Global English and Business Communications
English has become the language of international business. This course introduces students to the intricacies and variations of spoken and written English around the world. Examples are presented to demonstrate the influence of local language and culture on English, particularly in the context of business. Language strategies on how to effectively advertise, market, and sell in foreign countries and how to prepare for business negotiations with foreign companies are discussed.
3 credits

BTM 533 Advanced Managerial Communications
This course builds on managerial communication skills developed in BTM 506. The course introduces more interactive oral and interpersonal communication skills important to managers, including running meetings, listening, and contributing to group decision-making; presenting to an international group; and presenting to a hostile audience. The topics also include use of multimedia systems, electronic devices, and the Internet. Requirements will include individual and group written reports and a long oral presentation for a business audience with a project for another course. This course will be taught jointly by a group of faculty drawn from the disciplines of business, English, and linguistics.
3 credits

BTM 534 Gender and Diversity in the Workplace
The demographic composition of the high-tech labor force is changing fast. In the United States, the proportions of women, minorities, and people of other ethnic origins have steadily increased in recent years. This course presents an overview of these changes and current trends. In addition to the gender-related issues, the course also examines the diversity issues stemming from the differences in individual characteristics such as race, ethnicity, and national origin.
3 credits

BTM 541 Information Systems for Management
This course introduces the concepts, frameworks, tools, and techniques of information and communication technologies to improve managerial performance and to achieve organizational goals. Particular emphasis is placed on the understanding and evaluation of information systems; their applications in sales, marketing, finance, and operations; and implementation of information technology for productivity and economic advantage.
Prerequisite: Knowledge of spreadsheet and database software
3 credits

BTM 542 Using Information Technology to Achieve Customer Integration
This course will focus on the increasing requirement to consider the customer as a driving force in the success of the business, and how technology can be used to achieve full integration. The course will demonstrate the effective use of information technology to customer satisfaction and integration; starting with market research, to product design and specification, effective sales cycles, assuring ongoing customer satisfaction with all phases of the business relationship, and leveraging current and past customers for future growth.
Prerequisite: BTM 541 or permission of instructor
3 credits

BTM 543 Management of Information Systems I
This course introduces the basics of the management of information systems and examines both the issues surrounding the management of information technology resources (networks, systems, data, and applications) and the commercially available software that can facilitate the management of these resources. Both technical and financial considerations are analyzed.
Prerequisite: BTM 541 or permission of instructor
3 credits

BTM 544 Management of Information Systems II
This course builds on the concepts developed in BTM 543. It explores the critical issues of management of information systems, particularly the computing, communications, and connectivity among information systems from strategic, financial, organization, and technical perspectives. Topics include managing end-user computing; managing growth, computability, interoperability, and obsolescence; balancing centralization and decentralization; assessment of business value of new information and communication technologies.
Prerequisite: BTM 543 or permission of instructor
3 credits

BTM 545 Information Technology: Application Development
This course provides an overview of the application development process and a brief survey of the most popular commercial application development tools. As a course project, working under faculty guidance and industry input, the student will design and implement an information system using commercially available software packages.
Prerequisite: BTM 541 or permission of instructor
3 credits

BTM 546 Networking Concepts and Practices
We are embarking upon an age of networked intelligence. The age is transforming the ways we learn, think, and do business. This age is not just about the networking

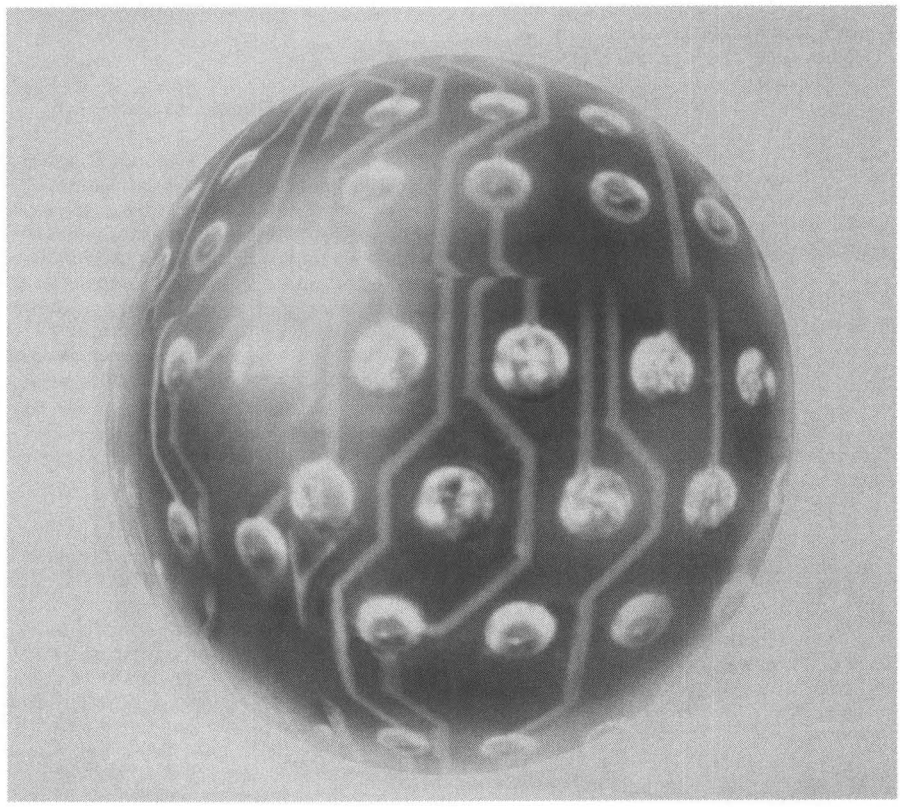
of technology; it is about the networking of humans through technology. Students will learn how networks can be structured so individuals and organizations can combine their intelligence, knowledge, and creativity for breakthroughs in the creation of wealth. They will learn how networks facilitate the sharing of knowledge and identification of problems before anything is manufactured, how engineering changes can be reduced at very early stages of production, and how to lower costs by integrating parts before production. Included is an overview of the practical aspects of networking technology. Various components of computer networking will be surveyed in sufficient detail to provide students with the necessary background to apply these concepts to the real world (Novell, NT, SNA, etc.).
3 credits

BTM 547 Electronic Commerce
This course is designed to give students an understanding of electronic commerce in general, and the Internet in particular, and their use in today's business. Topics include common tools for electronic commerce, using the Internet to improve customer service, electronic payment systems, inter-organizational commerce, digital cash, Electronic Data Interchange (EDI), value-added marketing, push-pull technology for marketing, etc. Attention will also be given to future trends in the digital economy. Students will use a variety of case studies designed to illustrate the practical application of what is learned in the classroom. Special lectures will be delivered by guest speakers drawn from the organizations that are at the forefront of electronic commerce.
3 credits

BTM 548 Information Systems and Law
This course examines the complex technological and legal issues concerning computer-based information systems. Topics include protection of personal privacy, knowledge-versus-product, proprietary rights in software, computer crime, computer ethics, integration of technical, social and legal concepts of information systems.
3 credits

BTM 549 Current Developments in Information Technology and Future Trends
Students will be exposed to the latest state-of-the-art developments and future trends in information technology. Speakers from leading hardware and software companies as well as universities and research laboratories will discuss the recent advances in the field and upcoming technologies. Each student will be required to submit a portfolio based on these presentations.
3 credits

BTM 551 Managing Data: Principles and Applications
The extraordinary advances in information processing will serve as the dynamo for business development. Incremental differences in abilities to acquire, distribute, store and analyze, and invoke actions based on information will determine the winners and losers in the battle for customers. The course focuses on the four distinct categories of information content that determines the state of the business, form that makes it possible to define the products to be produced, behavior information that will test the models in use, and action information that will pull it all together into the actual manufacture, testing, and distribution of the finished goods and services. The course will give students a knowledge of the tools for developing and disseminating these types of information, such as databases, data warehouses, and data marts, and the considerations, that must guide their effective use.
3 credits



BTM 552 Software Engineering Management
This course discusses the issues critical to the development, management, delivery, and upgrading of software in organizations. Particular emphasis is given to the management of software development projects including managerial planning and control and group efforts.
3 credits

BTM 561 Design, Manufacturing, and Marketing
This course develops an understanding of the flow of activities within companies that lead to the creation, marketing, and distribution of new products. Topics include identification of the consumer needs; manufacturing processes; issues involved in developing a product; integration across the disciplines of marketing, design, and manufacturing; cost analysis; and marketing plan for commercialization of a new product.
3 credits

BTM 562 Management of Manufacturing Systems
The course provides an overview of how product and service requirements are translated into manufacturing facilities, procedures, and organizations. Control and management of manufacturing systems through demand forecasting, inventory planning, production scheduling, quality control, MRP, and project control, are discussed. Topics also include management perspective of decisions that can have long-term impact on manufacturing such as capacity planning, plant location, distribution systems, manufacturing processes, and factory layout; manufacturing policy; and global trend.
3 credits

BTM 563 Information Systems for Manufacturing
This course discusses the role and contributions of information systems and technologies on the integrated manufacturing environment. An analysis is presented on how the manufacturers can improve manufacturing processes, improve productivity, reduce cost, and reduce lead time through the use of information technologies. The course also explores the concepts of information simplification such as JIT systems that are evolving as integral parts of the manufacturing information systems.
3 credits

BTM 564 Manufacturing Policy and Strategy
This course provides an exposure to the major concepts of manufacturing policy and strategy. The topics in manufacturing policy include degree of vertical integration (scope of the process), capacity level (scale of the process), major plant decisions (location, size, and focus), and choice of equipment and process technology. The course also analyzes the relationship between manufacturing strategy and (1) factors such as the company's competitive position, competitor actions, and government regulations; (2) corporate strategies; and (3) other areas such as finance, accounting, marketing, economics, and organizational behavior.
3 credits

BTM 571 Entrepreneurship: Starting the High-Tech Venture
This course covers what is necessary to start a business venture based on a high-technology product or service. Topics include turning a concept into a new venture, developing a business plan, identifying and evaluating the product and market, financing the venture, and management and organizational issues unique to technological ventures.
3 credits

BTM 572 Building a High-Performance Organization
This course focuses on the various ways the organizations change and learn in response to the technological developments and their utilization. The topics include, beyond their introductory level in BTM 571, team building, motivation, communication, decision-making, design of organization, selection of technical and non-technical personnel, compensation and reward systems, performance evaluation, labor relations, role of information systems, continuous improvement, and proactive approach.
Prerequisite: BTM 571, or permission of instructor
3 credits

BTM 573 Virtual Corporations
One of the most important characteristics of the changing economy is the ability of businesses to deliver products and services that create instant customer gratification in a cost-effective way. The production of these goods and services is not limited by geography nor are they limited by size, shape, or formats. The ultimate goal will be cost-effective instantaneous production of mass-customized goods and services. The course will explore both the concepts and the key enablers (interconnected real-time networks, e-mail, groupware, etc.) of virtual corporations.
3 credits

BTM 574 Creating a Learning Organization
Most organizations do not live past 40. Those that do have learned to create their own future by adapting to external threats and opportunities. Learning organizations are those that are continually expanding their capacity to create their future and whose employees are motivated to welcome an environment of constant change and learning as the world changes around them. This course examines how to create a learning organization to achieve a competitive advantage.
3 credits

BTM 575 Managing Mergers and Acquisitions of Technology-Based Companies
Unlike the companies of the industrial age where capital was tied up in plants and assembly lines, the capital of technology-based companies is intellectual property. Much of the means of production is owned by the worker. Unlike goods produced on the assembly line where development costs were low in comparison to the actual cost of making the product, goods produced by high-tech companies have high development costs and very low production costs. These and other differences between the structure of companies in the industrial age and those in the information age require a greater degree of information and understanding about the nature of the business when considering whether or not to acquire or merge.
3 credits

BTM 576 Stories of Successful High-Tech Enterprises
Special case studies of highly successful high-tech enterprises will be presented and discussed together with some failed ventures. Speakers from some of these companies will be invited to present their success stories and what they did right. Each student will be required to select and analyze one successful and one failed high-tech venture.
3 credits

BTM 581 International Business
The international business environment is changing rapidly and these changes immediately impact the business organizations, particularly in the field of high technology. This means that the managers cannot afford to remain indifferent to the issues of international business. This course therefore introduces students to the basic elements of international business, changing patterns, dynamics of global competition, financing and marketing problems, multinational enterprises, strategic alliances, regional marketing integration, government-business interactions in various parts of the world, and organizational challenges for managing the business across the borders.
3 credits

BTM 582 Transnational Organizations and the Global Economic Order
This course provides an overview of the evolution of the global economic order from the early emergence of international trade to the establishment of the World Trade Organization. It focuses on the implications of social and political developments for the organization of economic activity, considering specifically the forces that have greatly influenced the development of global capitalism and the transnational organization of business. A substantial portion of the course will be devoted to reviewing the contemporary social, political, and legal debates surrounding the emergence and growth of transnational corporate activities since the 1970s and their implications for the organization of transnational corporations.
3 credits

BTM 591 Research and Development Management
This course discusses managerial issues dealing with research and development in a technology-based, for-profit organization. Topics included are technology forecasting, technology planning, selection and evaluation of R&D projects, R&D team organization, resource allocation, managerial control, and measuring results. This course builds on BTM 511 and particular emphasis is given to creativity, motivating and managing creative individuals, innovation barriers, and project organization.
3 credits

Cellular and Developmental Biology (BCD)

Graduate Program Director: Nancy C. Reich, Health Sciences Center, Academic Tower B, L9, Room 183 (631) 444-7503
Senior Staff Assistant: Janet Koenig, Life Sciences Building 350 (631) 632-8533

Degree awarded: Ph.D. in Cellular and Developmental Biology

The Cellular and Developmental Biology Graduate Program, within the College of Arts and Sciences, is part of a larger, "umbrella" program, the Graduate Program in Molecular and Cellular Biology, which also includes Molecular Biology and Biochemistry and Immunology and Pathology. A student may choose the Cellular and Developmental Biology Program upon applying or at the end of the first year. The goal of this approach is to provide the student with the widest range of research possibilities.

The Graduate Program in Cellular and Developmental Biology provides training and research opportunities in the molecular and cellular bases of growth, differentiation, and morphogenesis of biological systems. Faculty members are drawn from departments within the Biological Sciences Division, Health Sciences Center, Brookhaven National Laboratory, and Cold Spring Harbor Laboratory, and are engaged in research on a large variety of organisms ranging from viruses and eukaryotic microorganisms to higher plants and animals. Methodologies and levels of analysis vary from the molecular to the cellular to the organismic. Emphasis is placed on the control mechanisms that define and regulate growing and developing systems.

The field of cellular and developmental biology is experiencing a period of rapid growth. Due to recent conceptual and technological advances, many of the classic problems in biology, which a short time ago seemed insoluble, are now experimentally approachable. The prospective student can expect a high-quality education in a stimulating setting.

In the first year of study, all 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 successfully complete a written Qualifying Exam. A student is advanced to candidacy for the Ph.D. degree after successfully defending a dissertation research proposal before a faculty committee. 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 of the program and applications for admission may be obtained from the graduate program director.

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 Pathology Department Library, which receives a selection of the most popular biomedical journals. 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

The Graduate Program in Cellular and Developmental Biology requires the following in addition to the minimum Graduate School admission 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. Students may be admitted without some of these undergraduate courses but will be required to make up these deficiencies during the first year.

B. Letters from three previous instructors.

C. A report of Graduate Record Examination (GRE) General Test scores.

D. Acceptance by both the Graduate Program in Cellular and Developmental Biology and the Graduate School.

Faculty

Professors

Bar-Sagi, Dafna[2], PhD., 1984, University at Stony Brook: *Ras* proteins in proliferation and transformation.

Benach, Jorge L.[2], Ph.D., 1972, Rutgers University: Pathogenesis of spirochetal infections; utilization of host macromolecules.

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.

Freundlich, Martin[1], Ph.D., 1961, University of Minnesota: Regulation of bacterial gene expression by interactive elements.

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[5,8], D.V.M./D.Sc., 1974, University of Paris, France: Biochemistry; function of the complement system.

Grollman, Arthur, P.[4], M.D., 1959, The 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, University at

Stony Brook: 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, Oxford University, 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, Cambridge University, 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.[1,2,5], Ph.D., 1975, University at Stony Brook: 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.

Schechter, Nisson[1,7], 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.

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.

Bingham, Paul M.[1], Ph.D., 1979, Harvard University: Genetic control of development and gene expression in animals.

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.

Hollingsworth, Nancy[1], Ph.D., 1988, University of Washington, Seattle: Chromosome structure and function during meiosis in yeast.

Kew, Richard R.[5], Ph.D, 1986, University at Stony Brook: 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.

McKinnon, David[3], Ph.D., 1987, John Curtin School of Medical Research, Australia: Molecular physiology of sympathetic neurons and cardiac muscle.

Mackow, Erich R.[8], Ph.D., 1984, Temple University: Rotavirus molecular genetics; determinants of viral neutralization and pathogenesis; reverse genetics; biochemistry of cell fusion.

Miller, W. Todd[6], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Moll, Ute M.[6], M.D., 1985, Ulm, Germany: The p53 tumor suppressor gene family: Function/regulation in normal cells and tumor-associated inactivation.

Morris, Andrew J.[4], Ph.D., 1988, University of Birmingham, England: Phospholipids and cellular signaling.

Prives, Joav[4], Ph.D., 1968, McGill University, Canada: Cytoskeletal membrane interactions in muscle cell.

Raleigh, Daniel P.[9], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Reich, Nancy, *Graduate Program Director.*[6] Ph.D., 1983, University at Stony Brook: Signal transduction and gene expression in response to cytokines and virus.

Sampson, Nicole[9], Ph.D., 1990, University of California, Berkeley: Protein structure-function; mammalian fertilization.

Scarlata, Suzanne[6], Ph.D., 1984, University of Illinois: Structure /oligomerization of membrane proteins.

Spector, Ilan[6], Ph.D., 1967, University of Paris, France: Neuronal differentiation and microfilaments.

Spitzer, Eric D.[5], M.D./Ph.D., 1985, The 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

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.

Garlick, Jonathan[10], D.D.S., 1985, Ph.D., 1993, University at Stony Brook: Oral and epidermal carcinogenesis/cancer gene therapy.

Kernan, Maurice[3], Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

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, The 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.

Rebecchi, Mario J.[8], Ph.D., 1984, New York University: Phospholipases and signal transduction.

Schindelin, Hermann[1], Ph.D., 1994, Free University, Berlin, Germany: Structure and function of metalloenzymes and enzymes involved in metallo-cofactor biosynthesis; protein crystallography.

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-The State University: Structure/function of bacteriophage T7 RNA polymerase.

Hannon, Gregory, *Assistant 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.

Hengartner, Michael O., *Associate Professor.*[15] Ph.D., 1994, Massachusetts Institute of Technology: *C. elegans* developmental genetics-apoptosis, neurobiology.

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 in fish.

Spector, David L., *Professor.*[15] Ph.D., 1980, Rutgers-The State 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., *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, 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.

1) Department of Biochemistry and Cell Biology

2) Department of Molecular Genetics and 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

15) Cold Spring Harbor Laboratory

Requirements for the Ph.D. Degree

A. Course Requirements

1. Molecular Genetics (BMO 503)

2. Graduate Biochemistry (BMO 520)

3. Biomembranes (BMO 517)

4. Cell Biology (BCD 656)

5. Developmental Biology (BCD 657)

6. One approved elective graduate course

7. Students in their first year also rotate in four laboratories with the goal of selecting an environment for their thesis research (BCD 530)

8. Participation in journal club (BCD 531/532); Student Seminars (BMO 603/604); Visiting Scientists Seminars (BMO 601/602)

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 will take a written qualifying examination covering the areas of cellular and developmental biology.

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 in cellular and developmental biology 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 appointed 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

BCD 500 Directed Readings in Genetics and Developmental Biology
Directed readings in topics of current interest, under supervision of a faculty sponsor, culminating in one or more critical review papers.
Prerequisite: Sponsor's approval
Yearly, 1-3 credits, repetitive
ABCF grading

BCD 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.
Fall, alternate years, 3 credits
ABCF grading

BCD 530 Projects in Developmental Biology
Individual laboratory projects, closely supervised by staff members, to be carried out in staff research laboratories on a rotation basis.
Fall and spring, 2 credits
ABCF grading

BCD 531, 532 Graduate Seminar in Developmental Biology
Seminars are given by graduate students on current literature in the fields of biochemistry and cell and developmental biology.
Fall and spring, 1 credit
ABCF grading

BCD 535 Physiology and Development of Higher Plants
Survey of selected topics in plant physiology with emphasis on developmental aspects. Areas from which specific problems are selected include photomorphogenesis, hormonal control of plant growth, and plant tissue culture.
Fall, alternate years, 3 credits
ABCF grading

BCD 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. Crosslisted with HBA 536.
Spring, 3 credits
ABCF grading

BCD 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. Crosslisted with HBA 537.
Fall, 3 credits
ABCF grading

BCD 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 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

BCD 599 Research
Original investigation under the supervision of a member of the staff.
Fall and spring, credit to be arranged
S/U grading

BCD 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. Crosslisted with HBA 656.
Spring, 4 credits
ABCF grading

BCD 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. Crosslisted with HBA 657.
Prerequisite: BCD 656
Fall, 3 credits
ABCF grading

BCD 699 Dissertation Research
Original investigations undertaken as part of the Ph.D. program under supervision of research committee.
Fall and spring, credit to be arranged
S/U grading

BCD 800 Summer Research
Summer, 0 credits
S/U grading

Chemistry (CHE)

Chairperson: Iwao Ojima, Chemistry Building 104 (631) 632-7885
Graduate Program Director: Daniel Raleigh, Chemistry Building 647 (631) 632-9547
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. The faculty takes great pride in the quality and sophistication of the instrumentation, and faculty members have the responsibility of maintaining certain pieces of equipment within their own research group.

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.

Biological Chemistry

A significant number of the faculty are using their chemical expertise to explore the chemical and physical details of biological phenomena. Research programs span biological chemistry, enzyme mechanisms, protein folding, membrane structure and function, biophysics and structural biology. Techniques such as high resolution NMR, stop-flow kinetics, fluorescence and Raman spectroscopy are used to probe protein structure, function, and folding. Novel biosynthetic and chemical strategies are being used to generate small molecules for use in probing enzyme mechanisms and exploring ligand-receptor interactions.

Inorganic Chemistry

Inorganic chemistry, being concerned with the synthesis, structure, and dynamics of the compounds formed by the more than 100 natural and synthetic elements, covers an extremely vast area of chemistry. New compounds and new synthetic methods are among the goals of inorganic chemistry. Such compounds range from materials important in technology to catalysts for industrial chemical processes, small molecules present in outer space, and metal complexes that serve as models for biological materials. The methodologies utilized in inorganic chemistry include a wide variety of spectroscopic techniques, kinetic methods, procedures for the elucidation of geometric and electronic structures, and theory. The breadth and depth of inorganic chemistry are well represented at Stony Brook, as seen by the following examples of current research: thermally and photochemically activated dynamic processes, in particular, electron transfer reactions; synthetic and structural studies of active site analogs of metalloenzymes such as the zinc proteins that regulate gene transcription and the high-potential iron-sulfur proteins; activation of small molecules by transition metal complexes and homogeneous catalysis; chemistry of unsaturated carbon-metal bonds in mononuclear compounds and in extended molecular assemblies; molecular orbital calculations and molecular mechanics methods applied to transition metal cluster compounds and related organometallic substances; NMR studies of zeolites and supported catalysts.

Magnetic Resonance

Magnetic resonance in the Chemistry Department ranges from studies in physiology to studies in chemical physics. Topics under investigation include the use of liquid and solid state nuclear magnetic resonance (NMR) spectroscopy and micro-imaging techniques with stable spin 1/2 and quadrupolar nuclides to study inorganic, organic, biological, and living systems. Projects in progress employ a range of single and N-dimensional NMR spectroscopic techniques and novel imaging techniques to elucidate chemical processes and determine the structures of biological and organic molecules in solution.

Novel NMR methods are being developed for the determination of the structures of micro- and macromolecules as they exist in disordered solids and to study the structure and dynamics of molecules in the liquid crystalline state and those absorbed on solid surfaces. Pulsed electron paramagnetic resonance (EPR) techniques are being developed to study metalloenzymes, organic conductors, and other molecules.

The NMR facility in the Department of Chemistry includes seven NMR spectrometers, a multinuclear, research grade, 600 MHz (14.1 T) spectrometer with 3-axis field gradient capability and a standard 51 mm bore magnet for liquids and solids CP/MAS spectroscopy, a multinuclear, research grade, 500 MHz (11.75 T) spectrometer with z-axis field gradient capability and a standard 51 mm bore magnet for liquids spectroscopy, a multinuclear research grade spectrometer at 400 MHz (9.4 T) with an 89 mm wide bore magnet that is available for imaging and solids spectroscopy, a 300 MHz (7.0 T) spectrometer with a z-axis gradients for routine liquid NMR spectroscopy, a multinuclear 250 MHz (5.88 T) standard bore magnet spectrometer that is also available for routine NMR spectroscopy, and two wide bore spectrometers dedicated to solids.

Macromolecules

With development of state-of-the-art X-ray diffraction and small-angle X-ray scattering (SAXS) at the State University of New York's X3 Beamline at the National Synchrotron Light Source at Brookhaven National Laboratory, the polymer and biomacromolecular physics group, being members of the participating research team (PRT), possesses one of the most powerful X-ray scattering facilities in the country. The experiments at Stony Brook make use of a wide variety of complementary techniques such as SAXS, laser light scattering, photon correlation spectroscopy, fluorescence photobleaching recovery, holographic relaxation spectroscopy, transient electric birefringence, and various forms of nuclear magnetic resonance spectroscopy. Stony Brook scientists can perform measurements to determine the structure and dynamical behavior of advanced polymeric materials, supramolecular systems, and biomacromolecules. Time-dependent processes can be studied using stop-flow, steady-flow, pressure-jump, and temperature-jump experiments together with time-resolved capabilities using intense radiation sources such as pulsed lasers and the synchrotron radiation. Unparalleled opportunities exist for interdisciplinary research using unique and novel instrumentation in polymer materials, polymer physics, colloid science, and biophysical chemistry.

Photon-Molecule Interactions

Recent developments in the use of lasers for the investigation of molecular structure and dynamics have led to a revolution in the fields of molecular spectroscopy and dynamics. Intimate details about the structure and interactions of atoms and molecules can now be studied to an extent never before possible. In this program the systems being studied by laser spectroscopy range from atoms and diatomic molecules to molecular crystals and polymers. In these systems various properties are being investigated, including nonlinear interactions with the radiation field, excited state electronic structure, radiationless transitions, ionization mechanisms, crystal field interactions, and photochemical reactions, as well as electron and energy transfer processes. Luminescence spectroscopy, luminescence excitation, multiphoton ionization, multiphoton photoelectron spectroscopy, Raman spectroscopy, and vacuum ultraviolet spectroscopy are among the techniques being used and developed for the ever greater understanding of atomic and molecular systems.

Soft X-Ray Spectroscopy

The National Synchrotron Light Source at Brookhaven National Laboratory, located only 15 miles from Stony Brook, provides unique opportunities for frontier research in chemistry. The synchrotron and associated devices are unequaled sources of high-intensity X-ray and vacuum ultraviolet radiation. One area of current research uses soft X-rays, photons with energies of 100 to 1000 eV, to investigate the excitation and relaxation of core electrons in molecules. Because core electrons, e.g., the 1s electrons of carbon, are tightly bound to individual atoms, the excitation energy is essentially localized on a particular atom in the molecule. This localization has the potential for producing photochemistry with far greater atomic site specificity than can be achieved by excitation of valence electronics with visible and ultraviolet light.

Surface Chemistry

Catalysis, corrosion, and friction are a few examples of familiar processes that occur on solid surfaces. The field of surface chemistry tries to unravel and understand the basic chemical principles that 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.

Reaction Dynamics

A variety of molecular and ion-beam techniques are being used in combination with laser spectroscopy and mass spectroscopy to study the dynamics of elementary chemical reactions. Lasers and high-energy particle beams are used together with ion-trapping techniques to produce cold, mass-selected metal cluster ions isolated in the gas phase. Photo- and collision-induced dissociation are used to study the effects of cluster size and composition on bonding and structure. Chemistry of the metal cluster ions can be studied using beam techniques, yielding a detailed picture of the reaction mechanisms and further information on the energetics of the cluster species.

Multiphoton ionization is used to prepare polyatomic reagent ions in selected vibrational states, including control over the vibrational mode. Guided beam techniques are used to study the effects of both vibrational and translational motion on reactivity and product-branching ratios. Supersonic expansions of radical species are produced by several discharge and pyrolysis techniques. The radicals react with a second reagent added to the expansion, and the reactions can be monitored in real time via multiphoton ionization and fluorescence spectroscopies.

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 2.75 (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

Chu, Benjamin, Ph.D., 1959, Cornell University: Laser light scattering; small angle X-ray scattering; nano-/microstructures and supramolecular formation in polymer colloids and micelles; photoelectrolyte gels; 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, antithrombotics, and enzyme inhibitors.

Professors

Alexander, John M., Ph.D., 1956, Massachusetts Institute of Technology: Reactions between complex nuclei; time scales of 10-22 seconds; evolution toward thermalization.

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.

Goldfarb, Theodore D.[2], Ph.D., 1959, University of California, Berkeley: Environmental chemistry, minimizing chemical pollution associated with waste disposal, energy production, and agriculture; science and public policy; ethics in science.

Haim, Albert[3], *Emeritus.* Ph.D., 1960, University of Southern California: Kinetics and mechanisms of inorganic reactions.

Hanson, David M., Ph.D., 1968, California Institute of Technology: Dynamics of core-electron excitation and decay in molecules; Synchrotron radiation-induced chemistry in films and on surfaces; classroom structures that improve student learning.

Herley, Patrick[4], Ph.D., 1964, Rhodes University; D.Sc., 1982, University of London, England: Physical (nucleation) processes occurring in the decomposition of inorganic solids.

Ishida, Takanobu, Ph.D., 1964, Massachusetts Institute of Technology: Isotope effects, stable isotope separation, electrochemistry of nitrogen oxides and carbon oxides in biological fluids.

Johnson, Francis[5], 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.[4], 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; low-energy electron diffraction (LEED); Auger electron spectroscopy (AES); photoemission (UPS).

Kerber, Robert C.[6], Ph.D., 1965, Purdue University: Chemical education; synthesis of organotransition metal complexes, mechanisms of their reactions; complexes of fulvenes, other polyenes.

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.

Lauher, Joseph W.[8], Ph.D., 1974, Northwestern University: Structural chemistry; design and synthesis of new inorganic and organic materials; hydrogen bonding; molecular graphics.

le Noble, William J., 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[9], 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, Germany: Synthesis and reactivity of metal-carbon multiple bonds; metal-carbon multiple bonds as components in molecular materials.

Parise, John B.[10], Ph.D., 1981, University of North Queensland, Australia: Synthetic solid-state chemistry; structural chemistry; crystallography; materials research.

Porter, Richard N., *Emeritus.* Ph.D., 1960, University of Illinois: Theoretical chemistry; quantum field theory of ensembles of molecules and photons; field theory of multiphoton spectra; field theory of critical phenomena.

Stell, George R.[11], Ph.D., 1961, New York University: Statistical thermodynamics; molecular theory of fluids; theories of gelation and polymerization.

Associate Professors

Drueckhammer, Dale G., Ph.D., 1987, Texas A&M University: Bioorganic chemistry; design, synthesis, and evaluation of enzyme inhibitors; enzyme reaction mechanisms; chemistry and enzymology of coenzyme A; receptor design for recognition and sensing of biological molecules.

Grey, Clare P., D.Phil., 1991, Oxford University, England: Materials chemistry; solid-state NMR spectroscopy; characterizing and modifying reactive sites in catalysts; adsorption and reactions of hydrofluorocarbons on basic catalysts; studies of disordered flourides and battery materials.

Hsiao, Benjamin S., Ph.D., 1987, University of Connecticut: Polymer physics; polymer crystallization; structure and property relationships in nanostructured polymers and biodegradable polymers; Synchrotron X-ray scattering and diffraction.

Lacey, Roy A.[7], Ph.D., 1987, University at Stony Brook: Nuclear chemistry; intermediate and relativistic energy heavy ion reaction studies.

Millar, Michelle M., Ph.D., 1975, Massachusetts Institute of Technology: Reactivity, electronic, and structural properties of transition metal complexes; organometallic chemistry; bio-inorganic chemistry.

Raleigh, Daniel P., *Graduate Program Director.* Ph.D., 1988, Massachusetts Institute of Technology: Biological chemistry; experimental studies of protein folding and protein structure; protein-ligand interactions via NMR; de novo design of novel proteins.

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.

Schneider, Robert F., *Director of Research Informatics and Compliance.* Ph.D., 1959, Columbia University: Chemical education; web-based instruction; university research administration; information systems; research compliance issues.

Sieburth, Scott M., Ph.D., 1983, Harvard University: New synthetic methods and strategies; total synthesis; organosilane inhibitors of protease enzymes; small molecule-receptor interactions.

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 organic compounds and materials; all-carbon molecules and selective fullerene formation; annulenes, helical polyenes, and other unusual conjugated systems.

Simmerling, Carlos, Ph.D., 1994, University of Illinois, Chicago: Computational chemistry and structural biology; molecular dynamics of biological macromolecules.

Adjunct Professors

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.

Springer, Charles S., Ph.D., 1967, Ohio State University: Biophysical chemistry; in vivo nuclear magnetic resonance; transcytolemmal water and cation transport; hyperfine relaxation and frequency shift NMR studies.

Number of teaching, graduate, and research assistants, fall 1999: 125

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, 1979

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1981

4) Joint appointment, Department of Materials Science

5) Joint appointment, Department of Pharmacology

6) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1986; Recipient of the President's Award for Excellence in Teaching, 1986.

7) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1998; Recipient of the President's Award for Excellence in Teaching, 1998

8) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990; Recipient of the President's Award for Excellence in Teaching, 1990

9) Joint appointment, Department of Biochemistry

10) Joint appointment, Department of Geosciences

11) Joint appointment, Department of Mechanical Engineering

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 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 530, 541, 542, in addition to CHE 531, 532, and two semesters of Teaching Practicum (CHE 610, 611) or the equivalent is required. 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.

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 (Organic/ Inorganic 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. Three courses from among CHE 501-530. The choice of courses must be distributed among at least two of the three areas, inorganic, organic, and physical chemistry.

2.Two graduate biology/biochemistry-oriented courses (for example, BMO 520, BMO 512, CHE 507, CHE 541, CHE 542) as approved by the graduate advisement committee. 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

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

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

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

CHE 507 Biomolecular Structure and Reactivity
The reactivity and physiological function of biological macromolecules and their monomeric constituents are described at the chemical level. The emphasis of this course reflects the most recent advances at the interface of organic chemistry and biochemistry. Specific topics include catalysis, biomimicry, protein and DNA modification, binding and target recognition, and correlation between three-dimensional structure and reactivity.
Prerequisite: BIO 361
3 credits

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

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

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

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

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
3 credits

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

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.
3 credits

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

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.
3 credits

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

CHE 531 Departmental Research Seminar
Meetings in which first-year graduate students learn about the research activities of the departmental faculty.
Fall, no credit

CHE 532 Literature Seminar
Students select and discuss topics from the current literature.
Spring, no credit

CHE 551 Glass Blowing
Basic scientific glass blowing: basic sealing techniques, Vac Line lay out, set up, and repairs. T-seals, ring seals, use of cutting machine, hardtorch, and bench torch. Safety with glass. Open to graduate students in the sciences.
Fall, 1-2 credits

CHE 589 Directed Study
Subject matter varies according to needs of student.
Variable and repetitive 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.
Summer, fall, or spring, 3 credits

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

CHE 592 Instrumental Methods
An introduction to the principles underlying the operation of modern instruments in chemical research and technology. The lecture material is supported by experiments performed using instruments available in the Department of Chemistry.
3 credits

CHE 593 Chemical Demonstrations
The design and implementation of demonstrations to illustrate modern concepts of chemistry.
3 credits

CHE 601 Special Topics in Synthetic Organic Chemistry
The subject matter varies depending on interests of students and faculty. Possible topics include asymmetric synthesis and natural product synthesis.
Prerequisite: A sound background in organic synthetic methods (e.g., CHE 503)
Variable and repetitive credit

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.
Variable and repetitive 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.
3 credits, repetitive

CHE 610, 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.
610: variable and repetitive credit
611: no credit, repetitive

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.
Variable and repetitive 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

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

CHE 682 Special Topics in Inorganic Chemistry
Subject matter varies, depending on interests of students and staff, but covers recent developments in inorganic chemistry.
Variable and repetitive 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.
Variable and repetitive credit

CHE 693 Physical Chemistry Seminar
Variable and repetitive credit

CHE 694 Biological Chemistry Seminar
Variable and repetitive credit

CHE 695 Inorganic Chemistry Seminar
Variable and repetitive credit

CHE 696 Organic Chemistry Seminar
Variable and repetitive credit

CHE 698 Colloquium
Variable and repetitive credit

CHE 699 Research
Variable and repetitive credit

Comparative Literature (CLG)

Chairperson: Krin Gabbard, Frank Melville, Jr., Memorial Library E4309 (631) 632-7460
Graduate Program Director: Beverly Haviland, Frank Melville, Jr., Memorial Library E4316 (631) 632-7460
Graduate Secretary: Mary Moran-Luba, Frank Melville, Jr., Memorial Library E4308 (631) 632-7456

Degrees awarded: M.A. in English; Ph.D. in English

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 English.

Stony Brook's doctoral program in comparative literature attaches special importance to the developments in contemporary interpretive theory that have transformed dominant concepts of 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 require inquiry into alternate means for approaching the literary work. 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 orient them toward 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.

Admission

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

Applicants holding the M.A. degree in English 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. These normally will include, in addition to the minimum requirements of the Graduate School:

A. A B.A. or M.A. degree from a recognized institution and in a suitable area of study.

B. Letters of recommendation.

C. Graduate Record Examination (GRE) General Test scores.

D. Two course papers in literature or another appropriate field.

Faculty

Professors

Charnon-Deutsch, Lou[4], 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.

Davis, Mike, C.Phil., 1980, University of California, Los Angeles: Urban history; the American West; climate history since 1800.

De la Campa, Román[1], Ph.D., 1977, University of Minnesota: Latin American literature; Latin and Caribbean cultural studies; contemporary theories of criticism.

Gabbard, Krin, *Chairperson.* Ph.D., 1979, Indiana University: Film theory and history; jazz; cultural studies; psychoanalytic approach to the arts; ancient Greek literature; drama; literary theory.

Kaplan, E. Ann, Ph.D., 1970, Rutgers-The State University: Contemporary theory; cultural studies (women in film, film noir, popular culture, television); film and literary theory.

Park, Sung-Bae, Ph.D., 1979, University of California, Berkeley: Korean religions; Wonhyo, Chinul, and T'oegye; classical Chinese literature; East Asian religions and philosophy; Ch'an and Hua-yen literature; Buddhist philosophy and Neo-Confucianism.

Petrey, Sandy, Ph.D., 1966, Yale University: 19th-century fiction; theories of the novel; contemporary criticism.

Silverman, Hugh J.[5], 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

Harvey, Robert[2], Ph.D., University of California, Berkeley: 20th-century and contemporary literature in French and English; critical theory; film.

Haviland, Beverly, *Graduate Program Director.* Ph.D., 1982, Princeton University: 19th- and 20th-century American, English, and French literature; literary and feminist theory; psychoanalysis; the history of the novel; Henry James.

Livingston, Ira, Ph.D., 1990, Stanford University: Poetics; cultural theory; Romanticism.

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; literature and politics; Renaissance literature; comparative literature methodology; translation theory; feminist literary criticism.

Rawlinson, Mary C.[3], Ph.D., 1978, Northwestern University: Aesthetics; literature and philosophy; Proust; Hegel; mystery and detective fiction.

Rzhevsky, Nicholas, Ph.D., 1972, Princeton University: 19th- and 20th-century Russian literature and culture; ideology; literature and theatre.

Assistant Professors

Cho, Sungtaek, Ph.D., 1995, University of California, Berkeley: Buddhist philosophy and history; comparative studies on Buddhism in India and East Asian countries; Buddhist classical languages (Pali, Sanskrit, Tibetan, and Classical Chinese); Korean Buddhism.

Reich, Jacqueline, Ph.D., 1994, University of California, Berkeley: Italian cinema; film theory; gender studies.

Setton, Mark, Ph.D., 1992. Oxford University: Chinese and Korean Confucianism and Taoism; Korean intellectual history.

Adjunct Faculty

Bottigheimer, Ruth B., D.A., 1981, University at Stony Brook: Tale collections; children's literature; fairy tales; sociocultural analysis of literature.

Number of teaching, graduate, and research assistants, fall 1999: 18

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1998

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1996

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1994

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990

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

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 3.0 overall grade point average for all graduate courses taken at Stony Brook to receive a degree.

B. Minor Option: Korean Studies

Graduate students in Comparative Literature may declare an official minor as part of their course of study. This minor will indicate a concentration within the larger fields of comparative literature and literary theory, and will be of value to students who wish to find employment in a relatively specialized field and want official recognition of their competence in that field.

To qualify for the minor, students must satisfy a specific set of course and examination requirements; these are supplementary to the general requirements of Graduate Studies in Comparative Literature, none of which is waived or in any way altered when a minor is selected.

Students must demonstrate proficiency in Korean by passing a proficiency examination as early as possible after entering the program. They must also demonstrate proficiency in another language relevant to their field of study (either Japanese or Chinese is recommended). Language courses will not count toward the fulfillment of course requirements.

The minor comprises 30 credits of graduate work, including:

1. Comparative literature core courses (18 credits).

2. Four additional courses, with a direct bearing on Korean studies (12 credits).

The M.A. reading list and examination will be modified to reflect the student's minor and special area of interest.

C. 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.

D. 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.

E. 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.)

F. 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. (See the department handbook for details.)

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. Minor Option: Korean Studies

See requirements for the M.A. degree.

C. First-Year Evaluation

See requirements for the M.A. degree.

D. Satisfactory Progress Toward the Ph.D.

In addition to requirements A through D, Ph.D. students must fulfill the following requirements:

1. Complete all core courses in the first two years of full-time study and all 48 credits for the Ph.D. in three years.

2. Take the comprehensive examination no later than one year after completion of coursework.

3. Submit a dissertation prospectus three months after the satisfactory completion of the comprehensive examination.

4. Advancement to candidacy should normally occur no later than the fourth year of full-time study and one year prior to the dissertation defense.

5. Students must satisfy all requirements for the Ph.D. within seven years after completing 24 credits of graduate work at Stony Brook.

E. Foreign Language Requirements

Ph.D. students may choose to demonstrate competence in either two major foreign languages or one major and two minor languages. For ways to demonstrate competence, see Foreign Language Requirements in the requirements for the master's degree and consult the department handbook.

F. 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 five 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. (For more details, see the department handbook.)

G. 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.

H. 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.

I. 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 *http://www.sunysb.edu/complit.*

Courses

CLT 501 Comparative Literature Methodology

An introduction to the discipline of comparative literature and 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, periodization, and reception theory.
Fall or spring, 3 credits
ABCF grading

CLT 510 History of Literary Theory–Part I
A history of literary theory studied in relation to literary masterpieces from classical Greece to the Enlightenment.
3 credits
ABCF grading

CLT 511 History of Literary Theory–Part II
A history of literary theory studied in relation to literary masterpieces from the Enlightenment to the present.
3 credits
ABCF grading

CLT 520 Problems in Translation
After studying translation theory and critically evaluating representative translations of literary works in their language and field of specialization, students translate a literary text.
Fall or spring, 3 credits
ABCF grading

CLT 530 Religious Studies Methodology
A survey of major approaches to religious studies. The course looks at how Religionswissenschaft came into existence in the 19th century, and investigates the various directions in which it has developed, keeping in view parallel developments in fields such as literary theory, philosophy, psychology, and theology.
Fall or spring, 3 credits
ABCF grading

CLT 597 Directed Readings for M.A. Students
Fall and spring, variable and repetitive credit
S/U grading

CLT 599 Independent Study
Fall and spring, 1-3 credits each semester, repetitive
ABCF grading

CLT 600 Seminar in Stylistics
Changing topics in the study of stylistic and structural elements of the literary text.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

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.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

CLT 602 Interdisciplinary Seminar
Specific problems in the relations between literature and other disciplines.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

CLT 603 Comparative Studies in Literary History
Changing topics in the study of literary periods and styles.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

CLT 604 Comparative Studies in Genre
Changing topics in the study of the history and theory of literary genres.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

CLT 607 Major Authors in Comparative Context
Critical and comparative examination of two or more major figures from different literary traditions.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

CLT 608 Cross-Cultural Perspectives
Key topics in genre, literary criticism, and methodology from a cross-cultural perspective. Emphasis is placed on an examination of differences as well as similarities. Presuppositions of specific literary traditions are questioned within the broader perspectives of philosophical and religious valences.
Fall or spring, 3 credits
ABCF grading

CLT 609 Seminar in Cultural Studies
Changing topics in the study of film, video, media, and popular culture. Specific works are studied within their historical and cultural contexts and approached through methodologies based in contemporary theory.
Fall or spring, 3 credits
ABCF grading

CLT 630 Seminar in Comparative Religion
Critical and comparative investigation of texts, figures, ideas, or themes from two or more religious traditions.
Fall or spring, 3 credits each semester, repetitive
ABCF grading

CLT 631 Textual Studies in Religion
An in-depth investigation of texts from one or more of the religious traditions, such as the Divine Comedy, the Rig Veda, one of the Upanishads, Confucius' Analects, Augustine's City of God, the Diamond Sutra, Rum's Mathnawi, and the Tao Te Ching.
Fall or spring, 3 credits
ABCF grading

CLT 632 Comparative Studies in Religion
An investigation of selected themes from one or more of the religious traditions, with emphasis on tracing the significance of these themes within the tradition and the problems of interreligious comparisons.
Fall or spring, 3 credits
ABCF grading

CLT 650 Seminar in Korean Literature
A seminar on special topics in Korean literature, investigating an author, period, genre, or movement.
3 credits
ABCF grading

CLT 652 Seminar in Korean Religious and Philosophical Thought
An examination of the major schools of thought that have influenced the flow of Korean philosophical and religious traditions. The major Buddhist leaders, such as Wonhyo, Uisang, and Chinul, are examined along with the distinctive neo-Confucianism of T'oegye and his successors. Korean Christianity, Korean Shamanism, and other Korean religious systems are also discussed.
3 credits
ABCF grading

CLT 690 Directed Readings for Doctoral Candidates
Fall and spring, variable and repetitive credit
S/U grading

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.
Fall and spring, 3 credits total
S/U grading

CLT 699 Dissertation Research
Prerequisite: Advancement to candidacy
Fall and spring, variable and repetitive credit
S/U grading

Computer Science (CSE)

Chairperson: Arie Kaufman, Computer Science Building 2431 (631) 632-8470
Graduate Program Directors: Michael Kifer, Computer Science Building 1429 (631) 632-8459; Arthur Bernstein, Computer Science Building 1427 (631) 632-8457
Graduate Program Administrator: Dolores Brush, Computer Science Building 1440 (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 the first goal through 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, and architecture.

For more information on the graduate program in computer science, browse the department's Web site at *http://www.cs.sunysb.edu.*

Computing Environment

The Computer Science Department is composed of a number of special interest labs (Visualization, Synchem, AI, OS, Experimental Systems, CASP, Logic Modeling, Security Systems, Samson, Algorithms) connected to a 2.6GB/sec backbone. The most typical systems are PC clones running FreeBSD, Linux or Win/NT and Sun Sparc systems (ranging from Ultra Enterprise 3500, Ultra5's to 80Mhz IPXs). There are a number of specialty systems of note: 16 cpu (195Mhz R10K Mips with 4GB of RAM) SGI Power Challenge, 4 cpu (225Mhz R10K) SGI Octane, video server implemented on a Pentium Pro PC clone running FreeBSD, FakeSpace, and Cave virtual reality workspaces. There is a public access lab of ten Sun Ultra5's, and each office is equipped with one dual processor Sparc20, two Sun IPX, and two Pentium PCs running Windows NT. The department maintains its own dial-up service and the Stony Brook campus is connected to the Internet via a T3 connection.

Library

The Computer Science and Engineering Library, located within the Computer Science Building, provides a pleasant environment for serious study and has a collection of more than 10,000 books, bound volumes of journals, conference proceedings, and technical reports. 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. The Library is staffed by a professional librarian, a full-time clerk, and several student assistants. 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. A bachelor's degree, usually in a science or engineering discipline or in mathematics, is required. The transcript should show a grade average of at least B (3.0/4.0) in all undergraduate coursework, and in the science, mathematics, and engineering courses.

B. 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. Either the degree in item A is in computer science or computer engineering from a recognized institution, or the student has an equivalent background. 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 345 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.

Students of exceptional promise with nonstandard background or who lack certain requirements may be considered for admission to the program on a provisional basis. The student will be informed of the requirements that must be satisfied for the termination of the provisional status.

Faculty

Distinguished Professor

Pavlidis, Theo, Ph.D., 1964, University of California, Berkeley: Image analysis; document processing including OCR; computer graphics.

Professors

Bachmair, Leo, Ph.D., 1987, University of Illinois, Urbana-Champaign: Computational logic; automated deduction; symbolic computation.

Bernstein, Arthur J., *Graduate Program Director.* 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; artificial intelligence.

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: computational complexity; automata theory; compiler design; concurrent systems.

Ramakrishnan, I.V., Ph.D., 1983, University of Texas, Austin: Declarative programming; rewrite systems.

Smith, David R., Ph.D., 1961, University of Wisconsin: Hardware description languages and synthesis; VLSI design tools; experimental chip architectures.

Smolka, Scott A., Ph.D., 1984, Brown University: Semantics of concurrency; design of distributed languages and algorithms; visual environments for concurrent 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.

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.

Chiueh, Tzi-cker, Ph.D., 1992, University of California, Berkeley: Experimental computer systems; computer architecture; database systems; VLSI hardware design/CAD.

Mitchell, Joseph, Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Skiena, Steven, Ph.D., 1988, University of Illinois, Urbana-Champaign: Computational biology; algorithms; discrete mathematics.

Stark, Eugene, Ph.D., 1984, Massachusetts Institute of Technology: Programming language semantics; theory of concurrency; formal specifications; verification; distributed algorithms.

Wasilewska, Anita, Ph.D., 1975, Warsaw University: Logic; knowledge representation; artificial intelligence.

Assistant Professors

Bender, Michael, Ph.D., 1998, Harvard University: Algorithms; theory of computation.

Mueller, Klaus, Ph.D., 1998, Ohio State University: Computer graphics; visualization; medical imaging.

Qin, Hong, Ph.D., 1995, University of Toronto, Canada: Computer graphics; geometric modeling; CAD; virtual reality; animation.

Ramakrishnan, C.R., Ph.D., 1995, University at Stony Brook: Analysis and verification of software; programming language implementation; logic programming; deductive databases.

Sekar, R.C., Ph.D., 1991, University at Stony Brook: Computer security; distributed systems; programming languages/software engineering.

Varshney, Amitabh, Ph.D., 1994, University of North Carolina, Chapel Hill: Interactive 3D graphics; scientific visualization; parallel graphics algorithms; geometric modeling; computational geometry.

Number of teaching, graduate, and research assistants, fall 1999: 105

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 30 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. Certain undergraduate (300 level) courses that are prerequisites to graduate courses can, with the permission of the instructor, be taken for graduate credit using the course designation CSE 587. A maximum of two undergraduate courses can be taken in this way. 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. If a student has had such experience within the four years preceding entry into the program and is able to submit material (technical reports, publications, patents, etc.) describing the work, the CSE 523/524 requirement may be waived after review of the submitted material by the faculty member currently responsible for the Laboratory in Computer Science. Note, however, that no course credit will be given for this previous

experience; the waived laboratory credits must be replaced by approved graduate electives in Computer Science. 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 research advisor who agrees to serve in that capacity. The advisor will supervise the student's other studies and advise the student on his or her choice of courses. 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. No more than nine credits of the thesis can be used toward 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 request permission from the graduate program director to take the Qualifying Exam. If the student passes the exam, he or she can apply for entry to the program. A Ph.D. student who has passed the Research Proficiency Exam can complete the requirements for an M.S. degree by satisfying the proficiency requirements and completing 30 credits of coursework including at most six credits of seminar and special topics courses. Ph.D. students who have not passed the Research Proficiency Exam must satisfy the usual requirements for the M.S. degree (30 credits including either thesis or project). Since students on the regular Ph.D. track are not permitted to take the CSE 523/524 project, this will usually mean using nine of their CSE 599/699 credits for an M.S. thesis.

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 satisfactorily pass the written Qualifying Examination to demonstrate their ability to undertake the course of study leading to the Ph.D. degree. The Qualifying Examination must be taken during the first year of residence. The qualifying exam is given twice a year. This normally occurs in May (the week after the finals period) and the first week in October. Students are expected to present themselves for the examination before the end of their first two semesters at Stony Brook.

The exam consists of three parts 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, Analysis of Algorithms, Logic, Graph Theory, and Combinatorics (CSE 303, CSE 371, AMS 301, CSE 373).

Software and Systems I:

Programming Languages, Compilers, Databases, Operating Systems (CSE 304, CSE 305, CSE 307, CSE 306).

Software and Systems II:

Digital Design, Networks and Communications, Computer Architecture, Computer Graphics. (ESE 318, CSE 345, CSE 310, CSE 328).

Each part consists of a three-hour written examination. The student is required to pass in all three subject areas. 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. Repetition of the written examination, upon failure, may be permitted by consensus of the faculty. Failure to pass the written qualifying examination may be considered evidence of unsatisfactory progress toward the Ph.D. degree and the student may be dismissed or placed on graduate probation.

After a student passes the Qualifying Exam, a list of three faculty members (including the advisor) who will make up the committee will be submitted to the graduate program director for approval in order to supervise the student's progress toward the Ph.D. degree. The advisor cannot be chair of the committee.

Each Ph.D. student is required to meet with the entire committee at least once every six months in order to discuss the following topics: quality and progress of student's research; general goals of student with regard to research and employment; current funding and prospects for future funding; publication record; progress toward the various exams.

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 as being appropriate to fill any missing proficiencies and prepare for the qualification examination. By the time of graduation, each student is required to accumulate at least 20 credits of full (regular lecture) courses, special topics courses or seminars. At most, five credits of seminars can be included in the 20 and courses such as CSE 587, CSE 600, CSE 696, CSE 698, and CSE 699 cannot be included. In addition, the student must register (for either 0 or 1 credit) and complete two semesters of CSE 600.

Grade requirements are the same as those for the M.S. degree. Students in the Ph.D. program may not enroll in CSE 523/524.

University policy requires that all doctoral students participate in an appropriately structured teaching practicum. This can be CSE 698 in conjunction with a TA in the first year.

D. Research Proficiency Examination (RPE)

Within approximately one year, but *no later than three semesters* (excluding summer) after passing the qualifying examination, the student must present a public research seminar followed by a session where the committee will ask questions both related to the seminar area and another distinct area that the student and committee have agreed upon in advance. A written report on the seminar material should be available one week before the seminar is given. Only faculty may be present during the question period. The committee may allow the student to repeat all or part of the presentation and question period if the faculty are not satisfied with the original performance.

Final qualification for admission to the research phase of the Ph.D. program will be determined by the faculty on the basis of performance on the written qualifying examination, the quality of the written report, the results of the associated oral examination, and the academic record achieved by the student to date.

Upon successful completion of the research proficiency examination, the student is eligible to be considered for advancement to candidacy. This status, called G5, is conferred by the dean of the Graduate School upon recommendation of the Department. Students must advance to candidacy at least one year before defending their dissertations. In exceptional circumstances the graduate program director may submit a written petition for a waiver of this requirement to the dean of the Graduate School. The Graduate School requires G5 students to register for one credit of research per semester only. Therefore any course distribution requirements (subsection C) should be completed by this point or special arrangements made with the instructor to record an audit grade in the student's file.

Failure to complete the research proficiency examination within the specified time frame and obtain the G5 status is considered evidence of unsatisfactory progress. Students whose status remains at the G4 level beyond five semesters after being admitted into the Ph.D. program may become responsible for the difference in tuition liability between G4 and G5 status.

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 ascertain the breadth and depth of the student's preparation to undertake a significant original research investigation. The proposal must be submitted to the student's thesis committee within 18 months of the time the student 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. Satisfactory progress is generally contingent upon submitting a satisfactory thesis proposal within 30 months after passing the written qualifying examination.

The major requirements of the thesis proposal is that the student must (1) be thoroughly familiar with the background and current status of the intended research area; (2) have clear and well-defined plans for pursuing the research objectives; and (3) offer evidence of progress in achieving these objectives. The student must be prepared to justify the effort to be expended in the research in terms of the value of the results expected, and to justify the extent and challenge of that research as evidence of research competence at the Ph.D. level.

The student will present the thesis proposal to the thesis committee in a seminar presentation. The thesis committee must include no fewer than four members, appointed by the dean of the Graduate School upon the recommendation of the Department chairperson. The committee appointment form submitted by the Department for approval is filed by the graduate program director using information supplied by the student and advisor. It must be filed two weeks prior to the date of the examination. The committee must include at least two faculty members from the Department. Students are encouraged to include one or more members from outside the Department. The presentation is not open to the general university community. 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 that 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 committee must have a minimum of four members (at least two of whom are faculty members from the department), including the research advisor(s), at least one person from outside the department, and a committee chairman. (Neither the research advisor nor the outside member may serve as the chairman.) The committee form submitted by the department for approval is filed by the graduate program administrator using information supplied by the student and advisor. It must be filed at least two weeks prior to the date of the examination. 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 Preliminary Examination, or who does not make satisfactory progress toward completing thesis research may lose his or her 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. In particular, the student may be required to pass the preliminary examination again in order to be permitted to continue work.

Courses

Required Courses for the M.S. Non-Thesis Option

CSE 523 Introduction to Software Engineering and Project Plan

Introductory lectures on topics relevant to software design and commercial/industrial programming environment will include system and module construction and decomposition methodologies (top down, bottom up, hierarchical), structured programming concepts, maintainability, reliability, system documentation, and management of software. The laboratory component consists of a project in programming or digital system design and will extend over two consecutive semesters to be completed in 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. Provided a project has been selected and work begun with an advisor, an R grade will be given pending completion of CSE 524.

Prerequisite: CSE 230
Fall, spring, and summer, 3 credits
ABCF grading

CSE 524 Project Completion

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
Fall, spring, and summer, 3 credits
ABCF grading

Graduate Courses

CSE 501 Digital Systems Synthesis

Topics include hardware description language (HDL) and specification styles, and an introduction to field programmable gate arrays (FPGA). There will be laboratory sessions in which students will use commercial tools for simulation, synthesis, and FPGA fitting. Currently these include a Verilog simulator used for pre- and post-synthesis, the Synopsys design compiler, and the Altera FPGA fitter.

3 credits
ABCF grading

CSE 502/ESE 545 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

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

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 307
3 credits
ABCF grading

CSE 515 Introduction to Transaction Processing Systems

Discusses transaction processing systems. Topics covered include models of transactions, including nested transactions and workflow; architectures of transaction processing systems, including client-server, two-tiered and three-tiered architectures; concurrency controls for conventional and relational databases including two-phase locking and the SQL isolation levels; logging and recovery; distributed transactions including the two-phase commit protocol; replication; Internet commerce, including encryption, the SSL and SET protocols, goods atomicity, and electronic cash.

Prerequisite: CSE 305
Fall, 3 credits
ABCF grading

CSE 525 Fundamentals of Window Systems

Topics include programming methodologies used in Window systems such as event-driven programming; overview of the X Window system and comparison with other systems such as Windows '95; methods of handling events (handlers, callbacks, and action procedures); widgets and toolkits; pipes and graphical front ends for existing programs; background processes and animation; communication between applications and selections; widget writing.

Prerequisites: Degree in Computer Science and experience in C programming
Spring, 3 credits
ABCF grading

CSE 526 Principles of Programming Languages
Discusses programming language concepts and design, with emphasis on abstraction mechanisms. Topics include language paradigms (procedural, object-oriented, functional, and logic), language concepts (values, bindings, types, modules), and foundations (lambda calculus, denotational semantics). Examples will be drawn from several representative languages, such as C, Java, Standard ML, and Prolog.
Prerequisite: CSE 307
Spring, 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 will apply simulation modeling methods to problems of their own design. Crosslisted with AMS/MGT 553.
Prerequisites: CSE 214 and AMS 310 or AMS 507
Fall, 3 credits
ABCF grading

CSE 530 Geometric Foundations for Graphics and Visualization
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 531 Fundamentals of Computer Networks
Topics include 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 modem standards and techniques (Trellis coding, etc.); data link layer: protocols; error detection and correction; flow control; network layer: protocols; routing algorithms; flow and congestion control; error detection and correction; transport layer: protocols; error detection and correction; congestion control; 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 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 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 539 Expert Systems
Topics include characteristics of some existing expert consultation and problem-solving systems; techniques, tools, and languages for designing and building such systems; knowledge representation; problems of knowledge base construction and maintenance; extracting the "expertise" from the experts. Students will participate in a class project in which an expert knowledge-based consultation system for a specific problem domain will be specified and built.
Spring, 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; the completeness theorem.
Pre- or co-requisite: MAT 313 and CSE 213
Spring, 3 credits
ABCF grading

CSE/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. Alternative: AMS 506.
Prerequisite: AMS 301
Spring, 3 credits
ABCF grading

CSE 548/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. Crosslisted with AMS 542.
Prerequisite: CSE 373
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. Crosslisted with AMS 545.
Prerequisite: CSE 373 or CSE 548
Fall, 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 Independent Study in Computer Science
Students can get credit for a project or an undergraduate course by registering for CSE 587. In the latter case, the student is limited to two appropriate undergraduate courses. 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 or the graduate program director. The description will reside in the student's file.
Fall and spring, 1-3 credits
ABCF grading

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. Not accepted for credit toward the M.S. degree.
Prerequisite: Permission of graduate program director
Fall and spring, 1-3 credits, variable and repetitive
S/U grading

CSE 599 M.S. Thesis Research
M.S. or pre-quals Ph.D. students who wish to enroll in CSE 599 for any number of credits must prepare a one- to two-page description of the work to be completed. The description must be approved by the research advisor, signed by both student and advisor, and reside in the student's file. Amendments to the proposal must be approved by the advisor.
Variable and repetitive credit
S/U grading

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. Many are biennial only.

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 603 VLSI Design
Design of application-specific integrated circuits using commercial tools. See also ESE 555.
Prerequisite: CSE 344, or CSE 501, or permission of instructor
3 credits
ABCF grading

CSE 612 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 615 Transactions 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 618 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 627 Introduction to 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 629 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 630 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 or 528 or 332 or 564
3 credits
ABCF grading

CSE 631 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 632 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 634 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 635 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 638 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 640 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 641 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
ABCF grading

CSE 643 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
3 credits
ABCF grading

CSE 646 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 534
3 credits
ABCF grading

CSE 647 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 648 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

Ph.D. Teaching and Research Experience

CSE 696 Ph.D. Internship in Research
See CSE 596 for similar description.
Fall and spring, 1-3 credits, variable and repetitive
S/U grading

CSE 698 Ph.D. 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

CSE 699 Ph.D. Dissertation Research
See CSE 599 for similar description.
Variable and repetitive credit
S/U grading

Seminars and Special Topics Courses

These are offered irregularly in the Spring or Fall semesters and normally cater to the needs of Ph.D. and research students. The seminars are normally one credit and the special topics courses two credits, although for a particular offering this may be increased one credit with the agreement of the graduate program director. G5 students are allowed to take special topics courses for just one credit.

CSE 650 Seminar in Theory of Computing
S/U grading

CSE 651 Seminar in Logic in Computer Science
S/U grading

CSE 652 Seminar in Algorithms
S/U grading

CSE 653 Seminar in Concurrency
S/U grading

CSE 654 Seminar in Database
S/U grading

CSE 655 Seminar in Languages
S/U grading

CSE 656 Seminar in Artificial Intelligence
S/U grading

CSE 657 Seminar in Image Processing
S/U grading

CSE 658 Seminar in Graphics
S/U grading

CSE 659 Seminar in Operating Systems
S/U grading

CSE 660 Seminar in Architecture
S/U grading

CSE 661 Seminar in Applications
S/U grading

CSE 662 Seminar in User Interfaces
S/U grading

CSE 663 Seminar in Virtual Reality
S/U grading

CSE 664 Seminar in Visualization
S/U grading

CSE 665 Seminar in Modeling and Simulation
S/U grading

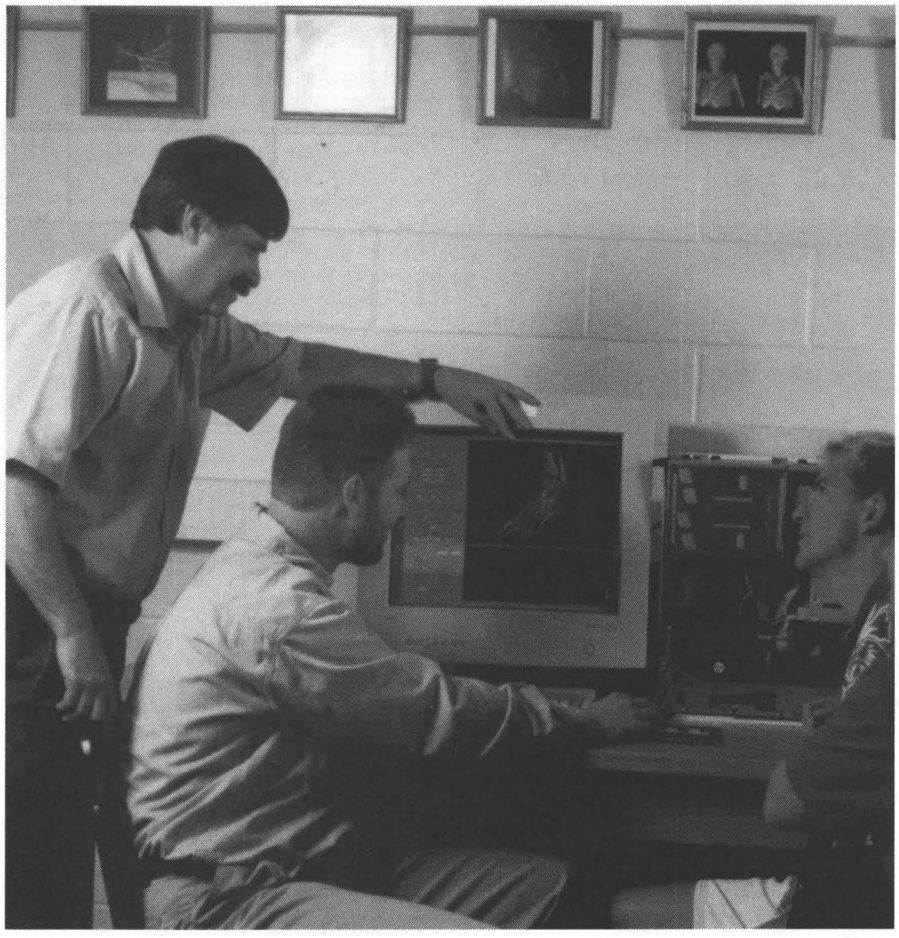
CSE 670 Special Topics in Theory of Computing
ABCF grading

CSE 671 Special Topics in Logic in Computer Science
ABCF grading

CSE 672 Special Topics in Algorithms
ABCF grading

CSE 673 Special Topics in Concurrency
ABCF grading

CSE 674 Special Topics in Database
ABCF grading



CSE 675 Special Topics in Languages
ABCF grading

CSE 676 Special Topics in Artificial Intelligence
ABCF grading

CSE 677 Special Topics in Image Processing
ABCF grading

CSE 678 Special Topics in Graphics
ABCF grading

CSE 679 Special Topics in Operating Systems
ABCF grading

CSE 680 Special Topics in Architecture
ABCF grading

CSE 681 Special Topics in Applications
ABCF grading

CSE 682 Special Topics in User Interfaces
ABCF grading

CSE 683 Special Topics in Virtual Reality
ABCF grading

CSE 684 Special Topics in Visualization
ABCF grading

CSE 685 Special Topics in Modeling and Simulation
ABCF grading

School of Dental Medicine

Dean: Barry R. Rifkin, Rockland Hall 160 (631) 632-8950

Advanced Graduate Certificates awarded: Advanced Graduate Certificate in General Dentistry; Advanced Graduate Certificate in Orthodontics; Advanced Graduate Certificate in Periodontics; Advanced Certificate in Endodontics; Advanced Graduate Certificate in the Care for the Developmentally Disabled
Degree awarded: D.D.S. in Dentistry

The School of Dental Medicine is an active participant in meeting the general mission of the University. The school conducts an excellent educational program for its students, contributes to scientific knowledge through its programs in research, and actively participates in community service through its programs in continuing education and its treatment center, which provides dental care to thousands of community residents each year.

The school is fully accredited by the Commission on Dental Education and the State Educational Department, and is a component school of the Health Sciences Center at Stony Brook. The school incorporates the disciplines of prosthodontics, operative dentistry, endodontics, and dental materials into a single department of General Dentistry. Orthodontics and pediatric dentistry combine to form the department of Children's Dentistry. Other departments in the school include Periodontics, Oral and Maxillofacial Surgery, Dental Medicine, and Oral Biology and Pathology.

Dental students and medical students take the same courses in anatomy, biochemistry, microbiology, pathology, pharmacology, and physiology. Small class size allows the student to receive highly personalized instruction. Didactic and clinical instruction is readily adapted to the needs of the individual student. The continued aim of the curriculum is to enable the graduate to enter into a general practice, advanced training for specialty care, public health, teaching and/or research. The school offers the Doctor of Dental Surgery Degree, in addition to postdoctoral education in orthodontics, endodontics, periodontics, advanced education in general dentistry, and care for the developmentally disabled. 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.

Opportunities are available to students who desire experience in dental/scientific research. These are made possible through the many research activities conducted by faculty of the school. Extensive clinic experience in all fields of dentistry is provided for students in the Dental Care Center. The Center is the largest dental care treatment facility on Long Island.

Since its inception in 1973, 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 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 Admissions
University at Stony Brook
Stony Brook, NY 11794-8709
(631) 632-8980

You may also request a copy of the School of Dental Medicine Admission 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: Walter Eanes, Life Sciences Building 650 (631) 632-8600
Graduate Program Director: Manuel Lerdau, Life Sciences Building 650 (631) 632-6633
Graduate Program Secretary: Marilyn Pakarklis, Life Sciences Building 650 (631) 632-8604

Degrees awarded: M.A. in Biological Sciences; 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 Sun Sparc Center 1000.

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 Professor

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.

Carpenter, Edward J.[3], Ph.D., 1969, North Carolina State University: Nitrogen cycling in the marine environment; physiology of nitrogen incorporation by marine algae; phytoplankton ecology.

Dykhuizen, Daniel E., Ph.D., 1971, University of Chicago: Population genetics and molecular evolution, especially of bacteria.

Eanes, Walter F., *Chairperson.* Ph.D., 1976, University at Stony Brook: Population and biochemical genetics of Drosophila; molecular evolution.

Fleagle, John G.[1], Ph.D., 1976, Harvard University: Primate evolution; comparative anatomy; behavioral ecology.

Futuyma, Douglas J.[5], Ph.D., 1969, University of Michigan: Ecological genetics; coevolution of species, especially of plants and insects; evolutionary biology.

Ginzburg, Lev, *Director of the Master's Program in Applied Ecology.* Ph.D., 1970, Agrophysical Institute, St. Petersburg, Russia: Theoretical and applied ecology.

Janson, Charles H., Ph.D., 1985, University of Washington: Social ecology of vertebrates; plant dispersal strategies.

Levinton, Jeffrey S., Ph.D., 1971, Yale University: Marine benthic ecology; population genetics of bivalve mollusks; paleoecology.

Lopez, Glenn R.[3], Ph.D., 1976, University at Stony Brook: Marine and freshwater benthic ecology; animal-microbe-sediment interactions; detritus.

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

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.

Conover, David O.[3], Ph.D., 1981, University of Massachusetts: Ecology of fishes; fisheries biology.

Gurevitch, Jessica, Ph.D., 1982, University of Arizona: Evolutionary ecology of plant populations and communities; plant physiological ecology.

Hechtel, George J.[6], Ph.D., 1962, Yale University: Systematics and zoogeography of marine demospongiae.

Lerdau, Manuel, T., *Graduate Program Director.* Ph.D., 1993, Stanford University: Plant ecology and physiology; global change.

Padilla, Dianna K., Ph.D., 1987, University of Alberta, Canada: Phenotypic plasticity, plant-herbivore functional ecology, ecology of invading species.

Assistant Professors

Bharathan, Geeta, Ph.D., 1993, University of Arizona: Evolution of angiosperms; homeobox genes; genome size.

Forster, Catherine A.[1], Ph.D., 1990, University of Pennsylvania. Vertebrate paleontology; systematics.

Vedder, Amy L., *Research Assistant Professor.*[8] Ph.D., 1989, University of Wisconsin-Madison: Mammalian ecology; tropical forest ecology; conservation biology, planning, and practice.

Number of teaching, graduate, and research assistants, fall 1999: 30

Students on fellowships: 15

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, repetitive
S/U grading

BEE 501 Directed Readings in the Biology of Organisms
Directed readings in topics of current interest, under supervision of a faculty sponsor, culminating in one or more critical review papers.
Prerequisite: Sponsor and approval of master's program executive committee
Fall and spring, 1-3 credits, repetitive
S/U grading

BEE 550 Principles of Ecology
Population dynamics, interactions of organisms, and 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, odd years, 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.
Prerequisites: BIO 220, BEE 552 or their equivalents, and a course in evolution
Spring, odd 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.
Fall, 1 credit; spring, variable credit
S/U grading

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, variable credit
S/U grading

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

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 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.
Prerequisites: BEE 550; BEE 551, or permission of instructor
Spring, odd years, 4 credits
ABCF grading

BEE 585 Introduction to Ecological Research
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, 0-2 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, 2 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, variable and repetitive credit
ABCF grading

BEE 599 Research
Original investigation undertaken with the supervision of a member of the staff.
Fall and spring, variable and repetitive credit
S/U grading

BEE 670 Informal Seminar
Presentation of preliminary research results and current research problems by students and faculty.
Fall and spring, no credit
S/U grading

BEE 671, 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.
Fall and spring, no credit
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 and spring, 0-2 credits, repetitive
S/U grading

BEE 690 Seminar on Evolutionary Processes
Seminars on selected topics concerning evolutionary processes.
Fall and spring, 0-2 credits, repetitive
S/U grading

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 and spring, 0-2 credits, repetitive
S/U grading

BEE 692 Seminar on the Environment and Human Affairs
Student seminars on selected topics concerned with the effect of man on the environment. Application of ecological and evolutionary theory to the solution of human problems.
Fall and spring, 0-2 credits, repetitive
S/U grading

BEE 693 Seminar on Population and Community Ecology
Student seminars on selected topics in population and community ecology.
Fall and spring, 0-2 credits, repetitive
S/U grading

BEE 699 Dissertation Research
Original investigations undertaken as part of the Ph.D. Program in Ecology and Evolution.
Prerequisite: Advancement to candidacy
Fall and spring, variable and repetitive credit
S/U grading

Economics (ECO)

Chairperson: William Dawes, Ward Melville Social and Behavioral Sciences Building N-605 (631) 632-7560
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. 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, (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; students are therefore encouraged to take as many courses as is consistent with the time needed for dissertation research.

The department houses the internationally known Center for Game Theory in Economics. It provides courses and a vigorous research atmosphere in game theory and its applications.

Admission

The Department of Economics admits students for both M.A. and Ph.D. programs. The admission requirements and course schedule are identical for both programs. Students are eligible to receive the M.A. degree if they have met the degree requirements listed later in this section.

Requirements for admission, in addition to the minimum Graduate School requirements, are as follows:

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, with proficiency demonstrated by a grade of at least B in the courses. Additional semesters of multivariate calculus and linear algebra are highly recommended. Further mathematics such as real analysis and topology are very helpful.

C. Letters of recommendation from three instructors or academic advisors.

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. To be eligible for financial support, a TOEFL minimum score of 600 is required.

F. Acceptance by the Department of Economics and by the Graduate School.

Students who do not meet 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.

Hurd, Michael D., Ph.D., 1972, University of California, Berkeley: Labor economics; econometrics.

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; econometrics; urban economics.

Neuberger, Egon, *Emeritus.* Ph.D., 1958, Harvard University: Comparative systems; Soviet and East European economics.

Neyman, Abraham, Ph.D., 1977, Hebrew University, Jerusalem: Game theory; mathematical 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.

Zschock, Dieter K., Ph.D., 1967, Tufts University: Economic development; labor economics.

Zweig, Michael, Ph.D., 1967, University of Michigan: Political economy; labor economics.

Assistant Professors

Armantier, Olivier, Ph.D., 1998, University of Pittsburgh: Econometrics; experimental economics.

Dwyer, Debra S., Ph.D., 1995, Cornell University: Microeconomics, health economics.

Kamihigashi, Takashi, Ph.D., 1994, University of Wisconsin, Madison: Economic theory; macroeconomics; international economics.

Park, Sangin, Ph. D., 1996, Yale University: Industrial organization; econometrics.

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 2000: 29

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.

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 or more 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 end of the third 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, with groupings in at least two fields. It is usual but not necessary that a dissertation topic be chosen from one of these fields of specialization.

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 applied econometrics, game theory, health/labor economics, economic demography, and industrial organization.

B. Seminars and Workshops

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 completion of all course requirements specified in item A, above, and the successful completion of the dissertation area exam. Advancement to candidacy normally must be achieved by the end of the sixth semester.

D. Dissertation

A dissertation, presenting the results of original and significant research, must be approved. An examination on a nominated area of dissertation research must be taken by the end of the fifth semester of study and must be passed by the end of the sixth semester of study. The examination may be written or oral, and its syllabus is to be determined by the student's dissertation committee in consultation with the student. A dissertation prospectus must receive approval of the thesis advisor and members of the thesis committee. 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 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.
Co-requisite: ECO 520
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
Spring, 3 credits
ABCF grading

ECO 502 Applied Microeconomic Problem Solving
Development and use of frameworks for applied microeconomic analysis. Specific applications to problems generally dealt with in ECO 500-501.
Prerequisite: ECO 501
3 credits
ABCF grading

ECO 510 Macroeconomics I
The first semester of a one-year course in macroeconomic theory. Deals with theories and determinants of income, employment, and inflation. Topics include static equilibrium models, theories of money demand and monetary phenomena, theories of the labor market and unemployment, rational expectations and stabilization policy, consumption, and investment.
Co-requisite: ECO 500
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
Co-requisite: ECO 501
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.
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
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
3 credits
ABCF grading

ECO 590 Mathematical Foundations of Contemporary Economic Theory I
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.
Fall, 3 credits
ABCF grading

ECO 599 Research in Special Topics
Variable and repetitive credit
S/U grading

ECO 604 Game Theory I
Games in extensive and strategic form: Zermelo's theorem, Minmax theorem, Nash's theorem, Kuhn's theorem with perfect recall, subgame and trembling hand perfect equilibria. Cooperative games (transferable utility): the core (Bondereva-Shapley theorem), market games, Shapley value, voting games and power indices, the equivalence principle with perfect competition; introduction to nontransferable utility games; Nash bargaining solution, two-sided markets. Crosslisted with AMS 552.
Fall, 3 credits
ABCF grading

ECO 605 Game Theory II
Refinements of strategic equilibrium; games with incomplete information; stochastic games. The Shapley value of games with many players; NTU-values. Crosslisted with AMS 555.
Spring, 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. Crosslisted with CEG 530.
Prerequisites: ECO 501, ECO 604, ECO 605, or permission of instructor
Fall or spring, 3 credits, repetitive
ABCF grading

ECO 609 Studies in Economic Theory
Prerequisite: ECO 501
3 credits, repetitive
ABCF grading

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
3 credits
ABCF grading

ECO 611 Advanced Macroeconomic Theory II
A continuation of ECO 610.
Prerequisite: ECO 610
3 credits
ABCF grading

ECO 619 Studies in Macroeconomics
Prerequisites: ECO 501, ECO 511
3 credits
ABCF grading

ECO 622 Seminar in Applied Econometrics
A survey of modern cross section econometric methods with emphasis on methods used in labor economics. Although the discussion takes place in the context of specific empirical applications, the goal is the understanding of the theoretical properties of the estimation methods. Topics include qualitative and limited dependent variables, maximum likelihood, nonlinear regression, random coefficient models, panel data, and Bayesian estimation. An interest in labor economics is desirable but not necessary.
Prerequisite: ECO 521 or permission of instructor
3 credits
S/U 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
3 credits
ABCF grading

ECO 629 Studies in Quantitative Methods
Prerequisite: ECO 521
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
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
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
3 credits
ABCF grading

ECO 641 Advanced Labor Economics Theory II
This is a continuation of ECO 640. There is, however, more emphasis on empirical application. Topics covered are labor contracts, unemployment and job turnover, labor demand, unionism, and signaling and screening.
Prerequisites: ECO 521, ECO 640
3 credits

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
Co-requisite: ECO 521
3 credits
ABCF grading

ECO 643 Demographic Economics II
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
Co-requisite: ECO 522
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
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.
1-6 credits
S/U grading

ECO 691 Seminar in Economic Theory
Preparation, presentation, and discussion of student and faculty research in economic theory. Topics covered by student papers are usually related to students' long-term research interests.
1-6 credits
S/U grading

ECO 695 Research Workshops
Designed to direct students to the selection of dissertation topics. Oral and written presentation of student papers with faculty participation. Several sections may be offered each semester in areas of broad research interest.
Prerequisite: Three semesters of coursework in the Ph.D. program
1-6 credits, repetitive
S/U grading

ECO 696 Dissertation Seminar
A seminar for students engaged in dissertation research. Students give presentations of their dissertation research.
1-6 credits, repetitive
ABCF grading

ECO 698 Practicum in Teaching
1-6 credits
S/U grading

ECO 699 Dissertation Research
1-9 credits
S/U grading

Electrical and Computer Engineering (ESE)

Chairperson: Serge Luryi, Light Engineering Building 273 (631) 632-8420
Graduate Program Director: Gregory Belenky, Light Engineering Building 239 (631) 632-8400/8397
Senior Staff Assistant: Maria Krause, Light Engineering Building 273 (631) 632-8420
Graduate Program Secretary: Deborah Kloppenburg, Light Engineering Building 267 (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 Department, in the College of Engineering and Applied Sciences, is involved in graduate teaching and research in many of these areas, including telecommunications, 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, 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

Particular areas of emphasis in current research and instruction in the graduate programs of the department are signal processing, solid state electronics, electromagnetic and optics, computer engineering, systems control, circuit, communications, and circuits/VLSI. Theoretical and experimental programs reflecting these areas are currently operative and students are encouraged to participate actively in these efforts. In addition to its emphasis on modern electrical and computer engineering, the department participates in interdepartmental graduate programs in computer science, management and policy, and bioengineering. These are described in their respective sections of this publication.

Systems Science and Engineering

Some of the research areas currently under investigation by faculty members and graduate students in systems science and engineering include the traditional areas of optimal control theory, systems and network theory, and computer-aided design. In addition, the interests include the application of systems science to robotics distributed control and to broader socioeconomic, urban transportation, power distribution, and energy and health systems. The Department of Electrical and Computer Engineering has close ties with related departments in order to meet these new challenges. The present academic and research programs in electrical engineering form an excellent basis for such activities. The course offerings appropriate to this area are ESE 502, ESE 503,ESE 508, ESE 527, ESE 529, ESE 530, ESE 539, ESE 541, ESE 542, ESE 543-544, ESE 545, ESE 547, and ESE 551. In addition, a number of courses useful to this subject area and offered by other departments are ECO 510-511, ECO 520-521, SOC 502, SOC 503, SOC 505, and SOC 514.

Communications and Signal Processing

Communications and Signal Processing continues to develop rapidly, which is a result of the major advances of the computer industry. There has been major progress in systems and techniques for computer networking, mobile communications, efficient modulation and coding, satellite communications, and optical communications using fibers or unguided laser beams. Particular areas of emphasis in current research and instruction include data transmission and computer communication networks, mobile radio and personal communication systems, satellite channels and communications traffic, detection of signals, estimation of signal parameters, radar signal processing, coding for error control, new modulation and multiplexing techniques, adaptive array techniques, and fiber-optic communications. The course offerings appropriate to this area are ESE 502, ESE 503, ESE 504, ESE 505, ESE 531, ESE 532, ESE 535, ESE 544, ESE 546, ESE 547, ESE 550, ESE 552, ESE 557, and ESE 560.

Computer Engineering, Digital Systems, and Electronics

A rapidly expanding area of engineering is the field of digital systems and electronics. The introduction of large-scale integrated circuits, such as microprocessors, has brought the price of digital electronics down so low as to make it possible for digital electronics to take over ever larger functions, from sewing machine stitch controls to inventory control. Current research and training in the program concentrates on integrated circuit design, artificial intelligence, computer organization, performance evaluation, computing system design and image processing, computer vision, and on both theoretical and prac-

tical problems associated with design and development. The department has a large number of powerful computers. The departments of Electrical and Computer Engineering and Computer Science work closely with one another in both research and teaching. The course offerings appropriate to this area are ESE 545, ESE 546, ESE 549, ESE 551, ESE 554, ESE 580, ESE 581, and CSE 502.

Solid-State, Microwave, and Quantum Electronics

The program of courses and research ranges from the basics of semiconductor and quantum physics to state-of-the-art optoelectronics and microwave devices. Important areas of research include design, characterization, and simulation of semiconductor devices including modern semiconductor lasers. The pertinent course offerings are ESE 510, ESE 511, ESE 512, ESE 514, ESE 515, ESE 516-517, ESE 518, ESE 520-521, ESE 523-524, ESE 560, and ESE 610.

Biomedical Engineering

Stony Brook's Department of Electrical Engineering participates in sponsoring a curriculum in Biomedical Engineering in the College of Engineering and Applied Sciences. In addition, the department offers courses in bioelectronics, and electronic instrumentation, as well as various courses in the format of seminars and internships. Research and student projects have also been implemented by faculty in the program, with major efforts in modeling of active physiological membranes, and design of biomedical instrumentation. The course offerings from which the student may make a selection include courses in electrical engineering and other disciplines including the biological and physiological sciences. The program of the individual student will be set and approved in consultation with a designated faculty advisor.

Facilities

The Department of Electrical and Computer Engineering operates laboratories for both teaching and research:

1. *The Advanced IC Design and Simulation Laboratory* contains equipment and computing facilities for the design, simulation, and characterization of analog, digital and mixed-signal integrated circuits. The instrumentation is networked to a PC.

2. *The Computer-Aided Design Laboratory* provides a network of PC based workstations. Advanced computer-aided design software for analog and digital systems design is available on these workstations.

3. *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.

4. *The Embedded Systems Laboratory* provides an excellent environment for teaching and research involving microprocessor-based embedded systems. Available equipment includes PC based development tools such as assemblers, compilers, simulators, and debuggers. The lab supports VHDL design and simulation, and includes a sophisticated device programming stations that programs virtually all popular memory and logic devices. A variety of industry standard test equipment is also available including oscilloscopes, logic analyzers, code-tap debuggers, etc.

5. *The Graduate Laboratory* is the general departmental computing facility equipped with 20 PIII-450 computers each with Windows NT operating systems, a four-processor SUN 2000, and a PIII-450 Linex server. All computers are connected by Ethernet.

6. *The Fluorescence Detection Lab* is involved in 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, DNA sequencing.

7. *The Fiber Optic Sensors Laboratory* is equipped to perform research in the broad area of fiber optic systems and optical signal processing. 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, biosensors. Applications include early detection of cataracts, submicroscopic particle sizing, and tip clearance sensors for rotating turbomachinery.

8. *The Optoelectronics Laboratory* is equipped with state-of-the-art tools for characterization and modeling of optoelectronic devices and systems.

Research is aimed at design and characterization of semiconductor lasers for different applications including telecommunication lasers and lasers for midinfrared applications.

9. *The Parallel and Neural Processing Laboratory* is equipped with Pentium PCs and a 64-processor Unix-based computer.

10. *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.

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. 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

University Professors

Marburger, John H., *Former President of the University at Stony Brook.*[1] Ph.D., 1967, Stanford University: Theoretical laser physics.

Distinguished Professors

Marsocci, Velio A.[2], Eng.Sc.D., 1964, New York University: Solid-state electronics; integrated electronics; biomedical engineering.

Pavlidis, Theodosis [4], Ph.D., 1964, University of California, Berkeley: Machine vision pattern recognition; computer graphics; robotics.

Truxal, John G., *Distinguished Teaching Professor Emeritus.*[7] Sc.D., 1950, Massachusetts Institute of Technology: Control and systems engineering; science education.

Zemanian, Armen H., Eng.Sc.D., 1953, New York University: Network theory; computational methods; VLSI modeling.

Professors

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.

Luryi, Serge, *Chairperson.* Ph.D., 1978, University of Toronto, Canada: Solid-state electronic devices.

Parekh, Jayant P., Ph.D., 1971, Polytechnic Institute of Brooklyn: Microwave acoustics; microwave magnetics; microwave electronics; microcomputer applications.

Rappaport, Stephen S., Ph.D., 1965, New York University: Communication theory; systems.

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.[3], Ph.D., 1973, University at Stony Brook: Digital system design; microprocessors; instrumentation.

Smith, David R., Ph.D., 1961, University of Wisconsin: Logic design; computer architecture.

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.

Associate Professors

Belenky, Gregory, *Graduate Program Director.* 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.

Dhadwal, Harbans, Ph.D., 1980, University of London, England: Laser light scattering; fiber optics; signal processing and instrumentation.

Djuric, Petar M., Ph.D., 1990, University of Rhode Island: Signal processing; signal and systems modeling.

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.

Phamdo, Nam, Ph.D., 1993, University of Maryland, College Park: Digital communications; data compression and coding; speech processing.

Robertazzi, Thomas G., 1981, Princeton University: Computer communications; performance evaluation; parallel processing.

Sussman-Fort, Stephen E., Ph.D., 1978, University of California, Los Angeles: VLSI; computer-aided circuit design; microwave circuits; active and passive filters; classical network theory.

Tang, K. Wendy, Ph.D., 1991, University of Rochester: Interconnection networks, parallel computing, and neural networks.

Yang, Yuanyuan, Ph.D., 1992, Johns Hopkins University: Parallel and distributed computing and systems; high-speed networks; optical networks; high performance computer architecture and fault-tolerant computing.

Assistant Professors

Dorojevets, Mikhail, Ph.D., 1988 Siberian Division of the USSR Academy of Sciences, Novosibirsk: Computer architectures, systems design.

Leuciuc, Adrian, Ph.D., 1996, Technical University of Iasi, Romania: Analog integrated circuits design, nonlinear circuits and systems, nonlinear and adaptive signal processing.

Adjunct Faculty

Driscoll, Timothy J., M.S., 1970, Polytechnic Institute of Brooklyn: Electrical power and distribution systems.

Garbuzov, Dmitry, Doctor of Physical and Mathematical Sciences, 1978, A.F. Iaffe Physical-Technical Institute, St. Petersburg, Russia: Design and technology semiconductor optoelectronic devices.

Swartz, Jerome[5], Ph.D., 1968, Polytechnic Institute of New York: Signal processing and laser technology.

Number of teaching, graduate, and research assistants, fall 1999: 36

1) Joint appointment, Department of Physics

2) Clinical Professor of Health Science

3) Recipient of State University Chancellor's Award for Excellence in Teaching, 1985

4) Joint appointment, Department of Computer Science

5) Symbol Technologies

6) Full-time appointment with Department of Technology and Society

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 grade point average of 3.0 or better in all graduate courses. Among these 30 credits, up to six credits may be ESE 597, ESE 599, ESE 691, ESE 698, or ESE 699. Only three of the six credits may be from ESE 698. All non-ESE courses must receive prior approval from the graduate program director.

B. Minimum of eight regular courses with at least a 3.0 grade point average. Of these eight, at least five regular courses must be in the Department of Electrical and Computer Engineering; three of the five must be selected from the following: ESE 502, ESE 503, ESE 511, ESE 520, ESE 532, ESE 545 or ESE 551 (only one of the two).

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 six transfer credits may be applied toward the degree with the approval of the program committee.

II. M.S. Thesis Option

A. At least 30 graduate credits with a grade point average of 3.0 or better in all graduate courses. 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 must receive prior approval from the graduate program director.

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 532, ESE 545, or ESE 551 (only one of the two).

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 six 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

A student must pass a written 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. 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 within 36 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.

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. Dissertation Defense

The student must defend the dissertation before an examining committee. 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

A one-year residency is required.

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 Graduate Laboratory in Electrical Sciences

Intended to familiarize the student with the use of research laboratory equipment, basic measurement techniques, and integration into an overall experimental project. Each student will select at least three experimental projects from the following areas to be supervised by the faculty: applied optics, microwave electronics, wave propagation, and solid-state electronics. The student must set up the experimental system, measure the necessary parameters, and perform the required experiments in order to complete the project.
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.
Prerequisite: ESE 503 or permission of instructor
Spring, 3 credits
ABCF grading

ESE 505 Traffic Performance Analysis of Mobile, Wireless, and Personal Communication Systems
Major issues for mobile, wireless, and personal communication systems. Interference, capacity, and use of spectral resources. System architecture. Spatial layout. Cellular systems. Spectral reuse. Cochannel and adjacent channel interference. Sectorization. Cell-splitting. Analog and digital cellar. Network control and resource allocation. Multiple access techniques. FDMA, TDMA, and CDMA. Relevant telecommunications traffic assignment. Channel borrowing. Hybrid schemes. Centralized and distributed control schemes. Data communication techniques. ARQ schemes. Packet and circuit switching. Traffic performance analysis for cellular and microcellular. The problem of call hand-off. Blocking and forced call terminations.
Prerequisite: ESE 503 or permission of instructor
Fall, 3 credits
ABCF grading

ESE 508 Analytical Foundations of Systems Theory
An exposition of the basic analytical tools for graduate study in systems, circuits, control, and signal processing. Sets and mappings, finite-dimensional linear spaces, metric spaces, Banach spaces, Hilbert spaces. The theory will be developed and exemplified in the context of systems applications such as nonlinear circuits, infinite networks, feedback control, signal restoration via projections, and optimal signal modeling.
Spring, 3 credits
ABCF grading

ESE 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 Semiconductor Electronics
This course provides an introduction to the physics, design, and fabrication techniques for planar MOSFET devices and LSI and VLSI integrated circuits. Topics include the following: surface field effect, MOS capacitors and transistors, threshold voltage as a function of oxide thickness, doping concentration, interface charge density and substrate bias, characteristics of MOS devices under different operating conditions for both low and high frequencies, equivalent circuits, and device parameters and their dependence on different processing techniques. The latest technological developments to achieve high-speed and high-density LSI circuits will also be discussed.
Prerequisite: ESE 511
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, 517 Integrated Electronic Devices and Circuits I and 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.
Fall, spring, 3 credits each semester
ABCF grading

ESE 518 Quantum Electronics II
Interaction of simple quantum systems with complex systems; semiclassical laser oscillation theory; stochastic theory of fluctuations. Brillouin scattering. Raman effect; spontaneous emission; interaction theory; quantum theory of laser oscillation; coupled Green's function relations. Quantized nonlinear optics; quantum noise; photon scattering.
Spring, 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 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 523 Integrated and Fiber Optics
The course includes the following topics: thin-film dielectric optical waveguides and modes, dielectric fibers, semiconductor planar waveguides, input and output couplers, groove reflectors, resonators and filters, modulators and detectors, semiconductor junction lasers and thin-film feedback lasers, fabrication techniques of thin-film guides and devices; optical communication system consideration and requirements.
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 Introduction to Integrated Circuits Technology
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.
Prerequisite: ESE 514
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 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

ESE 536/CSE 636 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
Fall, 3 credits

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.

ESE 541 Discrete Time Systems
Analysis and synthesis of discrete time systems and discrete time-controlled continuous systems. Topics include Z-transform and state variable representations of discrete time systems, controllability, and observability; Stability criterion; Synthesis methods. Dynamic programming and optimum control. Sampled spectral densities and correlation sequence. Optimum filtering and control of random processes.
Prerequisite: ESE 502
Spring, 3 credits
ABCF grading

ESE 542 Stability Theory and Application
Definition and application of stability criteria in both linear and nonlinear systems. Topics include equilibrium points, limit cycles, describing function analysis, construction of Lyapunov functions, the Popov circle criterion and perturbation methods. Application of stability theory to design of nonlinear control systems.
Spring, 3 credits
ABCF grading

ESE 543 Optimal Control
Topics include parameter optimization. La Grange multipliers, numerical techniques such as steepest descent. Newton's Method and conjugate gradients. In the area of trajectory optimization, the Hamilton-Jacobi Equations, Pontryagin Maximum Principle, and dynamic programming are applied to the quadratic regulator, minimum time, minimum fuel, and other linear and nonlinear control problems. Control in restricted phase space.
Fall, 3 credits
ABCF grading

ESE 544 Optimal Filtering and Data Reconstruction
Effects of stochastic noise and inexact measurement on the performance of control and communication systems. Topics include matching filter, coherent detection, optimal estimation, prediction, and smoothing of data using the Weiner-Hopf and Kalman-Bucy methods. The separation principle in optimal control of stochastic systems.
Spring, 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.
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 Networking
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).
Prerequisite: ESE 546 or permission of instructor
Summer or as needed in industry, 3 credits
ABCF grading

ESE 549 Fault Diagnosis of Digital Systems
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: ESE 318 or equivalent
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 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 VLSI Circuit 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-CAD Physical Design
Problems in computer-aided design for the physical design of VLSI circuits are surveyed, and algorithms for their solution are analyzed. Specific problems include global routing, placement, partitioning, channel routing, module generation, compaction, and performance optimization. Existing silicon compilers are studied. Students are expected to design and implement a VLSI-CAD tool.
Prerequisite: B.S. in Electrical Engineering or Computer Science
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 564 Fundamentals of Robotics II
This course advances ESE 563, with more emphasis on kinematic and dynamic equations, as well as advancing control strategy. In addition it covers the following topics: vision, sensory processing, collision-free trajectory plannings.
Prerequisite: Permission of instructor
Spring, 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 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
Spring, 3 credits
ABCF grading

ESE 570 Bioelectronics
Origin of bioelectric events; ion transport in cells; membrane potentials; neural action potentials and muscular activity; cortical and cardiac potentials. Detection and measurement of bioelectric signals; impedance measurements used to detect endocrine activity, perspiration, and blood flow; impedance cardiography; vector cardiography; characteristics of transducers and tissue interface; special requirements for the amplification of transducer signals.
Fall, 3 credits
ABCF grading

ESE 575 VLSI Signal/Array Processing
The course focuses on the front-end synthesis of VLSI systems in general and VLSI systems for signal processing in particular. The first phase of the course focuses on the derivation of both the data transformation section and control sequencing section from a behavioral description of an algorithm. The next phase briefly reviews the signal and image processing algorithms, and then addresses the development of special-purpose and dedicated processors for the signal and image processing algorithms. Current trends in processor design methodologies are discussed with examples. The emphasis is on the development of an application-specific processor for computation-intensive applications encountered in signal and image processing.
Prerequisite: ESE 318 and ESE 305, or equivalent
Spring, 3 credits
ABCF grading

ESE 580, 581 Microprocessor-Based Systems Engineering I and 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.
Fall, spring, 4 credits each semester
ABCF grading

ESE 585 Applications of Artificial Intelligence to Signal Processing
Principles of artificial intelligence with applications to signal processing and robotics; topics include stochastic pattern recognition, decision functions, mathematical programming, predicate calculus, and applications of expert systems.
Prerequisite: ESE 503
3 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 596 Internship in Bioengineering
Student will work with physicians in hospital or another clinical facility and will gain experience in clinical instrumentation diagnosis and in treatment of diseases.
Prerequisite: Physiology background
Fall, spring, 3 credits, repetitive
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, spring, variable and repetitive credit
S/U grading

ESE 599 Research
Fall, spring, variable and repetitive credit
S/U grading

ESE 610 Seminar in Solid-State Electronics
Current research in solid-state devices and circuits and computer-aided network design.
Fall, spring, 3 credits
ABCF grading

ESE 630 Seminar in Communication Theory
Fall, spring, 3 credits
ABCF grading

ESE 640 Seminar in Systems Theory
Recent and current research work in systems theory.
Fall, spring, 3 credits
ABCF grading

ESE 650 Advanced Topics in Digital Systems
Topics of special interest in the area of digital systems.
Fall, spring, 3 credits
ABCF grading

ESE 660 Seminar in Biomedical Systems Engineering
This seminar will treat topics of current interest in bioengineering. Modeling and simulations of physiological systems, such as cardiovascular, respiratory, renal, and endocrine systems. Instrumentation systems including automatic chemical assaying, electric probes, ultrasonic tracer methods, and radiation techniques. Application of computers in biomedicine.
Prerequisites: ESE 310; ESE 370 or equivalent
Fall, 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, spring, variable and repetitive credit
ABCF grading

ESE 691 Seminar in Electrical and Computer Engineering
This course is designed to expose students to the broadest possible range of the current activities in electrical and computer engineering. Speakers from both on and off campus discuss topics of current interest in electrical engineering.
Fall, spring, 1 credit, repetitive
S/U grading

ESE 698 Practicum in Teaching
Fall, spring, variable and repetitive credit
S/U grading

ESE 699 Dissertation Research
Fall, spring, variable and repetitive credit
S/U grading

English (EGL)

Chairperson and Graduate Program Director: Peter Manning, Humanities Building 254 (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, teaching, and creative writing. 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. The Poetry Center brings an array of distinguished poets and writers to campus for readings and workshops.

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, 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. 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.

In addition, all doctoral students must successfully complete the program requirements outlined above. Ph.D. students receiving financial support must enroll in EGL 697, 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 or creative writing, 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.

About the Graduate Record Examination

All applicants to the University at Stony Brook 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. A sample of the applicant's creative writing.

G. Acceptance by both the Department of English and the Graduate School.

Any deficiencies in these requirements shall not automatically bar admission, but it is understood that inadequacies in undergraduate preparation normally will require the student to take additional work, the amount to be determined by the appropriate graduate advisory committee. Additional work may not be used to fulfill M.A. degree requirements.

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

Armstrong, Paul, *Dean of the College of Arts and Sciences.* Ph.D., 1977, Stanford University: 19th- and 20th-century English and American literature; theory of interpretation; literature and phenomenology.

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 and Graduate Program Director.* 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.

Rosen, Carol, Ph.D., 1975, Columbia University: Dramatic theory and criticism; dramaturgy; comparative modern drama; Renaissance drama and Shakespeare.

Siskin, Clifford[5], Ph.D., 1978, University of Virginia: Romanticism; 18th-century British literature; literary theory and history; interdisciplinary and cultural studies.

Spector, Stephen, Ph.D., 1973, Yale University: Old and Middle English literature; history of the English language; the Bible; intolerance in medieval literature; Christianity and Judaism; drama through Shakespeare; manuscript study and bibliography; the "other" in medieval literature and society.

Associate Professors

Bashford, Bruce, Ph.D., 1970, Northwestern University: Literary theory and the history of criticism; rhetoric and the teaching of composition; the logic of interpretation and critical argument; humanism.

Belanoff, Patricia, *Undergraduate Program Director.* Ph.D., 1982, New York University: The teaching of composition and literature; rhetoric; Old English.

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.

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.

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.

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

Appelt, Ursula, Ph.D., 1994, University of Virginia: Renaissance literature; women in the early modern period; theories of history; literature of exploration.

Haralson, Eric, Ph.D., 1993, Columbia University: 19th- and 20th-century British and American literatures; men's studies; Henry James.

Hutner, Heidi, Ph.D., 1993, University of Washington: Restoration and 18th-century studies; feminist theory; colonial and postcolonial discourse; women writers.

Weheliye, Alexander, Ph.D., 1999, Rutgers University: African American Studies; diaspora studies; American studies; cultural studies; critical theory; popular music; history and theory of sound recording.

Number of teaching, graduate, and research assistants, fall 1999: 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, 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 requirements. The required ten courses must include one in at least four of the following eight areas, with at least one course in American literature:

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.

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.

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.

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 EGL 697, 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 examination without first satisfying the foreign language requirement. Students choosing Option I must satisfy one language requirement before taking the three area examinations 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.

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.

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 and two other members of the department who will serve as readers. After the student's director has conferred with the other readers and the dissertation committee has approved the proposal, the director will submit the proposal and names of the committee members to the graduate program

committee of the department for its approval. The graduate program director, in consultation with the student's dissertation committee, will name a reader from outside the department.

The four readers of the dissertation must recommend acceptance of the dissertation before it can be approved by the Graduate School. Students will present the results of dissertation research at a colloquium convened for that purpose by the Department of English, which will be open to interested faculty and graduate students.

G. The Dissertation Defense

At least eight weeks before the Graduate School's deadline for submitting the completed dissertation, the student will submit to his or her readers what is intended to be the final draft of the dissertation. No more than four weeks after that, if the readers have agreed that the dissertation is ready to be defended, the director will schedule the defense. (This is distinct from the actual acceptance of the dissertation, which can take place only at the defense itself.)

H. Teaching Program

Training in teaching is stressed by the department, and every student should expect to teach as part of the doctoral program. Teaching assistants instruct in a variety of courses including composition and introductions to poetry, fiction, and drama; tutor in the Writing Center; and assist in large lecture courses. An important part of the teaching experience is the Practicum in Teaching (EGL 697), 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 690 Dissertation Research or EGL 699, 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.

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

Content varies each semester.

EGL 501 Studies in Chaucer
3 credits
ABCF grading

EGL 502 Studies in Shakespeare
3 credits
ABCF grading

EGL 503 Studies in Milton
3 credits
ABCF grading

EGL 505 Studies in Genre
3 credits
ABCF grading

EGL 506 Studies in Literary Theory
3 credits
ABCF grading

EGL 509 Studies in Language and Linguistics
3 credits
ABCF grading

EGL 510 Old English Language and Literature
3 credits
ABCF grading

EGL 515 Middle English Language and Literature
3 credits
ABCF grading

EGL 520 Studies in the Renaissance
3 credits
ABCF grading

EGL 525 17th-Century Literature
3 credits
ABCF grading

EGL 530 Studies in the Age of Dryden
3 credits
ABCF grading

EGL 535 Studies in Neoclassicism
3 credits
ABCF grading

EGL 540 Studies in Romanticism
3 credits
ABCF grading

EGL 545 Studies in Victorian Literature
3 credits
ABCF grading

EGL 547 Late 19th-Century British Literature
3 credits
ABCF grading

EGL 550 20th-Century British Literature
3 credits
ABCF grading

EGL 555 Studies in Irish Literature
3 credits
ABCF grading

EGL 560 Studies in Early American Literature
3 credits
ABCF grading

EGL 565 19th-Century American Literature
3 credits
ABCF grading

EGL 570 20th-Century American Literature
3 credits
ABCF grading

EGL 575 British and American Literature
3 credits
ABCF grading

EGL 580 Poetry Workshop
3 credits
ABCF grading

EGL 581 Fiction Workshop
3 credits
ABCF grading

EGL 582 Drama Workshop
3 credits
ABCF grading

EGL 583 Nonfiction Workshop
3 credits
ABCF grading

EGL 585 Creative Writing Project
3 credits
ABCF grading

EGL 592 Problems in Teaching Writing or Composition
3 credits
ABCF grading

EGL 593 Problems in Teaching Literature
3 credits
ABCF grading

EGL 594 Contexts of Literary Study
3 credits
ABCF grading

EGL 597 Practicum in Methods of Research
Variable and repetitive credit
S/U grading

EGL 599 Independent Study
3 credits
ABCF grading

EGL 600 Proseminar: The Discipline of Literary Studies
3 credits
ABCF grading

EGL 601 Problems in History and Structure of the English Language
3 credits
ABCF grading

EGL 602 Problems in Bibliography, Editing, and Textual Criticism
3 credits
ABCF grading

EGL 603 Problems in Literary Theory and Criticism
3 credits
ABCF grading

EGL 604 Problems in Literary Analysis
3 credits
ABCF grading

EGL 605 Problems in Convention and Genre
3 credits
ABCF grading

EGL 606 Period and Tradition
3 credits
ABCF grading

EGL 607 Individual Authors
3 credits
ABCF grading

EGL 608 Problems in the Relationship of Literature to Other Disciplines
3 credits
ABCF grading

EGL 611 Critical Theory
3 credits
ABCF grading

EGL 612 Theories in Composition
3 credits
ABCF grading

EGL 613 Research in Composition
3 credits
ABCF grading

EGL 614 Topics in Composition and Writing
3 credits
ABCF grading

EGL 690 Dissertation Research
Variable and repetitive credit
S/U grading

EGL 695 Methods of Teaching English
3 credits
S/U grading

EGL 697 Practicum in Teaching English Literature
3 credits
S/U grading

EGL 698 Practicum in Teaching Writing
3 credits
S/U grading

EGL 699 Directed Reading
Variable and repetitive credit
S/U grading

French and Italian (FRN, ITL, DLF, DLI, DLL)

Chairperson: Charles Franco, Frank Melville, Jr., Memorial Library N4005 (631) 632-7440
Graduate Program Director: Ruth Plaut Weinreb, Frank Melville, Jr., Memorial Library N4020 (631) 632-7440
Secretary: Marie E. Sweatt, Frank Melville, Jr., Memorial Library N4005 (631) 632-7440

Degrees awarded: M.A. in Romance Languages and Literature; D.A. in Foreign Languages (French or Italian)

The M.A. program in French and Italian, in the College of Arts and Sciences, is designed to meet the needs of those interested in a Ph.D. program as well as those who wish to teach in secondary schools and junior colleges. It can also serve as a step toward careers in international business, industry, and international affairs. Students may specialize in one or several Romance languages in preparation for their degrees. The choice of courses will be determined by the student's previous experience, interests, and needs in flexible interaction with program requirements. Our carefully developed advising system enables us to tailor specially structured programs to suit the needs and interests of individual students.

M.A. Curriculum

The M.A. curriculum emphasizes linguistic proficiency as well as training in literature and its cultural context. Courses are generally taught in French or Italian; written and oral assignments are in French or Italian. Students must obtain the grade of B or better in advanced stylistics (FRN 507 or ITL 508) before being admitted to the M.A. examination. (Those with insufficient background will be directed toward remedial work and/or undergraduate courses; neither counts for degree credit.)

The curriculum is conceived so that students may acquire a general knowledge of French and/or Italian literature, culture, and history, as well as the techniques necessary to deal independently with literary texts. Upon entering, students are given a general reading list, and well before taking the M.A. examination they will select an area of concentration with the help of their advisors. Normally this will involve a specific topic or theme in two periods of literature to be chosen for study in greater depth.

Our graduate courses are open to qualified students in other fields and in the School of Professional Development program. Similarly, our students are encouraged to take courses in related areas. With the permission of their advisor and the graduate program director, students may obtain six credits outside the program.

Interdepartmental M.A. Curriculum

The Department of French and Italian and the Department of Hispanic Languages and Literature offer an M.A. in Romance Languages with concentrations in French and Spanish, Italian and Spanish, and French and Italian.

The curriculum is formulated according to the individual student's preparation, interests, and skills. It is a flexible program that will suit students who wish to go on to doctoral work as well as those who wish to terminate their studies with the master's degree.

Doctor of Arts Program

The program leading to the Doctor of Arts degree in Foreign Language Instruction is designed to train professionals in the field of foreign language teaching on the secondary, junior college, and college levels. It is also appropriate for providing a basis in language training for language education specialists and specialists in bilingual media and communications, and for marketing consultants whose expertise in foreign language(s) will aid business or advertising. The program is flexible, competency based, and, where possible, tailored to individual needs.

A more detailed description of the graduate program is available from the departmental office. This includes information on specific distribution requirements, fields of specialization, and 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 Department of French and Italian has available for its students the Language Learning and Research Center. 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. Sponsored by the Departments of Comparative Studies, Germanic and Slavic Languages and Literatures, French and Italian, Hispanic Languages and Literatures, and Linguistics, it is open to all students and staff of the University with preference being given to students and staff of these five departments. The Center hosts a variety of workshops and courses (see listings of courses under the Doctor of Arts program in relevant departments) relating to the intersection between technology and language learning.

Admission

Admission to the M.A. Program in Romance Languages (French or Italian)

For admission to Graduate Studies in French or Italian, 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.

B. Three letters of recommendation written by persons qualified to assess the candidate's preparation.

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

D. A transcript of undergraduate records.

E. Two sample papers on a literary topic, written in the language to be studied.

F. A cassette with readings in the language to be studied, and, for foreign students, in English.

G. Acceptance by both the Department of French and Italian and the Graduate School.

Provisional admission may be offered to those students not meeting some of the above requirements.

While it is expected that the applicant demonstrate superior preparation in French or Italian language and literature, an undergraduate major in French or Italian is not required.

Admission to the M.A. Program in Romance Languages, Interdepartmental Curriculum

For admission to graduate study in the interdepartmental M.A. degree program in Romance Languages, the following, in addition to the minimum Graduate School requirements, are normally required:

A. 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. Good command of both oral and written skills in the languages.

C. An official transcript of undergraduate record.

D. Letters of recommendation from three previous instructors.

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

F. Two sample papers on a literary topic, written in the languages to be studied.

G. Acceptance by both the departments and the Graduate School.

International students must furnish as much information as possible about their training abroad (official certification degrees and 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 M.A.T. Program in French 7-12 or Italian 7-12

Individuals interested in either of these M.A.T. programs should refer to the School of Professional Development section of this bulletin.

Admission to the Doctor of Arts Program, Graduate Studies in French and/or Italian

For admission to graduate study in the Doctor of Arts Program in Foreign Languages (French and/or Italian), the following, in addition to the requirements of the Graduate School, are normally required:

A. An M.A. degree or its equivalent.

B. Three letters of recommendation written by persons qualified to assess the candidate's preparation.

C. Results of the Graduate RecordExamination (GRE) General Test.

D. A transcript of undergraduate and graduate grades.

E. Demonstrated proficiency in French and/or Italian.

F. Two sample papers on a literary topic, written in the language(s) to be studied.

Faculty

Professors

Allentuch, Harriet[2], Ph.D., 1962, Columbia University: 17th-century French literature.

Brown, Frederick, Ph.D., 1960, Yale University: 19th- and 20th-century French literature.

Fontanella, Luigi, Ph.D., 1981, Harvard University: Modern Italian literature.

Mignone, Mario[3], Ph.D., 1972, Rutgers University: Contemporary Italian Literature.

Petrey, Sandy, Ph.D., 1966, Yale University: 19th-century French literature; critical theory; comparative literature.

Tursi, Joseph A., *Emeritus.*[1] Ph.D., 1965, New York University: Methodology.

Associate Professors

Franco, Charles, *Chairperson.* Ph.D., 1977, Rutgers University: Medieval Italian literature.

Harvey, Robert[4], Ph.D., 1988, University of California, Berkeley: Contemporary French literature; critical theory; film.

Hurley, E. Anthony, Ph.D., 1992, Rutgers University: French Caribbean literature; Francophone literature.

Repetti, Lori, Ph.D., 1989, University of California, Los Angeles: Italian and Romance linguistics; medieval literature.

Rizzuto, Anthony, Ph.D., 1966, Columbia University: 19th- and 20th-century French literature.

Weinreb, Ruth Plaut, *Graduate Program Director.* Ph.D., 1966, Columbia University: Pedagogy and 18th-century French literature.

Assistant Professors

Fedi, Andrea, Dottore in Lettere e Filosofia, 1989, University of Florence, Italy; Ph.D., 1994, University of Toronto, Canada: Italian Renaissance literature; historiography; computer-assisted research.

Ledgerwood, Mikle D., *Director of Language Center.* Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Reich, Jacqueline, Ph.D., 1994, University of California, Berkeley: Italian cinema; film theory; gender studies.

Research Professors

Blum, Carol, *Humanities.* Ph.D., 1966, Columbia University: 18th-century French literature; literature of the French Revolution.

Affiliated Faculty

Volat, Hélène, *Associate Librarian.* M.A., 1973, University at Stony Brook: French.

Number of teaching, graduate, and research assistants, fall 1999: 15

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990. Recipient of the President's Award for Excellence in Teaching, 1990

3) Recipient of the New York State/United University Professions Excellence Award, 1991

4) Recipient of the President's Award for Excellence in Teaching, 1996. Recipient of the Chancellor's Award for Excellence in Teaching, 1996

Degree Requirements

Requirements for the M.A. Degree, Graduate Program in French

A complete course of study in French language, literature, and culture is offered for candidates intending to teach at the secondary school level and for pre-Ph.D. candidates. In addition to the minimum Graduate School requirements, the following are required:

A. Course Requirements	Credits
1. FRN 507 Stylistics (Syntax and Composition)	3
2. FRN 508 Explication de Texte	3
3. Six courses in French literature	18
4. Two electives; FRN 501 and FRN 502 are highly recommended	6
	Total 30

B. Performance

A grade of B or higher for all courses listed under items A1, A2, and A3 is required.

C. Comprehensive Examination

At the completion of all coursework, candidates will take an oral and written comprehensive examination. For a detailed description, see the departmental handbook.

Requirements for the M.A. Degree, Graduate Program in Italian

The Department offers two tracks for concentration in Italian. In addition to the minimum requirements of the Graduate School, the following are required:

Track I–Italian with Concentration in Literature

A. Course Requirements	Credits
1. ITL 501 Modern Culture	3
2. ITL 508 Syntax and Composition	3
3. One of the following:	
ITL 507 Italian Linguistics	
ITL 511 History of the Italian Language	
ITL 512 Italian and Its Dialects	
ITL 513 Romance Linguistics	3
4. Six courses in Italian literature	18
5. Elective	3
Total	30

Special permission may be granted to replace two of the literature courses (6 credits) with a thesis.

B. Performance

A grade of B or higher for all courses listed under items A1 through A4 is required.

C. Comprehensive Examination

At the completion of all coursework, candidates will take an oral and written comprehensive examination.

Track II–Italian with Concentration in Language/Linguistics

A. Course Requirements	Credits
1. ITL 501 Modern Culture	3
2. FLA 505 Methods and Materials	3
3. ITL 508 Syntax and Composition	3
4. ITL 511 History of the Italian Language	3
5. One of the following:	
ITL 507 Italian Linguistics	
ITL 512 Italian and Its Dialects	
ITL 513 Romance Linguistics	3
6. Three courses in Italian literature	9
7. Two electives	6
Total	30

B. Performance

A grade of B or higher for all courses listed under items A1 through A6 is required.

C. Comprehensive Examination

At the completion of all coursework, candidates will take an oral and written comprehensive examination.

Requirements for the M.A. Degree in Romance Languages, Concentration in French and Italian, French and Spanish, or Italian and Spanish

Candidates choose one language as a major and one as a minor and must be able to do graduate work in both. To qualify for the degree, the M.A. candidate in French and Italian, French and Spanish, or Italian and Spanish normally completes 36 credit hours (12 courses). The distribution of these courses varies according to whether the student chooses Track I, with a concentration in literature, or Track II, with a concentration in language.

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

French and Italian

Track I–French and Italian with Concentration in Literature

A. Course Requirements
Major in French*

1. FRN 501 or FRN 502
2. FRN 507 Stylistics (Syntax and Composition)
3. FRN 508 Explication de Texte
4. At least 15 credits in French literature

Minor in Italian**

5. ITL 501 Modern Culture
6. ITL 508 Syntax and Composition
7. Two Italian literature courses to be chosen with permission of advisor

Major in Italian*

1. ITL 501 Modern Culture
2. ITL 508 Syntax and Composition
3. One of the following:
   ITL 507 Italian Linguistics
   ITL 511 History of the Italian Language
   ITL 512 Italian and Its Dialects
   ITL 513 Romance Linguistics
4. At least 15 credits in Italian literature

Minor in French**

5. FRN 507 Stylistics (Syntax and Composition)
6. One of the following:
   FRN 501 Contemporary Culture and Civilization
   FRN 502 French Civilization in Its Historical Perspective
   FRN 508 Explication de Texte
7. Two French literature courses to be chosen with permission of advisor

B. Performance

A grade of B or higher for all courses listed under items A1 through A3, A5, and A6 is required.

C. Final Examination

The final examination covers two areas of specialization, each combining works from French and Italian literature. For Italian, one area must include the Middle Ages and the Renaissance, and for French, one pre-19th-century period. The second area should be more modern.

Thus a student could offer (A) Medieval French and Italian literature and (B) Naturalism in France and Italy; or (A) Renaissance French and Italian literature and (B) Modern Italian and French drama.

Track II–French and Italian with Concentration in Language

A. Course Requirements
Major in French*

1. FRN 501 or FRN 502
2. FRN 507 Stylistics (Syntax and Composition)
3. FRN 508 Explication de Texte

4. At least nine credits (three courses) in French literature
5. Two elective courses in French

Minor in Italian**

6. ITL 501 Modern Culture
7. ITL 508 Syntax and Composition
8. Two Italian literature courses in the area of concentration

Major in Italian*

1. ITL 501 Modern Culture
2. ITL 508 Syntax and Composition
3. One of the following:
   ITL 507 Italian Linguistics
   ITL 511 History of the Italian Language
   ITL 512 Italian and Its Dialects
   ITL 513 Romance Linguistics
4. At least nine credits (three courses) in Italian literature
5. Two elective courses in Italian

Minor in French**

6. FRN 507 Stylistics (Syntax and Composition)
7. One of the following:
   FRN 501 or FRN 502
   FRN 508 Explication de Texte
8. Two French literature courses in the area of concentration

B. Performance

A grade of B or higher for all courses listed under items A1 through A3, A6, and A7 is required.

C. Comprehensive Examination

At the completion of all coursework candidates will take an oral and written comprehensive examination. See departmental handbook for details.

French and Spanish

A. Course Requirements

Major in French*

1. FRN 501 or FRN 502
2. FRN 507 Stylistics (Syntax and Composition)
3. FRN 508 Explication de Texte
4. At least 15 credits in French literature

Minor in Spanish**

5. SPN 510 Hispanic Culture or SPN 582 The Hispanic Tradition in the United States
6. SPN 515 Spanish Composition and Stylistics or SPN 509 Literary Theory, with permission
7. Two Spanish literature courses to be chosen with permission of advisor

Major in Spanish*

1. SPN 510 Hispanic Culture
2. SPN 515 Spanish Composition and Stylistics
3. One course numbered 501-504
4. At least 15 credits in Spanish literature

Minor in French**

5. FRN 507 Stylistics (Syntax and Composition)
6. FRN 501 or FRN 502
7. Two French literature courses to be chosen with permission of advisor or one French literature course and FRN 508 Explication de Texte

B. Performance

A grade of B or higher for all courses listed under items A1 through A3, A5, and A6 is required.

C. Comprehensive Examination

The final examination covers two areas of specialization, each combining works from French and Spanish literature. One area should be from group I, one from group II.

I. 20th-century; 19th-century; theatre; prose fiction; lyric poetry; colonial history.

II. French classical theatre and Spanish Golden Age; medieval literature.

Italian and Spanish

A. Course Requirements

Major in Italian*

1. ITL 501 Modern Culture
2. ITL 508 Syntax and Composition
3. One of the following:
   ITL 507 Italian Linguistics
   ITL 511 History of the Italian Language
   ITL 512 Italian and Its Dialects
   ITL 513 Romance Linguistics
4. At least 15 credits in Italian literature

Minor in Spanish**

5. SPN 510 Hispanic Culture
6. SPN 515 Spanish Composition and Stylistics
7. Two Spanish literature courses to be chosen with permission of advisor

Major in Spanish*

1. SPN 510 Hispanic Culture
2. SPN 515 Spanish Composition and Stylistics
3. One course numbered 501-504
4. At least 15 credits in Spanish literature

Minor in Italian**

5. ITL 501 Modern Culture
6. ITL 508 Syntax and Composition
7. Two Italian literature courses to be chosen with permission of advisor

B. Performance

A grade of B or higher for all courses listed under items A1 through A3, A5, and A6 is required.

C. Comprehensive Examination

The final examination covers two areas of specialization, each combining works from Italian and Spanish literature. One area should be from group I, one from group II.

I. 20th century; 19th century; theatre; prose fiction; lyric poetry; colonial history.

II. Italian Renaissance, Baroque, and Spanish Golden Age; medieval literature.

**Total of 24 major credits*

***Total of 12 minor credits*

Total credits required: 36

Requirements for the Doctor of Arts Degree in Foreign Language, Graduate Studies in French and/or Italian

A. Courses

A minimum of 36 course credits is required, to be distributed as follows:

Field of Specialization	Credits
Syntax or Morphology	3
Phonetics or Phonology	3
Civilization or Culture	3
History of the Language	3
Stylistics or Literary Translation	3
Three electives	9
Total	24

Pedagogy

Second Language Acquisition	3
Methods of Foreign Language Teaching	3

Practicum	3
Internship or Externship	3
Total	12

Degree candidates who are full-time teachers will, where possible, do their externship at an institution other than where they normally teach, e.g., high school teachers will be encouraged to teach an evening college course, and those teaching at a two-year or four-year college will be encouraged to teach at the secondary school level. When these arrangements are not possible, other provisions will be made in consultation with the D.A. committee. All degree candidates will be expected to have taught at least one course at the 200 level or above.

B. 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 professors of a pertinent course; or

2. Upon recommendation of the supervisor of the practicum, internship, or externship; or

3. 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.

C. Practical Experience

All candidates are required to fulfill the following teaching assignments during the program.

1. *Practicum:* The student is given charge of a three-hour section in a beginning or intermediate course in the area of language instruction. The practicum takes place after the student has successfully completed a course in language instruction that covers objectives, grading, and testing.

2. *Internship:* The student is apprenticed to a professor in charge of a literature, linguistics, and/or culture course for at least one semester. The internship may not precede the practicum.

3. *Externship:* The student will be required to teach at the undergraduate or secondary level in the local area, when feasible.

D. 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, language instruction, and methodology. All candidates receive a basic reading list. However, it will be the responsibility of the candidate to prepare, with his or her advisor, the section of the reading list that covers the student's area of specialization.

2. *Dissertation:* Upon successful completion of the comprehensive examination the candidate, in consultation with his or her dissertation director, must submit a dissertation proposal which will be reviewed by the D.A. committee. After the proposal is approved, a committee is appointed, in consultation with the program director. This committee includes a dissertation supervisor and at least two advisors. At least two faculty members must be from the department and at least one must be from outside the department. Six optional dissertation credits are available for those who desire them.

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.

Normally, a maximum of six credits of SPD courses or SPD crosslisted courses may be transferred. Under special circumstances and with approval of the department and the graduate program director, additional crosslisted credits may be counted toward the D.A. requirements.

Courses

For detailed descriptions of these courses, see the special departmental announcements. All courses numbered FRN 511-599 and ITL 522-599 have repetitive credit when the topic changes.

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 M.A. candidates 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, alternate 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

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 514 Seminar in Medieval French Literature
This course may be repeated for credit when topic changes. Topic and credits to be arranged.
ABCF grading

FRN 521 Literature of the French Renaissance
A study of the major literary and cultural developments characteristic of the civilization of the Renaissance in France. The works of such writers as Rabelais and Montaigne serve as both focus and starting point for broader inquiry into the artistic, social, and cultural movements accompanying the rebirth of art and letters in France.
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 Molière.
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 Bruyère, Mme de Sévigné, and Mme de Lafayette. Changing topic.
Fall or spring, 3 credits
ABCF grading

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 Encyclopédie, are examined.
Fall or spring, 3 credits
ABCF grading

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, Clôture, 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 551 Studies in Romanticism
Reading and research in the background and manifestation of romanticism in French literature.
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, Mallarmé, Verlaine, and Rimbaud, with an introduction to some important critical approaches to these texts.
Fall or spring, 3 credits
ABCF grading

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, Valéry, Ponge, Char, Césaire, Bonnefoy.
Fall or spring, 3 credits
ABCF grading

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 Clézio, Ben Jelloun, Mallet-Joris, Alexis, Duras, Deguy, Roche, Bonnefoy, Tournier.
Fall or spring, 3 credits
ABCF grading

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 Bâ, Chauvet, Césaire, Condé, Glissant, Roumain, Schwartz-Bart, Senghor, Werewere-Liking.
Fall or spring, 3 credits
ABCF grading

FRN 570 Special Topic 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 581 Independent Individual Studies
Fall and spring, 1-6 credits, repetitive
ABCF grading

FRN 599 Practicum in Teaching
Fall and spring, variable and repetitive credit
S/U grading

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. (Not for M.A. candidates in Italian.)
Fall or spring, 3 credits
ABCF grading

ITL 501 Modern Culture
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. Crosslisted with CEH 595.
Fall or spring, 3 credits
ABCF grading

ITL 505 Strategies for Teaching Italian
A workshop for teachers of Italian on all levels. Teaching strategies are discussed and demonstrated. Materials are developed by the partic pants. Guest lecturers and workshop leaders from various levels of instruction assist with several aspects of the course. Topics include communicative skills, use of realia, testing, visuals, and teaching culture.
Fall or spring, 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 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, alternate 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, alternate 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 516-517 Seminar on Dante
The *Vita Nuova*, the *Opere Minori*, and the *Divine Comedy* 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

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

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

ITL 562 Studies in Contemporary Literature
Contemporary Italian Poetry: The Quest for Meaning
Contemporary Italian poetry reflects a universe that does not answer to human expectations and desires. Although without faith or hope, the poets cannot become prisoners of ignorance about their own destiny and conduct an indomitable search for new values and answers. Besides the poetry of the two Nobel Prize winners Quasimodo and Montale, readings include selected poems by other outstanding poets such as Ungaretti, Saba, Compana, and Pasolini.
Fall or spring, 3 credits
ABCF grading

ITL 571 Italian Autobiography
A study of the development of introspection and self-awareness in Italian autobiography from Petrarch to the 20th century.
ABCF grading
Fall or spring, 3 credits

ITL 581 Independent Individual Studies
Fall and spring, variable and repetitive credit
ABCF grading

ITL 599 Practicum in Teaching
Fall and spring, variable and repetitive credit
S/U grading

D.A. Courses

DLF 601, DLI 601 Internship in Foreign Languages: French and Italian
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 602, DLI 602 Externship in Foreign Languages: French and Italian
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 699, DLI 699 Doctoral Research in Foreign Languages: French and Italian
Independent research for the Doctor of Arts degree. Open only to candidates for the Doctor of Arts who have passed the preliminary examination.
Fall and spring, 1-9 credits, repetitive
S/U grading

Language Learning and Research Center Courses

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.
Fall or spring, 3 credits
ABCF grading

DLL 571 Technology and Education
(Course open to non-D.A. graduate students.) Assumes knowledge of material taught in DLL 570. Addresses more globally and more theoretically the intersection between technology and languages. Issues of cognitive learning theory and educational psychology addressed.
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
ABCF 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
S/U 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

Genetics (BGE)

Graduate Program Director: J. Peter Gergen, Center for Molecular Medicine, Room 436 (631) 632-9030
Staff Assistant: Pam Sims, 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, immunogenetics, 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 also 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 the University at Stony Brook, 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, and Pharmacological Sciences. 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, Cancer Genetics and Cancer Biology, 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 2000-2001 academic year includes an $18,500 stipend, a full tuition scholarship, and health insurance. This same package is provided each year to continuing students in the program. The stipend is scheduled to increase to $20,000 for the 2001-2002 academic year.

Faculty

Distinguished Professor

Carlson, Elof A.[2], Ph.D., 1958, Indiana University: Mutational mosaicism in human disorders.

Professors

Bahou, Wadie[5], M.D., 1980, Massachusetts Medical Center: Human genetics; gene therapy.

Bar-Sagi, Dafna[3], Ph.D., 1984, University at Stony Brook: 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.

Bogenhagen, Daniel[6], M.D., 1977, Stanford University: Molecular biology of oocyte development.

Carter, Carol A.[3], Ph.D., 1972, Yale University: Retroviral replication; control mechanisms in protein assembly.

Delihas, Nicholas[3], Ph.D., 1961, Yale University: Structure, function, and evolution of small RNAs.

Dykhuizen, Daniel[4], Ph.D., 1971, University of Chicago: Causes of natural selection in microorganisms.

Eanes, Walter[4], Ph.D., 1976, University at Stony Brook: Genetic variation in natural populations.

Fisher, Paul[6], M.D., Ph.D., 1980, Stanford University: DNA replication; nuclear architecture; nuclear transport.

Futcher, A. Bruce[3], D.Phil., 1981, University of Oxford: Control of cell division in eukaryotic cells.

Gergen, J. Peter, *Graduate Program Director.*[2] Ph.D., 1982, Brandeis University: Regulation of transcription and the genetic control of development.

Grollman, Arthur[6], M.D., Johns Hopkins University: Mechanisms of DNA repair and mutagenesis in mammalian cells.

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: Viral molecular genetics; eukaryotic transcriptional regulation.

Katz, Eugene[3], Ph.D., 1969, University of Cambridge: Genetic studies on Dictyostelium discoideum.

Lennarz, William J.[2], Ph.D., 1959, University of Illinois: Biosynthesis and function of cell surface glycoproteins.

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, University at Stony Brook: Immunoglobulin gene expression and recombination.

McCleod, Kenneth[9], Ph.D., 1986, Massachusetts Institute of Technology: Growth, repair, and adaptation of biological systems.

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.

Smith, Steven[2], Ph.D., 1985, University of California, Berkeley: Structural biology.

Sternglanz, Rolf[2], Ph.D., 1967, Harvard University: Yeast molecular genetics.

Taichman, Lorne[7], M.D., 1965, University of Toronto, Canada: Kertinocyte biology; epithelial gene therapy.

Wimmer, Eckard[3], Dr.rer.nat., 1962, Gottingen, Germany: Poliovirus replication and picornaviral pathogenesis.

Associate Professors

Bingham, Paul[2], Ph.D., 1979, Harvard University: Regulation of differentiation; transposable elements; regulation of splicing.

Bliska, James B.[3], Ph.D., 1988, University of California, Berkeley: Molecular and cellular basis of bacterial-host cell interactions.

Citovsky, Vitaly[2], Ph.D., 1987, Hebrew University, Jerusalem: Nuclear transport and intercellular communication in plants.

Dean, Neta[2], Ph.D., 1988, University of California, Los Angeles: Protein trafficking in yeast.

Engebrecht, JoAnne[6], Ph.D., 1986, University of California, San Diego: Genetic analysis of meiosis.

Frohman, Michael[6], M.D., Ph.D., 1985, University of Pennsylvania: Early mammalian development.

Hollingsworth, Nancy[2], Ph.D., 1988, University of Washington: Meiotic chromosome synapsis, recombination, and segregation in yeast.

Konopka, James[3], Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Reich, Nancy[8], Ph.D., 1983, University at Stony Brook: Signal transduction and activation of gene expression by cytokines; cellular defense responses to viral infection.

Skiena, Steve[12], Ph.D., 1988, University of Illinois: Computational biology and informatics.

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.

Hadjiargyrou, Michael[9], Ph.D., 1992, City University of New York: Human molecular genetics; functional genomics.

Hearing, Janet C.[3], Ph.D., 1984, University at Stony Brook: Molecular analysis of latent Epstein-Barr virus DNA replication.

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.

Leatherwood, Janet[3], Ph.D., 1993, Johns Hopkins University: Cell cycle control of DNA replication.

Moll, Ute[8], M.D., 1985, University of Ulm: Tumor suppressor genes; role of p53 in human cancer.

Neiman, Aaron[2], Ph.D., 1994, University of California, San Francisco: Developmental regulation of the secretory pathway.

Schindelin, Hermann[2], Ph.D., 1994, Free University of Berlin, Germany: Structure/function relationships of macromolecules using crystallography and biochemical methods.

Thanassi, David[3], Ph.D., 1995, University of California, Berkeley: Biogenesis of bacterial adhesion organelles.

Tsirka, Stella[6], Ph.D., 1989, Aristotelian University of Thessaloniki, Greece: Tissue plasminogen activator in the mammalian hippocampus; neuronal-microglial interactions.

Adjunct Faculty

Cline, Hollis, *Professor.*[11] Ph.D., 1985, University of California, Berkeley: Neuronal development and plasticity.

Enikolopov, Grigori, *Associate Professor.*[11] Ph.D., 1978, USSR Academy of Sciences: Signal transduction in neurons.

Grewal, Shiv, *Assistant Professor.*[11] Ph.D., 1992, University of Cambridge: Chromosome dynamics and epigenetic control of gene expression.

Hannon, Greg, *Assistant Professor.*[11] Ph.D., 1992, Case Western Reserve University: Growth control in mammalian cells.

Helfman, David, *Professor.*[11] Ph.D., 1981, Emory University: Molecular basis for tissue-specific alternative RNA splicing; role of the cytoskeleton in cellular functions.

Hengartner, Michael, *Associate Professor.*[11] Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis in C. elegans; learning and memory.

Hernandez, Nouria, *Professor.*[11] Ph.D., 1983, Heidelberg, Germany: Transcription initiation and termination in human snRNA genes and HIV-1 LTR.

Herr, Winship, *Professor.*[11] Ph.D., 1982, Harvard University: Control of eukaryotic transcription.

Hirano, Tatsuya, *Associate Professor.*[11] Ph.D., 1989, Kyoto, Japan: Higher order chromosome structure and function.

Huang, Z. Josh, *Assistant Professor.*[11] Ph.D., 1994, Brandeis University: Neuroscience; experience-dependent development of the neocortex; mouse genetics; neurotrophins.

Jackson, David, *Assistant Professor.*[11] Ph.D., 1991, East Anglia, England: Plant development; genetics, cell-to-cell mRNA, and protein trafficking.

Joshua-Tor, Leemor, *Associate Professor.*[11] Ph.D., 1990, Weizmann: Structural biology and molecular recognition.

Krainer, Adrian R., *Professor.*[11] Ph.D., 1986, Harvard University: Mammalian mRNA splicing; regulation of alternative splicing; biochem-

istry of spliceosome assembly and RNA cleavage-ligation; origin and evolution of introns.

Lowe, Scott, *Associate Professor.*[11] Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis; anti-cancer therapy resistance.

Malinow, Roberto, *Professor.*[11] M.D., 1984, New York University: Synaptic transmission and plasticity in rodent hippocampus.

Martienssen, Robert, *Professor.*[11] Ph.D., 1986, University of Cambridge: Plant developmental genetics; transposable elements; chloroplast biogenesis.

McCombie, Richard, *Associate Professor.*[11] Ph.D., 1982, University of Michigan: Computational molecular biology.

Neuwald, Andrew, *Assistant Professor.*[11] Ph.D., 1987, University of Iowa: Classification and modeling of protein domains; protein structure and function prediction.

Skowronski, Jacek, *Associate Professor.*[11] M.D., Ph.D., 1981, Lodz, Poland: HIV genes and signal transduction in T cells.

Spector, David, *Professor.*[11] Ph.D., 1980, Rutgers University: Functional organization of the mammalian cell nucleus.

Stenlund, Arne, *Associate Professor.*[11] Ph.D., 1984, Uppsala, Sweden: DNA replication of bovine papillomas.

Stillman, Bruce, *Professor.*[11] Ph.D., 1979, Australian National: Eukaryotic DNA replication and its control.

Tansey, Bill, *Assistant Professor.*[11] Ph.D., 1991, University of Sydney: Cell cycle; gene regulation.

Tully, Timothy, *Professor.*[11] Ph.D., 1981, University of Illinois: Genetics of memory formation in drosophila.

VanAelst, Linda, *Associate Professor.*[11] Ph.D., 1991, Leuven, Belgium: Role of ras in mammalian cell transformation.

Wigler, Michael H., *Professor.*[11] Ph.D., 1978, Columbia University: Signal transduction and growth control in eukaryotes.

Xu, Rui-Ming, *Assistant Professor.*[11] Ph.D., 1990, Brandeis University: Structural biology; protein-RNA interactions.

Yin, Jerry, *Assistant Professor.*[11] Ph.D., 1986, University of Wisconsin-Madison: Genetics of learning and memory in drosophila.

Zhang, Michael, *Associate Professor.*[11] Ph.D., 1987, Rutgers University: Computational biology and genome informatics.

Zhong, Yi, *Associate Professor.*[11] Ph.D., 1991, University of Iowa: Neurophysiology; drosophila; learning and memory; neurofibromatosis; signal transduction.

Research Faculty

Anderson, Carl W., *Geneticist.*[10] Ph.D., 1970, Washington University: Molecular biology of adenovirus assembly; protein synthesis.

Burr, Benjamin, *Geneticist.*[10] Ph.D., 1969, University of California, Berkeley: Transposable genetic elements in maize.

Burr, Frances, *Botanist.*[10] Ph.D., 1968, University of California, Berkeley: Transposable genetic elements in maize.

Dunn, John J., *Senior Microbiologist.*[10] Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Freimuth, Paul, *Associate Biochemist.*[10] 1986, Columbia University: Mechanism of adenovirus entry into cells; role of cell adhesion molecules.

Lacks, Sanford A., *Senior Geneticist.*[10] Ph.D., 1960, Rockefeller University: DNA restriction, recombination, and repair.

Setlow, Richard B., *Microbiologist.*[10] Ph.D., 1947, Yale University: DNA damage and repair.

Studier, F. William, *Senior Biophysicist.*[10] Ph.D., 1963, Caltech: Genetics and physiology of bacteriophage T7.

Number of teaching, graduate, and research assistants, fall 1999: 43

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) Brookhaven National Laboratory

11) Cold Spring Harbor Laboratory

12) Department of Computer Sciences

Degree Requirements

Requirements for the M.A. Degree

The Graduate Program in Genetics normally does not accept a student whose goal is a master's degree. In exceptional instances, a student already in the graduate program may be awarded an M.A. degree upon completing an approved course of study, including a minimum of 30 graduate credit hours, passing a comprehensive examination, presenting and defending a research thesis, and fulfilling the minimum requirements of the Graduate School. A student must achieve an overall 3.0 grade point average in all graduate course taken at Stony Brook to receive a degree.

Requirements for the Ph.D. Degree

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

A. Course Requirements

1. Molecular Genetics (HBM 503/BMO 503)

2. Graduate Genetics (BGE 510)

3. Graduate Biochemistry (BMO 520)

4. Cell Biology (BCD 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, BCD657; 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. 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 fifth 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

The courses listed below are those that are specifically offered by the genetics program. Descriptions of several of the other required core courses and electives can be found in the appropriate sections of the bulletin (e.g., Graduate Biochemistry, BMO 520, is listed in the description of the Molecular Biology and Biochemistry Program).

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, variable
S/U grading

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
Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester
S/U grading

BGE 599 Graduate Research
Original investigation undertaken with the supervision of a member of the program.
Fall and spring, 1-8 credits, variable
S/U grading

BGE 691 Readings in Genetics
Readings in genetics literature and ethical questions.
Prerequisite: Permission of instructor
Fall, 1 credit
ABCF grading

BGE 699 Dissertation Research
Original investigations undertaken as part of the Ph.D. program under supervision of a member of the program.
Prerequisite: Advancement to candidacy
Fall and spring, 1-8 credits, variable
S/U grading

Geosciences (GEO)

Chairperson: Robert C. Liebermann, Earth and Space Sciences Building 255 (631) 632-8139
Graduate Program Director: Martin A. A. Schoonen, Earth and Space Sciences Building 220 (631) 632-8007
Graduate Secretary: Iris Roth, 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 Gesciences. 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 NSF Center for High Pressure Research (CHiPR) headquartered in 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

A wide range of research initiatives is made possible by extensive facilities for single-crystal and powder X-ray diffraction, with capabilities for in situ high-temperature and high-pressure studies. 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 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. 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, 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, Mössbauer lab, DCP and ion chromatography labs, X-ray diffraction facilities, and three synthe-

sis and experimental petrology labs. Additional work uses facilities in other Stony Brook departments (e.g., NMR) as well as 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 CHiPR (an NSF Science and Technology Center), which is a collaborative research enterprise of the Mineral Physics Institute at Stony Brook, in conjunction with the Geophysical Laboratory of the Carnegie Institution of Washington and the University of California at Davis. 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 the mechanical behavior of crustal rocks and the mechanics of earthquake rupture. Experimentally and theoretically based, this program focuses on brittle fracture, frictional instability, and fluid flow processes. 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.

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 and Tectonics

A primary focus of research in seismology and tectonics is the development of active plate boundaries, with an emphasis on the kinematics, mechanics, and seismicity of the zones of deformation associated with convergent plate margins. Current projects include the use of earthquake and geodetic data to constrain analytical, analog, and numerical modeling of the partitioning of strain at geometrically complex plate margins and the tectonic implications of that strain. Other topics of current research range from the seismicity and deformation in subducting slabs to field geophysical surveys of glaciotectonic deformation of Long Island sediments. All of these projects emphasize the use of integrated teleseismic, structural, geodetic, and field data to support quantitative modeling of deformation. This modeling involves a variety of numerical techniques using computers, as well as analytical calculations and analog studies of crustal deformation using laboratory-scale modeling.

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 Professor

Weidner, Donald J., *Professor.* 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 Professor

Hanson, Gilbert N., Ph.D., 1964, University of Minnesota: Application of radiometric and geochemical methods to petrologic and tectonic problems.

Liebermann, Robert C., *Chair.* Ph.D., 1969, Columbia University: Mineral physics; elastic and anelastic properties of rocks and minerals and their applications to the Earth's interior.

Professors

Aller, Robert C.[1], Ph.D., 1977, Yale University: Marine geochemistry; early marine diagenesis.

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.

Lindsley, Donald H., Ph.D., 1961, Johns Hopkins University: Application of phase equilibrium studies of silicate and oxide minerals to metamorphic and igneous petrology.

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., *Graduate Program Director.* 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

Holt, William E., Ph.D., 1989, University of Arizona: Seismotectonics of continental collision zones; kinematics of continental deformation; regional waveform propagation.

Nekvasil, Hanna, Ph.D., 1986, Pennsylvania State University: Experimental and thermodynamic investigations of mineral/melt equilibria in silicic magmas.

Assistant Professors

Rasbury, E. Troy, Ph.D., 1998, University at Stony Brook: 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.

Adjunct Faculty

Geller, Marvin[1], Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric dynamics; upper atmosphere; climate variability; aeronomy; physical oceanography.

Krause, David W.[2], Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution, including primates.

Research Professors

Gasparik, Tibor, Ph.D., 1981, University at Stony Brook: Phase equilibria studies of candidate mantle materials at high temperatures and pressures.

Number of teaching, graduate, and research assistants, fall 2000: 33

1) Joint appointment, Marine Sciences Research Center

2) Joint appointment, Department of Anatomical Sciences

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 562/ AMS 564	Numerical Hydrology
GEO 526	Low-Temperature Geochemistry
GEO 519	Geochemistry of Natural Waters

Category B

GEO 534	Computer-Assisted Math Problem Solving
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 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 (GEO 599). 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 GEO 599 Research 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 a total of 36 credits in scientific and pedagogical courses and teaching experience. The departmental M.A.T. advisor will determine a set of courses that are to be required for and accepted toward the M.A.T. degree in Earth Science. These are to include graduate course offerings in geology and other related sciences and mathematics. They will also include courses in general education and practical teaching experience in secondary schools. Individual programs will be tailored to the needs of the student, in consultation with the department M.A.T. advisor and the advisors at the Center for Science, Mathematics, and Technology Education.

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 Center for Science, Mathematics, and Technology Education 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, no 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 World Wide Web.
Prerequisite: Geosciences graduate standing
Spring, 3 credits
ABCF grading

GEO 514 Introduction to Physical Hydrogeology
Surface hydrology. Principles of groundwater flow. Well hydraulics. Geology of groundwater occurrence. Water quality and groundwater contamination. Hydrologic site evaluation.
Spring, 3 credits
ABCF grading

GEO 515 Geohydrology
Dynamics of fluids in porous media. Fundamentals of physical hydrogeology. Quantitative analysis of regional groundwater system and well hydraulics. Introduction to numerical simulation techniques. Hydrodynamic dispersion and basic concepts of contaminant transport.
Spring, alternate years, 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 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. Crosslisted with MAR 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, alternate 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.
Prerequisites: 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.
Prerequisites: 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. Crosslisted with MAR 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. Crosslisted with 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

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 585 Directed Studies
Special studies directed by various faculty members to be taken for variable and repetitive credit.
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 I or II, 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 I or II, 1-3 credits
ABCF grading

GEO 599 Research
Fall and spring, variable and repetitive credit
ABCF grading

GEO 600 Practicum in Teaching
0-3 credits, repetitive
S/U grading

GEO 603 Topics in Petrology
1-3 credits
ABCF grading

GEO 605 Topics in Sedimentary Geology-Paleontology
1-3 credits
ABCF grading

GEO 607 Topics in Geophysics
1-3 credits
ABCF grading

GEO 609 Topics in Mineralogy and Crystallography
1-3 credits
ABCF grading

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, no credit
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, no credit
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, and theses are discussed.
Fall and spring, no credit
S/U grading

GEO 699 Dissertation Research
Independent research for Ph.D. degree. Open only to candidates for the Ph.D. who have passed the preliminary examination.
Fall and spring, variable and repetitive credit
ABCF grading

Germanic and Slavic Languages and Literatures (GER, SLV, DLG, DLL, DLR)

Chairperson: Christina Y. Bethin, Frank Melville, Jr. Memorial Library N3011 (631) 632-7360
Graduate Program Director: Nicholas Rzhevsky, Frank Melville, Jr. Memorial Library N3004 (631) 632-7359
Graduate Secretary: Patricia O'Brien, Frank Melville, Jr. Memorial Library N3009 (631) 632-7360

Degrees awarded: M.A. in Germanic Languages and Literature; M.A. in Slavic Languages and Literature; D.A. in Foreign Languages (German); D.A. in Foreign Languages (Russian)

The Department of Germanic and Slavic Languages and Literatures, within the College of Arts and Sciences, offers a variety of programs in Germanic languages and literatures and Slavic languages and literatures. In addition to comprehensive graduate training in the academic field, these programs are unique in that they offer courses in teaching methodology and extensive supervised teaching experience in courses such as film, business German, and Russian poetry. The department is committed to providing the best possible graduate education: one of its members has been named Distinguished Teaching Professor and four have received the Chancellor's Award for Excellence in Teaching. The availability of numerous cultural institutions such as the Goethe House, the Kosciuszko Foundation, the New York Public Library, the Harriman Institute of Columbia University, and others enhances graduate study in the department.

The programs have been designed with today's career opportunities in mind. They emphasize the study of language, literature, and culture, and typically require the study of one other Germanic or Slavic language beyond either German or Russian. There are opportunities for students to take courses in the departments of Comparative Studies, History, Linguistics, Philosophy, Political Science, Theatre Arts, and other languages. The department strongly supports exchange programs with Germany, Poland, and the Commonwealth of Independent States. Students are encouraged to participate in semester- or year-long study abroad programs as part of their graduate training.

More detailed program information is available from the department office. Part-time study is permitted; some 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. Program in Germanic Languages and Literatures

The M.A. curriculum is designed to prepare the student to teach on the secondary school level as well as to prepare him or her for further graduate study leading to the D.A. or Ph.D. degree. While the major emphasis is on the modern period (including the former German Democratic Republic, women's literature, and film), the program also contains significant offerings in the fields of medieval literature and philology, pedagogy, and culture studies. Most courses are conducted in German. Experienced teaching assistants are encouraged to design and teach advanced courses on the undergraduate level. Students may elect to submit a master's thesis (Option 1) or to take additional coursework (Option 2) to complete the degree.

M.A. Program in Slavic Languages and Literatures

The program leading to the Master of Arts degree in Slavic Languages and Literatures prepares students for advanced research leading to the D.A. or Ph.D. degree as well as for teaching on the secondary and junior college levels. While the major emphasis is on Russian language and literature, students also have the opportunity to concentrate on one other Slavic area. This unique comparative approach offers a wide choice of career opportunities for graduates in academic and other fields. Outstanding graduate students are encouraged to teach advanced courses at the undergraduate level.

M.A.T. in German 7-12, M.A.T. in Russian 7-12

Please contact the School of Professional Development, or see its section in this bulletin.

D.A. Program in Foreign Languages: German Major or Russian Major

The program leading to the Doctor of Arts degree is designed to train professionals in the field of foreign language teaching on the secondary, junior college, or college level. It is also appropriate for providing a basis in language training for specialists in education and in bilingual media and communications, and for marketing consultants whose expertise in a foreign language will aid business or advertising. The program is flexible, competency based, and where possible, tailored to individual needs.

The program of study consists of work in the major field at the same level as that of Ph.D. programs, work in areas of professional preparation, demonstration of successful teaching, comprehensive examinations, and a doctoral dissertation. Students may elect to specialize in either German or Russian. The program is open to full-time and part-time students who have the M.A. or its equivalent.

Admission

Admission to the M.A. Program in Germanic Languages and Literatures

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

A. A bachelor's degree from an accredited institution.

B. An average of at least B in undergraduate German courses.

C. Proficiency in German language.

D. Letters of recommendation from three previous instructors.

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

F. Acceptance by both the Department of Germanic and Slavic Languages and Literatures and the Graduate School.

Provisional admission may be given to some students not meeting all of the above requirements.

If the applicant's preparation seems to indicate deficiencies in the German language, a language examination may be required during the first semester of study. If judged insufficiently prepared, the student may be required to enroll in GER 321 and perhaps GER 322 in addition to the other requirements listed in this bulletin.

Admission to the M.A. Program in Slavic Languages and Literatures

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

A. A bachelor's degree from an accredited institution.

B. An average of at least B in undergraduate Russian courses.

C. Letters of recommendation from three previous instructors.

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

E. Demonstrated proficiency in Russian.

F. Acceptance by both the Department of Germanic and Slavic Languages and Literatures and the Graduate School.

Provisional admission may be given to some students not meeting all of the above requirements.

Students judged to be deficient in language proficiency will be required to enroll in RUS 321 and RUS 322 or in an approved summer intensive Russian program.

Admission to the Doctor of Arts Program in Foreign Languages: German Major or Russian Major

In addition to the requirements of the Graduate School, the department requires:

A. An M.A. degree or its equivalent in coursework and credits.

B. Letters of recommendation from three previous instructors.

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

D. Demonstrated proficiency in German or Russian.

E. Acceptance by both the Department of Germanic and Slavic Languages and Literatures and the Graduate School.

Provisional admission may be given to some students not meeting all of the above requirements.

Faculty

Distinguished Professor

Elling, Barbara E.[1], Ph.D., 1971, New York University: 19th-century German literature; literature and culture studies; methods of language teaching; stylistics; reader reception theory.

Professors

Bethin, Christina Y.[3], Ph.D., 1978, University of Illinois: Slavic linguistics; phonology; Russian, Polish, Ukrainian languages.

Brown, Russell E., *Emeritus.* Ph.D., 1963, Harvard University: Modern German literature; film studies; women's literature; Trakl; Brecht; Kafka.

Czerwinski, Edward J., *Emeritus.*[2] Ph.D., 1965, University of Wisconsin: Russian literature; comparative literature; Dostoevsky; Slavic and East European theatre and drama.

Sjoberg, Leif, *Emeritus.* Ph.D., 1954, Uppsala University, Sweden: Scandinavian literature; Ibsen; Strindberg; Lagerkvist; Ekelof; Old Norse.

Associate Professors

Kerth, Thomas[4], Ph.D., 1977, Yale University: German literature of the Middle Ages; paleography.

Marker, Gary[6], Ph.D., 1977, University of California, Berkeley: Russian social and intellectual history.

Ruplin, Ferdinand A., *Emeritus.* Ph.D., 1965, University of Minnesota: Applied linguistics; Middle High German; historical linguistics.

Russell, John R., *Emeritus.* Ph.D., 1966, Princeton University: Rococo; the novella; computer-assisted instruction.

Rzhevsky, Nicholas, Ph.D., 1972, Princeton University: Russian and Soviet literature; ideology; Russian theatre; Russian intellectual history.

Vogel, Lucy, *Emerita.* Ph.D., 1968, New York University: 19th-century and early 20th-century Russian literature; symbolist poetry; Russian-Italian literary relations.

Assistant Professors

Bailyn, John, Ph.D., 1995, Cornell University: Slavic linguistics; Russian linguistics and syntax.

Bloomer, Robert K., Ph.D., 1990, University of Michigan: Germanic linguistics; morphology; etymology.

Kalinowska-Blackwood, Izabela, Ph.D., Yale University: Russian language and literature, Russian and Polish film.

Ledgerwood, Mikle[5], Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Westphalen, Timothy, Ph.D., 1991, Harvard University: Russian poetry; Russian symbolism; Russian literature of the 19th century; Bakhtin.

Lecturers

Dolezal, Stana, D.A., 1990, University at Stony Brook: East European literature and culture; Czech language.

Gross-Middeldorf Viola, Birgit, D.A., 1990, University at Stony Brook: Business German.

Lekic-Trbojevic, Anita, Ph.D., 1989, University of Illinois, Chicago: Serbo-Croatian language, literature, and culture.

Adjunct Faculty

Bottigheimer, Ruth B., *Associate Professor.* D.A., 1981, University at Stony Brook: Tale collections; children's literature; fairy tales; sociocultural analysis of literature.

Number of teaching, graduate, and research assistants, spring, 1999: 5

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1973

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1983

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1992. Recipient of the President's Award for Excellence in Teaching, 1992

5) Department of French and Italian

6) Department of History

Degree Requirements

Requirements for the M.A. Degree in Germanic Languages and Literatures

Option I:

A. Course Requirements	Credits
1. One 19th-century German literature course	3
2. One 20th-century German literature course	3
GER 545 or GER 546	3
GER 557 History of the German Language or GER 539 Contrastive Structures	3
GER 599 Thesis	6
3. 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

Total 30

B. Performance

Average of B or higher 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.

Option II:

A. Course Requirements

No thesis required–all 30 credits can be fulfilled by coursework as follows:

	Credits
1. GER 504 German Cultural History	3
GER 539 Contrastive Structures or GER 557 History of the German Language	3
One course in older Germanic languages (GER 558, 562, 563)	3
One course in 20th-century German literature (GER 545 or 546)	3
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
Total	30

B. Performance

Average of B or better for all graduate courses taken at Stony Brook.

Requirements for the M.A. Degree in Slavic Languages and Literatures

A. Course Requirements	Credits
SLV 571 Comparative Slavic Linguistics	3
RUS 506 Stylistics of Russian	3
SLV 504 Topics in Slavic Cultures	3
RUS 538 Russian Phonology and Morphology	3
SLV 580, SLV 581 Special Topic in Slavic Language I, II	6
One course in 19th-century Russian literature	3
One course in 20th-century Russian literature	3
Two electives at the graduate level with approval of the department	6
Total	30

B. Language Proficiency in Russian

A written and oral proficiency examination will be administered during the first week of classes in the Fall and Spring semesters. All students are required to take this examination to determine proficiency or placement. The Russian language proficiency requirement may be satisfied by one of the following:

1. Passing the examination

2. Appropriate coursework in Russian (RUS 321, RUS 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 (SLV 580, SLV 581, or an equivalent course)

3. One semester of 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.

Students in the M.A. program in Germanic Languages and Literatures and in the M.A. program in Slavic Languages and Literatures are subject to Graduate School regulations and policies with respect to transfer credit, extension of time limitation, grade point average, supervised teaching experience, registration, and other requirements.

Requirements for the D.A. Degree in Foreign Languages

A minimum of 36 credits is required, to be distributed as follows:

A. Major Field Courses	Credits
German Major	
Phonetics/Phonology of German	3
Morphology/Syntax of German	3
History of the German Language	3
German Stylistics or Literary Translation	3
German Culture and Civilization	3
Three courses in German literature to be selected from courses within the department	9
Total	24

Russian Major	Credits
Phonetics/Phonology of Russian	3
Morphology/Syntax of Russian	3
History of the Russian Literary Language	3
Russian Stylistics or Literary Translation	3
Russian or Slavic Culture	3
Three courses in Russian literature to be selected from courses within the department	9
Total	24

B. Professional Courses	Credits
Second Language Acquisition	3
Methods of Foreign Language Teaching	3
Practicum	3
Internship or Externship	3
Total	12

Additional courses may be required to meet individual needs upon consultation with the major advisor and the program director.

Degree candidates who are full-time teachers will, where possible, do their externship at an institution other than where they normally teach, e.g., high school teachers will be encouraged to teach an evening college course. Those teaching at a two-year or four-year col-

lege will be encouraged to teach at the secondary school level. When these arrangements are not possible, other provisions will be made in consultation with the D.A. committee.

C. Language Proficiency

Upon completion of 24 credits, all candidates will be expected to demonstrate proficiency in the major language.

Proficiency in the major language may be demonstrated:

1. By written recommendation of professors of the pertinent courses taken; or
2. Upon recommendation of the supervisor of the practicum, internship, or externship; or
3. By formal written examination (MLA) when the major advisor and D.A. committee deem it necessary.

Unsuccessful candidates may request a second testing during the subsequent semester.

D. Practical Experience

All candidates are required to fulfill the following teaching assignments during the program:

1. Practicum: The student is given charge of a three-hour section in a beginning or intermediate course in the area of language instruction. The practicum is to be assigned after the student has successfully completed a course in language instruction. This experience includes objectives, grading, and testing.

2. Internship: The student is apprenticed to a professor in charge of an appropriate literature, linguistics, and/or culture course for at least one semester. The internship may not precede the practicum.

3. Externship: The student will be required to teach at the undergraduate or secondary level in the local area, when feasible.

E. Final Evaluation

The final evaluation will be based directly on the specific program of study that the candidate has completed. In addition to demonstrating mastery of the individual curriculum requirements, the candidate is expected to evidence a certain synthesis of knowledge based on the component parts of the program. This final examination will be scheduled twice yearly, in November and April.

1. *Examination:* The final evaluation is to include both a written and an oral comprehensive examination and will include topics from all areas covered in the program. The comprehensive examination will be administered only after the candidate has demonstrated competence in the major area and in language instruction and methodology. All candidates will be provided with a basic reading list. However, it will be the responsibility of the candidates to prepare, with their major advisors, the optional part of the reading list to cover their individual specialties.

2. *Dissertation:* After the comprehensive exam the candidates, in consultation with their proposed dissertation director, must submit a dissertation proposal, which will be reviewed by the D.A. committee. After the proposal is approved, a dissertation director and two readers will be appointed, in consultation with the graduate program director. Nine optional thesis credits are available for those who desire them.

Transfer Credit

The Doctor of Arts 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.

Normally, a maximum of six credits of SPD courses or SPD crosslisted courses may be transferred. Under special circumstances and with approval of the department and the graduate program director, additional SPD crosslisted credits may be counted toward the D.A. requirements.

Courses

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 each semester

GER 501 Strategies of Teaching German
Detailed examination of various approaches to teaching German as a foreign language, conventional teaching aids, use of media in instruction. (Given at Goethe House in New York City.)
Fall, 3 credits

GER 502 Language Practicum
Techniques of classroom instruction; teacher and peer visitation and evaluation. To be taken in conjunction with initial teaching assignment.
Fall and spring, 3 credits each semester

GER 503 Literature Practicum
Apprenticeship to a senior professor for work in an undergraduate literature course. Preparation and delivery of lectures. Evaluation of students' performance in class and written work.
Fall and spring, 3 credits each semester

GER 504 Modern German Culture
Examination of major developments in the German-speaking countries in the areas of economics, history, politics, education, and the arts.
Spring, 3 credits

GER 505 Minor Germanic Languages
Intensive study of a Scandinavian language.
Fall, 3 credits

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

GER 539 Contrastive Structures: German-English
Contrastive study of the phonological, morphological, syntactic, and semantic structures of German and English.
Fall, 3 credits

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

GER 542 Literature of the Romantic Period
Selections from representative prose works, drama, and poetry from the period 1795-1830 are examined from various perspectives, including the sociology of literature.
Fall or spring, 3 credits

GER 544 20th-Century Prose
Major authors of modern German fiction are read and discussed. Texts many include works by Kafka, Mann, Böll, Grass, Wolf, and Handke. The course may also focus on works by a single author.
Fall, 3 credits

GER 545 20th-Century 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

GER 546 20th-Century 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

GER 547 Special Author Studies Tutorial
Fall and spring, 3 credits

GER 548 Special Period Studies Tutorial
Fall and spring, 3 credits

GER 549 German Film
Analysis of the new German cinema, concentrating on the work of Fassbinder, Wenders, Herzog, and Schlöndorff. Feminist and German Democratic Republic film will also be considered.
Spring, 3 credits

GER 553 Realism
Selections from representative prose works, drama, and poetry from the period 1835 to 1895 are examined from various perspectives, including the sociology of literature.
Spring, 3 credits

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

GER 558 Middle High German
An introduction to Middle High German grammar with representative reading from the Middle High German classics.
Fall, 3 credits

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

GER 565 Middle High German Literature
An introduction to German literature of the high courtly period (1150-1250). Among the genres discussed will be the courtly romance, the heroic epic, and the Minnelieder.
Spring, 3 credits

GER 599 Master's Thesis
1 credit, repetitive

GER 601 Special Author
Tutorial to be arranged with appropriate staff member.
Fall and spring, 3 credits each semester

GER 602 Special Period
Tutorial to be arranged with appropriate staff member.
Fall and spring, 3 credits each semester

GER 699 Dissertation Research
Taken after advancement to candidacy.
1 credit, repetitive

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, alternate years, 3 credits

RUS 503 Special Topic in Applied Linguistics
The course examines various topics in Russian and general applied linguistics such as Russian language acquisition, contrastive analysis, error analysis, and language testing.
Fall or spring, 3 credits

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

RUS 506 Stylistics of Russian
Advanced stylistic and textual analysis of the diverse styles of the Russian language: journalistic, literary, and technical.
Fall, alternate years, 3 credits

RUS 508 Russian Authors
A seminar in selected Russian authors, focusing on one or two of the following: Pushkin, Gogol, Dostoevsky, Turgenev, Tolstoy. May be repeated.
Fall, 3 credits

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. Crosslisted with CLT 504.
Fall, alternate years, 3 credits

RUS 511 Studies in Literary Genres
A seminar devoted to a specific genre (poetry, novel, short fiction, drama) in Russian literature. May be repeated.
Spring, 3 credits

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

RUS 514 20th-Century Russian Literature
A seminar in turn-of-the-century, Soviet postrevolutionary, and émigré Russian literature. The course deals with prose, poetry, and drama in the context of literary movements and traditions.
Fall, 3 credits

RUS 517 History of the Russian Literary Language
The development of the Russian literary language from the tenth century to the present. Although its emphasis is primarily on the historical development of the language, the course includes readings from early East Slavic and Middle Russian texts, such as the *Tale of Igor's Campaign*, *The Life of Avvakum*, etc., as well as discussions of genre and style.
Fall, 3 credits

RUS 520 Russian Syntax
A course in Russian syntax and advanced grammar from various theoretical frameworks.
Fall, alternate years, 3 credits

RUS 538 Russian Phonology and Morphology
The course studies the phonetics, phonology, and morphology of contemporary standard Russian.
Fall, alternate years, 3 credits

RUS 539 Teaching Strategies in Russian
An investigation of the methodology and materials available to teachers of Russian. The course examines applied linguistics in teaching.
Spring, 3 credits

RUS 540 Techniques of Class Instruction (Practicum)
Teacher supervision, visitation, and evaluation as well as help in development of lesson plans. To be taken in conjunction with a teaching assignment.
Fall or spring, alternate years, 3 credits

RUS 599 Master's Thesis
1-3 credits, repetitive

RUS 600 Proseminar
An introduction to the resources and working methodologies in Russian studies. Students are introduced to current trends in interpretation and analysis.
Fall, 3 credits

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

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

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 or spring, 3 credits

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

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, alternate years, 3 credits

SLV 504 Topics in Slavic Cultures
The course examines major topics in Slavic cultures and focuses on Slavic contributions to Western civilization.
Fall or spring, 3 credits

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

SLV 578 Directed Independent Studies
Fall, 1-6 credits

SLV 579 Directed Independent Studies II
Spring, 1-6 credits

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

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

D.A. Courses

The following courses are available only to candidates in the Doctor of Arts Program:

DLG 601, DLR 601 Internship in Foreign Languages: German and Russian
Students in the Doctor of Arts Program will assist an instructor as an aide in a literature, culture, or language course on the undergraduate level.
Fall and spring, 1-3 credits

DLG 602, DLR 602 Externship in Foreign Languages: German and Russian
Students in the Doctor of Arts Program will 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, 3-6 credits

DLG 603, DLR 603 Independent Readings in Foreign Languages: German and Russian
Independent readings on a selected topic in German language or literature and Russian language or literature.
Fall and spring, 1-6 credits, repetitive

DLG 699, DLR 699 Dissertation Research in Foreign Languages: German and Russian
Independent research 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
1-9 credits

School of Health Technology and Management

Chairperson: Alan Leiken, Health Sciences Center Level 2, Room 052 (631) 444-3243
Vice Chairperson and Graduate Program Director: Nanci Rice, Health Sciences Center Level 2, Room 052 (631) 444-3240
Graduate Secretary: Carol Callahan, Health Sciences Center Level 2, Room 052 (631) 444-3240

Advanced Graduate Certificate awarded: Advanced Graduate Certificate in Health Care Management; Advanced Graduate Certificate in Community Health
Degree awarded: M.S. in Health Care Policy and Management

M.S. in Health Care Management and Policy

The School of Health Technology and Management in the Health Sciences Center offers the Master of Science in Health Care Policy and Management; graduate study designed to improve the professional competence of qualified health professionals seeking careers in management, community health education and planning, and health policy. The curriculum is planned for practicing professionals with multiple backgrounds, interests, and needs. Students design a program tailored to their career goals in consultation with faculty advisors. After selection of a concentration and completion of core requirements in health care delivery, communication and group dynamics, statistics, and research methodology, students must complete at least 12 credits in the concentration and a practicum of three to six credits. There is a 36-credit minimum for obtaining the M.S. degree.

Admission

Admission requirements are a bachelor's degree from a recognized institution of higher learning, a minimum of a 3.0 grade point average in undergraduate study preferred, appropriate professional status, GRE General Test scores or those from an equivalent exam, and at least one year of experience in a health-related field.

For further information contact:

Doctor Nanci Rice
Department of Health Care Policy and Management
School of Health Technology and Management
Level 2, 052 Health Sciences Center
University at Stony Brook
Stony Brook, NY 11794-8204
(631) 444-3240

Advanced Certificate in Health Care Management

The Advanced Certificate Program in Health Care Management is a professional development program intended for health practitioners who require management training and managers who require specific training in the health care field. The Advanced Certificate Program 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. Four courses are selected from the course offerings in the School of Health Technology and Management. Two courses are selected from the course offerings in the W. Averell Harriman School for Management and Policy. The certificate is jointly awarded by the two schools to any student who attains a grade point average of 3.0 or higher in the certificate program.

Admission

Admission requirements include a bachelor's degree in any undergraduate major from a recognized institution of higher learning and an undergraduate grade point average of 2.8 or higher.

For further information contact:

Professor Alan Leiken
Department of Health Care Policy and Management
School of Health Technology and Management
Level 2, 052 Health Sciences Center
University at Stony Brook
Stony Brook, NY 11794-8204
(631) 444-3243, or:
Professor Thomas Sexton
W. Averell Harriman School for Management and Policy
103 Harriman Hall
University at Stony Brook
Stony Brook, NY 11794-3775
(631) 632-7181

Advanced Certificate in Community Health

The Advanced Certificate Program in Community Health is designed for health professionals including clinicians, health care managers, and health educators who are working or seeking to work in a variety of community health settings. These include health departments, private health agencies, HMOs, ambulatory care services, work sites and hospitals. The program is also designed for health professionals who are not specifically employed in a community health setting, but who plan and manage community health programs. All courses may be directly applied to the Master of Science in Health Care Policy and Management degree. The 18-credit program includes nine credits of core courses and nine credits of elective courses.

Admission

Applicants must have an earned bachelor's degree, an undergraduate GPA of 2.8 or better, and have health-related experience or be enrolled in a health-related graduate program.

For further information contact:

Doctor Nanci Rice
Department of Health Care Policy and Management
School of Health Technology and Management
Level 2, 052 Health Sciences Center
University at Stony Brook
Stony Brook, NY 11794-8204
(631) 444-3240

Hispanic Languages and Literature (SPN)

Chairperson: Román de la Campa, Frank Melville, Jr. Memorial Library N3015 (631) 632-6935/6959
Graduate Program Director: Victoriano Roncero-López, Frank Melville, Jr. Memorial Library N3013 (631) 632-9669
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). All applicants are required to provide their scores on the Graduate Record Examination (GRE) General Test (see "Requirements for Admission"). Admission without results of the GRE is provisional; continuing registration will be blocked unless the student takes the examination during the first semester of registration.

International applicants must score at least 600 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.

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

De la Campa, Román, *Chairperson.* Ph.D., 1975, University of Minnesota: Latin American and Caribbean literature; contemporary critical theory.

Charnon-Deutsch, Lou[2], Ph.D., 1978, University of Chicago: 18th- and 19th-century Peninsular literature; feminist theory.

Kaplan, Temma[4], Ph.D., 1969, Harvard University: Spanish and Latin American social history.

Nunes, Maria Luisa, *Emeritus.* Ph.D., City University of New York: 19th- and 20th-century Luso-Brazilian literatures; women's studies.

Read, Malcolm K., Ph.D., 1978, University of Wales: Spanish Golden Age literature and linguistics; Marxist and psychoanalytic literary criticism.

Sabat-Rivers, Georgina, *Emeritus.* Ph.D., The Johns Hopkins University: Spanish Golden Age and Spanish-American colonial literatures.

Lastra, Pedro, *Emeritus.* Ph.D., 1967, Universidad de Chile: Modern and contemporary Spanish-American literature.

Rivers, Elias L., *Emeritus.* Ph.D., Yale University: 16th- and 17th-century literature of Spain; sociolinguistic theory of literature.

Vasvari, Louise[1,3], 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.

Monasterios, Elizabeth, Ph.D., 1992, University of Toronto, Canada: 20th-century Hispanic poetry; theory of poetry.

Roncero-López, Victoriano, *Graduate Program Director.* Ph.D., 1987, University of Illinois, Champaign: 16th- and 17th-century literature of Spain; historiography; modern theory.

Vera-León, Antonio, Ph.D., 1987, Princeton University: 19th- and 20th-century Caribbean literature; cultural theory and critique.

Vernon, Kathleen, Ph.D., 1982, University of Chicago: 20th-century Spanish narrative and film.

Assistant Professors

Lagos, Cora, Ph.D., 1997, University of Michigan, Ann Arbor: Colonial Latin American literatures; testimonial narratives; Caribbean literature.

Ledgerwood, Mikle[5], Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Trigo, Benigno, Ph.D., 1992, Yale University: Turn-of-the-century Spanish-American literatures; Modernism; literary theory.

Lecturer

Ruiz-Debbe, Lilia, Ph.D., 1997, University of Geneva, Switzerland: Applied linguisitcs and language pedagogy.

Number of teaching, graduate, and research assistants, fall 1999: 20

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1976

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990

3) Comparative Literature

4) History and 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 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.

Students who wish to be confirmed as Ph.D. students must take the qualifying examination (1) at the beginning of their fourth semester if they enter the program with a B.A. in Spanish or equivalent, or (2) at the beginning of their second semester if they enter the program with an M.A. in Spanish, its equivalent, or any higher level of preparation. Since the majority of graduate students enter our program in the fall term with an M.A., most graduate students are required to take their qualifying examination in February of their first year. Students entering in January will be provided an opportunity to take the qualifying exam in September (at the beginning of their second or fourth semester).

The department selects six texts and submits the list to the student not later than four months before the exam. It consists of (1) four hours of written work; the student answers four of six questions, omitting the one that he or she has selected for the oral presentation, 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. Following the presentation, the faculty will ask questions.

Students who pass the qualifying exam are automatically admitted to the Ph.D. program. Students who do not pass the exam will be allowed to finish their master's degree but will not be permitted to advance to the Ph.D. program. Students are informed of the results of the exam only after all students have finished the oral portion of the exam. Traditionally, the chairperson and the graduate program director meet with individual examinees immediately after the last oral exam has been conducted 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 last minute changes are suggested by the committee. 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 one week 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

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive

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, repetitive
ABCF grading

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, repetitive
ABCF grading

SPN 541 19th-Century Spanish Literature until the Generation of 1898

Major literary works of the period are read and analyzed in depth, and their interrelation with the cultural context is discussed.
Fall or spring, 3 credits, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, and/or director of the M.A. comprehensive examination committee
Fall and spring, 1-6 credits, repetitive
ABCF grading

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, repetitive
ABCF grading

SPN 612 Topics Seminar
A seminar course designed primarily for doctoral students. The topic will be chosen by the professor from any of the major areas of Hispanic literature and linguistics required of all Ph.D. students. Ph.D. students must take from two to four of these seminars depending on their previous preparation.
Prerequisite: Admission to the Spanish Ph.D. program or permission of instructor
Fall and spring, 3 credits, repetitive
ABCF grading

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.
Prerequisites: 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, repetitive
S/U grading

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.
Prerequisites: 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, repetitive
ABCF grading

SPN 699 Directed Doctoral Research
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; permission of the dissertation director, graduate program director, or department chairperson
Fall and spring, 1-9 credits, repetitive
S/U grading

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

POR 575 Luso-Brazilian Readings
Major literary works from 19th- and 20th-century Portugal and Brazil, especially narratives.
Prerequisites: Reading proficiency in Portuguese and permission of instructor
Fall or spring, 3 credits, repetitive

Language Learning and Research Center Courses

DLL 570 Introduction to Media for Language Teaching
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.
Fall or spring, 3 credits

DLL 571 Technology and Education
Assumes knowledge of material taught in DLL 570. Addresses more globally and more theoretically the intersection between technology and languages. Issues of cognitive learning theory and educational psychology addressed.
Fall or spring, 3 credits

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

History (HIS)

Chairperson: Gary J. Marker, Ward Melville Social and Behavioral Sciences Building N-309 (631) 632-7510/7500
Graduate Program Director: Kathleen Wilson, Ward Melville Social and Behavioral Sciences Building N-331A (631) 632-7490/7515
Graduate Program Coordinator: Margaret Creedon, 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 26 full-time faculty and 110 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. 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 School of Professional Development section of this bulletin.

Faculty

Professors

Barnhart, Michael[1,2,3], Ph.D., 1980, Harvard University: U.S. foreign policy; 20th-century U.S. history; modern Japan.

Bottigheimer, Karl S., 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.

Cowan, Ruth S., Ph.D., 1969, The Johns Hopkins University: History of science; biology and technology; women in modern history.

Davis, Mike, C.Phil., University of California, Los Angeles: Urban history; environmental 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.

Gootenberg, Paul, Ph.D., 1985, University of Chicago: Colonial and modern Latin American history; Andean and Mexican history; comparative economic history.

Kaplan, Temma[7], Ph.D., 1969, Harvard University: Comparative history; 20th-century social movements of women.

Kuisel, Richard F., *Emeritus.* Ph.D., 1963, University of California, Berkeley: Contemporary Europe; political and economic history; modern France.

Landsman, Ned, Ph.D., 1979, University of Pennsylvania: U.S. colonial; intellectual and religious history; Anglo-American world.

Larson, Brooke, Ph.D., 1978, Columbia University: Colonial Latin America; Andean rural history; peasant societies and women in Latin America.

Lebovics, Herman, Ph.D., 1965, Yale University: Modern Europe; intellectual and cultural history; Germany and France.

Lemay, Helen R.[4], Ph.D., 1972, Columbia University: Medieval and Renaissance intellectual history; paleography; history of science and medicine; women's history.

Marker, Gary J., *Chairperson.* 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: 19th-century U.S. social and political history; police and criminal justice; Civil War and Reconstruction.

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 C., Ph.D., 1974, Stanford University: U.S. economic history; demography.

Schäfer, Wolf, Dr. Phil., 1983, University of Bremen, Germany: Social and historical studies of science and technology; European intellectual and social history; global history.

Seifman, Eli[6], 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: 19th-century U.S. social history; medicine, nursing, and psychiatry; women and family.

Weinstein, Fred, *Emeritus.* Ph.D., 1962, University of California, Berkeley: Theory in history; Russian and European history.

Associate Professors

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.

Lipton, Sara, Ph.D., 1991, Yale University: Medieval Studies; Jewish-Christian relations, Medieval art.

McAdoo, Willliam[5], Ph.D., University of Michigan: U.S. urban, social, and institutional history; immigration historiography; African-American history.

Owens, Leslie H.[5], Ph.D., 1972, University of California, Riverside: African-American history; U.S. southern history.

Williams, John A., Ph.D., 1963, University of Wisconsin: British Empire; Africa; the Commonwealth; expansion of Europe.

Wilson, Kathleen, *Graduate Director.* Ph.D., 1985, Yale University: British social, cultural and political, 17th-19th centuries; cultures of imperialism; gender studies; cultural, feminist, and postcolonial theory.

Wishnia, Judith[6,7], *Emeritus.* Ph.D., 1978, University at Stony Brook: Modern Europe; France; labor history; women's history.

Assistant Professors

Cash, Floris B.[5], Ph.D., 1986, University at Stony Brook: African-American history; African-American women's studies.

Man-Cheong, Iona, Ph.D., 1991, Yale University: Modern China; political institutions; cultural and social history; gender in China.

Rilling, Donna J., Ph.D., 1993, University of Pennsylvania: Early national U.S. history; legal, economic, urban, and labor history.

Sellers, Christopher, Ph.D., 1992, Yale University; M.D., University of North Carolina, Chapel Hill, 1992: U.S. enviromental, medical and cultural history.

Lecturer

Valerio-Jimenez, Omar, ABD, University of California, Los Angeles: U.S. immigration, borderlands, and Latino history.

Number of teaching, graduate, and research assistants, fall 2000: 24

1) Recipient of the President's Award for Excellence in Teaching, 1985

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1985

3) Recipient of the Teaching Merit Award, 1990

4) Recipient of the President's Award for Excellence in Teaching, 1985

5) Joint appointment, Africana Studies

6) Joint appointment, Social Sciences Interdisciplinary

7) Joint appointment, Women's Studies

8) Joint appointment, Sociology

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 the University at Stony Brook 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).

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. Required for all M.A. and M.A.T. students.
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.
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.
3 credits
ABCF grading

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. Required for M.A. in U.S. history.
3 credits
ABCF grading

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.
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. Required for M.A. in Latin American history.
3 credits
ABCF grading

HIS 562 Introduction to Modern African History
Field seminar in modern African history. Surveys major topics such as nationalism, anticolonial movements, and modernization.
3 credits
ABCF grading

HIS 563 Field Seminar in South Asian History
Surveys major topics such as nationalism, anticolonial movements, legacies of British imperialism, and modernization.
3 credits
ABCF grading

HIS 564 Introduction to East Asian History
Field seminar in modern East Asian history. Surveys major historical and cultural topics from modernization to revolution.
Spring, 3 credits
ABCF grading

Research Theme Seminars 532, 535, 543 Theme Seminars on Gender, Sexuality, and Reproduction

HIS 515, 516, 517, 532 Theme Seminars on Empire, Modernity, and Globalization

HIS 524-527 Core Seminar: History, Theory, and Practice

HIS 552-558 Theme Seminars on Nation, State, and Civil Society

HIS 581 Supervised Teaching
Teaching practicum that usually accompanies a student's assistantship.
3 credits
ABCF grading

HIS 582 Teaching Practicum
Practicum in teaching methods for new assistants. (MA. Workshop required deleted from the curriculum.)
Fall or spring, 3 credits
ABCF grading

Research and Theme Seminars

Research seminars provide advanced training for Ph.D. students in the practice of historical research and writing. They are offered on the basis of student need and the availability of faculty. At least two research and theme seminars are scheduled for each major field, i.e., U.S., European, and Latin American history, in the course of an academic year.
3 credits each

HIS 601, 603, 616 Research Seminars on Social and Cultural History

HIS 615-617 Research Seminars on Empire, Modernity, and Globalization

HIS 631-634 Research Seminars on Gender and Sexuality

HIS 622-623 Research Seminars on Ethnicity and Migration

HIS 652-655 Research Seminars on Nation, State, and Civil Society
3 credits
ABCF grading

HIS 682, 684, 686 Workshops
Specialized group reading tutorials for Ph.D. students.

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. Offered once each year.
3 credits
ABCF grading

HIS 699 Dissertation Research
Dissertation research under direction of advisor.
Prerequisite: Advancement to candidacy
Variable and repetitive credit
S/U grading

Linguistics (LIN, ESL)

Chairperson: Richard K. Larson, Ward Melville Social and Behavioral Sciences Building S-219 (631) 632-7778
Graduate Program Director: Frank Anshen, Ward Melville Social and Behavioral Sciences Building S-227 (631) 632-7776
Doctoral Program Advisor: Marie K. Huffman, Ward Melville Social and Behavioral Sciences Building N-253 (631) 632-1388
Graduate Secretary: Sandra Brennan, Ward Melville Social and Behavioral Sciences Building S-201 (631) 632-7774

Degrees awarded: M.A. in Linguistics; M.A. in Teaching English to Speakers of Other Languages; Ph.D. in Linguistics

The Department of Linguistics, in the College of Arts and Sciences, offers a course of studies leading to the degrees of Master of Arts in Teaching English to Speakers of Other Languages (TESOL) and Doctor of Philosophy in Linguistics. The graduate program in linguistics combines sophisticated instruction in theoretical linguistics with extensive practical training in the area of teaching English to foreign students, as well as other areas of applied linguistics.

The M.A. in TESOL is designed to equip students to become qualified teachers, teacher trainers, and curriculum specialists, and includes supervised teaching experience in the University's classes in English for foreign students. Graduates of the TESOL M.A. program generally go on to teach English as a foreign language abroad or in schools, colleges, and universities in the United States. The requirements of the M.A. 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 as well as its applications in language teaching, speech synthesis and recognition, and natural language processing. Students receive a thorough grounding in the fundamentals of grammatical theory through courses in syntax, semantics, phonology, phonetics, and morphology. Courses in the applications of linguistic theory that address computational, societal, and pedagogical concerns complete the curriculum.

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 and the qualifying examination.

A detailed description of the graduate programs is available from the departmental office.

Facilities

The Department of Linguistics and the Department of Computer Science jointly operate two laboratories containing NeXT/UNIX stations and IBM PCs devoted to research and instructional projects in semantics and natural language computation. The Phonetics Laboratory houses Kay CSLs and an array of NeXT, Macintosh, and IBM computers for spectral analysis, waveform analysis, pitch tracking, and speech synthesis.

Admission

Interested students should request information and application forms as early as possible, especially if they plan to apply for financial aid. New applications will be considered for the fall semester only.

Admission to the M.A. and Ph.D. Programs

For admission to the graduate program in linguistics, the following, in addition to the minimum Graduate School requirements, are normally required:

A. A bachelor's degree from a recognized institution with a minimum grade point of 3.0 or its foreign equivalent.

B. An official transcript of the undergraduate record.

C. Letters of recommendation from three previous instructors.

D. Proficiency in a foreign language equivalent to two years of college work.

E. Graduate Record Examination (GRE) General Test scores.

F. Students whose native language is not English must take the TSE in their home country or the SPEAK test upon arrival.

G. Foreign students must have obtained a score of at least 600 on the Test of English as a Foreign Language (TOEFL).

H. A writing sample—a short paper 2-3 pages, preferably a paper written for a course taken as an undergraduate, that will allow the department to assess your writing skills.

I. A CV or resume.

J. Acceptance 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.

Larson, Richard K., Ph.D., 1983, University of Wisconsin: Semantics; syntax.

Samuel, Arthur[4], Ph.D., 1979, University of California, San Diego: Perception; psycholinguistics.

Sridhar, S. N., Ph.D., 1980, University of Illinois: Syntax; psycholinguistics; bilingualism; applied linguistics.

Vasvari, Louise O.[1], Ph.D., 1969, University of California, Berkeley: Romance philology; historical linguistics; contrastive analysis; translation theory.

Warren, David S.[5], Ph.D., 1979, University of Michigan: Logic programming; database systems; interactive systems; artificial intelligence; natural language and logic.

Associate Professors

Anshen, Frank, *Graduate Program Director.* Ph.D., 1968, New York University: Sociolinguistics; morphology.

Brennan, Susan[4], Ph.D., 1990, Stanford University: Psycholinguistics; reference and lexical choice; communication; human/computer interaction; computational linguistics; caricature and face recognition.

Finer, Daniel L., Ph.D., 1984, University of Massachusetts-Amherst: Syntax; semantics; language acquisition.

Hoberman, Robert, Ph.D., 1983, University of Chicago: Semitic linguistics.

Huffman, Marie K., Ph.D., 1989, University of California, Los Angeles: Phonetics; phonology.

Kaufman, Dorit, Ph.D., 1991, University at Stony Brook: Language acquisition and attrition; language education.

Ledgerwood, Mikle D., *Director of the Language Center.*[3] Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Ludlow, Peter[2], Ph.D., 1985, Columbia University: Semantics; philosophy of linguistics.

Repetti, Lori, Ph.D., 1989, University of California, Los Angeles: Italian linguistics; Romance phonology; Italian dialectology.

Sridhar, Kamal K., Ph.D., 1977, University of Illinois: ESL; sociolinguistics; English in the international context; applied linguistics.

Assistant Professor

Bailyn, John, Ph.D., 1994, Cornell University: Russian syntax; language acquisition.

Research Associate Professor

He, Agnes W., Ph.D., 1993, University of California, Los Angeles: Discourse/conversation analysis; pragmatics; ESL/EFL teacher training; sociolinguistics.

Number of teaching, graduate, and research assistants, fall 1999: 18

1) Comparative Literature

2) Philosophy

3) European Languages

4) Psychology

5) Computer Science

Degree Requirements

Requirements for the M.A. Degree in TESOL

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

A. Formal Course Requirements

	Credits
1. LIN 522 Phonetics	3
LIN 524 Methods of TESOL	3
LIN 527 The Structure of English	3
LIN 530 Introduction to General Linguistics	3
LIN 571 Practicum in TESOL I	3
LIN 572 Practicum in TESOL II	3
2. Three of the following:	9
LIN 525 Contrastive Analysis	
LIN 526 Analysis of an Uncommonly Taught Language	
LIN 529 Methods and Materials of Tesol II	
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. One elective course approved by the department	3
Total	30

B. Performance

The student must achieve a grade point average of B 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.

Requirements for the Ph.D. in Linguistics

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

A. Core Courses

LIN 521 Syntax I

LIN 561 Syntax II

LIN 523 Phonology I

LIN 563 Phonology II

LIN 562 Semantics

Three courses in applications of linguistics such as:

LIN 522 Phonetics

LIN 541 Bilingualism

LIN 542 Sociolinguistics

LIN 532 Second Language Acquisition

Two electives approved by the graduate 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. Both papers must be successfully defended by the last day of classes of the fifth semester, and 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. Upon completion of this requirement, students will be considered to have advanced to candidacy.

C. Elective Credits

Successful completion of a total of 60 credits (this includes the 30 credits required in part A). Full-time students will normally register for 12 credits in each of their first two semesters in residence and for nine credits in each semester thereafter.

D. 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 Graduate 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.

E. Language Requirement:

Demonstrated knowledge of two foreign languages other than the student's mother tongue. This requirement 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 the fundamental notion of a grammar as a formal device that generates (describes) all and only the well-formed sentences of a language. The general methodology of modern syntax is applied to a wide range of problems in a variety of languages, providing students with the tools for independent analysis.
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.
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.
3 credits
ABCF grading

LIN 524 Methods and Materials of TESOL
Theoretical bases of foreign language pedagogy: inputs from linguistics, psychology, and education; overview of methods; syllabus design; lesson plans; teaching aids; techniques for teaching grammar, vocabulary, pronunciation, reading, and writing; teaching communicative competence; evaluating and creating textbooks and supplementary materials.
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. Crosslisted with CEL 551.
Pre- or co-requisites: LIN 530, or LIN 521 and LIN 523
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.
Pre- or co-requisites: LIN 530, or LIN 521 and LIN 523
3 credits, repetitive
ABCF grading

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.
Fall, 3 credits
ABCF grading

LIN 529 Methods and Materials of TESOL II
Drawing on theories in linguistics, psychology, and pedagogy; students explore methods of teaching English as a second and foreign language. Emphasis is placed on literacy development, content-based language instruction, curriculum design use of technology, and evaluation models.
Prerequisite: LIN 524 and permission of instructor
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. Crosslisted with CEC 530.
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 learners' 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.
Pre- or co-requisites: LIN 530, or LIN 521 and LIN 523
3 credits
ABCF grading

LIN 534 Applied Linguistics
A survey of the potential and actual applications of linguistic principles and findings to a variety of human concerns. The implications of linguistics for theories of language learning, syllabus design, error prediction and correction, literary analysis, nonstandard and nonnative varieties of language, language teaching for specific functions, and bilingual functioning.
Pre- or co-requisites: LIN 530, or LIN 521 and LIN 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.
3 credits
ABCF grading

LIN 541 Bilingualism
Study of the social, linguistic, educational, and psychological aspects of bilingualism. Crosslisted with CEL 541.
Pre- or co-requisites: 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. Crosslisted with CEL 542.
3 credits
ABCF grading

LIN 543 Psycholinguistics
An introduction to the main issues in the psychology of language. The course will deal with three major areas: (1) the psychological reality of linguistic theories and categories; (2) theoretical models and experimental studies of language comprehension, production, and acquisition; and (3) topics in representation of language in memory.
Prerequisites: LIN 521 and LIN 523, or LIN 530
3 credits
ABCF grading

LIN 550 Selected Topics in Linguistics
Topics are announced each semester; course may be repeated for credit if topic differs.
Fall and spring, 3 credits each semester
ABCF grading

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: LIN 522 or permission of instructor
3 credits
ABCF grading

LIN 561 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
3 credits
ABCF grading

LIN 562 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
3 credits
ABCF grading

LIN 563 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
3 credits
ABCF grading

LIN 564 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—are introduced.
Prerequisites: LIN 521 and LIN 523
3 credits
ABCF grading

LIN 571 Practicum in TESOL I
Students will observe and participate in teaching and evaluation activities with instructors in the English as Second Language Program. Students will also participate in the practicum seminar, where they will explore issues of professional development, language instruction, and assessment.
Fall, 3 credits
ABCF grading

LIN 572 Practicum in TESOL II
Students will conduct a needs analysis, design a curriculum, and develop evaluation instruments for predetermined groups of learners in specific contexts. Students will also participate in mentoring, teaching, and evaluation activities in the English as a Second Language Program and in other settings.
Prerequisite: LIN 571
Spring, 3 credits
ABCF grading

LIN 574 Student Teaching Seminar in English as a Second Language
Seminar on challenges and issues of teaching English as a second language at the elementary, middle, and secondary school levels. Critical analysis of actual situations encountered during the student teaching experience.
Prerequisites: LIN 524 and permission of instructor
Co-requisite: LIN 581 and LIN 582
3 credits
ABCF grading

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 or 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-requisite: LIN 581 and LIN 574
Fall or 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
1-3 credits, repetitive
S/U grading

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
1-3 credits, repetitive
S/U grading

LIN 595 Thesis
Exceptionally well-qualified students may be given the opportunity to present a thesis consisting of original work on a topic in linguistics. Only students who are specifically invited to do so by the faculty may take this course.
Fall and spring, 3-6 credits
S/U grading

LIN 680 Doctoral Seminar
Doctoral candidates will present and discuss their own research work.
Prerequisite: Advanced standing
Fall and spring, 3 credits each semester
S/U grading

LIN 698 Graduate Practicum in Teaching
Fall and Spring, 1-6 credits
S/U grading

LIN 699 Doctoral Research in Linguistics
Independent research for the Ph.D. degree. Open only to Ph.D. students who have advanced to candidacy.
Fall and spring, 1-9 credits, repetitive
S/U grading

LIN 800 Summer Research
Summer, no credit

DLT 601 Internship in TESOL
Students in the Doctor of Arts Program will assist an instructor as an aid in a language course on the undergraduate level.
Fall and spring, 1-3 credits
S/U grading

DLT 602 Externship in TESOL
Students in the Doctor of Arts Program will 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

DLT 699 Doctoral Research in TESOL
Independent research for the Doctor of Arts degree. Open only to candidates for the Doctor of Arts who have passed the comprhensive examination.
Prerequisite: Advancement to candidacy
Fall and spring, 1-9 credits, repetitive
S/U grading

W. Averell Harriman School for Management and Policy (MGT)

Director: Thomas R. Sexton, Harriman Hall 306 (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 306 (631) 632-7159
Office of Student Services: Maria Moore, Patrice Virgilio, Michele Smora Harriman Hall 102 (631) 632-7296 or 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

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 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. It is also open to graduate students enrolled in other Harriman programs or other graduate majors.

For Graduate Students—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.

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 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 Record Examination (GRE) General Test, or Graduate Management Admission Test (GMAT) scores.

D. Three letters of recommendation, one of which, if possible, should be from a professional working in a public agency or community or private organization 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. $50.00 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
HH, Room 102
W. Averell Harriman School for
Management and Policy
University at Stony Brook
Stony Brook, New York
11794-3775
(631) 632-7296
e-mail:oss@notes.cc.sunysb.edu

Faculty

Professors

London, Manuel[4], *Director of the Center for Human Resource Management.* Ph.D., 1974, Ohio State University: Personnel promotion policies; management training; organizational behavior.

Skorin-Kapov, Jadranka[3], Ph.D., 1987, University of British Columbia, Canada: Management information systems; operations research; artificial intelligence.

Wolf, Gerrit[4], Ph.D., 1967, Cornell University: Entrepreneurship; organizational behavior; human resources management; international management.

Associate Professors

Carroll, T. Owen[1], Ph.D., 1968, Cornell University: Nonlinear dynamics in finance; management information systems; pattern recognition with applications to finance.

Casey, Jeff T.[2], *Graduate Program Director.* Ph.D., 1986, University of Wisconsin: Human resource management; managerial judgment and decision making, negotiation and conflict resolution.

Preston, Anne E.[5], Ph.D., 1983, Harvard University: Labor economics; nonprofit organizations; applied econometrics; careers of scientists and engineers.

Sexton, Thomas R.[3], *Director of the Harriman School; Codirector of Health Services Research and Management Unit.* Ph.D., 1979, University at Stony Brook: Health care delivery systems; efficiency analysis; statistics.

Assistant Professor

Mazvancheryl, Sanal K., Ph.D., 1999, University of Michigan: Marketing; consequences of customer satisfaction; industrial organization models in marketing.

Lecturers

Alloca, Carl J., C.P.A., Long Island University, C.W. Post: Public and private accounting; auditing; taxation; and internal systems development and review.

Lewis, Herbert F., Ph.D., 1996, University at Stony Brook: Management science; operations management; management information systems.

Adjunct Faculty

Andreadis, George, M.B.A., Finance and Management.

Barr, Alan, J.D., Entrepreneuship.

Cohen, Robert, M.S., Information Systems Management.

Farmer, Carol, C.P.A., Accounting.

DeFilippe, Joseph, M.B.A., Marketing.

Fox, Edward, M.B.A., Marketing.

Galgano, Thomas M., J.D., Business Law.

Heaton, William, M.B.A., Management.

Lewis, Herbert, Ph.D., Operations Management.

Marlow, Frank, Ph.D., Human Resource Management.

Merrill, Linda J., M.A., Industrial and Labor Relations.

Saltzman, Steven, M.S., M.B.A., Counseling, Business Administration/Marketing.

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974

2) Joint appointment, Department of Political Science

3) Joint appointment, Department of Applied Mathematics and Statistics

4) Joint appointment, Department of Psychology

5) Courtesy appointment, Department of Economics

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 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 JOB-TRAK (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 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 brochures, 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 in the office. You can visit the Center's Web page at: *http://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 want 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 stopping by the Career Center.

Office of Student Services

Learning about current job market trends and specific companies and organizations is crucial for a successful job search. To facilitate this process, the Office of Student Services maintains updated files of companies, nonprofit organizations, and government agencies. Current job and internship opportunities are posted here throughout the year.

First-Year Required Courses

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 515 Data Analysis
The uses and limitations of mathematical techniques, especially in the use of data in advocating alternative policies. Probability, estimation, hypothesis testing, analysis of variance, and regression analysis are among the topics covered.
Fall, 4 credits
ABCF grading

MGT 517 Management Information Systems
The analysis and design of information systems to aid in managerial decision making. Intra- and Internet computing.
Spring, 3 credits
ABCF grading

MGT 532 Finance
Analysis of financial markets and the tools for operating in these markets. Description and evaluation of the existing system of government taxes, expenditures, and transfers. Equity, efficiency, and optimal taxation.
Spring, 3 credits
ABCF grading

MGT 533 Managerial Economics
The techniques and approaches of microeconomic reasoning are applied to issues of policy. The theory of the market and the price system are closely examined for the purpose of identifying those areas where neoclassical economics is helpful to the analyst and manager. Special attention is paid to cost-benefit analysis and models of economic behavior.
Fall, 3 credits
ABCF grading

MGT 535 Accounting
Topics include budgeting and accounting techniques. Building on basic practices in the private sector, the course develops practices unique to public and nonprofit sectors, e.g., government agencies. Special topics include cash flow management and debt financing and management.
Fall, 3 credits
ABCF grading

MGT 543 Modeling
The course develops the mathematical and computational tools useful in the analysis of problems and applies them to areas ranging from the design of local service delivery to the modeling of national policy issues. Topics include linear and integer programming, networks, and queuing.
Spring, 3 credits
ABCF grading

MGT 571 Marketing and Marketing Research
Concepts and techniques of marketing are discussed in detail. Emphasis is on case studies and applications to business, government, and nonprofit organizations.
Fall, 4 credits
ABCF grading

MGT 589 Operations Management
Analysis and management of manufacturing and services in business, government, and nonprofit institutions. Quality management, processes, automation, inventories, production, and scheduling. Text and cases.
Spring, 3 credits
ABCF grading

Second-Year Required Courses

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 (advertising, constituent services). Practice is given in analyzing and developing codes of ethics for various kinds of organizations.
Fall, 2 credits
ABCF grading

MGT 541 Workshop in Management
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 580 Strategy
This course presents the 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. Special attention is given to the study of the entrepreneurship process through which programs, resources, and new organizations are developed. Extensive use is made of case studies.
Spring, 4 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 in the private sector. Topics include employee ability, motivation and incentive systems, satisfaction, performance, staffing and retention, training, and employee development.
Fall, 3 credits
ABCF grading

Electives

MGT 503 Negotiation and Conflict Resolution
The course concerns itself with the methods and procedures for reducing conflict and confrontation between contending parties in order to reach agreement. Included is analysis of the techniques of 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 community relations, labor relations, international and domestic affairs, patient/doctor/hospital relations, and other areas where negotiation and mediation play a significant role in modern life. Crosslisted with CEX 547.
3 credits
ABCF grading

MGT 504 New Developments in Human Resource Administration
This is an advanced course, designed to examine new developments and professional concerns in human resource administration. The course focuses on such topics as Japanese methods of increasing productivity and their adaptation to the American workplace; developing union/management cooperation for productivity; methods of training to bring the disadvantaged into the workplace; impact of the computer revolution on the personnel field; specialized personnel needs of the new workforce in a high-tech and service economy. Crosslisted with CES 513.
Prerequisite: PAM 505/CES 515
Fall, 3 credits
ABCF grading

MGT 505 A Survey of Human Resources Administration
This is the mandated course in the human resource sector of the Human Resource Management curriculum. The basic elements of personnel administration are presented: an overview of human resource functions; recruitment, selection, and placement; job classification and development of wage and benefit systems; employee supervision, counseling, discipline, and grievance handling; and the legal framework of human resource administration. The course concludes with an overview of the human resource approaches specific to union and nonunion environments. Crosslisted with CES 515.
Spring, 3 credits
ABCF grading

MGT 506 A Survey of Labor Relations
This is the mandated 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; the major elements of collective bargaining and dispute resolution techniques used in both the private and public sectors of America's workplace. A discussion of the future of American labor unions in view of the new work force and modern human resource techniques concludes the class. Crosslisted with CES 516.
Fall, 3 credits
ABCF grading

MGT 507 Contemporary Issues in Labor Relations
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. The chief problems emerging in current negotiations in both the private and public sectors will be examined. Crosslisted with CES 518.
Prerequisites: PAM 506/CES 516
Spring, 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. Crosslisted with CES 520.
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 available to the individuals in the private, public, and nonprofit sectors. Future fringe benefit programs and policies are also explored. Crosslisted with CES 510.
Prerequisites: PAM 505/CES 515
Spring, 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. Communication, providing opportunities for job enrichment and career development, employee assistance programs, recreational programs, and developing the joint participation of employees and management are the hallmarks of the well-managed corporation. Crosslisted with CES 511.
Spring, 3 credits
ABCF grading

MGT 513 Models in Health Care Management
The application of statistical and management science models to problems faced by modern health care delivery institutions. Applications include analysis of length of stay and mortality data, and measurement of organizational efficiency.
Spring, 3 credits
ABCF grading

MGT 514 Collective Bargaining and Arbitration in the Public Sector
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. Students role play the negotiation of a public-sector contract: preparation of bargaining package, negotiation, mediation, fact-finding, and arbitration. They also prepare, present, and critique a public sector grievance case from its shop origins to its final disposition by arbitration. Crosslisted with CES 514.
Prerequisites: PAM 506/CES 516
Fall, 3 credits

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. Crosslisted with CES 519.
Prerequisite: PAM 506/CES 516
Spring, 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. Crosslisted with CES 521.
Spring, 3 credits
ABCF grading

MGT 523 Human Resource Management in the Individual Firm or Organization—Workshop
This course is designed for human resources practitioners who wish to prepare themselves for higher-level executive positions: planning for the personnel function relative to organizational purpose and size of work force; developing recruiting plans, job classifications, and wage schedules; establishing benefit systems; training supervisors; systematizing employee supervision and evaluation methods. Finally, the class develops such motivational incentives as career development, job enrichment, and employee assistance programs, and learns how to devise model affirmative action and employee safety procedures. Crosslisted with CES 523.
Spring, 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 negotiating parties: evaluation of economic and political environment; gathering of essential information; determination of bargaining style and strategy; role playing of negotiations using sample contracts. Guest lecturers critique class performance, offering suggestions for improving negotiation skills. Crosslisted with CES 524.
Prerequisite: PAM 506/CES 516
Spring, 3 credits
ABCF grading

MGT 525 Labor Relations Law
The course will explore the legal interrelationships in selected areas among employers, employees, unions, and government. Topics will include the evolution of labor relations law and the practical implications of legislation, court decisions, and regulatory procedures governing labor/management relations in both the public and private sectors. Crosslisted with CES 525.
Prerequisite: PAM 506/CES 516
Fall, 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. Includes preparation of job analysis, descriptions, specifications, and evaluations; theory of compensation systems as they relate to job satisfaction and employee morale; and 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-completes the course. Crosslisted with CES 526.
Prerequisite: PAM 505/CES 515
Spring, 3 credits
ABCF grading

MGT 527 Women, Work, and Dollars
The course addresses the economic and social struggle of women to achieve workplace equality. It includes an examination of their labor force participation: remuneration of women, segregated employment patterns, special problems of pink-collar and professional women, and an analysis of the corporate environment and the role of affirmative action in removing formal and informal barriers to progress. The campaign for pay equity, techniques for establishing a fair wage, conflicting views of pay, equity as a solution to sex discrimination, alternative definitions of success, and women's contribution to the world of work. Crosslisted with CES 517.
Spring, 3 credits
ABCF grading

MGT 530 Managerial Decisions
The subject of this course is how individual managers make decisions. The emphasis is on describing and understanding the psychological processes underlying intuitive judgment and choice and on characterizing the errors that decision makers are likely to make. Methods for avoiding these errors are proposed and examined.
Spring, 3 credits
ABCF grading

MGT 531 Political and Administrative Decision Making
Theory and practice of public sector decision making. Group decision models, bargaining and coalition theory, public choice, economic organization of public agencies, regulation exit and voice theory, metropolitan governance, and the role of formal planning.
Fall, 3 credits
ABCF grading

MGT 534 Public Finance
Normative and positive economic analysis of the public sector. Description and evaluation of the existing system of government taxes, expenditures, and transfers. Applied welfare economic analysis of types of market failure including public goods and externalities. Analysis of distortions to economic behavior caused by the imposition of taxes or subsidies. Equity and efficiency and optimal taxation.
Spring, 3 credits
ABCF grading

MGT 536 Financial Management
This course examines the financial and economic bases of a series of urban problems including transportation, employment, health, housing, and fiscal management. Macro- and microeconomic theory provide the framework for analysis.
Fall, 3 credits
ABCF grading

MGT 537 Employee Training and Career Development
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 enhance adult learning. Employee development strategies are reviewed. Students apply these concepts to a specific organization for hands-on learning. A focus on career planning and development gives students a chance to take interest inventories and make self-assessments of abilities and learning styles. Students formulate their own career plans and develop action strategies. Crosslisted with CEX 537.
Spring, 3 credits
ABCF grading

MGT 538 Organizational Change and Development: Opportunities for Human Resources Innovations
Acquaints 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. Crosslisted with CEX 538.
3 credits
ABCF grading

MGT 540 Linear Programming
Formulation of linear programming problems and solution 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. Crosslisted with AMS 540.
Corequisite: Linear algebra course
Fall, 3 credits
ABCF grading

MGT 542 Technology and Public Policy
Designed to provide students interested in entering careers in public service with an opportunity to deal with public policy and operational management issues that involve technology as a primary component.
Spring, 3 credits
ABCF grading

MGT 544 Discrete and Nonlinear Programming
Discrete optimization. Linear programming in which the variables are restricted to being integer valued. Cutting plane methods, enumeration methods, necessary and sufficient conditions for unconstrained and constrained optima. Crosslisted with AMS 544.
Prerequisite: MGT 540
Spring, 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. Crosslisted with AMS 546.
Prerequisite: AMS 530 or permission of instructor
Spring, even years, 3 credits

MGT 547 Economic Analysis of Contemporary Issues
This course is designed to illustrate the role of economic and statistical analysis in real world managerial and policy-making situations.
Fall, 3 credits

MGT 549 Economics of Recent Innovations in Organizational Design
This course examines recent labor-related innovations in the workplace from an economic perspective. Topics include team production, job design, and reward systems as they relate to current management trends, such as total quality management (TQM).
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. Crosslisted with AMS 550.
Prerequisite: AMS 507 or equivalent
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. Crosslisted with CSE 529 and AMS 553.
Prerequisite: CSE 201 or equivalent
Spring, 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. Crosslisted with 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. Crosslisted with AMS 556.
Prerequisite: MGT 550 or MGT 558
3 credits
ABCF grading

MGT 557 Inventory Theory
Nature of inventory systems. Design and control. Continuous and periodic review policies. Economic order quantities and the optimality of policies. Crosslisted with AMS 557.
Prerequisite: AMS 507
Fall, odd years, 3 credits
ABCF grading

MGT 558 Stochastic Processes
Review of probability theory. Poisson processes. Renewal theory. Markov processes. Applications to queues, statistics, and other problems of engineering and social sciences. Crosslisted with AMS 558.
Prerequisites: AMS 504; AMS 507 or equivalent
Spring, 3 credits
ABCF grading

MGT 559 Computational Finance
Computation in financial markets, securities valuation, portfolio theory, and trading. Excess returns to beta and full covariance treatment of portfolio returns and variance. Aspects of nonlinear dynamics applied to financial time series.
Fall, 3 credits
ABCF grading

MGT 560 Design and Analysis of Management Information Systems
Integrates the areas of computer technology, systems analysis, systems design, and organizational behavior to aid in designing large-scale applications and decision support systems. Both the technological and managerial aspects of system design and implementation are considered.
Prerequisite: MGT 517
Fall, 3 credits
ABCF grading

MGT 561 Expert Systems for Management
Management view of expert systems, including basic principles, current topics, and hands-on development.
Fall, 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, the structure of telecommunication networks, organizations involved in telecommunications, business applications, layered architectures in data networks, protocols, local area networks, performance evaluation, and elements of queueing theory.
Fall, 3 credits
ABCF grading

MGT 563 Local Area Network Implementation and Applications
This course focuses on the practical and management aspects of installing, maintaining, and troubleshooting a local area network. The focus is on Novell networks; general issues of laying out and selecting cabling, hardware, and software are considered. Consideration is also given to the selection and implementation of applications packages that are specifically designed for network use. Included are monitoring and management tools, as well as end-user programs. Students gain hands-on experience.
3 credits
ABCF grading

MGT 565 Industrial Marketing
An in-depth study of marketing strategies used by those business that manufacture and market goods and services that are used by other companies to help produce their goods.
Spring, 3 credits
ABCF grading

MGT 566 New Ventures
This course focuses on the essential qualities of successful new enterprises. Examples of both successful and failed new ventures are given. Students develop a business plan for their own new venture and present it to venture capitalists.
Fall, 3 credits
ABCF grading

MGT 567 Expert Systems in Manufacturing
This course examines the role of knowledge-based systems in manufacturing today. A number of actual systems of different types are considered, from the perspectives of development, innovation, implementation, and validation. Emphasis is placed on applications rather than theoretical aspects of the system.
Fall, 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. Crosslisted with AMS 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.
Fall or spring, 3 credits
ABCF grading

MGT 574 Consumer Behavior and Decision Processes
This course is designed to help students understand the consumption activities of individuals and their impact on marketers. Theories from various disciplines (marketing, sociology, psychology) are borrowed. Topics include experimental methodology; motivation, personality, and situational influences; perception, learning, attitude, and decision making.
3 credits

MGT 576 Safety Management
Acquaints students with the challenges and solutions necessary to manage organizations competitively, while ensuring compliance with the myriad of environmental and safety regulations present. Cases and group exercises will be used to examine potential problem areas and develop realistic solutions. This course will enable the student to have a strong grasp of the essentials of occupational and environmental health and safety management. Crosslisted with EST 576, CEX 576.
Fall or spring, 3 credits
ABCF grading

MGT 578 Theory and Management of Nonprofit Organizations
The purpose of the course is to develop an understanding of the role of nonprofit organizations in the U.S. economy, the public policy issues affecting the nonprofit sector, and the problems of managing nonprofit organizations. The scholarly literature on nonprofit organizations is examined, and case studies of problem solving and program development in the nonprofit sector are analyzed.
Fall, 3 credits
ABCF grading

MGT 582 Business-Government Relations
This course covers topics in the regulation of business, the lobbying of government, joint ventures, and contracting.
Spring, 3 credits
ABCF grading

MGT 588 Database Management
The purpose of this course is to introduce the prospective information systems professional to fundamental concepts of database design and management.
3 credits
ABCF grading

MGT 591 Special Topics in Policy Analysis and Public Management
Designed to accommodate innovative subject matter on an experimental basis and to provide courses taught by visiting faculty.
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MGT 595 Individual Directed Research in Policy Analysis and Public Management
Designed to accommodate independent research projects on an individual basis with faculty guidance.
Fall and spring, variable and repetitive credits
ABCF grading

MGT 599 Internship Practicum
Designed to accomadate Management and Policy graduate students working on their internship project requirment while under supervision of an advisor.
Fall, spring, summer
1 credit
S/U grading

Marine Sciences Research Center (MAR, OCN)

Dean: Marvin A. Geller, Endeavour Hall 145 (631) 632-8700
Graduate Program Director: Glenn Lopez, Dana Hall 111 (631) 632-8660
Coordinator of Atmospheric Sciences Program: Sultan Hameed, Endeavour Hall 131 (631) 632-8681
Director of Waste Reduction and Management Program: R. Lawrence Swanson, Dutchess Hall 147 (631) 632-8704
Staff Assistant: Nancy Glover, Endeavour Hall 105 (631) 632-8681

Degrees awarded: Graduate Certificate in Oceanic Science; Graduate Certificate in Waste Management; M.S. in Marine Environmental Sciences; Ph.D. in Coastal Oceanography

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 tracks 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 7,969 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 seatable 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. Current faculty research interests are described below.

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 Environmental Sciences

The M.S. program offered by MSRC consists of a rigorous interdisciplinary approach to coastal oceanography and coastal zone management. 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 Coastal Oceanography

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 mature 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. Seabed diagenesis, 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 fishery stocks. The MSRC is one of the primary centers of knowledge on the early life history of any finfish and shellfish species. Research topics include larval transport, habitats, mortality, predator-prey interactions, genetic adaptations, and aquaculture.

Admission

Admission to the M.S. Program in Marine Environmental Sciences and to 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 the Graduate School.

Admission to the Ph.D. Program in Coastal Oceanography

For admission to the graduate program in Coastal Oceanography 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 M.S. degree need not be in oceanography or marine sciences. 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) 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 Professor

Aller, Robert C., Ph.D., 1977, Yale University: Marine geochemistry; marine animal-sediment relations.

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.

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.

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, University at Stony Brook: 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[6], 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.

Lee, Cindy, Ph.D., 1975, University of California, San Diego (Scripps): Marine geochemistry of organic compounds; organic and inorganic nitrogen cycle biochemistry.

Lopez, Glenn R., *Graduate Program Director.* Ph.D., 1976, University at Stony Brook: Benthic ecology; animal-sediment interactions.

Meyers, William J. *Emeritus.*[7] Ph.D., 1973, Rice University: Carbonates; sedimentology.

Schubel, J.R., *Emeritus.*[8] 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.*[9] 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.

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.

Cosper, Elizabeth M., Ph.D., 1981, City University of New York: Phytoplankton physiology and ecology; resistance of microalgae to pollutants.

Lonsdale, Darcy J., Ph.D., 1979, University of Maryland: Zooplankton ecology with special interest in physiology; life history studies.

Lwisa, Kamazima M.M., Ph.D., North Wales: Structure and dynamics of shelf seas.

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.

Zhang, Minghua, Ph.D., 1987, Institute for Atmospheric Physics, Academia Sinica, Beijing: Atmospheric sciences; modeling of climate.

Assistant Professors

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.

Colle, Brian A., Ph.D., 1997, University of Washington: Synoptic meteorology; mesoscale numerical modeling and forecasting; coastal meteorology.

Conley, Daniel C., Ph.D., 1983, University of California, San Diego (Scripps): Sediment transport; wave boundary layers; nearshore processes.

Goodbreed, Steven L., Jr., Ph.D., 1999, College of William and Mary: Coastal and subaerial margin systems; development and sedimentary processes.

Mak, John E., Ph.D., 1992, University of California, San Diego (Scripps): Atmospheric chemistry and biosphere-atmosphere interactions; isotope geochemistry.

Lecturers

Heidelberger, Edwin C.[5], M.S., 1969, New York University: Meteorology, weather prediction.

Roethel, Frank J., Ph.D., 1982, University at Stony Brook: Environmental chemistry; behavior of coal waste in the environment; solution chemistry.

Adjunct Faculty

Andreoli, Aldo[1], M.C.E., 1962 New York University: Water pollution control; water supply; subsurface denitrification.

Berger, Harold[2], 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.[12], Ph.D., 1986, Florida Institute of Technology: Environmental chemistry; contaminant transport and leachability; waste treatment technologies.

Cowen, Robert K.[3], Ph.D., 1985, University of California, San Diego (Scripps): Fishery oceanography; nearshore fish populations; fish ecology.

De Zafra, Robert[13], Ph.D., 1958, University of Maryland: Positron annihilation.

Falkowski, Paul G.[4], Ph.D., 1975, University of British Columbia, Canada: Marine phytoplankton ecology; phytoplankton physiology.

Herman, Herbert[6], Ph.D., 1961, Northwestern University: Surface engineering.

Lin, Senjie, Ph.D., 1995, University at Stony Brook: Phytoplankton ecology and dynamics.

Miller, Mark A.[4], Ph.D., 1994, Pennsylvania State University: Meteorology; surface-based remote sensing; marine boundary layer clouds.

Padilla, Diana[9], Ph.D., 1987, University of Alberta, Canada: Marine function ecology; invasion biology.

Shumway, Sandra[14], Ph.D., D.Sc., 1976, University of Wales, England: Physiological ecology of marine invertebrates; shellfish biology; toxic algae.

Sponaugle, Susan C.[3], Ph.D., 1994, University at Stony Brook: Fish ecology; tropical marine ecology; conservation.

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[10], Ph.D., 1978, University of Delaware: Estuarine sedimentology; ocean and estuarine policy and management.

Yen, Jeannette,[11] Ph.D., 1982, University of Washington: Marine zooplankton ecology; predator-prey interactions; sensory perception and lipid metabolism of copepods.

Yudin, Valery, Ph.D., 1986, University of St.Petersburg, Russia: Dynamics and chemistry of the middle atmosphere.

Research Faculty

Conversi, Alessandra, *Assistant Professor.* Ph.D., 1992, University of California, San Diego (Scripps): Decadal time series; water quality monitoring.

Woodhead, Peter M.J., *Professor.* B.S., 1953, Durham University, England: Behavior and physiology of fish; coral reef ecology; ocean energy-conversion systems.

1) Northville Industries

2) Regional Director (Retired) Region 1, New York Department of Environmental Conservation

3) University of Miami

4) Brookhaven National Laboratory

5) NOAA National Weather Service (Retired)

6) Joint appointment, Department of Materials Science and Engineering

7) Joint appointment, Department of Earth and Space Sciences

8) New England Aquarium

9) Joint appointment, Department of Ecology and Evolution

10) Hudson River Foundation

11) Georgia Institute of Technology

12) Southern Connecticut State University

13) Joint appointment, Department of Physics and Astronomy

14) Southampton College

Degree Requirements

Requirements for the M.S. Degree in Marine Environmental Sciences

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 track).

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 Coastal Oceanography

There are two tracks in the Ph.D. program–one in oceanography and one in atmospheric sciences.

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

A. Departmental examination. Students in the oceanography track will be required to demonstrate profiency in the material covered in MAR 501 Physical Oceanography, MAR 502 Biological Oceanography, MAR 503 Chemical Oceanography, and MAR 506 Geological Oceanography. Students in the atmospheric sciences track will be required to demonstrate profiency in the material covered in MAR 544 Atmospheric Radiation, MAR 593 Theoretical Meteorology I, MAR 594 Theoretical Meteorology II, and MAR 596 Atmospheric Chemistry as well as one of the core oceanography courses (MAR 501, MAR 502, MAR 503, or MAR 506).

B. Ph.D. degree dissertation proposal approved by three MSRC faculty.

C. Sea experience or appropriate field experience for students in the oceanography track.

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 Environmental Sciences 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 509 Survey of Oceans
Comprehensive survey of the oceanography of the world ocean. The course will include a discussion of oceanographic methods and the interaction among the physics, biology, chemistry, and geology of the ocean. Crosslisted with CEI 541.
Prerequisite: Permission of instructor
Fall and 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. Crosslisted with CEY 512.
Prerequisites: MAR 502, MAR 503
Fall, 3 credits
ABCF grading

MAR 514 Marine Management
The course discusses waste management issues particularly affecting the marine environment. Topics include ocean dumping, sewage treatment, fish kills, beach pollution, and nuisance algal blooms. Techniques for managing the waste stream are presented.
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. Crosslisted with CEY 504.
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. Crosslisted with CEY 505.
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 corequisites: 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. Crosslisted with CEY 507.
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 is concerned with understanding these processes and the structure-activity relationships that are 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.
Prerequisite: GEO 526, 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. Crosslisted with CEY 509.
Prerequisite: Permission of instructor
Spring, 3 credits
ABCF grading

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 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 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 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 538 Statistical Methods for Atmospheric and Marine Sciences
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

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 544 Atmospheric Radiation
Discussion of the compositions and radiative components of planetary atmospheres. Blackbody and gaseous radiation with emphasis on the respective roles of electromagnetic theory and quantum statistics. Derivation of the equation of transfer and radiative exchange integrals, with application to energy transfer processes within the atmospheres of Earth and other planets.
Fall, alternate years, 3 credits
ABCF grading

MAR 545 Continental Margin Sedimentation
Examination of the sedimentary processes active across continental margins including coastal environments, shelf, slope, and rise.
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 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 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, variable and repetitive credit
ABCF grading

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, variable and repetitive credit
ABCF grading

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 555 Introduction to Mathematics for Marine Scientists
Course is designed to assist non-math/physics majors who take required core courses as well as advanced courses in our program. 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, 3 credits
ABCF grading

MAR 556 Biology of Fishes
Lectures and laboratories on comparative evolution, morphology, physiology, and ecology of fishes with emphasis on marine and estuarine forms.
Prerequisite: Permission of instructor
Fall, alternate years, 3 credits
ABCF grading

MAR 557 Introduction to Risk Assessment and Risk Management
The quantification of the degree of hazard resulting from human activities as adopted by governmental agencies to establish the priorities of the many hazards of our daily lives. This course explores 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 in the management of risks and the problems associated with risk communication are studied. Case studies involving each of these topics are evaluated. Crosslisted with CEY 557.
Fall, 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 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 absorption 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. Crosslisted with GEO 562.
Prerequisite: Permission of instructor
Fall, alternate years, 3 credits

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
Spring, alternate years, 3 credits
ABCF grading

MAR 570 Time Series
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

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, 2 credits
ABCF grading

MAR 572 Geophysical Simulation
Basic equations and boundary conditions. Linear and nonlinear instabilities. Finite-difference and time integration techniques for problems in geophysical fluid dynamics. Numerical design of global atmospheric and ocean models. Crosslisted with ESC 555.
Fall, alternate years, 3 credits
ABCF grading

MAR 573 Special Topics—Chemical Oceanography
This course is designed for the discussion of topics of special interest on demand that are not covered in regularly scheduled courses. Examples of possible topics include carbonate chemistry, isotope chemistry, and microbial chemistry.
Prerequisite: Permission of instructor
Spring, 3 credits
ABCF grading

MAR 574 Special Topics—Physical 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 atmosphere ocean interaction and diffusion or dispersion in the ocean.
Prerequisite: Permission of instructor
Fall, 1-4 credits
ABCF grading

MAR 575 Special Topics—Geological 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 coastal processes, fluvial processes, physics of sediment transport, and groundwater flow.
Prerequisite: Permission of instructor
Spring, 3 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, no credit

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 the permission of instructor
Spring, 2 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.
Prerequisites: Stratigraphy and sedimentary marine geology
Fall, 2 credits
S/U grading

MAR 590 Research
Original investigation undertaken with the supervision of the advisor.
Prerequisite: Permission of instructor
Fall and spring, variable and repetitive credit
S/U grading

Atmospheric Science Courses

MAR 544 Atmospheric Radiation
Discussion of the composition and radiative components of planetary atmospheres. Blackbody and gaseous radiation with emphasis upon 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. Crosslisted with ESC 544.
Fall, alternate years, 3 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. Crosslisted with ESC 523.
Spring, 3 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. Crosslisted with ESC 545.
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. Crosslisted with ESC 546.
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. Crosslisted with ESC 547.
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. Crosslisted with ESC 515.
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. Crosslisted with ESC 516.
Prerequisite: Permission of instructor
Fall, alternate years, 3 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

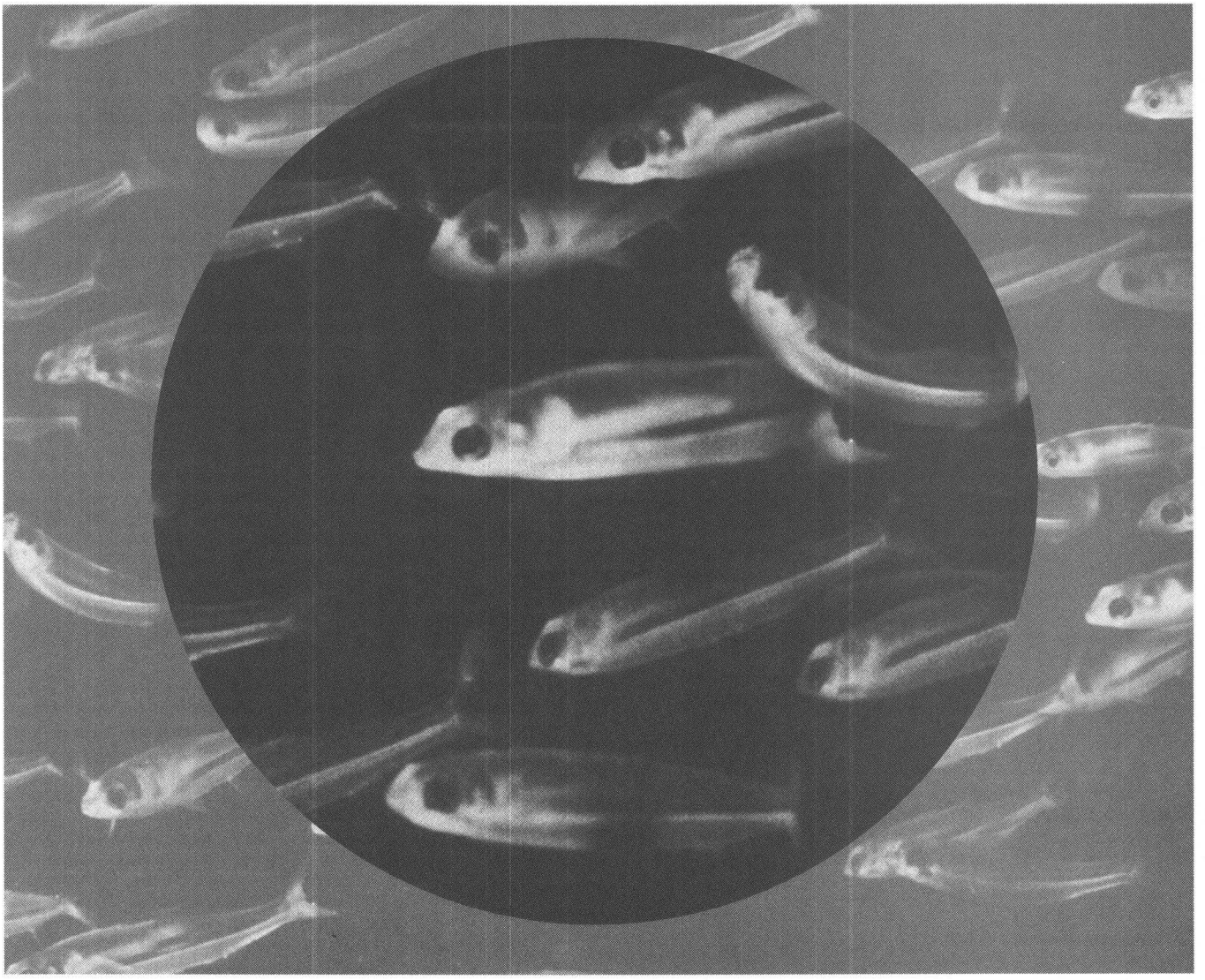
OCN 624 Oceanic Fronts
Course includes a description of various classes of fronts, including planetary scale fronts, major current boundaries, shelf break fronts, upwelling fronts, plumes, and tidal stirring fronts. Coverage of basic frontal dynamics and circulation, biological/chemical interactions, 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, variable and repetitive credit
ABCF grading

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, variable and repetitive
ABCF grading

OCN 670 Practicum in Teaching
Fall and spring, 1-3 credits, repetitive
S/U grading

OCN 677 Benthic Ecology
Ecological interactions of benthic organisms with their habitat. There is discussion of the nature of competition, predation, and disturbance, and of life history and feeding strategies. Most of the course covers investigation



of invertebrate fauna of coastal marine sediments, but there are discussions of intertidal, abyssal, and lacustrine habitats.
Prerequisite: MAR 502, MAR 506, or permission of instructor
Spring, alternate years, 2 credits
ABCF grading

OCN 694 Graduate Seminar in Atmospheric Sciences
Discussion of special research topics centered on monographs, conference proceedings, or journal articles. Topics include climate change, atmospheric chemistry, radiation transfer, and planetary atmospheres. This course is intended primarily for students who have passed the written qualifying examination in atmospheric sciences, although other students may enroll with permission of faculty seminar leader. Crosslisted with ESC 694.
Fall and spring, 1 credit, repetitive
S/U grading

OCN 699 Ph.D. Research
Research course exclusively for students who have been advanced to candidacy in the Coastal Oceanography Program.
Fall, spring 1-12 credits
S/U grading

Materials Science and Engineering (ESM)

Chairperson: Michael Dudley, Engineering Building 314 (631) 632-8484
Graduate Program Director: Patrick Herley, Engineering Building 204 (631) 632-8478
Department Office: Engineering Building 314 (631) 632-8484

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 for 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 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.

Learning at a Distance Master's Program

Students can complete the requirements for the master's degree through the EngiNet Program. Each semester at least one core course will be offered on EngiNet by the Department. With the prior approval of the Graduate Director, students may also enroll in EngiNet courses at other SUNY campuses for credit toward this degree. EngiNet courses are on-campus graduate courses in Engineering and Applied Sciences that have been designed by the professor to also encourage your participation from off the campus. You are registered into a course along with regular students but respecting your limitations of work, time, and travel, you participate in the course from a distance. EngiNet offers a time-delayed and/or live environment that would be similar to your attendance in on-campus classes. Currently, courses are delivered on videotape immediately following in-class lectures. Course notes, assignments, and exams are sent directly to you. Often, these course materials are distributed on WWW sites and through chat boards and e-mail on the Internet. Some courses are teleconference format using PicTel or direct fiber optic links. At selected corporate sites where there are a number of students interested in a particular course, we arrange for live lectures at the remote site.

Advanced Graduate Certificate Program in Biomedical Engineering

The Graduate Program in Biomedical Engineering at the University at Stony Brook trains individuals holding baccalaureate degrees in engineering, mathematics, physics, and related areas 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 Advanced Certificate Program is 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. Our goal of actively promoting the development of a creative, versatile biomedical engineer is accomplished by exposing the individual to the biology, engineering, and business concepts critical to succeeding in the biomedical research and development environment. Students may matriculate directly into the Biomedical Engineering Certificate Program or into a graduate degree (M.S. or Ph.D.) program, in which case they may complete the Biomedical Engineering curriculum as a complement to their graduate degree requirements. Training in Biomedical Engineering is directed by a faculty drawn primarily from the College of Engineering and Applied Sciences, which includes the Harriman School of Management and Policy. In addition, participating faculty from the College of Arts and Sciences, the Health Sciences Center, as well as from Brookhaven National Laboratory provide extensive research opportunities. Breadth 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 self-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 Life Sciences, Engineering and Business Schools. Contact the department for additional 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.

Research Activities

Since its inception some 25 years ago, the Department has had a strong research component, with a major emphasis in surface science and engineering. Currently the Department has 14 full-time faculty members, many of whom hold guest appointments at Brookhaven National Laboratory. The Department of Energy awarded the

contract to manage Brookhaven Laboratory starting in 1998 to Brookhaven Science Associates, a consortium of other universities, led by Stony Brook and the Battelle Memorial Institute. The University's new relationship with this premier research facility will greatly enhance Stony Brook's research programs through availability of major facilities.

At Brookhaven, 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 Brookhaven. 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 plastic deformation and fracture, as well as to interesting materials behaviors. The topographic method is also being used in department-based study of surface chemical reactivity. In 1996 the National Science Foundation awarded Materials Research Science and Engineering Centers in Polymers and Thermal Spray Research to the Department of Materials Science and Engineering, making us the only public University with two MRSECs. 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 conducts both applied and fundamental research on thermal spray technology, which involves melt spray formation of protective coating and free standing forms. The Thermal Spray Laboratory is a unique facility containing a vast array of industrial-level plasma and combustion spray devices. The laboratory is developing an infrastructural maintenance center under sponsorship of the U.S. Army Corps of Engineers and the NY/NJ Port Authority. The laboratory is currently working on several spray form manufacturing programs with government and industry, including an NSF-sponsored Strategic Manufacturing Initiative Program and a Department of Commerce-sponsored Advanced Technology Program, and actively collaborates with a wide range of industries to develop applications for thermal spray technology in materials engineering.

As a result of the University's Engineering 2000 initiative, our ties with industry are growing stronger: faculty are working with industry on joint research projects and submitting cooperative proposals to outside agencies. The Materials Science Department is a member of the Center for Advanced Manufacturing, which is already making an impact on the regional manufacturing base.

Stony Brook's own facilities include state-of-the-art LEED, electron microscope, atomic force microscope, and ESCA 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.

Analytical electron microscopy is well served by a digitally controlled Philips CM12 STEM, complete with EDX and parallel-reading EELS facilities. As well as being a routine research tool for revealing the microstructure and local chemical composition of materials, this equipment is being used in fundamental studies of radiation-sensitive materials and of diffusion-induced grain boundary migration.

Other surface-related research involves ion beam modification of the mechanical and corrosion behavior of alloy steels. Using electron spectroscopy for chemical analysis (ESCA), models explaining corrosion behavior of metal surfaces are being developed. The structure of epitaxial surface monolayers is being studied using low-energy electron diffraction (LEED); extension of this research is also performed at the NSLS. The preparation of thin films of magnetic metals is studied using ultra-high-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. A University-industrial-national laboratory effort on microbial-influenced corrosion has been initiated. Also, bacteria-metal ion interactions are being studied with electron spectroscopy for purposes of bioremediation. Research is also being performed on the chemical make-up of the newly discovered high-temperature superconductors. Novel methods of rapidly spraying such materials onto surfaces are being developed.

The newest program involves the study of microgravity on crystal growth processes. The research, funded by NASA, has been part of its space program since 1972. Experiments are designed at Stony Brook and conducted on various shuttle missions.

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 39 full-time, fully supported students and as many as 16 part-time students, most of whom work in Long Island's high-technology industries.

Admission

Admission is based upon the faculty'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 Professor

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.

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: Corrosion science; XPS; AES; RHEED; ion implantation; protective coatings.

Dudley, Michael, *Chairperson.* Ph.D., 1982, University of Warwick, England: Synchrotron topography; crystal defects; mechanical properties.

Herley, Patrick J., *Graduate Program Director.*[2] Ph.D., 1960, Rhodes University, South Africa; Ph.D., D.I.C., 1964, D.Sc., 1982, Imperial College, England: Fine particles; crystal growth; crystal defects; chemistry of solids.

Herman, Herbert, Ph.D., 1961, Northwestern University: Protective coatings; thermal spray; composites; marine materials.

Jona, Franco P.[2], Ph.D., 1949, Swiss Polytechnic Institute (E.T.H.), Switzerland: Surface physics; LEED.

Rafailovich, Miriam, Ph.D., 1980, University at Stony Brook: Polymeric liquids; phase transitions; thin film wetting phenomena; atomic force microscopy; ion, X-ray, and neutron scattering.

Seigle, Leslie, *Emeritus.* Ph.D., 1951, Massachusetts Institute of Technology: Thermodynamics of solids; diffusions in solids; protective coatings.

Sokolov, Jonathan C., Ph.D., 1983, University at Stony Brook: Surface and interface properties of polymers and blends; phase transitions; neutron and X-ray scattering; EXAFS; SIMS.

Associate Professor

Sampath, Sanjay, Ph.D., 1989, University at Stony Brook: Thermal spraying; protective coatings; intermetallics; spray forming.

Assistant Professors

Gersappe, Dilip, Ph.D., 1992, Northwestern University: Polymer theory and simulation.

Halada, Gary, Ph.D., 1993, University at Stony Brook: Electron spectroscopy; electrochemistry; surface engineering; thin films; engineering design.

Research Professors

Larson, David Jr., *Principal Research Scientist.* Ph.D., 1984, Northwestern University: Compound semiconductor and eutectic crystal growth; microgravity processing; advanced X-ray and infrared characterization techniques; smart materials.

Gambino, Richard, *Principal Research Scientist.* M.S., 1976, Polytechnic Institute of New York: Magnetic thin films; magneto-optical properties; Hall effect and magneto-resistance of magnetic metals; epitaxial growth of magnetic materials.

Adjunct Faculty

Allan, Marita, Ph.D., 1991, Monash University, Australia: Mechanical and physical properties of cementitious materials.

Bari, Robert A.[1], Ph.D., 1969, Brandeis University: Condensed matter physics; nuclear waste management; probabilistic risk assessment.

Dorfman, Benjamin, Sc.D., 1974, Institute of Semiconductors, Novosibersk, Russia: Physics and technology of solid state devices.

Francis, A.J., Ph.D., 1971, Cornell University: Microbiology; biosystems; process sciences.

Goland, Allen N.[1], Ph.D., 1956, Northwestern University: Solid-state physics; defects; interaction of radiation with condensed matter.

Hough, Paul, Ph.D., 1950, Cornell University: Particle physics.

Hazem, Tawfic, Ph.D., 1979, University of Waterloo, Canada: Mechanical Engineering.

Issacs, Hugh S.[1], Ph.D., 1963, Imperial College, London: Corrosion; scanning techniques for surface defects; surface analysis.

Johnson, Peter D.[1], 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.

Li, Chou, Ph.D., 1951, Purdue University: Physical Metallurgy.

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.

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.

Schwarz, Steven, Ph.D., 1980, Stanford University: Materials and device characterization by SIMS.

Srivasta, Arun, Ph.D., 1989, North Carolina State University: Materials Science and Engineering.

Strozier, John, J., Ph.D., 1958, Cornell University: Solid state physics.

Suenaga, Masaki[1], Ph.D., 1969, University of California, Berkeley: Metallurgy of superconducting materials.

Welch, David O.[1], 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.[1], Ph.D., 1978, University of Florida: Analytical electron microscopy; X-ray fluorescence; semiconductor defects.

Number of teaching, graduate, and research assistants, fall 1995: 45

1) Brookhaven National Laboratory

2) Joint appointment, Department of Chemistry

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.

2. Of the required 30 credits, 18 must be graduate course credits offered by the department, excluding ESM 599, 697, 698, and 699.

3. The 30 credits must include a minimum of five core courses selected from the following list: ESM 511 or higher-level thermodynamics course; ESM 512 or higher-level diffraction course; ESM 513; ESM 521; ESM 522 or higher-level imperfections course; ESM 523; ESM 523; ESM 531; ESM 533 and PHY 511 or CHE 521; PHY 512 or CHE 522; PHY 555; PHY 556; PHY 682; BME

501; BME 503; BME 504. At least one of these courses must be taken in each semester until the core program requirement is met. In addition, all students who are supported as Teaching Assistants must complete ESM 501, Teaching Techniques.

4.The 30 credits must include at least three credits of ESM 698.

C. Terminal Status

A student in this degree option is considered a terminating student.

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. An average grade of B or better is required for all courses.

2.The 30 credits must include a minimum of five core courses selected from the following list: ESM 511 or higher-level thermodynamics course; ESM 512 or Higher-level diffraction course; ESM 513; ESM 521; ESM 522 or higher-level imperfections course; ESM 523; ESM 531; ESM 533 and PHY 511 or CHE 521; PHY 512 or CHE 522; PHY 512 or CHE 522; PHY 555; PHY 556; PHY 682; BME 501; BME 503; BME 504. At least one of these courses must be taken in each semester until the core program requirement is met. In addition, all students who are supported as Teaching Assistants must complete ESM 501, Teaching Techniques.

3.The 30 credits must include at least three credits of ESM 698 and six credits of ESM 599.

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 faculty of the graduate program will recommend to the dean of the Graduate School through the graduate program committee 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.The student must pass, with a grade of B or better, a minimum of five core courses selected from the following list: ESM 511 or higher-level thermodynamics course; ESM 512 or higher-level diffraction course; ESM 513; ESM 521; ESM 522 or higher-level imperfections course; ESM 523; ESM 531; ESM 533 and PHY 511 or CHE 521; PHY 512 or CHE 522; PHY 555; PHY 556; PHY 682; BME 501; BME 503; BME 504. At least one of these courses must be taken in each semester until the core program requirement is met. In addition, all students must complete ESM 501, Teaching Techniques.

3.The student must pass at least three credits of ESM 698 and six credits of ESM 699.

C. Qualifying Examination

In order to qualify for advancement to candidacy for the Ph.D., the students must first pass a written qualifying examination.

D. Preliminary Examination

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. Full-time students entering the program with a bachelor's degree must take the preliminary examination before the end of their fourth semester. If a second examination is required, it must be completed by the tenth week of the fifth 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 the 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. Residency

Two consecutive semesters of full-time study are required.

I. 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 504 Biomaterials Science and Analysis
Course content is directed toward providing a thorough treatment of the engineering issues implicit in understanding living tissue interactions with processed materials. Emphasis on identifying and elimination surface contamination, corrosion, and optimizing material properties and compatibility.
Prerequisite: Permission of instructor
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 that 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
Variable and repetitive credit

ESM 600 Seminar in Surface Science
Discussions and reading on current problems in surface physics, chemistry, and crystallography.
Spring, 3 credits
ABCF grading

ESM 602 Seminar in Plasticity and Fracture
Intended for advanced students, especially those doing research in the area. Topics: detailed description of defects and their relations to mechanical structure; dislocation theory; plasticity and yield criteria; creep and fatigue; microscopic theory of fracture including ductile and brittle behavior and the relationship of plastic flow to cleavage.
Prerequisite: ESM 513
Fall, 3 credits
ABCF grading

ESM 604 Seminar in Ultrasonic Methods and Internal Friction in Solids
Review of advanced measurement techniques in the field of ultrasonics coupled with quantitative descriptions of experimental variables related to the sample microstructure. Applications to optical, electrical, and mechanical properties are discussed. Use of ultrasonics for nondestructive evaluation is considered.
Prerequisite: ESM 513
Spring, 3 credits
ABCF grading

ESM 605 Advanced Diffraction Techniques
Advanced topics in diffraction theory including the dynamical theory in perfect and imperfect crystals and its applications in imaging methods. Other topics from the following list are pursued if time is available: EXAFS/EXELFS/SEXAFS; LEED/RHEED; small-angle scattering; Kossel line and electron channeling patterns; convergent beam diffraction; phonon scattering; glancing incidence X-ray diffraction; diffraction from defect structures; colored symmetry; holography.
Prerequisites: ESM 512 or permission of instructor
Fall, 3 credits
ABCF grading

ESM 606 Seminar in Optical Properties of Material
A survey of modern optical materials and their characterization. The properties of both glasses and crystalline materials are related to physical origin. Electro-optic, elasto-optic, and magneto-optic properties and their interrelations are related to applications in technology including laser systems, displays, and spectroscopy.
Fall, 3 credits
ABCF grading

ESM 608 Seminar in Catalysis
Introduction to homogeneous and heterogeneous catalysis. Geometric factors in catalysis. The kinetics of heterogeneous catalysis. Electronic factors in catalysis: metals, semiconductors, and surface species. Preparation and properties of metal surfaces. Porosity. Typical industrial processes, e.g., Fischer-Tropsch, ammonia synthesis, ammonia oxidation, etc.
Fall, 3 credits
ABCF grading

ESM 610 Seminar in Reactions in Inorganic Solids
Crystal growth and the nature of defects in inorganic solids. Crystallography and nucleation phenomena in selected inorganic single crystals. Theories of isothermal decomposition kinetics. Measurement of decomposition rates. Radiation effects and nature of radiation damage in inorganic solids. Photodecomposition and the underlying theories of photolysis.
Fall, 3 credits
ABCF grading

ESM 612 Seminar in Advanced Thermodynamics of Solids
The fundamentals of the thermodynamics of irreversible processes are presented and the theory applied to thermal diffusion, thermoelectric transport, and other coupled processes in solids. Thermodynamics of multicomponent phase equilibria. Diffusion, oxidation, and other rate processes in ternary and higher-order systems.
Prerequisite: ESM 511
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 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.
3 credits, repetitive
S/U grading

ESM 697 Materials Science Colloquium
A weekly series of lectures and discussions by visitors, local faculty, and students presenting current research results.
1 credit, repetitive
S/U grading

ESM 698 Practicum in Teaching
3 credits, repetitive
S/U grading

ESM 699 Dissertation Research
Prerequisite: Advancement to candidacy
Variable and repetitive credit
S/U grading

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: Joann Debis, 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.

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 courses are given in the evenings and in the summer on a two-year cycle, each course being offered once every two 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 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, and Graduate Record Examination (GRE) General Test scores.

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 (600 for supported students) 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.

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.

Plohr, Bradley James, Ph.D., 1980, Princeton University: Applied mathematics; partial differential 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

Minsky, Yair, Ph.D., 1989, Princeton University: Low-dimensional geometry and topology.

Sutherland, Scott, *Director of Computing.*[2] Ph.D., 1989, Boston University: Dynamical systems; root-finding algorithms; computing.

Assistant 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.

Wunsch, Jared, Ph.D., 1998, Harvard University: Partial differential equations.

Yang, Tonghai, Ph.D., 1995, University of Maryland: Number theory; algebraic geometry; algebra and representation theory.

James H. Simons Instructors

Chen, Weimin, Ph.D., 1998, Michigan State University: Low-dimensional topology and geometry.

Comech, Andrew, Ph.D. 1997, Columbia University: Partial differential equations and real analysis.

Dowker, Ian, Ph.D., 2000, Harvard University: Gauge theory and complex geometry.

Gadgil, Siddartha, Ph.D., 1999, California Institute of Technology: Low dimensional topology.

Ksir, Amy, *VIGRE Fellow.* Ph.D., 1999, University of Pennsylvania: Algebraic geometry.

Matveyev, Rostislav, Ph.D., 1997, Michigan State University: Low-dimensional geometry and topology.

VIGRE Fellow

Tapp, Kristopher, Ph.D., 1999, University of Pennsylvania: Differential geometry.

Lecturer

Barcus, Alexandra, *Director of the Mathematics Learning Center.* Ph.D., 1991, Harvard University: Mathematics education.

Number of teaching, graduate, and research assistants, fall 1999: 56

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 518 Seminar in the Uses of Mathematics, MAT 519 Seminar in Mathematics Teaching; EST 565, Personal Computers in Learning Environments; and either EST 570, Design of Computer Courseware, or 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 518, and EST 565.

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 Analysis, MAT 550 Real Analysis I, 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. A detailed syllabus for this examination is available upon request. 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 two years 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

Core Courses For Teacher Option

MAT 511 Fundamental Concepts of Mathematics
The axiomatic method. The theory of sets. Introduction to mathematical logic. The construction of number systems. The philosophy of mathematics. Primarily for secondary schoolteachers of mathematics.
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.
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.
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.
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.
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 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
ABCF grading

Introductory Courses For Professional Option

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. Introduction to Lie groups and to the classical groups.
Spring, 3 credits
ABCF grading

MAT 534 Algebra I
Linear algebra: fields, vector spaces, dimension, bases, matrices, linear maps, determinants, canonical forms. Multilinear algebra: bilinear forms, Hermitian forms, spectral theorem, symmetric and tensor products, exterior products.
Fall, 3 credits
ABCF grading

MAT 535 Algebra II
Groups: normal subgroups, Jordan-Holder theorem, fundamental theorem of Abelian groups. Rings: ideals and homomorphisms, Euclidean rings, polynomial rings, unique factorization. Fields: transcendence, algebraic extensions, primitive elements, fundamental theorem of Galois theory, applications.
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, 3 credits
ABCF grading

MAT 544 Analysis
An introduction to the theory of ordinary and partial differential equations. Existence and uniqueness of solutions. Matrix methods. Power series methods. Fourier series and the Fourier transform. The heat equation. Laplace's equation and the wave equation. Harmonic functions.
Fall, 3 credits
ABCF grading

MAT 546 Differential Equations
Basic concepts in ordinary and partial differential equations. Existence, uniqueness, and stability theorems. Geometric theory of characteristics and the Froebenius theorem. Typical features of elliptic, hyperbolic, and parabolic equations.
Spring, 3 credits
ABCF grading

MAT 550 Real Analysis I
Lebesgue measure and integration, Radon-Nikodym theorem, Lebesgue-Stieltjes measures, Fubini and Tonelli theorems, classical Banach spaces.
Spring, 3 credits
ABCF grading

MAT 551 Real Analysis II
Banach space, Hilbert space, Hahn-Banach and uniform boundedness theorems, topics in topological vector spaces, distribution theory.
Fall, 3 credits
ABCF grading

MAT 552 Introduction to Lie Groups and Lie Algebras
Foundations of Lie groups and Lie algebras, classical groups and homogeneous spaces. Abstract Lie algebras. Basic representation theory of compact Lie groups.
Prerequisites: 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, 569 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, 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.
Prerequisite: MAT 531
Fall and spring, 3 credits each semester
ABCF grading

MAT 588 First-Year Seminar I
Workshop on basic graduate-level mathematics skills and knowledge. Skills include reading and writing proofs, solving problems, reading mathematics. Topics cover fundamental ideas and theories such as constructions of number systems, interchange of limits, the Euclidean algorithm, and the axiom of choice.
Fall, 3 credits
S/U grading

MAT 589 First-Year Seminar II
Same concept as MAT 588, but covers different materials.
Spring, 3 credits
S/U grading

MAT 590 Problem Seminar
Analyze problems and explore supplementary topics related to the core courses in the Professional M.A. Option. Focus on preparation for the doctoral comprehensive examination.
Fall and spring, 3 credits each semester, repetitive
S/U grading

MAT 598 Teaching Practicum
Seminar and workshop for new teaching assistants.
Fall, 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.

MAT 602, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 608, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 614, 615 Topics in Algebraic Geometry
Typical topics are drawn from varieties and schemes, algebraic curves, and their arithmetics.
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 620, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 626, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 632, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 638, 639 Topics in Real Analysis
Topics selected from functional analysis, harmonic analysis, Banach algebras, operator theory.
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

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

MAT 644, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 648, 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
Fall and spring, 3 credits each semester, repetitive
ABCF grading

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 and spring, 3 credits each semester, repetitive
S/U grading

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.

MAT 662, 663 Advanced Topics in Algebra
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 666, 667 Advanced Topics in Algebraic Topology
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 670, 671 Advanced Topics in Complex Analysis
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 674, 675 Advanced Topics in Differential Equations
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 678, 679 Advanced Topics in Real Analysis
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

MAT 682, 683 Advanced Topics in Differential Geometry
Prerequisite: Permission of instructor
Fall and spring, 3 credits each semester, repetitive
ABCF grading

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 and spring, 3 credits each semester, repetitive
S/U grading

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.

MAT 696 Mathematics Seminar
S/U grading

MAT 697 Mathematics Colloquium
S/U grading

MAT 698 Independent Study
S/U grading

MAT 699 Dissertation Research
S/U grading

Mechanical Engineering (MEC)

Chairperson: Fu-Pen Chiang, Light Engineering Building 105 (631) 632-8311
Graduate Program Director: Foluso Ladeinde, Light Engineering Building 107 (631) 632-8816
Graduate Secretary: Betty Kraebel, 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 mechanical design.

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 microsystems. 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 are studied with emphasis on mathematical modeling and simulation of deformation, failure, stability, and microstructural transformation. These issues span a wide range of interests, which 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 multicomponent 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 moire 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 ultrafast 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 study 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; moire and laser methods for stress analysis.

Harris, Stewart, Ph.D., 1965, Northwestern University: Brownian motion theory and its applications; epitaxial crystal growth.

Irvine, Thomas F., Jr., *Emeritus.* Ph.D., 1956, University of Minnesota: Measurement of thermophysical properties; rheological fluid mechanics; heat transfer.

Kincaid, John, Ph.D., 1974, Rockefeller University: Statistical mechanics and thermodynamics.

Kushner, Alan, Ph.D., 1976, University of Maryland: Solid and computational mechanics.

O'Brien, Edward E., *Emeritus.* Ph.D., 1960, Johns Hopkins University: Turbulent transport.

Prasad, Vishwanath, Ph.D., 1983, University of Delaware: Convective heat transfer; heat transfer in porous media; melting/solidification; crystal growth; thin film deposition; computational methods.

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.

Nakamura, Toshio, Ph.D., 1986, Brown University: Solid mechanics; composite materials; computational fracture mechanics.

Rastegar, Jahangir, Ph.D., 1976, Stanford University: Mechanical design.

Wang, Lin-Shu, Ph.D., 1966, University of California, Berkeley: Energy conversion; thermodynamics; combustion heat engines.

Visiting Associate Professor

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.

Assistant Professors

Alonso, Peralta, Ph.D. 1998 Arizona State University: Solid mechanics; thin film mechanics.

Bluestein, Daniel, Ph.D., 1992, Tel Aviv University, Israel: Fluid mechanics and biofluids.

Kukta, Robert V., Ph.D., 1998, Brown University: Solid mechanics; mechanics of thin films; micromechanical modeling of defects in crystals, crystal growth.

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.

Singh, Raman P., Ph.D., 1995, University of Rhode Island: Experimental solid mechanics; fracture mechanics; advanced and heterogeneous materials.

Zhang, Hui, Ph.D., 1994, Polytechnic University: micro-heat transfer; biothermal-fluid sciences; solidification; materials processing; computational methods.

Zheng, Lili, Ph.D. 1994, Cambridge University, England: Turbulence combustion; solidification; magnetohydrodynamics; two-phase flow.

Visiting Assistant Professor

Saad, Messiha, Ph.D., 1993, North Carolina State University: Internal combustion engines, emissions, and heat transfer.

Adjunct Faculty

Greene, G. Alanson, *Professor, Brookhaven National Laboratory.* Ph.D., 1980, University at Stony Brook: Heat transfer; hydrodynamics.

Kutt, Lembit M., *Associate Professor.* Ph.D., 1982, Columbia University: Nonlinear finite element analysis; composite material behavior.

Mayourian, Moez, *Assistant Professor.* Ph.D., 1985, Columbia University: Kinematics and dynamics.

Oman, Richard, *Professor.* Sc.D., 1959, Massachusetts Institute of Technology: Technology transfer; fluid mechanics.

Pak, Eugene, *Assistant Professor.* Ph.D., 1985, Stanford University: Theoretical and experimental research on fracture mechanics of piezoelectric ceramics.

Raghu, Surya, *Assistant Professor.* Ph.D., 1987, Yale University: Experimental fluid mechanics of combustion.

Affiliated Faculty

Cess, Robert D., *Distinguished Professor and Distinguished Service Professor, Marine Sciences Research Center.* Ph.D., 1959, University of Pittsburgh: Atmospheric sciences; climate modeling; greenhouse effect; nuclear winter theory.

Rubin, Clinton, *Director of Biomedical Engineering Program, Department of Orthopaedics.* Ph.D., 1983, University of Bristol: Biophysical regulation of tissue growth and repair; modeling *in vivo* skeletal strains.

Stell, George, *Department of Chemistry.* Ph.D., 1961, New York University: Molecular theory of the fluid state; ionic fluid structural properties; transport in multiphase systems.

Number of teaching, graduate, and research assistantships, fall 1999: 40

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 like 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 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 at the end of the first semester in our department and 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. Finally, faculty advisors must ensure that students select one Ph.D. committee member from their minor field.

F. Preliminary Oral Examination

The student must choose a dissertation topic in consultation with his/her doctoral dissertation advisor as soon as possible after passing the written qualifying examination. Within one year after passing the written qualifying examination, the student is required to submit a written dissertation proposal and present it in a preliminary oral examination conducted by an examination committee. The examination 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 written dissertation proposal must be distributed to the examination committee members at least two weeks before the examination.

The preliminary oral examination probes the doctoral student's ability to perform the dissertation research. The student will be examined on the proposed dissertation topic and its objective, the problem formulation, research approach, and knowledge in related areas. The majority of the examination committee must approve the student's performance in order for the student to be admitted to candidacy for the Ph.D. degree. The examination committee may grant provisional approval of the dissertation proposal subject to the completion of additional work.

G. 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.

H. Dissertation Research and Defense

Once the dissertation proposal is approved and the student is advanced to candidacy, the official recommendation for the appointment of the dissertation defense committee (normally, the same committee as the preliminary oral examination 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 defense 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 semester. The chairperson of the committee must submit a written report to the graduate program director on the student's progress after each review.

At the completion of the dissertation, the dissertation defense is scheduled and announced by the graduate program director. 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. Dissertation defenses are open to the faculty and graduate students. The final approval of the dissertation must be by a majority vote of the dissertation defense 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

MEC 501 Convective Heat Transfer

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

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.
Prerequisite: none
Fall
3 credits

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 condensation, cooling techniques, cooling at various packaging levels, thermal elastic effects, computations for electronic systems.
Prerequisite: none
Fall, alternate years
3 credits

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.
Prerequisite: none
Spring, alternate years
3 credits

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); selection 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
3 credits

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.
Prerequisite: none
Fall
3 credits

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
3 credits

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, 3 credits

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.
Prerequisite: none
Spring
3 credits

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.
Prerequisite: none
Fall
3 credits

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

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.
Prerequisite: none
Spring
3 credits

MEC 522 Thermal System Design
The central role of design in the epistemology of engineering. Device design and system design. Quantitative data for system design: operating characteristics of compressors, turbines, heat exchangers, piping systems, internal combustion engines, and other component equipment. Components matching and system simulation. Optimization; thermo-economic evaluation and optimization using energy analysis. Case studies: refrigeration and air conditioning systems; combined cycles; steam-injected gas turbines.
Prerequisite: none
Spring
3 credits

MEC 523 Internal Combustion Engines
Combustion fundamentals. Carnot cycle; reversible internal combustion engine cycle; introduction to practical internal combustion. engine cycles. Internal combustion piston engines; engine combustion and emission processes; engine operating characteristics. Gas turbine engines. Composite engines: turbocharging piston engines; gas generator engines; turbocompounding engines. Method of exhaust heat recovery for improvement of thermal efficiency. Method of intercooling-supercharging for thermal efficiency improvement.
Prerequisite: none
Fall, alternate years
3 credits

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.
Prerequisites: MEC 511, MEC 512
Spring, alternate years
3 credits

MEC 525 Mechanical Systems Design
The formulation of design problems frequently encountered in mechanical systems as optimization problems. Theory and application of methods of mathematical programming for the solution of optimum design problems. Procedures for attacking a new design problem, formulation of design concepts into analyzable models, applications of interactive computer software, and related topics will also be emphasized.
Prerequisite: Permission of instructor
Fall, alternate years
3 credits

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.
Prerequisite: Permission of instructor
Spring
3 credits

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.
Prerequisite: none
Fall
3 credits

MEC 537 Experimental Fluid Mechanics 1: Measurement Techniques
Fundamentals of measurements and instrumentation. Operating principles and performance characteristics of instruments for measurements of physical quantities such as velocity, pressure, and temperature. Introduction to hot-wire anemometry and laser-Doppler velocimetry along with current optical measuring techniques. Application of flow-visualization techniques to liquid and gas flows. Laboratory demonstrations.

Prerequisite: none
Spring, alternate years
3 credits

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.
Prerequisite: none
Spring, alternate years
3 credits

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.
Prerequisite: none
3 credits

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

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

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, alternate years
3 credits

MEC 554 Wave Propagation in Solids
(Formerly Vibration and Wave Propagation in Solids)
Lagrangian equations of motion for discrete systems. Solutions of problems with finite degrees of freedom, normal coordinates. Elastic wave propagation in infinite and bounded continuous media. Transient wave propagation using transform analysis. Asymptotic methods of integration.
Prerequisite: MEC 541
Fall, alternate years
3 credits

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.
Prerequisite: none
Spring, alternate years
3 credits

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, alternate years
3 credits

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.
Prerequisite: none
Fall
3 credits

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
Spring, alternate years
3 credits

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.
Prerequisite: none
Fall
3 credits

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

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, 3 credits

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
3 credits

MEC 579 Optomechanical Engineering
Optics and laser technologies play an increasingly important role today in mechanical engineering. The objective of this course is to train mechanical engineers in the fundamentals of optics and lasers and how optics and laser technologies can be used to solve various problems in the fields of solid mechanics, design and manufacturing, and thermal and fluid systems. Topics include fundamentals of optics and lasers, dimensional and surface metrology, machine vision, measurement of temperature, concentration and density, optical techniques for stress analysis and nondestructive testing, and laser material processing.
Fall
3 credits

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
3 credits

MEC 583 Computer-Integrated Manufacturing
Basic principles of computer-integrated manufacturing. The topics include an historical review, planning and design of products and processes, optimization of manufacturing and productivity, computer and data processing technologies, and elements of the production systems, and their interfacing.
Prerequisite: none
Spring
3 credits

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

MEC 599 Research
Research work toward a thesis in M.S.
Prerequisite: Advisor's permission
Variable and repetitive credit

MEC 630, 631, 632, 633, 634, 635, 636, 637 Special and Advanced 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 and specialized topics will be discussed, particularly those of current interest.
3 credits, repetitive

MEC 630 Special Topics in Fluid Mechanics

MEC 631 Special Topics in Heat Transfer

MEC 632 Special Topics in Statistical Mechanics

MEC 633 Special Topics in Thermodynamics

MEC 634 Advanced Topics in Kinematics and Dynamics of Machines

MEC 635 Advanced Topics in Nonlinear Dynamic Systems

MEC 636 Advanced Topics in Mechanical Vibration

MEC 637 Special Topics in Precision Engineering

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-integral, HRR-field, stability of crack growth, dynamic fracture, creep fracture, interface and three-dimensional cracks, and other topics associated with current engineering applications.
Prerequisite: MEC 541
Spring, alternate years
3 credits

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, alternate years
3 credits

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.
Prerequisite: none
Spring
3 credits

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 and repetitive credit

MEC 698 Practicum in Teaching
Every TA must register for the course.
0 credit, repetitive

MEC 699 Dissertation Research
Research work toward a Ph.D. thesis.
Prerequisite: Advisor's permission
Variable and repetitive credit

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

The School of Medicine consists of basic science and clinical departments that have the responsibility for preclinical and clinical instruction of students in all the schools of the Health Sciences Center as well as University-wide responsibility to students in other schools on the campus. Basic science departments include Anatomical Sciences, Biochemistry and Cell Biology, Molecular 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
University at Stony Brook
Stony Brook, NY 11794-8434
(631) 444-2113

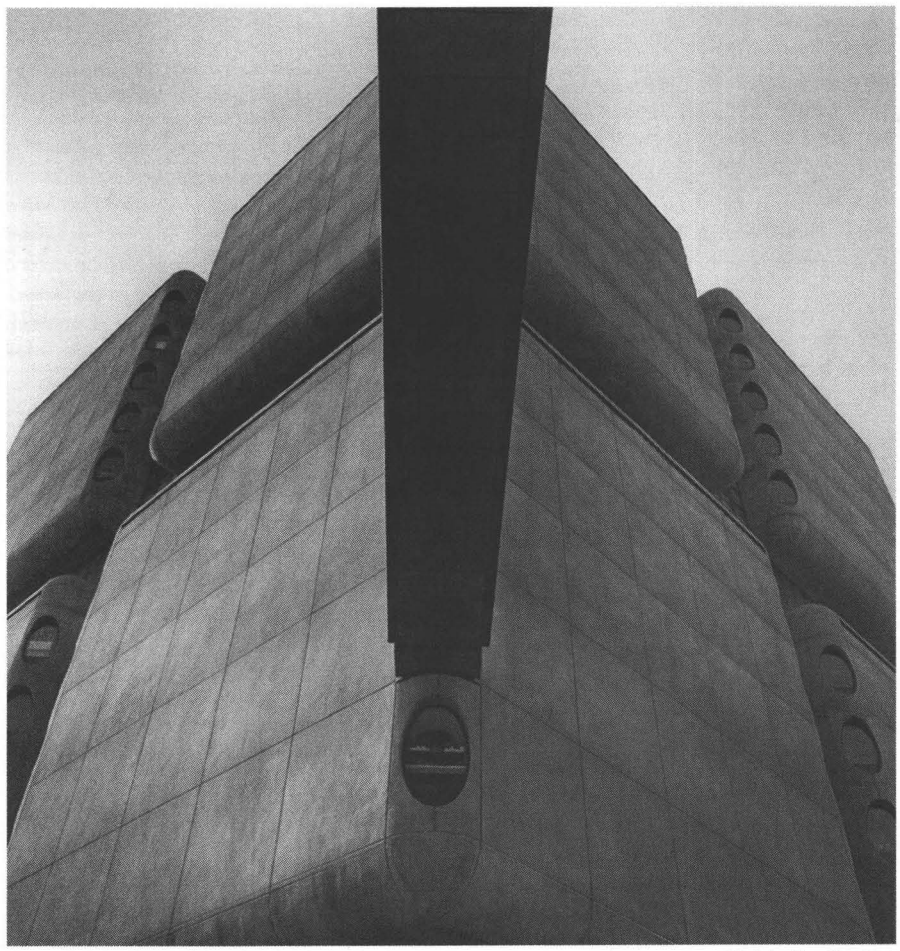


Photo by Tom Giacalone

Molecular Biology and Biochemistry (BMO)

Chairperson, Department of Biochemistry and Cell Biology: William J. Lennarz, Life Sciences Building 450 (631) 632-8550
Graduate Program Director: Nancy C. Reich, Health Sciences Center, Academic Tower B, L9, Room 183 (631) 444-7503
Senior Staff Assistant: Janet Koenig, Life Sciences Building 350 (631) 632-8533

Degree awarded: Ph.D. in Molecular Biology and Biochemistry

The Molecular Biology and Biochemistry Graduate Program is part of a larger, "umbrella" program, the Graduate Program in Molecular and Cellular Biology, which also includes Cellular and Developmental Biology and Immunology and Pathology. A student may choose the Molecular Biology and Biochemistry Program upon applying or at the end of the first year. The goal of this approach is to provide the student with the widest range of research possibilities.

The Graduate Program in Molecular Biology and Biochemistry offers a full graduate program leading to the Ph.D. degree. The course of study is designed to prepare the student to formulate and attack biological problems at the molecular and cellular levels. Training is offered in a broad range of research areas, including the biosynthesis of proteins and nucleic acids, the molecular and cellular basis of gene expression, metabolic control mechanisms, molecular genetics, the chemical basis of enzyme action, the physical biochemistry of macromolecules, the structure and function of proteins, membrane biochemistry, and contractile systems and ultrastructure.

The faculty of the program is drawn from several departments: members of the Department of Biochemistry and Cell Biology as well as members from other basic sciences and clinical science departments at Stony Brook, Brookhaven National Laboratory, and Cold Spring Harbor Laboratory. There is extensive cooperative interaction between faculty and students in various graduate programs.

Facilities

A full range of state-of-the-art facilities and equipment is available for research in molecular biology and biochemistry.

Admission

Graduate Studies in Molecular Biology and Biochemistry requires the following in addition to the Graduate School admission requirements:

A. A bachelor's degree with the following minimal preparation: mathematics through one year of calculus; chemistry, including organic chemistry 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 Molecular Biology and by the Graduate School.

In special cases, students not meeting all of the requirements listed in item A may be admitted, but such deficiencies must immediately be remedied.

Faculty

Professors

Bar-Sagi, Dafna[2], Ph.D., 1984, University at Stony Brook: *Ras* proteins in proliferation and transformation.

Benach, Jorge L.[2], Ph.D., 1972, Rutgers University: Pathogenesis of spirochetal infections; utilization of host macromolecules.

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.

Freundlich, Martin[1], Ph.D., 1961, University of Minnesota: Regulation of bacterial gene expression by interactive elements.

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[5,8], D.V.M./D.Sc., 1974, University of Paris, France: Biochemistry; function of the complement system.

Grollman, Arthur, P.[4], M.D., 1959, The 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, University at Stony Brook: 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.[1,2,5], Ph.D., 1975, University at Stony Brook: 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.

Schechter, Nisson[1,7], 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.

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.

Bingham, Paul M.[1], Ph.D., 1979, Harvard University: Genetic control of development and gene expression in animals.

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.

Hollingsworth, Nancy[1], Ph.D., 1988, University of Washington, Seattle: Chromosome structure and function during meiosis in yeast.

Kew, Richard R.[5], Ph.D, 1986, University at Stony Brook: 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, W. Todd[6], Ph.D., 1989, Rockefeller University: Tyrosine phosphorylation and signal transduction.

Moll, Ute M.[6], M.D., 1985, Ulm, Germany: The p53 tumor suppressor gene family: Function/regulation in normal cells and tumor-associated inactivation.

Morris, Andrew J.[4], Ph.D., 1988, University of Birmingham, England: Phospholipids and cellular signaling.

Prives, Joav[4], Ph.D., 1968, McGill University, Canada: Cytoskeletal membrane interactions in muscle cell.

Raleigh, Daniel P.[9], Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and amyloid formation.

Reich, Nancy, *Graduate Program Director.*[6] Ph.D., 1983, University at Stony Brook: 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.

Scarlata, Suzanne[6], Ph.D., 1984, University of Illinois: Structure /oligomerization of membrane proteins.

Spector, Ilan[6], Ph.D., 1967, University of Paris, France: Neuronal differentiation and microfilaments.

Spitzer, Eric D.[5], M.D./Ph.D., 1985, The 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

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.

Garlick, Jonathan[10], D.D.S., 1985, Ph.D.; 1993, University at Stony Brook: Oral and epidermal carcinogenesis/cancer gene therapy.

Kernan, Maurice[3], Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

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, The 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.

Rebecchi, Mario J.[8], Ph.D., 1984, New York University: Phospholipases and signal transduction.

Schindelin, Hermann[1], Ph.D., 1994, Free University, Berlin, Germany: Structure and function of metalloenzymes and enzymes involved in metallo-cofactor biosynthesis; protein crystallography.

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-The State University: Structure/function of bacteriophage T7 RNA polymerase.

Hannon, Gregory, *Assistant 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.

Hengartner, Michael O., *Associate Professor.*[15] Ph.D., 1994, Massachusetts Institute of Technology: *C. elegans* developmental genetics-apoptosis; neurobiology.

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 in fish.

Spector, David L., *Professor.*[15] Ph.D., 1980, Rutgers-The State 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., *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, 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.

1) Department of Biochemistry and Cell Biology

2) Department of Molecular Genetics and 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

15) Cold Spring Harbor Laboratory

Degree Requirements

Requirements for the M.A. Degree

The Graduate Program in Molecular Biology and Biochemistry normally 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.A. degree upon completing an approved course of study, including a minimum of 30 graduate credit hours with an overall 3.0 grade point average, passing a comprehensive examination, submitting and defending a master's thesis, and fulfilling the minimum requirements of the Graduate School.

Requirements for the Ph.D. Degree

A. Course Requirements

Core courses:

1. Graduate Biochemistry I (BMO 520)

2. Molecular Genetics (BMO 503/HBM 503)

3. Physical Biochemistry (BMO 512)

4. Experimental Biochemistry (BMO 509, 510), a two-semester course in which the student spends a half semester in each of four different faculty laboratories actively participating in the research work of the laboratory

5. Cell Biology (BCD 656)

6. One elective course in molecular biology or a related field

7. Enrollment every semester in three seminar courses: Colloquium in Molecular Biology (BMO 601, 602), which is a series of invited lectures by visiting scientists from other institutions; Student Seminar (BMO 603, 604), in which each student presents a talk on a topic from the current literature; and Molecular Biology Workshop (BMO 605, 606), in which faculty members, postdoctoral fellows, and advanced students present informal progress reports on their current research activities.

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 one proposition. The student proposes an original mechanism or theory that could serve to explain a biological phenomenon in molecular terms, and devises hypothetical experiments designed to test the proposal. The proposition may be in any area of molecular biology, including the probable area of the Ph.D. dissertation. The student presents a detailed write-up of the background and logic of the proposition and the experiments proposed 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. 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.

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

BMO 500 Directed Readings in Molecular Biology
Directed readings in topics of current interest, under supervision of a faculty sponsor and culminating in one or more critical review papers.
Prerequisite: Sponsor's approval
Yearly, 1-3 credits
ABCF grading

BMO 503/HBM 503 Molecular Genetics
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. Crosslisted with HBM 503.
Prerequisite: Permission of instructor
Fall, 3 credits
ABCF grading

BMO 506 Glycobiology: The Role of Glycoproteins in Biology and Disease
A seminar course in which the recent literature dealing with the role of glycoproteins and other types of glycoconjugates in biology and disease are discussed. Students are required to present and discuss recent research publications in selected topics dealing with glycobiology.
Prerequisite: Permission of instructor
Spring, alternate years, 2 credits
ABCF grading

BMO 509, 510 Experimental Biochemistry
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, minimum 2 credits each semester, variable
ABCF grading

BMO 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: BMO 520; CHE 301 or 312
Spring, 2 credits
ABCF grading

BMO 517 Biomembranes
Examines the molecular architecture of membranes; the organization, functions, and assembly of lipids and proteins in biological membranes.
Prerequisite: Undergraduate biochemistry and permission of instructor
Fall, 1 credit
ABCF grading

BMO 520 Graduate Biochemistry
Several topics in modern biochemistry are treated at an advanced level. Topics covered include protein structure, methods of peptide and protein analysis, and purification, enzyme kinetics and mechanisms, and enzyme regulation.
Prerequisite: HBC 331
Fall, 3 credits
ABCF grading

BMO 546 Human Diseases; Mechanisms and Therapy
Human diseases will be studied at biochemical and molecular cell lines. Aspects of mechanism will be considered with particular attention to pathogenesis and therapeutic intervention.
Prerequisite: BMO 520 or BMO 503 and/or consent of course director
Spring, 3 credits
ABCF grading

BMO 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.
Fall and spring, 1 credit
S/U grading

BMO 599 Research
Original investigation undertaken with the supervision of a faculty member.
Fall and spring, credit to be arranged
S/U grading

BMO 601, 602 Colloquium in Molecular Biology
A weekly series of talks and discussions by visiting scientists in which current research and thinking in various aspects of molecular and cellular biology will be presented. This course is required of all students every semester in which they are registered in the Graduate Program in Molecular Biology and Biochemistry, and attendance is mandatory. Visitors are welcome.
Fall and spring, 1 credit each semester
S/U grading

BMO 603, 604 Student Seminar in Molecular 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 Molecular Biology and Biochemistry. Attendance is mandatory. Visitors are welcome.
Fall and spring, 1 credit each semester

BMO 605, 606 Molecular Biology Workshop
Progress reports given each week by members of the faculty, postdoctoral fellows, and advanced graduate students on their current research. This course is required of all students every semester in which they are registered in the Graduate Program in Molecular Biology and Biochemistry, and attendance is mandatory. Visitors are welcome.
Fall and spring, 1 credit each semester
S/U grading

BMO 685-688 Advanced Seminars
Topics to be arranged. Visitors are welcome.
Fall and spring, 1 credit each semester
S/U grading

BMO 699 Dissertation Research
Original investigations undertaken as part of the Ph.D. program under supervision of a research committee.
Prerequisite: Advancement to candidacy
Fall and spring, credit to be arranged
S/U grading

BMO 800 Summer Research
Summer, 0 credits
S/U grading

Molecular Microbiology (HBM)

Acting Chairperson: Michael Hayman, Life Sciences Building 234A (631) 632-8792
Graduate Program Director: Patrick Hearing, Life Sciences Building 260 (631) 632-8813
Staff Assistant: Pam Sims, Life Sciences Building 130 (631) 632-8812

Degree awarded: Ph.D. in Molecular Microbiology

Graduate study in Molecular Microbiology, within the Health Sciences Center, offers a diversified course of study leading to the Ph.D. degree. The major areas of study are viral and cellular oncology, signal transduction, regulation of gene expression and DNA replication, cell biology, molecular mechanisms of bacterial and viral pathogenesis, and nucleic acid/protein structure and interactions.

Studies are directed toward an understanding of cell biology, molecular genetics, and microbial pathogenesis as well as 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 one-half floors of the Life Sciences Building. Approximately 30,000 square feet of research space are available, including 32 research laboratory modules of 550 square feet each. Each research module 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, oligonucleotide and peptide synthesis facility, glassware washing facility, analytical equipment lab, protein and nucleic acid sequencing lab, environmental rooms, electron microscope, darkrooms, computer facility, animal care facility, and fermentor facility. Major items of equipment are organized into these central facilities, which are readily available to trainees. The Centers for Molecular Medicine, a new state of the art research and teaching facility, serves as a physical and intellectual bridge between investigators in the adjacent Life Sciences Building and the nearby University Health Sciences Center. The world-renowned research facilities at the Cold Spring Harbor and the Brookhaven National Laboratories are available to members of the department. The Health Sciences Library and Barry S. Coller Learning Center, located in the Health Sciences Center, contains collections of biological and medical books and journals presently totaling 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 the University at Stony Brook 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.

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 $18,500 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

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.

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

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, *Graduate Program Director.* 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.

Marcu, Kenneth[5], Ph.D., 1975, University at Stony Brook: 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

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

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

Konopka, James B., Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Assistant Professors

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

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

Mackow, Erich R.[4], Ph.D., 1984, Temple University: Rotavirus molecular genetics; determinants of viral neutralization and pathogenesis; reverse genetics; recombinant vectors and mucosal immunity; biochemistry of cell fusion.

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: Protein synthesis; molecular biology of adenovirus; protein phosphorylation.

Dunn, John J., *Professor.*[1] Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Grodzicker, Terri, *Associate Professor.*[2] Ph.D., 1969, Columbia University: Genetics of DNA tumor viruses; genetic analysis of viral regulatory functions; analysis of adenoviral vectors.

Herr, Winship, *Professor.*[2] Ph.D., 1982, Harvard University: Transcriptional control mechanisms in mammalian cells.

Matkovic, Christopher S., *Assistant Professor.*[4] M.D., 1974, Columbia University; Ph.D., 1972, Harvard University: Clinical infectious disease.

Roy, Craig, *Assistant Professor.*[7] Ph.D., 1991, Stanford University: Molecular biology of Legionella.

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, University at Stony Brook: Papilloma viruses; cell-virus interactions; viral transformation.

Stillman, Bruce W., *Professor.*[2] Ph.D., 1979, Australian National University: Mechanism of DNA replication, particularly adenovirus, SV40, and yeast.

Studier, F. William, *Professor.*[1] Ph.D., 1963, Caltech: Genetics and physiology of bacteriophage T7.

Research Faculty

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.

Hengartner, Michael, *Associate Professor.*[2] Ph.D., 1994, Massachusetts Institute of Technology: Apoptosis in *c. elegans*; learning and memory.

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.

Luff, Benjamin, *Professor.* M.D., 1976, Albert Einstein Medical College: Pathobiology of *Borellia* and toxoplasma.

Mackow, Erich R., *Assistant Professor.*[4] Ph.D., 1984, Temple University: Rotavirus molecular genetics.

Reich, Nancy, *Associate Professor.*[6] Ph.D., 1983, University at Stony Brook: 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.* M.D., Ph.D., 1985, Johns Hopkins University: Molecular biology of microbial pathogens.

Steigbigel, Roy, *Professor.* M.D., 1966, University of Rochester School of Medicine: Treatment of HIV infection.

Tonge, Peter J., *Assistant Professor.* 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.

Wigler, Michael, *Professor.*[2] Ph.D., 1978, Columbia University: Signal transduction and growth control eukaryotes.

Number of teaching, graduate, and research assistants, fall 2000: 32

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) Yale University

8) Department of Biochemistry and Cell Biology

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 two-day 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

Graduate Biochemistry I

Molecular Genetics

Experimental Microbiology (lab rotations)*

Microbiology Seminar

Readings in Microbiology Literature

Biomembranes

Spring

Graduate Genetics

Biology of Cancer (alternate years)

Cell Biology

Experimental Microbiology (lab rotations)*

Microbiology Seminar

Teaching Assistantship

**Students rotate through two 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

Microbial Pathogenesis

Immunology

Graduate Research

Microbiology Seminar

Readings in Microbiology Literature

Teaching Assistantship

Spring

Biology of Cancer (alternate years)

Graduate Research

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 (similar to an NIH grant proposal), 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

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. Crosslisted with BMO 503.
Prerequisite: Permission of instructor
Fall, 3 credits
ABCF grading

HBM 509, 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
Fall and spring, 1-8 credits each semester
S/U grading

HBM 511 Biophysics of Macromolecules
Introduces the chemical principles and techniques needed for the study of biological macromolecules. Topics covered include solution chemistry, chemical thermodynamics, binding and disassociation equilibria, denaturation phenomena, spectroscopy, and hydrodynamics. This course is intended to prepare non-chemistry majors for more advanced work in biophysics.
Prerequisites: Permission of instructor; course background in calculus, general chemistry, physics, and biochemistry
Fall, even years, 3 credits
ABCF grading

HBM 522 Biology of Cancer
A short course with the emphasis on cancer as a disease of man. Lectures address human cancer as seen by the clinician and as basic research relates to human disease. This course provides students with a link between courses in cell and molecular biology and the application of this basic information to tumor management.
Spring, even years, 1 credit
ABCF grading

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 modules, 1-4 credits per module
ABCF grading

HBM 599 Graduate Research
Original investigations under faculty supervision.
Prerequisite: Permission of instructor
Fall and spring, 1-9 credits each semester
ABCF grading

HBM 640 Molecular Mechanisms of Microbial Pathogenesis
This course covers the molecular mechanisms of pathogenesis of a selected group of very important viral and bacterial pathogens. While much of the course is taught by MGM faculty, a significant portion of the material is presented by invited lecturers who are leaders in their fields. Rather than present a "bug parade," the course focuses on principles of microbial pathogenesis as illustrated by the best understood viral and bacterial pathogens. This course is directed to graduate students, post-doctorate and medical fellows, and advanced medical students who are contemplating careers in Infectious Disease Research.

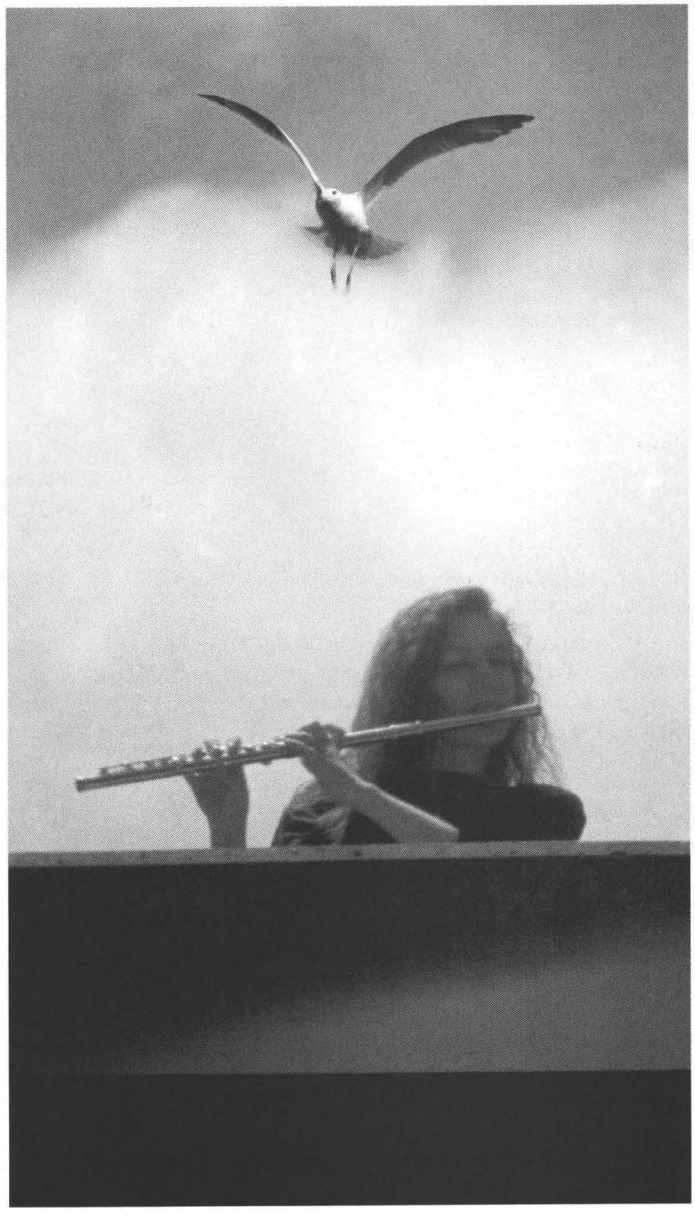
Prerequisites: HBM/BMO 503 and BMO 520
Fall, odd years, 3 credits
ABCF grading

HBM 690 Microbiology Seminar
A weekly meeting devoted to current work in the department. Enrolled students present seminars each week throughout the semester.
Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester, repetitive
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

HBM 699 Dissertation Research in Microbiology
For the student who has been advanced to candidacy. Original research will be under the supervision of the thesis advisor and advisory committee.
Prerequisite: Permission of dissertation advisor
Fall and spring, 1-9 credits
ABCF grading

HBM 800 Full-Time Summer Research
Full-time laboratory research projects supervised by faculty members.
Prerequisites: Permission of instructor and full-time graduate student status
Summer, no credit
S/U grading



Music (MUS)

Chairperson: Judith Lochhead, Staller Center 3310 (631) 632-7330
Graduate Program Director: Peter Winkler, Staller Center 3307 (631) 632-7330
Graduate Secretary: Joan Vogelle, 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 in music 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. A special emphasis in each of these programs 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. Opportunity for advanced work in more than one area is innate to the design of the programs at the doctoral level. For students at that level who propose to do serious work both in performance and in some other area, the decision to pursue either 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, 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 century 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 organizations for students in the M.M. and D.M.A. programs include Collegium Musicum, Chamber Music, Camerata Singers, Stony Brook Symphony Orchestra, and Opera Workshop, an interdisciplinary course given together with the Theatre Arts Department.

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. The music library contains an extensive research collection of books, periodicals, scores, microfilms, and recordings, and includes an excellent listening facility.

The department also has a collection of early instruments, including several harpsichords and organs, a consort of viols, and some Renaissance wind instruments.

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. 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 tapes.

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 free two-part counterpoint in either 16th-century or 18th-century style, according to the student's choice
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 undergraduate or graduate 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 taped audition. Audition dates, usually designated for February, are announced by the department each fall. Applicants should contact their prospective major teachers regarding suitable repertory for auditions. The audition in harpsichord will include continuo realization.

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

E. Scores of the Graduate Record Examination (GRE) General Test.

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

Entering students, except those in conducting, will be examined in ear training during the week before the beginning of classes, and will be placed in the appropriate courses. For conducting students the ear training examination is part of the audition.

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. Current audition schedules are available on request from the department. 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 examples of their work in music history or music theory. One or two essays completed as coursework in either area would be appropriate. Other evidence of such work—exercises in composition or analysis, for example—would be welcome as well.

Students who do not possess a Master of Music degree from Stony Brook must demonstrate a level of achievement in ear training commensurate with MUS 506, and demonstrate preparation in music history and theory commensurate with the M.M. requirements. Students in voice who do not possess a Master of Music degree from Stony Brook must satisfy the ear training, piano proficiency, and foreign language requirements of the Stony Brook M.M. degree in voice.

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 February 1 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, 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.M. 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 February 1 for fall admission. The application should be accompanied by 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 master's comprehensive examination.

Entering students who have not already done so must successfully complete the appropriate advisory examination 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

Eddy, Timothy, *Member, Orion String Quartet.* M.Mus., 1970, Manhattan School of Music; pupil of Bernard Greenhouse: Cello; cello repertory; chamber music.

Fuller, Sarah[2], Ph.D., 1969, University of California, Berkeley: Medieval and Renaissance music; history of music theory.

Gosman, Lazar, Diploma, 1949, Moscow State Conservatory, Russia; pupil of David Oistrakh: Violin; orchestral conducting.

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

Lawton, David, Ph.D., 1973, University of California, Berkeley: Orchestral and opera conducting; 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, University at Stony Brook: 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.

Stern, Mitchell, B.Mus., 1978, Curtis Institute of Music; pupil of Dorothy DeLay and Ivan Galamian: Violin; viola, chamber music.

Winkler, Peter, *Graduate Program Director.*[1] M.F.A., 1967, Princeton University: Composition; theory and history of popular music.

Associate Professors

Auner, Joseph, 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.

Goldstein, Perry, *Coordinator of Musicianship.*[4] Ph.D., 1986, Columbia University: Theory.

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

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

Assistant Professor

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

Lecturer

Faulk, Daniel, *Director of the Jazz Program.* M.A., 1998 Rutgers University: Jazz history; theory and performance; director of jazz ensembles.

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

Performing Artists in Residence

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

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

Cross, Richard, A.B., Cornell University: Voice; opera workshop.

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

DesRoches, Raymond, M.Mus., 1961, Manhattan School of Music: Percussion; percussion ensemble.

Goldburn, Dennis, 1970, Hartt College of Music: Bassoon, chamber music.

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

Levine, Julius, *Coordinator of Chamber Music.* B.S., 1947, Julliard School of Music: Chamber music.

Neidich, Charles, B.A., 1975, Yale University; pupil of Leon Russianoff: Clarinet; 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.

Radcliff, Susan, D.M.A., 1998, University at Stony Brook: Trumpet, chamber music.

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

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

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

Directors

Burns, Miriam, *Director of the University Orchestra.* M.M., 1989, Mannes College of Music: Conducting.

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

Meier, Gustav, *Director of the Stony Brook Symphony Orchestra.* Diploma (graduate), 1953, Zurich Conservatory of Music, Switzerland: Conducting.

Number of teaching, graduate, and research assistants, fall 2000: 67

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

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

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

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

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 spring 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 program 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 Music Department's foreign language exam during their first semester of residence. Students who fail the examination must take an appropriate language course or demonstrate evidence of comparable formal preparation (such as private tutoring) before retaking the examination.*

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. The German examination must be taken at the beginning of the first semester of study. Both examinations must have been taken by the end of the second semester.

C. Comprehensive Examinations

Written and oral examinations in the history of music and in the analysis of preassigned compositions.

D. Research Paper

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

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

5. MUS 523 Advanced Composition, to be taken every semester of residence.

B. Comprehensive Examination

Written examination in the analysis of preassigned 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). If advanced undergraduate courses (MUS 432-478) are used to satisfy the requirement, the credit earned will not count toward the 30 graduate credits required for the degree. 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 special circumstances a student may petition to have this requirement waived on a per-concert basis; a memorandum outlining policies and procedures for such a waiver is available from the Music Department's Graduate Office. Students in voice are required to enroll in MUS 566, Camerata Singers, or MUS 579, Opera Workshop, for two semesters. This requirement may be waived at the request of either the conductor or the major teacher. Participation in the accompaniment pool is required of all pianists and harpsichordists during each semester of full-time residence. Students in harpsichord are expected to participate in the Colloquium Musiciam for two semesters. All students except those in the conducting programs must be enrolled in MUS 571 during each semester of full-time residence.

If a course in a department other than Music is taken toward the degree, approval from the graduate program 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

These are offered each semester.

1. Students must take one jury examination during each academic year.

2. Students must take and pass the jury examination in the semester prior to the one in which the degree recital is given.

3. 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 do not pass the exam may satisfy the requirement by

taking the equivalent of FRN or GER 112 and achieving a grade of B or higher. 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. Public Recital

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 tape 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 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 program 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 after two years of full-time residence.

A. Work in the Student's Area of Specialization

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

B. Essays

Two papers, one on an analytical topic and one on a historical topic, are required. These essays may be on performance-oriented subjects. A paper written for a graduate seminar or proseminar will serve as the basis for each doctoral essay. The student must then enroll in MUS 695, Doctoral Essay Tutorial, to develop and revise each essay. The revision of each essay must be provisionally approved by the course instructor and the student's directing committee no later than one year after the end of the semester in which the course was taken.

C. Public Lecture-Recital

A colloquium illustrated by live performance: The lecture 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, in a semester prior to the one in which the lecture-recital is given.

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

Either a substantial portion of one of the recitals, described above in section C, or the lecture-recital, section B, must be devoted to 20th-century music.

E. Foreign Language

A reading knowledge of French, German, or Italian is required. Students in harpsichord must read any two of the following languages: French, German, or Italian. Students in voice must pass the Music Department's reading examinations in any two of the following languages: Italian, French, German, or Russian, and must demonstrate singing competence in Italian, French, and German as part of the Doctoral Jury Examination.

Instrumentalists and conductors: Instrumentalists and conductors entering the D.M.A. program with some prior language background must take the Music Department's foreign language examination at the beginning of their first semester of study. Students who pass the examination will have satisfied the requirement for the language in question. Students who do not pass the examination have two options for satisfying the requirement:

1. After additional study, they may retake the exam in the following semester. Students who pass the exam on the second try will have satisfied the requirement for the language in question. Those who fail the exam a second time must use option 2:

2. They may take a placement exam given by the appropriate language department and complete the recommended coursework with a grade of B or higher. The level of proficiency expected is the equivalent of a year of college-level elementary language courses. Appropriate Stony Brook courses are FRN 111-112, GER 111-112, or ITL 111-112. Instrumentalists who elect to satisfy the requirement by taking appropriate courses and achieving a grade of B or better are not required to retake the Music Department foreign language exam.

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. Students may take these courses in preparation for the Music Department's foreign language exam, but then they must take and pass the exam to satisfy the requirement.

Vocalists: 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. Students entering the D.M.A. program in voice are expected to have a basic proficiency equivalent to the Stony Brook M.M. requirement of one year each of college-level Italian, French, and German. If any one of these proficiencies is lacking, the student must fulfill this requirement and must enroll in elementary courses in the appropriate language(s) during the first year of study. New D.M.A. students in voice should take the Music Department's foreign language examinations in any languages previously studied at the beginning of the first semester of study. Students who pass the examination will have satisfied the requirements in that language. Students who do not pass the examination must take appropriate elementary language courses, and must retake and pass the Music

Department examination at a later date in order to satisfy the requirement. Students who fail the exam a second time will be required to take further coursework before retaking the examination.

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.

International students, except those in the D.M.A. programs in harpsichord and voice, whose native language is not English may satisfy the language requirement by demonstrating proficiency in English as a second language. Students should consult with the graduate director about this option.

The contract toward candidacy may specify further language proficiency depending upon the proposed plan of study.

F. Teaching

A minimum of two semester-long courses, either or both of which may comprise individual lessons, ensemble coaching, or classroom teaching, is required.

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

H. 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.

I. Doctoral Jury Examinations

One jury will be played at the end of 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.

J. First-Year Academic Review

In order to be in good standing, D.M.A. students must have taken one of the two academic courses required (History or Theory) by the end of the first year of the program, and must have taken the foreign language proficiency exam 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.

K. 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 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 (see Requirement B).

3. Completion of Requirements C through I.

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

L. Completion of the Doctoral Contract

The Doctoral Contract will be completed after presentation of the fourth public recital (see Requirement A) and approval of the final form of both doctoral essays by the course instructor and the student's directing committee (see Requirement B).

M. 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. The program must not include works previously performed to satisfy other graduate degree requirements.

2. Submit a doctoral examination prospectus that focuses on significant features 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.

N. Doctoral Degree Recital

The doctoral degree recital may be performed after the degree recital examination has been passed. It must demonstrate a distinguished, professional level of performance. A recording of this recital, along with the program and the doctoral examination prospectus, is to be 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 that is appropriate. Final approval of the contract, and of any revisions that may be necessary, rests with the graduate program 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 be completed within one or two 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 public lecture or 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 20th-century music. See section B, paragraph 2 below.

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

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

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

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

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

In order to satisfy the requirement, composers must complete both the essay and the lecture or colloquium. Historians and theorists 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 language proficiency depending on the area of the dissertation.

D. Teaching

A minimum of two semester-long courses, 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, normally the area of the dissertation.

F. Dissertation

The dissertation shall be a significant original work of scholarship or composition. Approval of the dissertation in scholarship will rest upon a formal oral defense to be conducted by the dissertation committee. Approval of the dissertation in composition rests with the dissertation committee. The composer will present a public colloquium on the dissertation work(s).

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 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 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 comprehend single compositional tendencies in Western music. Recent topics have included Mozart's operas, Goethe's Faust and the symphonic tradition, Bach cantatas, Beethoven sonatas, and introduction to popular music studies.
Fall and spring, 3 credits each semester
(See note following MUS 509)
ABCF grading

MUS 508 Studies in Composition and Theory
Study of contemporary compositional techniques or of traditional writing styles, including both analysis and exercises in writing. Various specific topics offered each semester.
Fall and spring, 1-3 credits, variable
(See note following MUS 509)
ABCF grading

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.
Prerequisite: Audition
Fall and spring, 1-3 credits
ABCF grading

Note: Not more than eight credits of MUS 507, 508, and 509 combined may be counted toward the degree.

MUS 510 18th-Century Counterpoint
A study of the art of combining voices under the conditions of tonal harmony through written exercises in the style of J.S. Bach.
Spring, 3 credits
ABCF grading

MUS 511 Compositional Techniques of the 20th Century
A study, by practical exercises in writing, of some of the important techniques of the present century in organization or non-organization of pitch, rhythm, line, motive, and form.
Fall, 3 credits
ABCF grading

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 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 and literature of the field.
Spring, 3 credits
ABCF grading

MUS 518 Advanced Projects in Computer Music
Advanced projects, individual or collaborative, in computer music. The course may be repeated. Projects must be approved by instructor before students register.
Spring, 1-3 credits
ABCF grading

MUS 523 Advanced Composition
Individual projects for graduate students in composition.
Fall and spring, 2-6 credits each semester
ABCF grading

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.
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.
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.
3 credits
ABCF grading

Special Topics Courses

Topics to be chosen each time a course is offered will depend upon the needs of the students and the interests 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.
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.
3 credits
ABCF grading

MUS 545 Topics in Renaissance Music
Historical, analytical, and critical issues related to Renaissance music. Recent topics have included early 15th-century song repertories, the boundaries of the Renaissance, and the works of Ockeghem.
3 credits
ABCF grading

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.
3 credits
ABCF grading

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.
3 credits
ABCF grading

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.
3 credits
ABCF grading

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.
3 credits
ABCF grading

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 posttonal and 12-tone music; and theories of timbre and texture.
Fall or Spring, 3 credits
ABCF grading

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.
3 credits
ABCF grading

MUS 560 Score Reading
Intensive drill in score reading. Singing, composing, and playing in open score with movable clefs. Students must have basic proficiency at the keyboard. Limited to eight students. Priority given to students in the conducting program.
3 credits
ABCF grading

MUS 561 Orchestral Conducting
Advanced training in the preparation and conducting of orchestral scores from the standard repertory. Students study the works in a seminar and then conduct them in regular supervised readings with the Stony Brook Symphony Orchestra. Open only to students in the graduate conducting programs.
Fall and spring, 3 credits each semester
ABCF grading

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 each semester
ABCF grading

MUS 564 Advanced Choral Conducting B
Advanced training in preparing and conducting choral works. Not open to students enrolled in the graduate conducting programs.
Fall and spring, 3 credits each semester
ABCF grading

MUS 565 Stony Brook Symphony Orchestra
Study and performance of orchestral works from the baroque period to the present. Weekly readings of important works from the standard repertory.
Fall and spring, 1-2 credits, variable
ABCF grading

MUS 566 Camerata Singers
Study and performance of choral works for chamber chorus from all periods of music history. May be repeated.
Fall and spring, 1 credit each semester
ABCF grading

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.
1-2 credits, variable
ABCF grading

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 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 each semester
ABCF grading

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 a weekly coaching session, at least three hours per week of uncoached rehearsal, and at least one performance per semester
Fall and spring, 1-2 credits, variable
ABCF grading

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, variable
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, variable
ABCF grading

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, variable
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.
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 each semester
ABCF grading

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 or spring, 2 credits
ABCF grading

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 each semester
S/U grading

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

MUS 593 Practicum in Performance
Individual instruction and/or coaching for professional performing experience.
Fall and spring, 1 credit
S/U grading

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 each semester
ABCF grading

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 each semester, repetitive
ABCF grading

MUS 599 Independent Studies
Individual studies under the guidance of a faculty member. Each student must submit to the graduate program 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 program 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).
Fall and spring, variable credit
ABCF grading

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 the equivalent
Fall and spring, 3 credits each semester
ABCF grading

MUS 623 Directed Study in Composition
Intended for doctoral students in composition.
Fall and spring, 1-12 credits each semester, repetitive
ABCF grading

MUS 661 Directed Study in Conducting
Intended for doctoral students in conducting.
Fall and spring, 1-12 credits each semester, repetitive
ABCF grading

MUS 671 Directed Study in Instrumental and Vocal Performance
Intended for doctoral students in instrumental and vocal performance.
Fall and spring, 1-12 credits each semester, repetitive
ABCF grading

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 a graduate seminar or proseminar with a grade of "B" or better, in which they have written a paper that can be developed into a doctoral essay.
Prerequisite: A graduate seminar or proseminar in music history, theory, or analysis
Fall or spring, 1-2 credits
ABCF grading

MUS 696 Doctoral Colloquium
Students are required to enroll in MUS 696 in a semester prior to the one in which the Ph.D. colloquium or the D.M.A. lecture-recital is given. The instructor, chosen in consultation with the directing committee, acts as an advisor or tutor, and signals to the graduate program committee that the colloquium or lecture-recital may be given.
Fall and spring, 1 credit
S/U grading

MUS 697 Directed Reading
Intended for preparation for the preliminary examinations and related requirements.
Fall and spring, 1-12 credits each semester, repetitive
S/U grading

MUS 699 Directed Dissertation Research Intended for Work in the Area of the Dissertation
Fall and spring, 1-12 credits each semester, repetitive
S/U grading

MUS 800 Summer Research
Students who receive support for summer research must register for this course, which gives them full-time status.
Summer, no credit

MUS 850 Summer Teaching
Students who receive support for summer teaching must register for this course, which gives them full-time status.
Summer, no credit

Neurobiology and Behavior (BNB)

Chairperson: Lorne Mendell, Life Sciences Building 550 (631) 632-8616
Graduate Program Director: Mary Kritzer, Life Sciences Building 550 (631) 632-8616
Graduate Administrator: Barbara Mummers, Life Sciences Building 550 (631) 632-8630

Degree awarded: Ph.D. in Neurobiology and Behavior

The Graduate Program in Neurobiology and Behavior, 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, Center for Behavioral Neuroscience, Health Sciences Center, 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 newly developed 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 Neurobiology and Behavior 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 Professor

Mendell, Lorne M., *Chairperson.* Ph.D., 1965, Massachusetts Institute of Technology: Control and plasticity of spinal pain circuits.

Professors

Adams, Paul R., Ph.D., 1974, University of London, England: Learning in large sparse networks; neocortical design and sleep.

Brehm, Paul, Ph.D., 1975, University of California, Los Angeles: Physiology and development of synapses.

Brink, Peter[6], Ph.D., 1976, University of Illinois: Electrotonic synapses.

Cabot, John B., Ph.D., 1976, University of Virginia: Neural control of the cardiovascular system.

Davis, James N.[2], M.D., 1965, Cornell University: Recovery from brain injury; models of cerebral ischemia.

Evinger, Craig, Ph.D., 1978, University of Washington: Neural control of eye movements.

Fetcho, Joseph, Ph.D., 1985, University of Michigan: Motor control; neural networks in spinal cord.

Goldgaber, Dmitry Y.[7], Ph.D., 1979, Academy of Medical Sciences, Moscow, Russia: Alzheimer's; Downs Syndrome; aging.

Halegoua, Simon, Ph.D., 1978, University at Stony Brook: Molecular and cell biology of neural development.

Levine, Joel M., Ph.D., 1980, Washington University: Molecules regulating brain differentiation and development.

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

Matthews, Gary G., Ph.D., 1975, University of Pennsylvania: Retinal physiology.

McLaughlin, Stuart[6], Ph.D., 1967, University of British Columbia, Canada: Biophysics of excitable membranes.

Morin, Lawrence P.[7], Ph.D., 1974, Rutgers University: Neural control of mammalian circadian rhythms.

Schechter, Nisson[7], Ph.D., 1971, Western Michigan University: Molecular biology of optic nerve development.

Schmidt, Jakob[1], Ph.D., M.D., 1963, Ludwig-Maximilians University; University of California, Riverside: Regulation of acetylcholine receptors.

Sherman, S. Murray, Ph.D., 1969, University of Pennsylvania: Structure and function of the visual system.

Walcott, Benjamin, Ph.D., 1968, University of Oregon: Neural control of lacrimal gland function.

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

Associate Professors

Collins, William F.[11], Ph.D., 1980, University of Pennsylvania: Spinal control of pelvic function.

Evinger, Marian J.[4], Ph.D., 1978, University of Washington: Regulation of neurobiological gene expression.

Frohman, Michael[5], Ph.D., M.D., 1985, University of Pennsylvania: Cell behavior during mammalian embryogenesis.

Gnadt, James W., Ph.D., 1985, University of Alabama, Birmingham: Brain mechanisms controlling eye movements.

Kritzer, Mary, *Graduate Program Director.* Ph.D., 1989, Yale University: Sex differences in cortical microcircuitry.

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

Trimmer, James[1], Ph.D., 1987, University of California, San Diego: K-channels; regulation and function in nerve/muscle.

Whitaker-Azmitia, Patricia[8], Ph.D., 1979, University of Toronto, Canada: Role of serotonin in brain development.

Assistant Professors

Anderson Brenda J.[8], Ph.D., 1993, University of Illinois: Neuroanatomical and metabolic plasticity; imaging.

Kernan, Maurice, Ph.D., 1990, University of Wisconsin: Molecular basis of mechanoreceptor function.

Khalsa, Partap S.[3], D.C., Ph.D., 1995, Worcester Polytechnic Institute; University of Massachusetts Medical School: Neurophysiology of proprioception and pain.

McLaughlin, Susan K., Ph.D., 1989, University of Florida: Molecular basis of taste and taste bud development.

Robinson, John K.[8], Ph.D., 1991, University of New Hampshire: Psychopharmacology of learning and memory.

Solomon, Irene C.[6], Ph.D., 1994, University of California, Davis: Neural control of respiratory and cardiovascular function.

Wollmuth, Lonnie, Ph.D., 1992, University of Washington: Molecular properties of cortical signaling.

Adjunct Faculty

Cline, Hollis, *Investigator.*[10] Ph.D., 1985, University of California, Berkeley: Molecular control of neuronal plasticity.

Dewey, Stephen L., *Scientist.*[9] Ph.D., 1985, University of Iowa: Functional interactions between neurotransmitter systems.

Enikolopov, Grigori, *Associate Investigator.*[10] Ph.D., 1978, Academy of Science, Russia: Nitric oxide, neuron differentiation, and survival.

Gatley, S. John, *Scientist.*[9] Ph.D., 1975, University of Newcastle-upon-Tyne, England: Neuroimaging, neurochemistry, and pharmacology of drug abuse.

Gifford, Andrew N., *Associate Scientist.*[9] Ph.D., 1989, St. Andrews University, Scotland: Actions of drugs-of-abuse in the central nervous system.

Malinow, Roberto, *Investigator.*[10] M.D., Ph.D., 1984, New York University; University of California, Berkeley: Synaptic transmission and plasticity.

Peña, Louis A., *Assistant Scientist.*[9] Ph.D., 1991, University of California, Los Angeles:

Svoboda, Karel, *Assistant Investigator.*[10] Ph.D., 1994, Harvard University: Dynamics of neocortical circuits and their plasticity.

Tully, Timothy, *Investigator.*[10] Ph.D., 1981, University of Illinois: Genetics of memory formation in Drosophila.

Yin, Jerry, *Associate Investigator.*[10] Ph.D., 1986, University of Wisconsin: Genetics of memory.

Zhong, Yi, *Associate Investigator.*[10] Ph.D., 1991, University of California, Berkeley: Molecular control of neuronal plasticity.

Number of teaching, graduate, and research assistants, fall 1999: 33

1) Primary appointment with Department of Biochemistry

2) Primary appointment with Department of Neurology

3) Primary appointment with Department of Orthopedics Service

4) Primary appointment with Department of Pediatrics

5) Primary appointment with Department of Pharmacology

6) Primary appointment with Department of Physiology and Biophysics

7) Primary appointment with Department of Psychiatry

8) Primary appointment with Department of Psychology

9) Primary appointment with Brookhaven National Laboratory

10) Primary appointment with Cold Spring Harbor Laboratory

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

Degree Requirements

Requirements for the M.A. Degree

The Graduate Program in Neurobiology and Behavior normally does not accept a student whose goal is an M.A. degree. In exceptional instances, a student already in the graduate program may be awarded an M.A. degree upon completion of an approved course of study, including 30 graduate credit hours, a comprehensive 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 (BMO 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 neurobiology and behavior (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 Seminar (BNB 531). Offered on alternate years, this seminar course focuses on instruction in the presentation of research seminars. Under faculty guidance, students make research presentations of their own work. Each presentation is evaluated by student peers and is videotaped for post-hoc self evaluation.

5. Neurobiological Techniques (BNB 525). This course is an interesting series of demonstration-style 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 and molecular and developmental biology.

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 a series of essay questions that cross disciplinary boundaries (molecular/biochemistry, cellular, integrative/behavioral).

C. Advancement to Candidacy

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

D. Ph.D. Dissertation

A dissertation that constitutes an original and significant contribution to the field of neurobiology and behavior is required for the Ph.D. The work must be of a quality acceptable for publication in a recognized scientific journal. 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 Neurobiology and Behavior, 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.
Prerequisite: Sponsor and approval of graduate committee
Annually, 1-3 credits, repetitive
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, repetitive
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 each semester
ABCF grading

BNB 552 Neurobiological Techniques
A series of laboratory exercises designed to give students hands-on experience in the basic laboratory techniques of contemporary neuroscience. Includes intracellular and extracellular recording, neuronal tissue culture, neuroanatomical techniques, and integrative physiology.
Spring, 2 credits
ABCF grading

BNB 555 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 of 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. Crosslisted with HBH 555.
Prerequisite: Staff approval
Fall, 3 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 brain are used.
Prerequisites: BIO 334 and permission of instructor
Fall, 2 credits
ABCF grading

BNB 561 Neurobiological Basis of Vision
This course introduces students to the basic principles of neurobiology as exemplified in the vertebrate visual system. Understanding the transduction of light as electrical responses in photoreceptors introduces many of the key molecules of the nervous system: ion channels, G proteins, signalling enzymes, and neurotransmitter receptors. Further information processing in the retina uses synaptic transmission, voltage dependent conductances, elaborate circuitry, and neuromodulation. Information is then encoded in action potentials and sent to the brain for further analysis. The intermeshing of molecular, cellular, circuit, system, and behavioral events are stressed.
Prerequisites: BIO 334 or equivalent and permission of instructor
Fall, 4 credits
ABCF grading

BNB 562 Motion: Motor Control and the Reflex Pathway
The physiology, development, and molecular biology of motor systems are described. Basic aspects of the nervous system including reflex arcs, ion channels, gene expression, and nerve growth are described in the context of the spinal cord.
Spring, 4 credits
ABCF grading

BNB 563 Integration: Sensory Systems and Sensorimotor Transformations
Several sensory systems are examined at the cellular level and used to illustrate the basic principles of sensory transduction. Sensorimotor transformations and motor control systems are investigated. The integration between sensory and motor systems is considered with an emphasis on their control of several "ideal" behaviors.
Prerequisite: Permission of instructor
Fall, 3 credits
ABCF grading

BNB 564 Neuroscience
Prerequisite: BNB 563
Spring, 4 credits
ABCF grading

BNB 574 Molecular Neurobiology of Learning and Memory
Basic cellular and molecular processes of nerve cells are correlated with higher-order nervous system functions such as learning and memory. One focus is on the cellular and molecular basis of neurotransmission and the modulation of nerve excitability. Emphasis is also placed on the molecular events underlying those aspects of neural development that later contribute to the modifiability or plasticity of the adult nervous system. These cellular processes will be related to behavioral adaptation in various models of learning and memory obtained from simple animals to higher vertebrates. Co-scheduled with BIO 374.
Spring, 3 credits
ABCF grading

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, credit to be arranged
S/U grading

BNB 697 Advanced Neurobiology and Behavior Seminar
Seminar presentations delivered by faculty, associates, students, and visiting speakers.
Prerequisite: Permission of instructor
Fall and spring, repetitive credit, 1 credit each semester
S/U grading

BNB 699 Dissertation Research
Original investigation undertaken as part of the Ph.D. program under the supervision of the dissertation committee.
Fall and spring, credit to be arranged
S/U grading

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 Perinatal/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

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 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:
Joyce Lichter
Assistant to the Dean for Student Affairs
School of Nursing
Health Sciences Center
University at Stony Brook
Stony Brook, NY 11794-8420
(631) 444-3200

Oral Biology and Pathology (HDO)

Chairperson: Israel Kleinberg, Westchester Hall 196 (631) 632-8923
Graduate Program Director: Lorne B. Taichman, Westchester Hall 201 (631) 632-8923, Fax (631) 632-9704,
E-mail: *Lorne.Taichman@sunysb.edu*
Graduate Secretary: Patricia Calia, 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. 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

Professors

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.

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.

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.

McNamara, Thomas F., *Emeritus.* Ph.D., 1959, Catholic University of America: Microbial etiology of dental caries and periodontal disease; immune mechanisms involved in dental pathogenesis; viral infection in oral microorganisms; significance of secretory IgA in caries prevention.

Sreebny, Leo M., 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., *Graduate Program Director.* M.D., 1965, M.Sc., 1967, University of Toronto, Canada; Ph.D., 1971, University of Wisconsin: Biology of epithelial keratinocyte growth and differentiation; cutaneous and mucosal gene therapy; viral and nonviral methods for gene transfer; keratinocyte secretion.

Assistant Professors

Garlick, Jonathan A., D.D.S., 1985, Ph.D., 1993, University at Stony Brook; Cert. Oral Pathology, Long Island Jewish Medical Center: Mechanisms of oral and epidermal carcinogenesis; wound healing response of oral and epidermal keratinocytes; effect of smokeless tobacco on early neoplasia; epithelial gene therapy.

Ryan, Maria E., D.D.S., 1989, Ph.D. 1998, University at Stony Brook; 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.

Adjunct Faculty

Auborn, Karen J., *Assistant Professor.* Ph.D., 1983, Rutgers University and University of Medicine and Dentistry of New Jersey: Expression and replication of papillomaviruses in keratinocytes; effects of hormonal metabolism on the pathogenesis of papillomaviruses.

Steinberg, Bettie, *Associate Professor.* Ph.D., 1976, University at Stony Brook: Biology of papillomaviruses and their interaction with epithelial cells; viral oncogenesis.

Research Faculty

Ghazizadeh, Soosan, *Assistant Professor.* Ph.D. 1994, University at Stony Brook: 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.

Simon, Marcia, *Associate Professor, 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.

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 calcifications and calculus formation are examined.
Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; permission of instructor
Fall and spring, 3 credits each semester

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 receive particular attention.
Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; permission of instructor
Fall and spring, 3 credits each semester

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 vagina, the skin, and their role in oral disease are dealt with.
Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; permission of instructor
Fall and spring, 3 credits each semester

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, 562, and 563 or their equivalent; permission of instructor
Fall and spring, 3 credits each semester

HDO 535 Epithelial Keratinization and Differentiation

The course examines the growth and differentiation of stratified squamous epithelia. Particular emphasis is placed on molecular events involved in the differentiation pro-

gram. Consideration is also given to mechanisms involved in cutaneous disorders.
Prerequisites: Permission of instructor required; HBP 531 suggested; students must have background in cellular biochemistry and molecular biology
Fall or spring, 3 credits each semester

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; permission of instructor
Fall and spring, 3 credits each semester

HDO 550 Oral Diagnostics and Therapeutic Technology, Lectures and Laboratory Techniques
Recent advances in the use and development of research technology for the early diagnosis and treatment monitoring of oral and systemic disease. Special attention is paid to the principles of technology transfer including patents and patenting; searching of on-line databases is a key component. The course includes relationships of dry mouth to salivary physiology, diabetes, and drug medications; salivary film measurements, wetting of oral surfaces, visco-elasticity and lubricity; the use of the Periotron and enzyme assays for the diagnosis of gingivitis and periodontal disease; instrumentation used in sensitive teeth measurement and evaluation of treatment effectiveness using oral compositions and iontophoresis; oral candidiasis and denture stomatitis and early detection and causes of dental caries; oral malodor measurements including use of the Halimeter and its use in the formulation of oral compositions. Application to clinical practice and clinical studies is covered.
Prerequisites: HDO 560, 561, 562, and 563 or their equivalent; permission of instructor
Fall and spring, 4 credits each semester

HDO 560 Oral Biology and Pathology I
This course is 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. The course consists of the following two units of instruction: (1) the embryological development of the face and oral cavity and (2) the biology and pathology of the oral mineralized tissues.
Prerequisites: Undergraduate degree in basic science and permission of instructor
Fall and spring, 3 credits each semester

HDO 561 Oral Biology and Pathology II
This course is 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. The course consists of the following two units of instruction: (1) the microbiology of the oral cavity and (2) the biology and pathology of the oral mucous membranes.
Prerequisites: Undergraduate degree in basic science and permission of instructor
Fall and spring, 3 credits each semester

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 and permission of instructor
Fall and spring, 3 credits each semester

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. The course consists of the following two units of instruction: (1) the biology and pathology of the oral sensory systems and (2) the biology and pathology of oral motor systems.
Prerequisites: Undergraduate degree in basic science and permission of instructor
Fall and spring, 3 credits each semester

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: Student must be enrolled in a master's or doctoral program
Fall and spring, 3 credits each semester

HDO 599 Graduate Research
Original investigations undertaken with supervision of a faculty member.
Prerequisite: Permission of instructor
Fall, spring, and summer, 1-12 credits

HDO 690 Oral Biology and Pathology Seminars
Research seminars by students, staff, and visiting scientists.
Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester, repetitive

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
Fall and spring, 1-4 credits each semester

HDO 699 Dissertation Research in Oral Biology and Pathology
Original investigation undertaken with supervision of a member of the staff.
Prerequisite: Advancement to candidacy and permission of thesis advisor
Fall, spring, and summer, 1-9 credits

Pathology (HBP)

Chairperson: Frederick Miller, Health Sciences Center BHS T-9, Room 140 (631) 444-3000
Graduate Program Director: Ute Moll, Health Sciences Center BHS T-9, Room 153 (631) 444-2459
Graduate Secretary: Adrienne Cascio, Health Sciences Center BHS T-9, Room 140 (631) 444-3000
Graduate Secretary: Janet Koenig, Life Sciences Building 350 (631) 632-8533

Degree awarded: Ph.D. in Cellular and Molecular Pathology

The Department of Pathology, in the Health Sciences Center, offers a graduate program in Immunology and Pathology leading to the Ph.D. degree. This program is a track within a larger "umbrella" program in Molecular and Cellular Biology, which also includes tracks in Molecular Biology and Biochemistry and Cellular and Developmental Biology. Students are admitted to the umbrella program and choose a track of 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 track 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, all 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 the Immunology and Pathology track 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 director.

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 H. Bentley Glass Biological Sciences Library and the Pathology Department Library, which receives a selection of the most popular biomedical journals. 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 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, including laboratory.

B. A minimum grade point average of 2.75 (B-) in all undergraduate courses and 3.00 (B) in science and mathematics courses.

C. Letters from three previous instructors and results of the Graduate Record Examination (GRE) General Test. Results of the Advanced Test in either Biology or Biochemistry are recommended.

D. 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 according to the department's requirements.

Faculty

Professors

Bar-Sagi, Dafna[2], PhD., 1984, University at Stony Brook: *Ras* proteins in proliferation and transformation.

Benach, Jorge L.[2], Ph.D., 1972, Rutgers University: Pathogenesis of spirochetal infections; utilization of host macromolecules.

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.

Freundlich, Martin[1], Ph.D., 1961, University of Minnesota: Regulation of bacterial gene expression by interactive elements.

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, The 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, University at Stony Brook: 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, University at Stony Brook: 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.

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.

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.

Bingham, Paul M.[1], Ph.D., 1979, Harvard University: Genetic control of development and gene expression in animals.

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.

Hollingsworth, Nancy[1], Ph.D., 1988, University of Washington, Seattle: Chromosome structure and function during meiosis in yeast.

Kew, Richard B.[5], Ph.D, 1986, University at Stony Brook: 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.

Moll, Ute M., *Graduate Program Director.*[5] M.D., 1985, Ulm, Germany: The p53 tumor suppressor gene family: Function/regulation in normal cells and tumor-associated inactivation.

Prives, Joan[4], Ph.D., 1968, McGill University, Canada: Cytoskeletal membrane interactions in muscle cells.

Reich, Nancy L.[5], Ph.D., 1983, University at Stony Brook: Signal transduction and gene expression in response to cytokines and virus.

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.

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

Bustelo, Xose[5], Ph.D., 1990, University of Santiago, Spain: Role of the Vav family of oncoproteins in signal transduction and tumorigenesis.

Garlick, Jonathan[10], D.D.S., 1985, Ph.D., 1993, University at Stony Brook: Oral and epidermal carcinogenesis/cancer gene therapy.

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.

Kernan, Maurice[3], Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.

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.

Morris, Andrew J.[4], Ph.D., 1988, University of Birmingham, England: Phospholipids and cellular signaling.

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.

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.

Schindelin, Hermann[1], Ph.D., 1994, Free University, Berlin, Germany: Structure and function of metalloenzymes and enzymes involved in metallo-cofactor biosynthesis; protein crystallography.

Tonge, Peter J.[9], Ph.D., 1986, University of Birmingham, England: Spectroscopic insights into enzyme mechanisms and protein structure; drug design.

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.

Hannon, Gregory, *Assistant 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.

Hengartner, Michael O., *Associate Professor.*[15] Ph.D., 1994, Massachusetts Institute of Technology: C. elegans developmental genetics-apoptosis; neurobiology.

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 1999: 18

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. BMO 503 Molecular Genetics
2. BMO 517 Biomembranes
3. BMO 520 Graduate Biochemistry
4. BCD 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 BMO 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 fifth 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 501 Introduction to Tissue Biology
An overview of the microscopic anatomy of the human body, this course deals primarily with the structure and function of the various cell types in each organ system. This is a survey course designed to provide graduate students with a foundation in histology that is needed in order to understand cellular and molecular pathology.
Prerequisite: Permission of instructor
Spring, 1 credit
ABCF grading

HBP 511 Pathobiology for Graduate Health Care Practitioners
For graduate students who have obtained primary health care bachelor's degrees. The course uses 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
Fall and spring modules, 3 credits
ABCF grading

HBP 531 General Pathology
Introduction to the nature and causes of disease, death, reaction to injury, and repair. Analysis of associated structural changes in cells and tissues, with reference to their functional correlates.
Prerequisites: Histology, gross anatomy, physiology, and biochemistry; prior or concurrent microbiology; and permission of instructor
Spring modules, 4-6 credits with lab, 3 credits without lab
ABCF grading

HBP 532 Medical Immunology
A general introduction to 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 courses in biology, biochemistry, genetics, and histology (these courses may be taken concurrently with HBP 532) and permission of instructor
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, serological quantitation of proteins and hormones, immunoglobulin structure, the genetics of immunoglobulin synthesis, cellular cooperation in the immune response, hypersensitivity, tolerance, and transplantation. Open to advanced undergraduates.
Prerequisites: Advanced courses in biology and biochemistry and permission of instructor
Fall, 3 credits
ABCF grading

HBP 546 Human Diseases
Human diseases will be studied at biochemical and molecular cell lines. Aspects of mechanism will be considered with particular attention to pathogenesis and therapeutic intervention. Crosslisted with BMO 546.
Prerequisite: Approval of instructor
Spring, 3 credits
ABCF grading

HBP 553 Pathology of Neoplasia
A study of the nature and behavior of neoplastic tissue, the etiologies of cancer, and 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 levels.
Prerequisite: Permission of instructor
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 and permission of instructor
Spring, 2 credits
ABCF grading

HBP 556 Laboratory Medicine
A four-week, full-time (6 hours per day) course dealing with clinical laboratory decision-making and the basis for the laboratory evaluation of human disease. The presentations are both didactic and practical and are given by an interdepartmental faculty. While intended principally for senior medical students, the course might be taken by advanced microbiology or biochemistry students interested in clinical applications.
Prerequisite: Permission of instructor
Spring module, 6 credits
ABCF grading

HBP 561 Electron Microscopy for Experimental Pathologists
Use of the electron microscope (EM), alone and in conjunction with other methodologies, in studies of biological dysfunction. Special techniques include histochemistry, enzyme histochemistry, immunohistochemistry, diffraction, stereo EM, and scanning EM. Design of protocols, preparation, and interpretation of data.
Prerequisite: Permission of instructor
Fall and spring semesters, variable credit, 2-6 credits per semester
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 "Honors in Teaching" on their transcript.
Prerequisite: Permission of instructor
Fall and spring, 1 credit per semester
S/U grading

HBP 590 Seminars in Immunology
A series of monthly seminars focusing on research in progress by the participants, current journal articles in the field of immunobiology, and prepared reviews of specified areas in the general field.
Prerequisite: MCB graduate student
Fall and spring, 1 credit per semester
S/U grading

HBP 599 Graduate Research in Pathology
Original research projects under faculty supervision.
Fall and spring, 1-12 variable credits
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, general pathology course, permission of instructor
Fall, variable credit, 1-3 credits per semester
ABCF grading

HBP 691 Journal Club in Pathology
Designed to provide students with a forum for acquiring skills involved in the critical analysis and presentation of scientific data by active participation in seminars on major topics in cellular and molecular pathology and critical discussion of selected topics with presentation of papers from the literature.
Prerequisite: Permission of instructor
Fall and spring, 1 credit per semester
ABCF grading

HBP 695 Teaching Practicum in Pathology
Practice instructions in the teaching of pathology carried out under faculty orientation and supervision.
Prerequisite: Permission of instructor
Fall and spring, repetitive, 1-4 credits per semester
ABCF grading

HBP 699 Dissertation Research in Pathology
Original investigation undertaken as part of the Ph.D. program under the supervision of a staff member.
Prerequisite: Advancement to candidacy
Fall and spring, variable and repetitive credit, 1-9 credits per semester
S/U grading

HBP 800 Summer Research
Summer, 0 credits
S/U grading

Pharmacological Sciences (HBH)

Chairperson: David Williams, Health Sciences Center T-7, Room 140 (631) 444-3083
Graduate Program Director: JoAnne Engebrecht, Health Sciences Center T-7, Room 189 (631) 444-7815
Graduate Program Administrator: Beverly Campbell, Health Sciences Center T-8, Room 196 (631) 444-3057

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 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. 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 Chemistry Building. Faculty laboratories, including those faculty located in the recently opened Center for Molecular Medicine, are equipped for the most modern biochemical, biophysical, and chemical research. Facilities of a specialized nature maintained by the department include ultracentrifugation, spectroscopy, fluorimetry, recombinant DNA, transgenic mouse tissue research, chromatography, mass spectrometry, microscopy imaging, x-ray crystallography, and NMR. Specialized toxicology facilities include a carcinogen laboratory for biochemical work and a P3 facility for animal work at the University. All laboratories in Pharmacological Sciences are equipped with networked personal computers. These computers serve everyday laboratory operations such as E-mail, Web access, DNA sequence analysis, protein analysis, literature search and retrieval functions, and word processing; all are available to graduate trainees. Pharmacological Sciences also has a Silicon Graphics-based molecular modeling and NMR research facility. Other computer resources include: dye-sublimation printing, CD-ROM writing, digital scanning, and remote network access. Library facilities include the Health Sciences Library and the Pharmacological Sciences Library.

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.

C. Graduate Record Examination (GRE) General Test scores is desirable and TOEFL for foreign students. One advanced test in biochemistry, biology, chemistry, computer science, physics, or mathematics.

D. Acceptance 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 (2000-2001) is $18,500 and includes health insurance coverage.

Faculty

Distinguished Professor

Reich, Edward, M.D., 1956, Johns Hopkins University; Ph.D., 1962, Rockefeller University: Autocrine regulation; parasite biochemistry; design of new therapeutic systems.

Professors

Adams, Paul R.[3], Ph.D., 1974, London University, England: Ion channels and synaptic transmission.

Bar-Sagi, Dafna[10], Ph.D., 1984, University at Stony Brook: Transmembrane signaling and growth control of cell proliferation and oncogenic transformation.

Bogenhagen, Daniel, M.D., 1977, Stanford University School of Medicine: Molecular genetic analysis of mitochondrial DNA; DNA repair.

Cohen, Ira S.[14], M.D., Ph.D., 1974, New York University: Electrophysiology of the heart.

Fisher, Paul A., M.D., Ph.D., 1980, Stanford University: Structure and function of the cell nucleus; enzymology of eukaryotic DNA synthesis.

Grollman, Arthur P.[1], M.D., 1959, Johns Hopkins University: Chemical carcinogenesis and mutagenesis.

Johnson, Francis, Ph.D., 1954, University of Glasgow, Scotland: Synthesis of natural products; halocarbon compounds; medicinal chemistry of antitumor agents; mechanism of action of environmental carcinogens and mutagens.

Malbon, Craig C., *Vice Dean for Research.* Ph.D., 1976, Case Western Reserve University: Cell and molecular biology of neurotransmitter receptors and G proteins; genetic regulation of transmembrane signaling elements by permissive hormones and differentiation.

Mandel, Gail[11], Ph.D., 1978, University of California, Los Angeles: Molecular biology of neuronal receptors and ion channels.

Said, Sami I.[9], M.D., 1951, Cairo University, Egypt: Biology of VIP and related neuropeptides; interactions with nitric oxide in physiology and disease; mechanisms and modulation of cell injury, inflammation and cell death, especially in the lung and neuronal cells.

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.

Springer, Charles S., Jr., *Senior Chemist.*[8,16] Ph.D., 1967, Ohio State University: In vivo nuclear magnetic resonance studies of biological systems.

Wang, Rex Y.[15], Ph.D., 1975, University of Delaware: Neuropharmacology; dopamine, serotonin, glutamate receptors; the action of antipsychotic drugs and substances of abuse.

Williams, David L., *Chairperson.* Ph.D., 1972, University of Illinois, Urbana-Champaign: Cell biology of lipoprotein receptors; molecular biology of atherosclerosis.

Associate Professors

Berrios, Miguel, 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.

Eisenberg, Moises, Ph.D., 1972, California Institute of Technology: Computer-based modeling of biomolecular molecules and their interactions with drugs.

Engebrecht, JoAnne, *Graduate Program Director.* Ph.D., 1986, University of California, San Diego: Meiosis and signal transduction.

Evinger, Marian J.[13], Ph.D., 1978, University of Washington: Transcriptional regulation of PNMT gene expression.

Frohman, Michael A., M.D., Ph.D., 1985, University of Pennsylvania: Neural differentiation and signal transduction.

Haltiwanger, Robert[7], Ph.D., 1986, Duke University: Structure, biosynthesis, and function of nuclear and cytoplasmic glycoproteins.

Iden, Charles R., Ph.D., 1971, Johns Hopkins University: Biomedical mass spectrometry; structure studies of oligodeoxynucleotides and peptides using FAB/MS.

McKinnon, David[11], Ph.D., 1987, Australian National University, Australia: Molecular physiology of sympathetic neurons and cardiac muscle.

Miller, W. Todd[14], Ph.D., 1987, Rockefeller University: Signal transduction by tyrosine kinases.

Moll, Ute M.[12], M.D., 1970, Ulm, Germany: Tumor suppressor gene research; mechanism of p53 inactivation.

Morris, Andrew J., Ph.D., 1988, University of Birmingham, England: Roles of phospholipids in cellular signaling.

Morrison, Sidonie A.[9], D.Phil., 1973, University of Oxford, England: Mechanisms of infection and pathogenesis in HIV-1 disease, emphasizing role of host cell factors; restoration of immune function during highly active antiretroviral therapy.

Newman, George C.[18], M.D., Ph.D., 1976, University of Virginia: Restoration of adenine nucleotides after transient ischemia in hippocampal brain slices; quantitative cerebral blood flow using echo-planar MRI.

Prives, Joav M., Ph.D., 1968, McGill University, Canada: Regulation of surface receptors in muscle cells.

Reich, Nancy C.[12], Ph.D., 1983, University at Stony Brook: Signal transduction and gene expression induced by cytokines and viral infection.

Shibutani, Shinya, Ph.D., 1983, Toyama Medical and Pharmaceutical University, Japan: Chemical carcinogenesis and mutagenesis.

Trimmer, James S.[7], Ph.D., University of California, San Diego: Molecular neurobiology; structure and regulation of voltage-sensitive ion channels.

Assistant Professors

Kisker, Caroline F., Ph.D., 1994, Frie Universitat, Berlin, Germany: Structure/function studies on DNA repair enzymes and molybdenum cofactor containing enzymes.

Schindelin, Hermann[7], Ph.D., 1994, Freie Universitat, Berlin; Crystallographic and biochemical studies of metalloenzymes.

Tsirka, Styliani-Anna E.[16], Ph.D., 1989, University of Thessaloniki, Greece: Neuronal-microglial interactions.

Research Faculty

De los Santos, Carlos, *Assistant Professor.* Ph.D., 1987, University of Buenos Aires, Argentina: NMR solution structures of damaged nucleic acids and repair proteins.

Hernandez, Nouria, *Associate Professor.*[5] Ph.D. 1983, Heidelberg, Germany: Transcription of the human small nuclear RNA genes and the HIV-1 virus.

Mangel, Walter F., *Professor.*[16] Ph.D., University of Illinois, Urbana-Champaign: Regulation of proteolytic activity in normal and abnormal physiological processes in virus infections, plague, and malaria; development of antiviral, antiplague, and antimalarial agents.

Moriya, Masaaki, *Associate Professor.* Ph.D., 1981, Nagoya University, Japan: Cellular Response to DNA Damage.

Rosenquist, Thomas, *Assistant Professor.* Ph.D., 1989, University of Wisconsin-Madison; Genetic analysis of mammalian oxidative DNA damage repair.

Number of teaching, graduate, and research assistants, fall 1999: 25

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 (BMO 520)

2. Molecular Genetics (BMO 503)

3. Biochemical Laboratory Techniques (HBH 545)

4. Cell Biology (BCD 656)

5. Principles of Pharmacology I, II (HBH 533, 534)

6. Ethical Conduct of Research (HBH 610)

7. Proposal Preparation in Regulatory Biology

8. Two electives, at least one of which should be a course offering of the Program in Molecular and Cellular Pharmacology.

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 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 therapeutic and toxic actions. Primarily for medical, dental, and graduate students.
Prerequisites: Physiology, biochemistry, and permission of instructor
Modules 4, 5, and 6, 5 credits

HBH 533 Principles of Pharmacology I
Basic principles of medical pharmacology for graduate students, continued as HBH 534 in the Spring semester. These two courses present basic principles of pharmacokinetics and drug design as well as the experimental basis of drug therapy. Aspects of the physiology underlying pharmacology are considered to provide an appreciation of the interplay of drugs in multiple physiological systems. Graduate students enrolled in HBH 533 and 534 participate in a journal club on topics related to the course.
Prerequisite: Permission of instructor
Fall semester, 3 credits

HBH 534 Principles of Pharmacology II
Continuation of HBH 533.
Prerequisite: HBH 533
Spring semester, 3 credits

HBH 545 Biochemical Laboratory Techniques
An introduction to the theoretical principles and experimental techniques used in modern biochemical research. Lectures and demonstrations are used to present topics in laboratory computers, chromatography, mass spectrometry, protein sequencing, cloning technology, sedimentation, electrophoresis, ligand binding, and nuclear magnetic resonance. Procedures for the safe handling of toxic chemicals and radioisotopes are also discussed.
Prerequisite: Permission of instructor
Fall, 3 credits

HBH 546 Human Diseases: Mechanisms in Therapy
Human diseases will be studied at biochemical and molecular cell lines. Aspects of mechanism will be considered with particular attention to pathogenesis and therapeutic intervention. Crosslisted with BMO 546, HBP 546
Spring, 3 credits
ABCF grading

HBH 553 Signal Transduction
The course will emphasize fundamental concepts in signal transduction (e.g., membrane-protein and protein-protein interactions, amplification of signals) and individual lectures will apply these concepts at each stage of cell signaling from the cell surface to the nucleus, where signal transduction leads to specific gene expression. Crosslisted with HBY 533.
Spring, odd years, 3 credits
ABCF grading

HBH 560 Proposal Preparation in Regulatory Biology
A literature-based course focusing on major research areas in molecular and biochemical pharmacology. The first part of the course will expose students to a series of examples of recent grant proposals. The second part of the course will feature student presentations of their research proposals. Due to the coordination of this course with the Qualifying Exam, registration is limited to Pharmacology Program students.
Prerequisite: Permission of instructor and full-time pharmacology graduate status
Spring semester, 3 credits
ABCF grading

HBH 564 DNA Damage, Repair, and Carcinogenesis
An advanced course focusing on genomic damage, DNA repair, and mutagenesis in prokaryotic and eukaryotic cells. Biochemical and genetic studies are emphasized with particular reference to chemical carcinogenesis. This course offers an opportunity to develop a basic understanding of the molecular and cellular biology of DNA damage as it applies to genetic and environmental toxicology.
Prerequisite: Graduate biochemistry
Spring semester, odd years, 3 credits

HBH 580 Selected Topics in Pharmacology
Student seminars and readings on topics to be arranged through consultation with faculty.
Prerequisite: Permission of instructor
Fall and spring semesters, variable credit

HBH 590 Pharmacology Seminars
Advanced research seminars by staff and visiting lecturers.
Prerequisite: Permission of instructor
Fall and spring, 1 credit

HBH 599 Graduate Research in Pharmacological Sciences
Original research projects under faculty supervision.
Prerequisite: Permission of instructor
Fall, spring, and summer, variable credit

HBH 601 Practicum in Teaching Pharmacology
Practical experience and instruction in the teaching of pharmacology carried out under faculty orientation and supervision.
Prerequisites: Permission of instructor and full-time graduate status
Fall and spring semesters, 1 credit

HBH 610 Ethical Conduct of Research
Lectures and discussion sessions on ethical conduct of research in molecular and cellular pharmacology. Due to the small group discussion format, this course is open to Pharmacology graduate students only.
Summer, no credit

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 nerve cell structure and 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. Crosslisted with BNB 655.
Prerequisite: Permission of instructor
Fall, even years, 3 credits

HBH 699 Dissertation Research in Pharmacology
Original investigation undertaken as part of the Ph.D. program under supervision of thesis advisor and committee.
Prerequisite: Advancement to candidacy
Fall, spring, variable credit

HBH 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor and full-time graduate student status
Summer, no credit

Philosophy (PHI)

Chairperson: Edward S. Casey, Harriman Hall 209 (631) 632-7590
Graduate Program Director: Kenneth Baynes, Harriman Hall 216 (631) 632-7580
Graduate Secretary: Martha J. Smith, Harriman Hall 207 (631) 632-7580

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. Departmentally based, funded exchanges with the University of Tübingen, the University of Marburg, the University of Bochum, and the University of Paris give students the 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 Professor

Ihde, Don, Ph.D., 1964, Boston University: Phenomenology; philosophy of technology; hermeneutics.

Distinguished Service Professor

Gelber, Sidney, *Emeritus.* Ph.D., 1954, Columbia University: Political philosophy.

Professors

Allison, David B., Ph.D., 1974, Pennsylvania State University: Contemporary European philosophy.

Casey, Edward S., *Chairperson.* Ph.D., 1967, Northwestern University: Aesthetics; phenomenology; philosophy of psychology.

Dilworth, David, Ph.D., 1963, Fordham University; Ph.D., 1970, Columbia University: East Asian languages and cultures.

Grim, Patrick, B.Phil., 1975, University of St. Andrews, Scotland; Ph.D., 1976, Boston University: Ethics; logic; contemporary analytic philosophy.

Howard, Dick, Ph.D., 1970, University of Texas: Political and social philosophy; Marxism.

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.

Nolan, Rita D., Ph.D., 1965, University of Pennsylvania: Philosophy of language; theory of knowledge; philosophy of psychology.

Oliver, Kelly[9], Ph.D., 1987, Northwestern University: 20th-century French philosophy; continental feminist theory; Nietzsche.

Silverman, Hugh J.[4], Ph.D., 1973, Stanford University: Continental philosophy; 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[8], 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, The Johns Hopkins University: Philosophy of science; philosophy of technology; environmental issues.

Sternfeld, Robert, *Emeritus.* Ph.D., 1948, University of Chicago: Logical theory; epistomolgy.

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

Baynes, Kenneth, *Graduate Program Director.* Ph.D., 1987, Boston University: Social and political philosophy; moral theory; modern and contemporary German philosophy.

Crease, Robert, Ph.D., 1987, Columbia University: Philosophy of science; aesthetics.

Edwards, Jeffrey, Ph.D., 1987, Universitat Marburg, Germany: History of philosophy; Kant; modern philosophy.

Ludlow, Peter, Ph.D., 1985, Columbia University: Philosophy of language; cognitive science; linguistics.

Manchester, Peter[2], Ph.D., 1972, Graduate Theological Union: Greek philosophy; Heidegger.

Mar, Gary[7], Ph.D., 1985, University of California, Los Angeles: Logic; philosophy of mathematics; contemporary analytical philosophy; philosophy of religion.

Miller, Clyde Lee[6], Ph.D., 1974, Yale University: History of philosophy.

Rawlinson, Mary C., Ph.D., 1978, Northwestern University: 19th-century philosophy; Hegel; aesthetics and literary theory; philosophical psychology; philosophy of medicine.

Assistant Professors

Cormier, Harvey, Ph.D., Harvard University:

American philosophy; William James and pragmatism; philosophy and culture.

Number of teaching, graduate, and research assistants, fall 1999: 30

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, 1993

8) Recipient of the Commonwealth of Virginia's Outstanding Faculty Award, 1990; University of Richmond's Distinguished Educator Award, 1984

9) 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. One seminar will be team taught by philosophy faculty members knowledgeable about fields outside philosophy, along with faculty members from the relevant disciplines. A second team-taught seminar, or a regular graduate course in another discipline taught by graduate faculty, will fulfill the basic interface requirement. Two additional courses from this category may be taken to fulfill concentration requirements.

3. Five seminars in contemporary philosophy are required. Three seminars in the preeminent styles or modes of philosophy are required: one in continental philosophy (PHI 630), one in analytic philosophy (PHI 631), and one comparative seminar (PHI 632). The comparative seminar will be team-taught with faculty from two different traditions centering upon a common theme. These 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. This 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 may be awarded the M.A. degree upon completion of the minimum coursework offerings for items 1 through 3 of the Ph.D. seminar requirements (for a total of 30 graduate credits of graded coursework), and two of the three projects listed in Section B, General Requirements.

Courses

Detailed course descriptions for the doctoral program are available from the Philosophy Department office each semester.

Doctoral Program in Philosophy

All courses are 3 credits unless otherwise noted.

I. History Courses

Three of the four history courses marked with an asterisk (*) are required, plus two additional courses for a concentration in the history of philosophy. History courses will feature an intensive writing component.

***PHI 600 Ancient Philosophy**
ABCF grading

***PHI 601 Medieval and/or Renaissance Philosophy**
ABCF grading

***PHI 602 Modern Philosophy**
ABCF grading

***PHI 603 19th-Century Philosophy**
ABCF grading

PHI 604 Special Topics in the History of Philosophy
Variable and repetitive credit
ABCF grading

II. Interface Studies Seminars

Two team-taught interface seminars, or one team-taught interface seminar and a graduate seminar in another discipline will fulfill the basic interface requirement. For a concentration in Interface Studies two additional seminars must be taken (from among team-taught or approved non-philosophy graduate seminars).

PHI 610 Philosophy and the Arts
ABCF grading

PHI 611 Philosophy and Literature
ABCF grading

PHI 612 Philosophy and Psychology
ABCF grading

PHI 613 Philosophy and Politics
ABCF grading

PHI 614 Philosophy and Linguistics
ABCF grading

PHI 615 Philosophy and Feminism
ABCF grading

PHI 616 Philosophy and Technology
ABCF grading

PHI 617 Philosophy and Environmental Studies
ABCF grading

PHI 618 Philosophy and the Sciences
ABCF grading

PHI 619 Special Topics in Interface Studies
Variable and repetitive credit
ABCF grading

III. Contemporary Philosophy Seminars

The three seminars marked with an asterisk (*) are required. Two additional seminars chosen from the remaining list of contemporary philosophy seminars must be taken to fulfill the basic requirement. Two more seminars may be chosen to fulfill concentration requirements.

***PHI 630 Seminar in Continental Philosophy**
ABCF grading

***PHI 631 Seminar in Analytic Philosophy**
ABCF grading

***PHI 632 Seminar in Comparative Philosophy**
ABCF grading

Additional Seminars in Contemporary Philosophy

PHI 633 American Pragmatism and Naturalism
ABCF grading

PHI 634 Eastern Philosophy
ABCF grading

PHI 635 Philosophy of Science and Logic
ABCF grading

PHI 636 Metaphysics
ABCF grading

PHI 637 Epistemology
ABCF grading

PHI 638 Philosophical Psychology
ABCF grading

PHI 639 Social and Political Philosophy
ABCF grading

PHI 640 Ethics
ABCF grading

PHI 641 Aesthetics
ABCF grading

PHI 642 Philosophy of Religion
ABCF grading

PHI 643 Semiotics
ABCF grading

PHI 644 Special Topics in Contemporary Philosophy

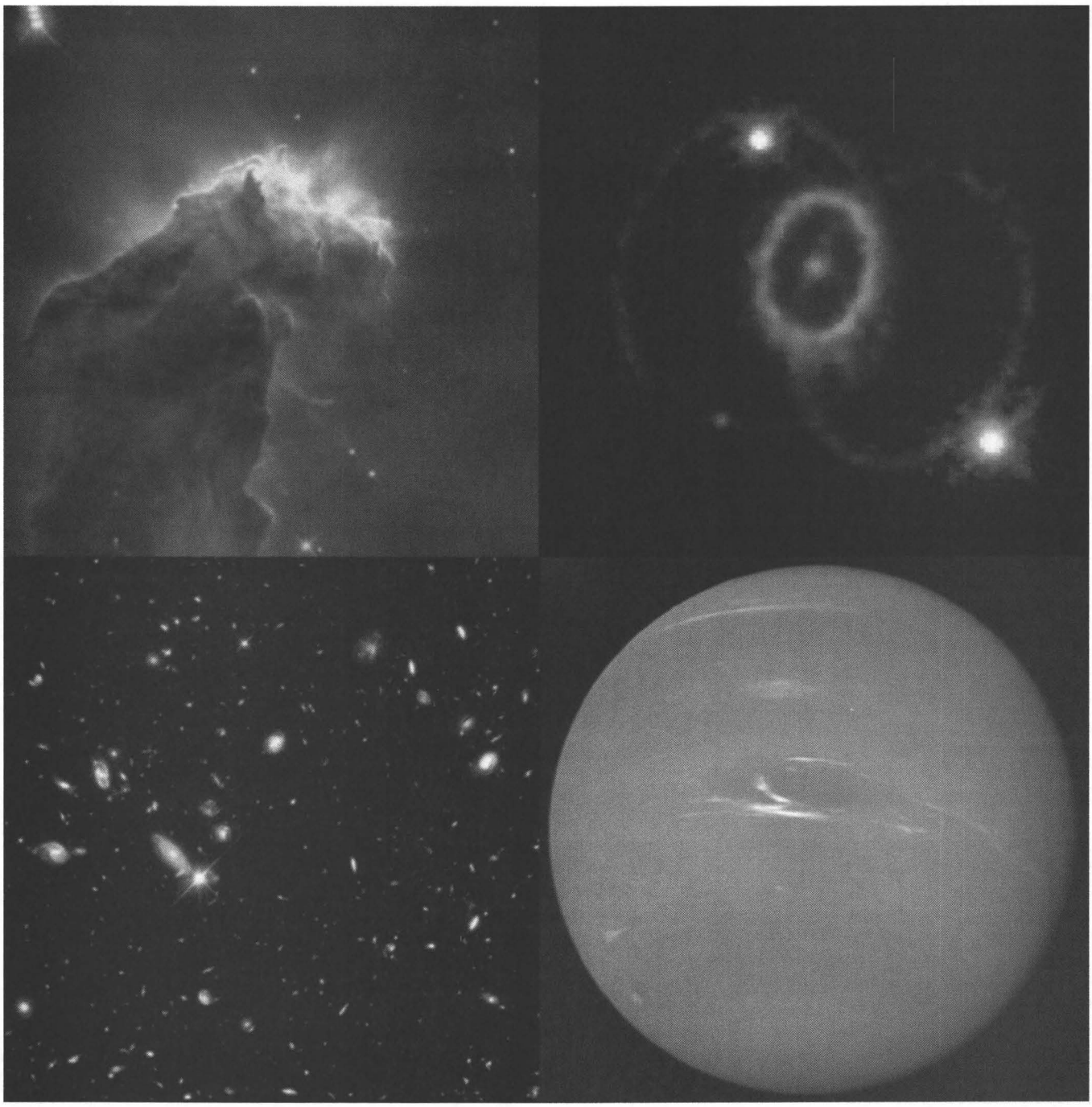
IV. Independent and Directed Studies

PHI 620 Advanced Problems in Philosophy
Variable and repetitive credit
ABCF grading

PHI 621 Independent Study
Variable and repetitive credit
S/U grading

PHI 622 Supervised Teaching
3 credits
S/U grading

PHI 699 Dissertation
Special topics seminars and additional seminars may be repeated when taken for a concentration, or as courses beyond the minimum required. Ten courses plus two additional seminars in one of the three concentrations are the minimum coursework requirements. All students are also required to take PHI 623 Teaching Practicum. Students are strongly encouraged to take additional courses and seminars in any of the offerings.
Variable and repetitive credit
S/U grading



Astronomy photos courtesy of NASA.

Physics and Astronomy (PHY)

Chairperson: Janos Kirz, Physics Building P-110 (631) 632-8100
Graduate Program Director: Peter W. Stephens, 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; 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 Arts program is available for students seeking an advanced education in physics or physics teaching. There is also a Master of Science in Scientific Instrumentation program for those interested in experimental physics.

The department has a large base of research facilities installed on campus and is a principal user of the major high-energy and solid-state physics facilities at Brookhaven National Laboratory (BNL), located only 20 miles away. Astronomers in the department make regular use of the wide array of instrumentation available for observation, from radio to gamma-ray wavelengths. 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 the standard model, string theory, supersymmetry, and statistical mechanics. The Nuclear Theory Institute is working on the theory of hadronic matter and nuclear astrophysics. The Stony Brook Radiation Laboratory supports experimental research in nuclear and high-energy physics. The Nuclear Physics Group operates the superconducting linear accelerator for nuclear physics research on campus and uses the Relativistic Heavy Ion Collider at Brookhaven National Laboratory. The High Energy Group uses the large D0 detector at the Fermilab Tevatron Collider and is a participant in experiments at Super Kamiokande and K2K in Japan for proton decay searches and neutrino physics. It is preparing for research with the Atlas experiment at the CERN Large Hadron Collider. The Institute for Interface Phenomena concentrates on research in device-oriented solid-state physics based on superconductors and semiconductors. The Institute for Atmospheric Science offers a program in atmospheric physics.

In addition, there are many independent research efforts within the department. There are strong theoretical and experimental groups in condensed matter research. We have an in-house 19 Tesla magnet and dilution refrigerator, a molecular beam epitaxy machine, an array of He refrigerators, and setups at the UV and X-ray rings of the National Synchrotron Light Source at BNL. The latter is also the base for the growing effort in X-ray microscopy and holography. There are well-equipped laboratories for research in atomic physics and lasers. Present research interests involve cooling and trapping atoms, effects of strong AC and DC fields, quantum chaos, nonlinear and quantum optics, and a host of related topics.

The department has a dynamic program in both theoretical and observational astronomy. This research includes extragalactic astronomy and cosmology, millimeter-wave and radio observations of molecular clouds, infrared and X-ray observations of star-forming regions, X-ray observations of neutron stars, stellar astronomy, and nuclear astrophysics. Faculty and students are frequent users of the National Optical Astronomy Observatories, the National Radio Astronomy Observatories, the observatories at Mauna Kea and Cerro Tololo, and the millimeter wave facilities at FCRAO and IRAM. They have also received extensive time on space-based observatories, including Einstein, IRAS, IUE, Hubble, and ROSAT.

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 amount of time needed to graduate is five years. The Master's in Scientific Instrumentation involves a thesis project in instrumentation design or development.

The Stony Brook Physics and Astronomy Department, which has been highly ranked in national surveys for the quality of its graduate program, its faculty, and the impact of its published research, strives to make a graduate education in physics intellectually stimulating and educationally rewarding. The wide research program supported by its large faculty offers exciting opportunities for every interested and qualified student.

Research and Facilities

Experimental High-Energy Physics

The Stony Brook faculty have been in the forefront of high energy research at most of the premier facilities in the United States, Europe, and Japan. Currently a large effort is based on the D0 experiment at the Fermilab collider, the highest energy accelerator in the world. The detector is being upgraded to seek new understanding of the top quark discovered in 1995, to explore the mechanism of electroweak symmetry breaking and search for Higgs boson, to study CP violation in the b quark system, to probe the strong QCD force in new regions, and to seek new phenomena such as supersymmetry. A part of the group is involved in the Super-Kamiokande experiment and the K2K experiment. The Super-Kamiokande detector, located deep underground in 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. The discovery has a far-reaching impact in the elementary particle physics and considered by many as once in a generation type of discovery. The experiment also aims to detect neutrinos from supernova bursts and is sensitive to a host of possible proton decay signals. The experiment has already set the world's best limits on the proton decay lifetimes. The K2K experiment is a long baseline neutrino oscillation experiment which aims to confirm the discovery made by the Super-Kamiokande experiment on neutrino oscillation by using

accelerator-generated neutrino beams. Neutrinos are generated at the KEK laboratory on the East Coast of Japan and shot through the earth to the Super-Kamiokande detector located 250 km away on the West Coast of Japan. The experiment is currently taking data. The Stony Brook Super-Kamiokande/K2K Group, composed of 14 members, is participating in all aspects of these experiments making significant contributions. The group is also participating in the Atlas experiment at the CERN large Hadron Collider, expected to begin in 2005, and is building components of that detector. Our proximity to Brookhaven National Laboratory continues to provide fruitful opportunities for research; we are a part of an experiment to measure the elastic scattering of polarized protons there.

Experimental Nuclear Physics

Since 1983, Stony Brook has operated a superconducting heavy-ion LINAC, 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 properties of nuclei at very high angular momentum and at finite nuclear temperatures, fusion and fission of the heaviest elements in order to determine global properties of nuclear matter and to search for superheavy nuclei, and the production of radioactive nuclei in magneto-optical traps for laser studies of atomic and nuclear hyperfine transitions. The lab has extensive research equipment and modern data acquisition systems. Stony Brook faculty also pursue a program in relativistic heavy-ion physics using the 12 GeV per-nucleon beams from the AGS accelerator at nearby Brookhaven National Laboratory (BNL). They are leading an international collaboration that operates a large detector exploring the stopping of relativistic ions in nuclei and the production of hot and superdense nuclear matter, probing the conditions for producing a quark-gluon plasma. As the next step, the group is preparing a major detector for the Relativistic Heavy-Ion Collider (RHIC) presently being constructed at BNL. The entire research program offers students access to an excellent in-house networked computer base and the attraction of participating in the continuing development of major novel experimental devices.

Optical Sciences

The optical sciences are among the most dynamic areas of physics. Their impact in contemporary life will continue to grow in the future. Organized in an optics consortium, at least six groups in the Physics and Astronomy 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.

Atomic, Molecular, and Optical Physics and Quantum Electronics

Experimental and theoretical studies focus on the interaction of light and matter under different circumstances and conditions. We are exploring new topics on optical manipulation of atoms both in the quantum (deBroglie) and the classical domains. We can exert electrostatic forces on Rydberg atoms, strong bichromatic forces on both Rb and He, and delicate momentum changes caused by Raman transitions. We explore dark state physics, coherent control of momentum exchange between atoms and light fields, and entanglement between orthogonal spaces. Rydberg atoms are sensitive probes for electric field measurements. Experimentally, the precision achieved is on a par with magnetic fields. 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 permit a particular outcome. Noise added to the coherent driving fields has given surprises and new opportunities for diagnosis and control of reaction paths. Quantum optics experiments focus on the non-classical properties of light as revealed in the particle-particle or particle-wave correlations. The studies of the electromagnetic field in the context cavity quantum electrodynamics allow quantitative and qualitative investigations of open quantum systems. Collaboration with the Nuclear Structure Laboratory has created a laboratory for fundamental physics symmetries based on the francium atom. 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. Theoretical studies of Bose Einstein condensates probe interesting new regimes of many-body physics and complement ongoing experimental explorations in many laboratories.

Condensed Matter and Device Physics

An active program in solid-state and low-temperature physics is being carried out by several groups in the department. Areas of study include semiconductors, fullerenes, metal nanoclusters, low-temperature high-temperature superconductors, temperature phase transitions in two-dimensional solids, integer and fractional quantum Hall effect, Wigner crystallization of two-dimensional electron gas in semiconductor heterostructures, electronic properties of election-hole systems, Josephson effect in tunnel junctions, and superconducting weak links, macroscopic quantum coherence effects, correlated single-electron tunneling in ultrasmall tunnel junctions and structures, and electro-optic effects in quantum wells and superlattices. There is also a rapidly growing program in applied solid-state physics that includes development of ultrafast superconducting digital devices and integrated circuits based on magnetic flux quantization, and single-electronic devices using ultrasmall tunnel junctions with dimensions down to 30 nm. The experiments at Stony Brook make use of a wide variety of techniques, including X-ray scattering and diffraction, superconducting quantum interferometry, scanning electron microscopy, optical and infrared spectroscopy, transport measurements performed at ultralow temperatures down to 5 millikelvin, and ultrahigh magnetic fields up to 19 Tesla. Several projects involving synchrotron radiation are under way at the National Synchrotron Light Source at Brookhaven National Laboratory. For fabrication of samples a wide variety of modern techniques 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, Ultraviolet, and Surface Physics

The National Synchrotron Light Source at nearby Brookhaven National Laboratory provides unparalleled opportunities for research with X-rays and vacuum ultraviolet radiation. Work in progress includes the study of phase transitions using X-ray scattering, the development of X-ray microscopy and holography, and the study of multiple excited atomic and molecular species.

Atmospheric Research

Atmospheric research is carried out within the department and also, by arrangement, with faculty in the Institute for Terrestrial and Planetary Atmospheres (ITPA). Primary research interest within the Department centers on the measurement of stratospheric trace gases by ground-based remote sensing techniques, and has led, among other discoveries, 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. Ongoing instrument development is an active component of the Department's remote-sensing research, and draws on techniques in the forefront of current advances in cryogenic engineering and thin-film superconductivity, to improve the detection of gases with concentrations of as little as a few parts per billion of background air in the stratosphere. Research in the Institute for Terrestrial and Planetary Atmospheres includes studies of the chemistry and the large scale and mesoscale dynamics of atmospheres, of factors establishing the balance of radiative transfer through atmospheres (the "greenhouse effect" and related phenomena), of characterization of 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. A variety of active theoretical and experimental research programs, a close interaction of students in Physics and Astronomy with those in the ITPA research programs, and access to major data banks and computing facilities offer students a way to actively participate in finding solutions to global-scale atmospheric-environmental problems facing the world in the 21st century.

Institute for Theoretical Physics

Research at the Institute for Theoretical Physics includes varied topics of fundamental interest. Quantum-field theories supply the language for our description of matter on the smallest scales. Supersymmetric field theories, supergravity, and string theories are being studied and developed, with attention to both their mathematical structure and physical consequences. Of special interest is the quantum mechanical description of gravitation and its relation to other forces. In addition, there is an active program in statistical mechanics, particularly in the area of exactly solvable models. Progress in statistical mechanics and field theory is facilitated by the many physical concepts and mathematical methods that they share. Other active areas of study address the forces and particles of high-energy physics referred to as the "standard model," including electroweak interactions and quantum chromodynamics. Recent and ongoing studies include detailed phenomenological calculations and analysis of high-energy scattering experiments, the development of improved approximation methods for both quantum chromodynamics and electroweak interactions, the analysis of neutrino masses and other extensions of the standard model, computer-based lattice simulations of fermionic systems, and the study of magnetic monopoles and high-energy particle-nucleus collisions. This wide range of topics and interests encourages fruitful interactions with the nuclear physics, condensed matter, high-energy experimental, nuclear experimental, and other groups in the Department of Physics and Astronomy, as well as with the departments of Mathematics and Applied Mathematics.

Nuclear Theory

Studies in modern nuclear physics concentrate on the structure of hadrons and their interactions, which can be used to derive effective interactions valid for nuclear matter and nuclei. Many-body theory is used to interpret the observed complexities of nuclear structure with the aid of appropriate models. Topics of current interest include the derivation of the properties of baryons and their low-energy interactions from quantum chromodynamics and studies of a variety of infinite Fermi systems including neutron stars. In anticipation of significant experimental advances in relativistic heavy-ion physics, a number of problems regarding nuclear matter at high densities and temperatures, particularly its quark-gluon plasma phase, are being considered.

Condensed Matter Theory and Statistical Mechanics

The development in the last decade 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, 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 effects. Computer simulation of solids and liquids (including problems involving interfaces, surfaces, amorphous states, and electronic structure) is being performed using both local dedicated super minicomputers 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.

Nonlinear Dynamics

The research program concentrates on the development of consistent perturbation expansions, using the method of normal forms. The techniques have significant computational advantages over competing procedures and have been applied to the analysis of a variety of nonlinear systems including electrical and mechanical oscillations and vibrations, accelerator orbit theory, nuclear magnetic resonance, dissipative systems, and boundary value problems.

Accelerator and Beam Physics

Research in accelerator physics is being carried out at Stony Brook and in a number of departments at nearby Brookhaven National Laboratory (BNL). The research covers theoretical and experimental aspects of circular and linear accelerators as well as interaction of particle beams with electromagnetic radiation. 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 under development such as the Relativistic Heavy-Ion Collider and 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 has 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. Stony Brook 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 mm wave antenna. Extragalactic millimeter wave 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

This research focuses on supernovae, neutron stars, and nucleosynthesis. Stony Brook dense matter equations of state and neutrino opacities are used world-wide. Hydrodynamic simulations of supernovae and protoneutron star evolution emphasize the role of neutrinos; SN 1987A spectacularly confirmed Stony Brook predictions of neutrino fluxes and energies. Neutron star cooling, including the roles of composition, superfluidity and structure, and model atmospheres are also investigated. Astronomers at Stony Brook recently discovered a nearby isolated neutron star in X-rays; new observations with Hubble may determine, for the first time, a neutron star's radius. The coalescence of binary neutron stars is also studied.

Star Formation and Stellar Astronomy

Star formation research at Stony Brook focuses on the low-mass pre-main sequence evolution and the true initial mass function. This research has demonstrated that most pre-main sequence stars are not T-Tauri objects. The role of multiplicity is also investigated, using IR lunar occultations, as is the evolution of circumstellar discs.

Ground-based optical and radio and space-based UV and X-ray observations are used to probe the chromospheric and coronal activities of cool stars. RS CVn, FK Coronae, and late A and F dwarf stars are being studied using Doppler imaging. The winds of hot stars are explored to investigate whether their ionization structure and large X-ray emissions are explained by ionic drift velocities.

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 of B in the sciences and mathematics.

C. Submission of the Graduate Record Examination (GRE) General Test. Note that the Physics GRE subject test is also recommended.

D. Acceptance by the Department of Physics and Astronomy and the Graduate School.

In special cases, a student not meet-

ing requirement A (or, in unusual cases, requirement B) may be admitted on a provisional basis. 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, *Emeritus.* Ph.D., 1948, University of Chicago: Theoretical physics; field theory; statistical mechanics; particle physics.

University Professor

Marburger, John H., *Director of Brookhaven National Laboratory and Former President, University at Stony Brook.* Ph.D., 1966, Stanford University: Laser theory.

Distinguished Professors

Brown, Gerald E., Ph.D., 1950, Yale University: Theoretical physics; the many-body problem.

Grannis, Paul D., Ph.D., 1965, University of California, Berkeley: Experimental high-energy physics.

Kirz, Janos, *Chairperson.* Ph.D., 1963, University of California, Berkeley: Experimental high-energy physics; energy physics; X-ray optics.

Solomon, Philip, Ph.D., 1964, University of Wisconsin: Interstellar molecules; radio astronomy; physics of interstellar medium; galactic structure; stellar mass loss; quasistellar objects.

Distinguished Service Professor

Paul, Peter, 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.

Balazs, Nandor L., *Emeritus.* Ph.D., 1951, University of Amsterdam, Netherlands: Theoretical physics: statistical mechanics; general relativity.

Courant, Ernest D., *Emeritus.*[1] 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.

Fossan, David B., Ph.D., 1961, University of Wisconsin: Experimental nuclear 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, University at Stony Brook: Experimental condensed matter physics.

Jacak, Barbara, Ph.D., 1984, Michigan State University: Experimental nuclear physics; relativistic heavy ions.

Kahn, Peter B., *Undergraduate Program Director.* 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.[1], Ph.D., 1964, University of Pittsburgh: Nuclear theory.

Lattimer, James M., Ph.D., 1976, University of Texas: Nuclear, nutrino, and high-energy astrophysics: supernovae, neutron stars, dense matter; geochemistry: gain formation, isotopic anomalies, chemical condensation in early solar nebulae.

Lee, Linwood L., *Emeritus.* Ph.D., 1955, Yale University: Experimental nuclear physics.

Likharev, Kostya, Ph.D., 1979, Moscow State University, Russia: condensed matter 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 and relativistic heavy ion physics.

McCarthy, Robert L., Ph.D., 1971, University of California, Berkeley: Experimental high-energy physics.

McCoy, Barry M.[1], Ph.D., 1967, Harvard University: Theoretical physics; statistical mechanics.

McGrath, Robert L., *Provost and VP of Brookhaven Affairs.* Ph.D., 1965, University of Iowa: Experimental nuclear physics.

Mendez, Emilio, *Director of the Institute for Interface Phenomena.* Ph.D., 1979, Massachusetts Institute of Technology: Experimental condensed matter physics.

Mihaly, Laszlo, Ph.D., 1977, Eotvos Lorand University, Budapest, Hungary: Experimental condensed matter physics.

Muether, Herbert R., *Emeritus.* Ph.D., 1951, Princeton University: Experimental nuclear physics.

Nathans, Robert, *Emeritus.* Ph.D., 1954, University of Pennsylvania: Experimental condensed matter 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.

Shuryak, Edward, Ph.D., 1974, Institute of Nuclear Physics, Novosibirsk, Russia: Theoretical nuclear physics.

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: Experimental nuclear physics.

Stephens, Peter W., *Graduate Program Director.* Ph.D., 1978, Massachusetts Institute of Technology: Experimental condensed matter physics.

Sterman, George[1], 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.

Van Nieuwenhuizen, Peter, *Director of Yang Institute for Theoretical Physics.* Ph.D., 1971, University of Utrecht, Netherlands: Theoretical physics; quantum field theory.

Weisberger, William I.[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

Averin, Dmitrii V., Ph.D., 1987, Moscow State University, Russia: Theoretical condensed matter physics.

Graf, Erlend H., Ph.D., 1967, Cornell University: Experimental low-temperature physics.

Hemmick, Thomas, Ph.D., 1989, University of Rochester: Experimental nuclear physics; relativistic heavy ions.

Jacobsen, Chris, Ph.D., 1988, University at Stony Brook: X-ray microscopy and holography.

Jung, Chang Kee, Ph.D., 1986, Indiana University: Experimental high-energy physics.

Lanzetta, Kenneth M., Ph.D., 1988, University of Pittsburgh: Formation and evolution of galaxies; evolution of the intergalactic medium.

Mould, Richard A., *Emeritus.* Ph.D., 1957, Yale University: Theoretical physics; general relativity; quantum theory of measurements.

Orozco, Luis, Ph.D., 1987, University of Texas, Austin: Quantum optics; atomic physics.

Peterson, Deane M., Ph.D., 1968, Harvard University: Stellar atmospheres; radiative transfer; Bp stars; lunar and asteroid occultations; high-time resolution photometry.

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.

Assistant Professors

Aleiner, Igor, Ph.D., 1996, University of Minnesota: Theoretical condensed matter physics.

Drees, Klaus Axel, Ph.D., 1989, University of Heidelberg: Experimental nuclear physics; relativistic heavy ions.

Evans, Aaron, Ph.D., 1996, University of Hawaii: Optical and radio astronomy evolution and collision of galaxies.

Hobbs, John, Ph.D., 1991, University of Chicago: Experimental high-energy physics.

Kakushadze, Zurab, Ph.D., 1996, Cornell University: String theory.

Schaefer, Thomas, Ph.D., 1992, Regensburg: Theoretical nuclear physics.

Wijers, Ralph, Ph.D., 1991, University of Amsterdam: Theoretical high-energy astrophysics.

Research Faculty

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: Experimental condensed matter physics.

Swesty, Doug, Ph.D., University at Stony Brook: Computational and nuclear astrophysics.

Adjunct Faculty

Ben-Zvi, Ilan, Ph.D., 1967, Weizmann Institute, Israel: Accelerator and beam physics.

Forman, Miriam, Ph.D., 1972, University at Stony Brook: Cosmic rays.

Geller, Marvin, *Dean and Director of the Marine Sciences Research Center.* Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric physics.

Lee-Franzini, Juliet, Ph.D., 1960, Columbia University: Experimental high-energy physics.

Lissauer, Jack J., Ph.D., 1982, University of California, Berkeley: Formation of the solar system; ring dynamics; cratering on satellite surfaces.

Lourie, Robert, Ph.D., 1986, Massachusetts Institute of Technology: Experimental nuclear physics; relativistic heavy ions.

Peggs, Steven, Ph.D., 1981, Cornell University: Accelerator physics.

Number of teaching, graduate, and research assistants, fall 1999: 180

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.

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 spend at least one semester as a teaching assistant in an undergraduate laboratory, 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. 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. Teaching assistant 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. Satisfactory completion of an approved program of courses, with a minimum cumulative grade point average of 3.0.

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. Students who took and completed elsewhere a lab course similar in scope and depth may be released from taking this course. Exemptions will be decided by a committee formed of the instructors teaching the course. A student desiring an exemption must submit a written request no later than the beginning of the second week of the semester to one of the instructors.

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 preliminary examination, which consists of two parts: (1) a written comprehensive examination and (2) an oral examination on a broad range of topics relevant to the student's intended area of thesis research. The written part of the comprehensive examination is offered at the beginning of each semester. It must be passed in the student's fourth semester of study at Stony Brook or earlier. The oral examination must be passed before the beginning of the fifth semester of study.

D. Acceptance of graduate student by an advisor for thesis work.

E. Teaching experience at least equivalent to that obtained in a one-year appointment as a teaching assistant, usually carried out in the first year.

F. Advancement to candidacy for the Ph.D. The department's recommendation to the Graduate School for advancement to candidacy is based on the satisfactory completion of all requirements listed above.

G. Research, dissertation, and passing the dissertation examination.

H. 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. Special relativity. Introduction to selected advanced subjects such as nonlinear oscillations, parametric oscillations, classical perturbation theory, integrable and chaotic systems, mechanics of fields.
Fall, 3 credits
ABCF grading

PHY 503/504 Methods of Mathematical Physics I, II
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, integral equations, perturbation theory as applied to linear and nonlinear systems. This course should be taken by entering graduate students seeking enrichment in these areas.
3 credits each semester
ABCF grading

PHY 505/506 Classical Electrodynamics
Electrostatics in vacuum and matter; eigenfunction-expansion and Green-function methods; special relativity and relativistic particle dynamics; magnetostatics in vacuum and matter; Maxwell's equations and gauge invariance; electromagnetic waves; radiation, and scattering in vacuum and matter; additional topics as time permits.
3 credits each semester
ABCF grading

PHY 510 Introduction to Nonlinear Dynamics
This course concentrates on developing the basic 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.
3 credits each semester
ABCF grading

PHY 511/512 Quantum Mechanics
Topics include basic quantum physics and mathematical apparatus; angular momentum; symmetries; gauge theory; semiclassical theory of radiation; Dirac theory; and numerous concrete applications to atoms, nuclei, etc.
3 credits each semester
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, 3 credits
ABCF grading

PHY 515, 516 Methods of Experimental Research
An experimental course required for all graduate students. The goal of the course is to provide firsthand experience with the pitfalls and rewards 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, and condensed matter physics. Students can gain experience in handling cryogenic liquids (LN2 and LHe), vacuum systems, lasers, pulse counting and coincidence methods, resonance measurements, and electronic instrumentation like 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. There are currently twelve different experiments across the four groups.
3 credits each semester
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 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 within the plane-parallel and LTE approximations are described. Models for the calculation of the emergent stellar spectra are discussed, and departures from the plane-parallel and LTE approximations are investigated. 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.
Alternate years, 0-3 variable 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.
Alternate years, 0-3 variable 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; equilibria of collisionless systems; and spiral structure. The course also includes a brief introduction to cosmology.
Alternate years, 0-3 variable 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
Alternate years, 0-3 variable credits
ABCF grading

PHY 530 Stellar Atmospheres
An in-depth investigation of the outer layers of stars, including a detailed development of the line and continuum formation process, both in LTE and with departures from LTE. The theory of stellar winds is developed, including both thermally driven winds (the solar wind) and line-driven winds (O star winds). The theory of non-radiative energy sources and the formation of chromospheres and coronae will be developed, as well as the formation of "star spots." Techniques for computing model atmospheres and emergent spectra are described, and the ATLAS code is introduced. Emphasis is placed on recent observations and on observational features that provide diagnostics for these astrophysical plasmas.
Every fourth year, 0-3 variable credits
ABCF grading

PHY 531 Nuclear, Neutrino, and Relativistic Astrophysics
A detailed study of the application of nuclear and neutrino physics and relativity to astrophysics. Beginning with a discussion of nuclear structure and the nuclear matter equation of state, stellar interiors, nuclear reactions, the late stages of stellar evolution, and novae and supernovae explosions are investigated. The structure, formation, and evolution of white dwarves and neutron stars are treated, including observational constraints. Additional topics include the structure and properties of black holes, the evolution of close binaries, nucleosynthesis and the chemical evolution of the Galaxy, and neutrino astronomy, including the solar neutrino problem and the particular case of SN 1987A.
Every fourth year, 0-3 variable credits
ABCF grading

PHY 532 Star Formation
This course describes the empirical foundations and theoretical understanding of the formation and early evolution of stars. Topics discussed include the initial mass function, the sites of star formation, stellar clusters and associations, pre-main sequence stellar evolution, circumstellar disks, and molecular outflows.
Every fourth year, 0-3 variable 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.
Every fourth year, 0-3 variable credits
ABCF grading

PHY 534 Galactic and Extragalactic 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.
0-3 variable credits
ABCF grading

PHY 540 Statistical Mechanics
Brief review of thermodynamics, principles of physical statistics, systems of non-interacting particles: Boltzmann, Fermi-Dirac, and Bose-Einstein statistics. Applications to ideal gases, electrons and phonons in solids, and black body radiation. Approximate treatment of non-ideal gases. First-order and second-order phase transitions. Ising model, transfer matrix, and renormalization group approach. Fluctuations in thermal equilibrium, fluctuation-dissipation theorem, brief review of non-equilibrium fluctuations. Basic notions of ergodicity, classical and quantum chaos.
Spring, 0-3 variable 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 nonequilibrium phenomena.
Fall, 0-3 variable credits
ABCF grading

PHY 551 Nuclear Physics I
Basic properties of quarks, nucleons and nuclei; independent particle models; collective models; equation of state of nuclear matter; quark matter phase transition; relevant experimental techniques.
0-3 variable credits
ABCF grading

PHY 552 Nuclear Physics II
Nuclear reactions from 1 ev to ultrarelativistic energies, relativistic nuclear many-body theory, thermodynamics of nuclear matter and chaos in nuclear physics.
0-3 variable 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 magnetism.
0-3 variable 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.
0-3 variable credits
ABCF grading

PHY 557 Elementary Particle Physics
Introduction to elementary particle physics. Symmetries and invariance in particle physics. Experiments in particle physics and experimental results. The properties of particles in terms of quarks and leptons and their interactions. An introduction to the electro-weak theory and models for strong interactions. Interactions at high energies. Interactions between particles and matter and their application in particle detectors. A case study of modern particle detectors.
0-3 variable credits
ABCF grading

PHY 565, 566 Quantum Electronics I, II
Quantum electronics is a synthesis of quantum physics and electrical engineering and is introduced in two independent semesters.

PHY 565 Atomic Physics
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.

PHY 566 Quantum Optics
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.
Each semester, 0-3 variable credits
ABCF grading

PHY 580 Special Research Projects
Research under the direction of a faculty member. Not open to Ph.D. candidates.
Each semester, 0-3 variable credits
ABCF grading

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 variable 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.
2 credits each semester, may not be taken for credit more than two semesters
ABCF grading

PHY 585 Special Study
Reading course in selected topics.
Each semester, 0-3 variable credits
ABCF grading

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.
Each semester, 1-12 credits, variable and repetitive
S/U grading

PHY 599 Graduate Seminars I, II
Special research topics centered on monographs, conference proceedings, or journal articles. Topics include solid-state physics, elementary particles, atomic physics and quantum optics, and nuclear physics, galactic and extragalactic astronomy, and cosmology. Both courses are required for all first-year graduate students.
1 credit each semester
ABCF grading

PHY 600 Practicum in Teaching
2 credits, repetitive
ABCF grading

PHY 610, 611 Quantum Field Theory I, 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.
0-3 variable credits each semester
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.
0-3 variable 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.
0-3 variable credits
ABCF grading

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, no credit, repetitive
ABCF grading

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 may enroll with permission of the faculty seminar leaders. 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 to 1 credit
ABCF grading

PHY 668 Astronomy Colloquium
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, no credit, repetitive
ABCF grading

PHY 670 Seminar in Theoretical Physics
0 or 1 credit
S/U grading

PHY 672 Seminar in Elementary Particle Physics
0 or 1 credit
S/U grading

PHY 674 Seminar in Nuclear Physics
0 or 1 credit
S/U grading

PHY 676 Seminar in Solid-State Physics
0 or 1 credit
S/U grading

PHY 678 Seminar in Quantum Electronics
0 or 1 credit
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
ABCF grading

PHY 681 Special Topics in Statistical Mechanics
ABCF grading

PHY 682 Special Topics in Solid-State Physics
ABCF grading

PHY 683 Special Topics in Radiation Physics
ABCF grading

PHY 684 Special Topics in Nuclear Physics
ABCF grading

PHY 685 Special Topics in Mathematical Physics
ABCF grading

PHY 686 Special Topics in Elementary Particles
ABCF grading

PHY 688 Special Topics in Astrophysics
ABCF grading

PHY 690 Special Topics in Quantum Electronics
ABCF grading

PHY 698 Colloquium
0 or 1 credit
ABCF grading

PHY 699 Dissertation Research
Independent research for Ph.D. degree candidates. Open only to students who have advanced to candidacy.
Each semester, variable and repetitive credit
S/U grading

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 140 (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 of SUNY 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 World Wide 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 & 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 two semesters in course(s) 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 BMO 517, Graduate Biochemistry BMO 520, Human Physiology HBY 501, Teaching Practicum HBY 695, Principles of Neuroscience HBY 554, 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 either Physical Biochemistry BMO 512 (or Biophysical Chemistry HBY 511).

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. Biochemistry and Molecular Biology: Cell and Tissue Biology BCD 656, Molecular Genetics HBM 503, Regulatory Biology HBH 560, Molecular and Physiological Basis of Drug Action HBH 533, Immunology HBP 533, 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.

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.

E. Students may be admitted provisionally under the following circumstances:

1. If GREs have not been taken, they must be taken during the first semester of registration.

2. 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:

a. Prior attendance at an English-speaking educational institution for at least two years

b. Receipt of a score of 80/85 on ALI/GU test (American Language Institute of Georgetown University)

c. Certification from an English Language Institute before arrival at Stony Brook

d. Successful English language interview upon arrival at Stony Brook.

Faculty

Professors

Abumrad, Nada A., Ph.D., 1978, State University of New York Health Science Center at Syracuse: Mechanism of membrane transport of fatty acids.

Abumrad, Naji N.[11], M.D., 1971, American University of Beirut, Lebanon: Hormonal control of protein metabolism.

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.

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, University Medical 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.

Goligorsky, Michael S.[2], M.D., 1970, Ph.D., 1973, Kiev Medical Institute, Russia: Signal transduction.

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, Irin 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.

Tewarson, Reginald P.[8], Ph.D., 1961, Boston University: Numerical analysis; mathematical models in physiology.

Van der Kloot, William G., *Emeritus.* Ph.D., 1952, Harvard University: Cellular neurophysiology.

Walcott, Benjamin[1], Ph.D., 1968, University of Oregon: Neural control of lacrimal glands, anatomy and physiology.

Associate Professors

Cabot, John B.[11], Ph.D., 1976, University of Virginia: Central nervous system control of cardiovascular function.

Clausen, Chris, Ph.D., 1979, University of California, Los Angeles: Electrical properties of transporting epithelia.

Dilger, James P.[5], Ph.D., 1980, University at Stony Brook: Neuromuscular junction; ion channels in nerve membranes.

Hurewitz, Adam[2], M.D., 1973, New York Medical College: Respiratory physiology.

Lowe, Scott W.[6], Ph.D., 1994, Massachusetts Institute of Technology: Molecular mechanisms of apoptosis in cancer.

McLeod, Kenneth[9], Ph.D., 1986, Massachusetts Institute of Technology: Effects of electrical fields on bone tissue.

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: Effects of pressure on membrane-component interactions.

Smaldone, Gerald C.[2], M.D., Ph.D., 1975, New York University: Respiratory physiology.

Spector, Ilan, Ph.D., 1967, University of Paris, France: Electrophysiology of nerve and muscle cell lines; ion channels; neurotoxins.

Assistant Professors

Marshak, Daniel R.[6], Ph.D., 1983, Rockefeller University: Neurite extension factor from mammalian brain.

Nassar, Nicolas, Ph.D., 1992, University Joseph Fourier and EMBL: Protein-protein interactions.

Saltman, Adam E.[3], M.D., Ph.D., 1990, Columbia University: Surgical preconditioning and atrial arrhythmias.

Solomon, Irene C., Ph.D., 1994, University of California, Davis: Reflex and central neural control of cardiovascular and respiratory function.

Wymore, Randy S.[15], Ph.D., 1995, University of California, Irvine: Molecular biology of cardiac ion channels and pumps.

Research Faculty

Baldo, George J., *Assistant Professor.* Ph.D., 1982, University at Stony Brook: Lens intercommunication; gap junctions.

Cameron, Roger H., *Assistant Professor.* Ph.D., 1990, University at Stony Brook: Electron microscopy; pharmacology of plasma cells secretion.

Dixon, Jane E., *Assistant Professor.* Ph.D., 1987, Australian National University: Molecular biology of potassium channels.

El-Maghrabi, Raafat, *Associate Professor.* Ph.D., 1978, Wake Forest University: Enzyme regulation; hormonal control of metabolism.

Gao, Junyuan, *Assistant Professor.* Ph.D., 1994, University at Stony Brook: Sodium potassium pump current in cardiac myocytes.

Hod, Yaacov, *Associate Professor.*[12] Ph.D., 1977, Israel Institute of Technology: Hormonal regulation of gene transcription.

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, University at Stony Brook: Biophysics of ion channels.

Rebecchi, Mario J., *Assistant Professor.*[5] Ph.D., 1984, New York University School of Medicine: Signal transduction in mammalian cells.

Sochet, Nava, *Assistant Professor.* Ph.D., 1985, University at Stony Brook: Discovery and development of bioactive marine natural products.

Sutherland, John C., *Senior Biophysicist.*[7] Ph.D., 1967, Georgia Institute of Technology: Biological effects of ultraviolet radiation on DNA; spectroscopy; synchrotron radiation.

Varadaraj, Kulandaiappan, *Assistant Professor.* Ph.D., 1991, Madri Kamaraj University: Lens membrane proteins and gap junctions.

Wang, Hsien Yu, *Associate Professor.* Ph.D., 1989, University at Stony Brook: Signal transduction and development.

Yu, Han Gang, *Assistant Professor.* Ph.D., 1993, University at Stony Brook: Cardiac pacemaker channels.

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

Degree Requirements

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

A. Completion of HBY 501, HBY 530, HBY 511 (or BMO 512), BMO 517, BMO

520, HBY 554, 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
An introduction to normal function of human tissues and organs and their regulation by nervous and endocrine systems. Emphasis on the organization and function of physiological control systems and the maintenance of a constant internal environment. Enrollment restricted to fully matriculated graduate students with permission of instructor.
Spring modules, 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. Crosslisted with HBM 511.
Prerequisite: Permission of instructor
Fall, even years, 3 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. The course includes a laboratory with demonstrations and discussions of current issues in cellular physiology and biophysics.
Prerequisites: Undergraduate physics, physical chemistry, biochemistry, biology, calculus, and permission of instructor
Fall, 4 credits
ABCF grading

HBY 531 Medical Physiology
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 insofar 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 module, 8 credits
ABCF grading

HBY 552 Physiology of Excitable Membranes
Topics covered in this course include the resting potential, the basis of the action potential, linear cable properties, and synaptic transmission. Model systems studied in detail include squid axon, the neuromuscular junction, and the cardiac Purkinje fiber.
Prerequisites: Physics, physical chemistry, and calculus
Spring, even years, 3 credits
ABCF grading

HBY 553 Signal Transduction
The course will emphasize fundamental concepts in signal transduction (e.g., membrane-protein and protein-protein interactions, amplification of signals) and individual lecturers 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.
Spring, odd years, 3 credits
ABCF grading

HBY 554 Principles of Neuroscience
The aim of this course is to highlight and create an understanding as to how the human nervous system operates.
Prerequisites: Undergraduate biochemistry, biology and chemistry
Permission of instructor
Fall, 3 credits
ABCF grading

HBY 570 Student Journal Club
Graduate student presentation on a selected topic with faculty consultation.
Prerequisite: Limited to students of the Physiology and Biophysics program
Fall and spring, 1 credit each semester, repetitive
S/U grading

HBY 590 Special Topics in Physiology and Biophysics
Student seminars and tutorials on advanced topics to be arranged through consultation with faculty members.
Prerequisite: Permission of instructor
Fall and spring, 1-2 credits each semester, repetitive
S/U grading

HBY 591 Physiology and Biophysics Research
Original investigation undertaken with a member of the staff.
Prerequisite: Permission of instructor
Fall and spring, 1-12 credits each semester, repetitive
ABCF grading

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
Fall and spring, 1 credit each semester, repetitive
S/U grading

HBY 695 Practicum in Teaching in Physiology and Biophysics
Practical experience and instruction in the teaching of physiology and biophysics carried out under faculty supervision.
Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester, repetitive
ABCF grading

HBY 699 Dissertation Research in Physiology
Original investigation undertaken as part of the Ph.D. program under supervision of thesis advisor and committee.
Prerequisite: Advancement to candidacy
Fall, spring, summer, 1-9 credits
ABCF grading

HBY 800 Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
Prerequisites: Permission of instructor and full-time graduate status
Summer, no credit
S/U grading

Political Science (POL)

Chairperson: Mark Schneider, Ward Melville Social and Behavioral Sciences Building S-711 (631) 632-7667
Graduate Program Director: Paul Teske, Ward Melville Social and Behavioral Sciences Building S-755 (631) 632-7634
Graduate Coordinator: Linda Pfeiffer, Ward Melville Social and Behavioral Sciences Building S-703 (631) 632-7650

Degrees awarded: M.A. in Political Science; M.A. in Political Science with emphasis on 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 Department of Economics and the W. Averell Harriman School for Management and Policy at Stony Brook provide additional courses on policies and political economy.

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 tax evasion from the perspectives of the government and the citizen, the effect of market-like incentives in school choice, subsidy flows in the European Union, the role of social capital in environmental decisionmaking, 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 nominations to the Supreme Court, congressional and Supreme Court decision making, the role of economic forces in American national elections, voting in congressional elections, issues of gender and the law, 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 mainframe and 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.

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 two 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 those 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 Professor

Lodge, Milton G., Ph.D., 1967, University of Michigan: Political psychology; political cognition.

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.

Scarrow, Howard A., Ph.D., 1954, Duke University: Political parties; New York State politics and elections; British politics and elections.

Schneider, Mark, *Chairperson.* Ph.D., 1974, University of North Carolina, Chapel Hill: Urban public policy; urban service delivery; administration and public policy.

Scholz, John T., Ph.D., 1977, University of California, Berkeley: Administration and public policy: implementation, regulation, enforcement, and compliance.

Segal, Jeffrey A., Ph.D., 1983, Michigan State University: Judicial process and behavior; research methods; American politics.

Teske, Paul, *Graduate Program Director.* Ph.D. 1988, Princeton University: Political economy; urban politics; regulatory policy.

Associate Professors

Casey, Jeff T., Ph.D., 1986, University of Wisconsin: Behavioral decision theory; organizational behavior; political psychology.

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.

Jones, Bradford S., Ph.D., 1994, University at Stony Brook: Voting behavior; Congress; event history analysis; methodology.

Taber, Charles, Ph.D., 1989, 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.

Berger, Mark, Ph.D., 1999, Duke University: American politics, Congress, parties, methodology.

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.

Molette-Ogden, Carla, Ph.D., 1997, Washington University, St. Louis: Judicial politics, specifically judicial decision-making and the implications of demographic changes in courts' membership; gender issues and the law; law and politics.

Van Winkle, Steven R., Ph.D., 1996, Ohio State University: Judicial politics; American politics; legislative politics; positive political theory; research methods.

Number of teaching, graduate, and research assistants, fall 2000: 22

Degree Requirements

Requirements for the M.A. Degree

In addition to the minimum requirements of the Graduate School, the department requires all candidates to complete 30 credits of approved graduate coursework in which a grade of B or higher has been received.

M.A. Program in Political Science with Emphasis on Public Policy

The M.A. program in Political Science with Emphasis on Public Policy prepares students for entry and mid-level analytic and management positions in state, local, and federal agencies, in nonprofit 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 & 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 & 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 & 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 is spent 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 is spent working with the dissertation director and selecting a dissertation committee consisting of four faculty members—three from the Department of Political Science and one with whom the student has worked outside of the department. The third year culminates with a presentation of the dissertation proposal by the student and its acceptance by the dissertation committee.

Should the dissertation committee reject the proposal, a candidate is allowed to revise the proposal for a subsequent defense. If this second defense also results in failure, the student's program is terminated.

Upon successful conclusion of research, the student defends the completed dissertation to the committee and the University community at large.

Courses

M.A. in Political Science with Emphasis on Public Policy

Required courses (POL 501, POL 502, POL 509, POL 510, POL 535, POL 536) are open to qualified students from other programs with permission of the graduate program director. Elective courses are open to all graduate students.

POL 501 Introduction to Statistics for Public Policy

This course acquaints student with statistics from the perspective of the consumer of information, as well as the occasional producer of such. It begins with the basics of applied statistical analysis, and builds to simple regression analysis. Requires use of computer packages.
Prerequisites: Some elementary mathematics/statistics background helpful
Fall, 3 credits
ABCF grading

POL 502 Intermediate Statistics for Public Policy

This course utilizes multivariate regression analysis and explores violations of the basic model and other issues related to regressions and similar analysis. Requires use of computer packages.
Prerequisite: POL 501 or equivalent
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 focuses on the details of public budgeting, exploring the use of program and functional budgets, capital and operating budgets, intergovernmental expenditures, cross-walking, etc. Focuses on state and local governments.
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.
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

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 531.
3 credits
ABCF grading

POL 534 Intergovernmental Relations and Policy Delivery

The examination of the formulation, implementation, and impact of intergovernmental policy. 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. Crosslisted with CER 534.
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. Skills stressed in the course include developing a research strategy and design, choosing measures, analyzing data, and communicating results. Students develop a program evaluation of their own.
Prerequisite: Permission of graduate studies director
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.
Fall, 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. 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.
3 credits
ABCF grading

POL 544 Human Behavior as Rational Action
The economic approach is applied to a wide range of human activities. Individuals interacting with one another are assumed to have stable preferences and exhibit maximizing behavior. The collective consequences of such individual rationality are inferred through the method of equilibrium analysis. Subtopics include the prisoner's dilemma, the logic of collective action, the evolution of cooperation, the paradox of voting, and the art of political manipulation. Crosslisted with CEI 504.
3 credits
ABCF grading

POL 553 Foundations: Comparative/International
Survey and evaluation of the major theoretical approaches, issues, and problems in comparative political analysis. The course examines such areas as political development, empirical democratic theory, or political socialization, along with a detailed examination of one or more selected non-American political systems.
3 credits
ABCF grading

POL 560 American Democracy: Its Critics and Defenders
This course examines the components of American democratic government by considering the pros and cons of suggested reforms. Critics and defenders of the 200-year-old constitutional order (including Congress, president, Supreme Court) are emphasized, as are arguments surrounding the role of political parties, pressure groups, and the bureaucracy. Most of the readings are from contemporary authors and reference sources. Crosslisted with CEI 560.
3 credits
ABCF grading

POL 580 Long Island: The Year 2000
An assessment of what the future may hold for Long Island in the year 2000, by some of the business, government, and university leaders who may help shape the future. An examination of issues relating to the arts, education, employment, energy, environmental protection, housing, opportunities for minorities, recreation, transportation, and waste management. Consideration of the role of regional development plans. The course includes lectures, discussions, and opportunities for informal interaction with many of the speakers. Crosslisted with CED 580.
3 credits
ABCF grading

POL 596 Directed Policy Research
Student works under supervision of faculty member on research project related to public policy.
1-6 credits, repetitive
ABCF grading

POL 597 Master's Paper in Public Policy
This course is primarily for students already employed in a related field. In lieu of internship, students write 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
1 credit, repetitive
S/U grading

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

Ph.D. Program

The required courses for first-year students are given every year; electives are generally offered every other year. Courses are open to qualified students from other programs with permission of the graduate program director.

Required Courses

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 proposal under the guidance of a faculty member familiar with his or her area of interest. Proposals are due in the middle of March.
1-6 credits, variable and repetitive
ABCF grading

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 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

Electives: Methodology

POL 606 Time Series Analysis
This course introduces students to stochastic models and their applications to time series data. The process of choosing a proper ARIMA model and estimating its parameters is demonstrated, with a minimum of abstract derivation and a maximum of hands-on examples taken largely from economics and electoral politics. The course covers the use of time series for forecasting and studying intervention effects, and modeling lag structures in relationships among several time series. Topics of current interest such as co-integration and vector autoregression are also addressed.
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 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 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, repetitive
ABCF grading

POL 677 Advanced Topics: Methods II
A continuation of POL 676.
3 credits
ABCF grading

Electives: American Politics

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 Elections
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 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, repetitive
ABCF grading

POL 674 Advanced Topics: American Politics II
A continuation of POL 673.
3 credits
ABCF grading

Electives: Public Policy

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.
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 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, repetitive
ABCF grading

POL 671 Advanced Topics: Public Policy Analysis II
A continuation of POL 670.
3 credits
ABCF grading

Electives: Political Psychology

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 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 678 Advanced Topics: Political Psychology/Behavior I
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.
Prerequisites: POL 605, 608
3 credits, repetitive
ABCF grading

POL 679 Advanced Topics: Political Psychology/Behavior II
A continuation of POL 678.
3 credits, repetitive
ABCF grading

Electives: General

POL 667 Political Elites
A critical review of established and new theoretical approaches and methodological orientations to the study of political elites.
3 credits
ABCF grading

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, repetitive
ABCF grading

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, repetitive
ABCF grading

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, repetitive,
S/U grading, ABCF 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
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, repetitive
S/U grading

POL 693 Practicum in Teaching
1-3 credits
S/U grading

POL 699 Doctoral Dissertation Research
Prerequisite: Permission of graduate program director
1-9 credits, repetitive
S/U grading

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 Career Development Programs: Jane O'Brien, Ward Melville Social and Behavioral Sciences Building N-247 (631) 632-7071
Assistant Dean for Academic Services and Student Advisement: Sandra Romansky, Ward Melville Social and Behavioral Sciences Building N-201 (631) 632-7050
Director of Curriculum Development, Electronic Extension, and Lifelong Learning Programs: Patricia Baker, Ward Melville Social and Behavioral Sciences Building N-215 (631) 632-9159
Assistant Director of Advising and Admissions: Jennifer Young, Ward Melville Social and Behavioral Sciences Building N-201 (631) 632-7050

Advanced Graduate Certificates awarded: A.G.C. in Coaching; A.G.C in Educational Computing; A.G.C. in Environmental/Occupational Health and Safety; A.G.C. in Human Resource Management; A.G.C. in Industrial Management; A.G.C. in Information Systems Management; A.G.C. in Operations Research; A.G.C. in School Administrator and Supervisor; A.G.C. in School District Administrator; A.G.C. in Software Engineering; A.G.C. in Waste Management
Degrees awarded: Master of Arts in Liberal Studies; M.A.T. in English 7-12; M.A.T. in Foreign Languages 7-12 (French, Italian, German, or Russian); M.A.T. in Science 7-12 (Biology, Chemistry, Earth Science or Physics); M.A.T. in Social Studies 7-12; Master of Professional Studies

The School of Professional Development, or SPD as it is fondly known by its many students and numerous graduates, was originally founded as the Center for Continuing Education in 1967. In 1987, in recognition of its broadened academic mission, the name was changed to the School of Continuing Education. The mission has expanded again, necessitating the change to its current name in 1995. This year, SPD celebrates its 33rd anniversary.

SPD offers the Master of Arts in Liberal Studies Program, Stony Brook's first and foremost part-time graduate program. In 1989, the Master of Professional Studies and the Master of Arts in Teaching Social Studies were added. The curriculum was also expanded to include 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, school administrator and supervisor, school district administrator, software engineering, and waste management. M.A.T.s in English, foreign languages, and sciences were also added.

For complete information on the programs discussed in this section, call (631) 632-7050 to request the current SPD Bulletin, or visit the Web site at *http://www.sunysb.edu/spd.*

Admission

To avoid delays in the processing of a candidate's application, all application procedures should be attended to well in advance of the semester in which a student wishes to begin classes. MA/LS or MPS applicants must:

A. Attend an on-campus group orientation session, at which time all degree requirements will be outlined and each applicant's course of study will be planned. Call (631) 632-7050 to schedule an orientation appointment.

B. Submit a completed MA/LS or MPS application and a $50 application fee at the orientation session.

C. Arrange to have an official transcript sent to SPD from the college that awarded their bachelor's degree.

D. Provide proof of immunity from measles, mumps, and rubella.

M.A.T. applicants should follow the special application procedures outlined in the M.A.T. application packet, available by calling (631) 632-7055.

International Student Admission

In addition to the application and admissions requirements listed above, students who plan to study in the United States as non-immigrant F-1 or J-1 students must meet the following requirements for issuance of the certificate of eligibility Form I-20 or IAP-66. This form is used for obtaining and maintaining non-immigrant student status in the United States.

A. English Proficiency

The University at Stony Brook has established minimum English language competency requirements for admission to graduate study and for receiving support as a graduate student. Under certain conditions students may be admitted without meeting the admission requirements, but under no circumstances may a student teach in a laboratory or class until they have demonstrated a proficiency in English.

There are specific requirements nonnative speakers of English must fulfill to be admitted to graduate study. All students who are not native speakers of English must demonstrate proficiency in English. These students must submit a TOEFL paper score of at least 550 or a TOEFL computer-based score of at least 213 for admission. Students scoring below 550 (213) or providing alternate documentation may be admitted in rare cases with approval of the dean of the Graduate School, but will be subject to additional requirements upon arrival. All students must declare their native language as part of the admission process. Admission to graduate study for non-native speakers of English is contingent upon satisfactory fulfillment of this requirement. Intentional misrepresentation by a student of his/her native language is academic dishonesty.

All non-native English speaking graduate students who have instructional responsibilities must have a TSE or SPEAK score of 55. The award of a Teaching Assistantship will be contingent on the candidate's ability to speak English proficiently.

B. Financial Verification

International students who are admitted to a degree or certificate program at the University at Stony Brook will need to obtain a Certificate of Eligibility, Form I-20 or IAP-66, from the University in order to enter or remain in the United States in F-1 student or J-1 exchange visitor status. This applies to new students, transfer students from another U.S. university, or to students for another SUNY campus.

A "Request for Certificate of Eligibility and Declaration and Certification of Finances for International Students" form must be completed and returned with the required supporting documentation that necessary funds are available to finance your education and living expenses at Stony Brook. The form is available at *http://www.grad.sunysb.edu* or in International Services.

C. Immigration Status

An F-1 or J-1 international student must take a full course of study (typically at least 12 credits per semester), must attend a mandatory orientation program, and must consult with an international student advisor upon arrival and before (1) accepting employment, (2) traveling outside of the United States either temporarily or permanently, (3) applying for a U.S. visa abroad, (4) transferring to another institution within the United States, (5) changing to another non-immigrant or immigrant status (for example: from F-1 to "permanent resident"), or (6) changing his or her major or level of study. To maintain student status, an international J-1 or F-1 student must be enrolled full time and have a valid passport, Form I-94, and Certificate of Eligibility Form I-20 or IAP-66.

International students transferring from other schools in the United States must have their Certificate of Eligibility Form I-20 or IAP-66 processed for transfer by an international student advisor at Stony Brook in order to maintain F-1 or J-1 status in the United States. J-1 students must complete this process before commencing study at Stony Brook. F-1 students must complete the transfer procedure within the first 15 days of classes. All international students are required to attend a mandatory orientation program and must meet with an international student advisor within the first two weeks of classes for an intake interview.

D. Health Insurance

For information regarding SUNY's mandatory student health insurance, contact the Student Health Insurance Office in the West Campus Health Service (Infirmary). The phone number is (631) 632-6054.

Academic Advising

SPD's academic advisors help students enrolled in the MA/LS and MPS degree programs plan their curriculum. All applicants for these degrees must meet with an SPD academic advisor at the time of application in order to develop a program of study and to review degree requirements. Call (631) 632-7050 to schedule a conference with an advisor.

Applicants for the M.A.T. degrees are advised about program requirements by the directors of each M.A.T. program.

Students wishing to apply to SPD's graduate certificate programs should call (631) 632-7050.

Although students may schedule appointments with an advisor as needed throughout their program of study, they remain individually responsible for meeting program requirements.

Prerequisites

Prerequisites, which indicate the course background expected of students, are listed for the student's benefit. Students who do not secure permission to register when it is cited as a prerequisite run the risk of being denied admission to the course at the beginning of the semester.

Credit Limitations

A. The maximum number of graduate credits earned at Stony Brook as a non-matriculated student (GSP) that can be applied toward the requirements of an SPD degree or advanced certificate is 12.

B. A maximum of six credits of any independent study, directed readings, research courses, and non-specific seminars may be counted toward an SPD master's degree (the limit for an advanced graduate certificate is three credits), unless specific prior approval is obtained from the SPD Committee of Academic Standing through a formal petition requesting leave to exceed this limit. This petition must be specific regarding the rationale and reason for such a request and have an accompanying letter from the faculty member of record fully explaining the need to exceed this limit.

C. At the written request of returning students, Stony Brook graduate courses that are over five years old when a student is admitted or readmitted to an SPD degree program will be individually reviewed by appropriate department/faculty to determine if they may be applied toward current SPD degree requirements. Grades in such courses must be B- or higher. A course that is both over five years old when a student is admitted or readmitted to an SPD degree program and carries a grade below B- is ineligible for review and cannot be used to satisfy SPD program requirements. Students requesting an individual review of such courses are required to have a cumulative grade point average (GPA) of 3.00 or higher.

D. A maximum of six graduate credits from another institution that are no more than five years old at the time a student is admitted or readmitted to an SPD degree program may be transferred toward degree requirements. There is a three credit maximum for certificate programs. Transfer is not automatic. You must request the transfer, and the request must be reviewed and approved by the SPD's transfer credit advisor. (For complete information, see section on transferring graduate credits from other institutions.)

E. Matriculated Stony Brook graduate students who complete graduate courses in programs other than SPD degrees or certificates may petition SPD's Committee on Academic Standing to have these courses included in an SPD program provided that the courses have not been used to complete another Stony Brook graduate diploma, certificate, or degree at the same level. (For instance, students who have completed a graduate certificate in Health Care Management may not use courses within this certificate for another certificate. Students who complete one master's degree may not use the same credits for another.) These courses must carry grades of B- or higher and be relevant to SPD degree and certificate requirements.

Similarly, courses used for one SPD credential may not be included in

another SPD credential earned at the same level.

Transferring Graduate Credits from Other Institutions

A. A student may transfer a maximum of six graduate credits to an SPD degree. These credits must be from institutions authorized to grant graduate degrees by recognized accrediting agencies and must be applicable to graduate degree programs offered by these institutions.

B. Credits must be clearly graduate level and in keeping with graduate studies offered at Stony Brook.

C. Credits must carry the grade of B or higher. Pass or satisfactory grades are not transferrable unless these grades can be substantiated by the former institution as being at least B quality. The grades for credits transferred from other institutions are not included in any calculation of a student's grade point average or in any evaluation of the student's academic standing in an SPD program.

D. Credits cannot be more than five years old at the time of the student's admission or readmission to matriculated status.

E. Credits used to fulfill a requirement for either a baccalaureate or another graduate degree may not be transferred to an SPD program.

F. Transferred courses cannot be used to satisfy the Liberal Studies course requirements in the Master of Arts in Liberal Studies program. The way in which transferred credits may be applied to other SPD program requirements will be determined by the school's transfer credit advisor.

G. If a transferred course has been determined to have a Stony Brook equivalent, a student may not take this equivalent for credit toward an SPD degree.

H. No credits may be transferred from another institution until a student has completed at least one graduate course as an SPD student.

I. After admission into an SPD program, a student must obtain prior approval from the transfer credit advisor to take courses at another institution for SPD credit.

J. Credits earned through correspondence, travel, or video courses, or credits earned through examination may not be transferred.

K. Credits earned through specially formatted programs (those that are not offered in a traditional semester-long format) may be considered for transfer provided they comply with all of the above transfer policies. In addition, a completed Transfer Credit Request Form must be supplemented with additional information as follows: a complete syllabus, a list of required text(s) and outside readings, a complete schedule of class meetings, and the basis for student evaluation.

Forms to request the transfer of credits and approval to take courses at another institution for SPD credit are available in the SPD Office or from the school's academic advisors.

Master of Arts in Liberal Studies (MA/LS)

The Master of Arts in Liberal Studies program is the University's most extensive part-time evening graduate program. Each semester more than 2,000 graduate students choose from over 150 evening courses offered by more than 25 academic departments. The MA/LS 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.

The Master of Arts in Liberal Studies meets the master's degree requirement for permanent certification in all certification areas except those related to pupil personnel service and educational administration.

MA/LS Admission

To be considered for the MA/LS degree program, students must hold a bachelor's or advanced degree from an accredited institution of higher education. A cumulative undergraduate GPA of 2.75 or higher is required to matriculate in these programs. Students with an undergraduate cumulative GPA of less than 2.75 will be considered for provisional admission.

Provisionally admitted part-time students must achieve a 3.00 after attempting six graduate credits (applicable to their program) at Stony Brook. Full-time students (12 or more credits) must achieve a 3.00 after their first semester. If a 3.00 GPA is not achieved as above, students normally will not be permitted to re-enroll.

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.

MPS Admission

To be considered for the MPS degree program, students must hold a bachelor's or advanced degree from an accredited institution of higher education. A cumulative undergraduate GPA of 2.75 or higher is required to matriculate in these programs. Students with an undergraduate cumulative GPA of less than 2.75 will be considered for provisional admission.

Provisionally admitted part-time students must achieve a 3.00 after attempting six graduate credits (applicable to their program) at Stony Brook. Full-time students (12 or more credits) must achieve a 3.00 after their first semester. If a 3.00 GPA is not achieved as above, students normally will not be permitted to re-enroll.

Master of Arts in Teaching (M.A.T.)

Each 39-credit Master of Arts in Teaching program includes a set of pro-

fessional education courses and a concentration in an academic discipline. Students who complete an M.A.T. program satisfy both the registered and approved program requirements for New York State secondary grades 7-12 provisional teacher certification in M.A.T. subject areas (i.e., English, French, German, Italian, Russian, Biology, Chemistry, Earth Science, 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.

M.A.T. Admission

Admission is selective, based on a review by the appropriate program director of the M.A.T. application and attached personal statement, three letters of recommendation, and official copies of all previous college transcripts. All students seeking admission to M.A.T. programs must possess an undergraduate major or a minimum of 36 credits in the content field. Scores from the Graduate Record Examination (GRE) General Test are also required. Although students may be admitted without the GRE scores, they must show evidence that they are planning to take the GRE during the first semester of registration in the M.A.T. program.

M.A.T. 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). For additional information about this graduate program, please address inquiries to Elsa Emenheiser, Director, M.A.T. in English Program, Department of English, University at Stony Brook, Stony Brook, New York 11794-5350; or telephone (631) 632-7303 or 632-7055.

Admission

Applicants for admission to the M.A.T. in English must have completed an academic major in English or a minimum of 36 credits in English with a cumulative GPA of at least 3.00. They must also demonstrate through their application and recommendations that they possess the temperament and disposition to be an effective teacher. It is expected that applicants will have little or no previous coursework in education or formal classroom teaching experience. To be considered for admission, all students must submit or have sent to the School of Professional Development:

A. A completed M.A.T. application and health form with $50 application fee;

B. Three letters of recommendation;

C. Official copies of all previous college transcripts;

D. An official report of scores earned on the Graduate Record Examination General Test.

Note: In order to be recommended by the University at Stony Brook for New York State certification in English grades 7-12, students in the M.A.T. in English must have completed at least one year of a college-level study of a foreign language and a minimum of 36 credits in English in their combined undergraduate and graduate coursework.

M.A.T. 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 M.A.T.s each consist of 39 graduate credits of coursework.

For additional information about this graduate program, please address inquiries to Sarah Jourdain, Director, M.A.T. in Foreign Language Programs, University at Stony Brook, Stony Brook, New York 11794-3359; or telephone (631) 632-7440 or 632-7055.

Admission

Applicants for admission to the M.A.T.s in foreign language are expected to have good preparation in the program language (preferably a major or a minimum of 36 credits) with a minimum GPA of 2.75 in their overall bachelor's degree program and at least a 3.00 in language studies. They must also demonstrate through their application and recommendations that they possess the temperament and disposition to be an effective teacher. It is expected that applicants will have little or no previous coursework in education. To be considered for admission, all students must submit or have sent to the School of Professional Development:

A. A completed M.A.T. application and health form with $50 application fee;

B. Three letters of recommendation;

C. Official copies of all previous college transcripts;

D. Several sample papers from their undergraduate program that demonstrate level of proficiency in the program language;

E. An official report of scores earned on the Graduate Record Examination General Test.

Note: In order to be recommended by the University at Stony Brook for New York State certification in a foreign language, grades 7-12, students in the M.A.T.s in foreign language must have completed at least a minimum of 36 credits in the program's foreign language in their combined undergraduate and graduate coursework. Students who are admitted to the M.A.T./FLA programs on the basis of demonstrated proficiency (determined according to ACTFL guidelines) but who have not actually accumulated 36 credits in the program's language will be advised by the FLA Teacher Education Program Advisor about ways to meet the 36-credit certification requirement.

M.A.T. 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 39 graduate credits of coursework.

Admission

Applicants for admission to any of the M.A.T.s in science will be required to have completed an academic major in a science or a minimum of 36 credits in science. They must also demonstrate through their application and recommendations that they possess the personal traits required of effective teachers. Most applicants will have little or no previous coursework in education or formal classroom teaching experience. To be considered for admission, all students must submit or have sent to the School of Professional Development:

A. A completed M.A.T. application and health form with $50 application fee;

B. Three letters of recommendation;

C. Official copies of all previous college transcripts;

D. An official report of scores earned on the Graduate Record Examination General Test.

All interested students should first consult with the program's director to determine whether or not they should proceed with the application procedures.

For Biology M.A.T. program advisement, call Dr. David Bynum at (631) 632-9750.

For Chemistry M.A.T. program advisement, call Dr. Frank Fowler at (631) 632-7938.

For Earth Science M.A.T. program advisement, call Dr. Gilbert Hanson at (631) 632-8210.

For Physics M.A.T. program advisement, call Dr. Clifford Swartz at (631) 632-8175.

For applications and/or additional information about this graduate program, please contact the Professional Education Program at (631) 632-4PEP, the appropriate director noted above, or the associate dean of SPD at (631) 632-7055.

Note: In order to be recommended by the University at Stony Brook for New York State certification in a science, grades 7-12, students in the M.A.T. in Biology, Chemistry, Earth Science, or Physics must have completed at least a minimum of 36 credits in science and at least one year of college-level study of a foreign language in their combined undergraduate and graduate coursework.

M.A.T. 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.

Admission

Applicants for admission to the M.A.T. in social studies must have completed an academic major (a minimum of 36 credits) in history or another social science major (excluding psychology, education, and linguistics) and at least 18 credits of history, of which nine credits must be at the upper-division level. They must also demonstrate through their application and recommendations that they possess the temperament and disposition to be an effective teacher. It is expected that applicants will have little or no previous coursework in education or formal classroom teaching experience. To be considered for admission, all students must submit or have sent to the School of Professional Development:

A. A completed M.A.T. in social studies application and health form with $50 application fee;

B. Three letters of recommendation;

C. Official copies of all previous college transcripts;

D. An official report of scores earned on the Graduate Record Examination General Test.

For additional information about this graduate program, please address inquiries to Dr. Georges Fouron, Director, M.A.T. in Social Studies Program, University at Stony Brook, Stony Brook, New York 11794-4333; or telephone (631) 632-7693 or 632-7055.

Note: In order to be recommended by the University at Stony Brook for New York State certification in social studies, grades 7-12, students in the M.A.T. in social studies must have completed at least one year of college-level study of a foreign language and at least 36 credits in social sciences (excluding psychology, education, and linguistics) in their combined undergraduate and graduate coursework. Among the 36 credits in social science at least 18 credits must be distributed as follows: three credits in each of the following: economics, Asian history, African history, Latin American history, U.S. history, and European history. Students who are deficient in the foreign language or social science areas will be advised by the director of the M.A.T. in social studies about taking additional courses to satisfy New York State-approved program requirements.

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, Educational Computing, Environmental/Occupational Health and Safety, Human Resource Management, Industrial Management, Information Systems Management, Operations Research, Software Engineering, 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.

In addition, SPD also offers School Administrator and Supervisor (SAS) and School District Administrator (SDA) advanced graduate certificate programs for educators who have already attained a master's degree. Credit requirements are 30 and 36 credits respectively.

Admission (For all advanced graduate certificate programs except SAS and SDA)

A. Prospective candidates may obtain an application for a graduate certificate program by writing, calling, or visiting the School of Professional Development. Candidates who wish to apply simultaneously to a SPD degree program will be advised about

additional application procedures that must be followed.

B. Completed applications should be submitted to SPD. An official copy of the college transcript that verifies that the candidate has been awarded a bachelor's degree from an accredited institution must also be sent to SPD as well as any other transcripts showing college level coursework.

C. To be admitted to a graduate certificate program, an applicant should have the background and ability which, in the judgment of the individual directors of each certificate program, are sufficient to enable him or her to progress satisfactorily through the program. An undergraduate cumulative GPA of 2.75 is required. Students with less than a 2.75 average will be considered for provisional admission. Provisionally admitted part-time students must achieve a 3.00 after attempting six graduate credits (applicable to the program) at Stony Brook. Full-time students (12 or more credits) must achieve a 3.00 after their first semester. If a 3.00 GPA is not achieved as above, students normally will not be permitted to re-enroll.

Certificate Requirements (For all programs except SAS and SDA)

A. A student preparing for a School of Professional Development graduate certificate must complete certificate requirements as listed beneath each program title within five years from his or her official date of admission to the program, and with at least a 3.00 cumulative GPA. Students may request advising appointments with SPD advisors to discuss certificate program requirements by calling (631) 632-7050.

B. Candidates must formally request issuance of these certificates through the School of Professional Development at Stony Brook upon satisfactory completion of all program requirements. This may be done by completing and submitting a graduation application available in the SPD office.

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 additional information on the Coaching Certificate Program, please contact Ms. Theresa Tiso of the Division of Physical Education and Athletics at (631) 632-7215.

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 additional information, contact Joanne English Daly, Director of the Educational Computing Program, Department of Technology and Society at (631) 632-8767.

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 current information on the Environmental/Occupational Health and Safety Graduate Certificate Program, contact 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 current information on the Human Resource Management Graduate Certificate Program, contact Jeff Casey, Director of Graduate Studies at the W. Averell Harriman School at (631) 632-7171.

Advanced Graduate Certificate in Industrial Management

This 18-credit program is designed to help managers develop their abilities to use advanced technologies in their companies and understand their business processes in order to reduce waste and inefficiencies to improve the bottom line of their companies. The program consists of graduate credits drawn from the M.S. degree in Technological Systems Management. Graduates will gain the knowledge required for promotion, career advancement, and to become

future leaders of industry.

For current information about the Industrial Management Graduate Certificate program, contact Professor Herbert Schiller in the Department of Technology and Society at (631) 632-8518.

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 current information on the Information Systems Management Graduate Certificate program, contact Jeff Casey, W. Averell Harriman School at (631) 632-7171.

Advanced Graduate Certificate in Operations Research

The A.G.C. 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 additional information, contact Professor Alan Tucker, coordinator of the Operations Research graduate concentration in the Department of Applied Mathematics and Statistics at (631) 632-8365.

Advanced Graduate Certificate in Software Engineering

The School of Professional Development, in collaboration with the Department of Computer Science, in the College of Engineering and Applied Sciences, offers an 18-credit graduate certificate program in Software Engineering.

This certificate is designed to provide an alternate route for training and retaining of individuals involved in high technology industries who come out of other technical disciplines and want to gain computer expertise. It is also for those who need a basic grounding in the writing of software packages that may be used to adapt current procedures and practices on both the management and manufacturing side of the "new" corporate culture.

The certificate program will be designed to meet individual needs and will be germane to the student's background and training. For further information, contact Dr. Michael Kifer, Graduate Program Director, Computer Science Department at (631) 632-8459.

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 additional information, contact the Waste Reduction and Management Institute at (631) 632-8704.

Advanced Graduate Certificate School Administrator and Supervisor (SAS)

School teachers interested in pursuing a challenge beyond the classroom are invited to apply for this program, which provides an up-to-date curriculum that can prepare students for such advanced positions as building principal, assistant building principal, department chairperson, or dean of students, among others. The program is offered in collaboration with the University's Professional Education Program.

The SAS Certificate requires completion of 30 graduate credits as follows:

Foundations: 9 credits

CEQ 501 Educational Administrative Theory I, 3 credits
CEQ 502 Educational Administrative Theory II, 3 credits
CEQ 503 Educational Administrative Practice, 3 credits

Requirements: 9 credits

CEQ 541 School Building Administration, 3 credits
CEQ 528 School Law, 3 credits
CEQ 555 Supervision of Instruction, 3 credits

Electives: 3 credits

Elective course may be selected from an approved list in consultation with the program director.

Internship and Seminar: 6 credits

CEQ 551 Internship in School Building Administration, 3 credits
CEQ 552 Internship Seminar, 3 credits

Project Seminar: 3 credits

CED 595 Project Seminar. Each student is required to do an individual research project on a topic of special

academic interest or professional relevance under the direction and supervision of a faculty member and subject to the approval of the program director.

Courses that satisfy the program requirements listed above are offered regularly during the Fall and Spring semesters. Although Summer Session will have some graduate courses that can be applied toward the School Administrator and Supervisor Certificate, students should plan on meeting critical course requirements during either the Fall or Spring semesters.

Any students seeking to enter the program with deficiencies will be advised how to meet admission requirements through prerequisite study.

SAS Admission Requirements

Applicants for admission to the School Administrator and Supervisor Certificate program are expected to have a thorough grounding in an academic subject area as well as professional courses in teacher education. They must possess the intellectual skills to do advanced graduate course work (at least a B average in their prior graduate studies) and must display interest and ability to become an effective administrator as evidenced by an essay to be included in the students application packet.

All students must complete the following in order to be considered for admission to the program:

1. An official School of Professional Development application form;

2. An essay (no more than two typewritten, double-spaced pages) outlining the student's background, goals and objectives, and philosophy of leadership;

3. Three letters of recommendation, at least two of which must be from school supervisory personnel or administrators who have a thorough knowledge of the individual with regard to temperament and disposition to become an effective leader;

4. One official copy of all previous college transcripts from regionally accredited institutions; graduate transcripts of candidates for admission to the SAS program must indicate that the candidate has been awarded a master's degree;

5. Letter from employer stating that the candidate has three years of teaching, administrative, supervisory, or pupil personnel services experience excluding civil service;

6. A nonrefundable application fee in the amount of $50;

7. Provide proof of immunity from measles, mumps, and rubella.

For additional information about this graduate program, please address inquiries to: SAS/SDA Program, School of Professional Development, University at Stony Brook, Stony Brook, NY 11794-4310; or telephone (631) 632-7055.

School District Administrator (SDA) Advanced Graduate Certificate

This 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, district director, and director of PSEN students. This program is offered in collaboration with the University's Professional Education Program.

The SDA Certificate requires completion of 36 graduate credits as follows:

Foundations: 9 credits

CEQ 501 Educational Administrative Theory I, 3 credits
CEQ 502 Educational Administrative Theory II, 3 credits
CEQ 503 Educational Administrative Practice, 3 credits

Requirements: 15 credits

CEQ 515 School District Administration, 3 credits
CEQ 528 School Law, 3 credits
CEQ 555 Supervision of Instruction, 3 credits
CEQ 571 Business Administration, 3 credits
CEQ 572 School Personnel Management, 3 credits

Electives: 3 credits

Elective courses may be selected from an approved list in consultation with the program director.

Internship and Seminar: 6 credits

CEQ 561 Internship in School District Administration, 3 credits
CEQ 562 Internship Seminar, 3 credits

Project Seminar: 3 credits

CED 595 Project Seminar. Each student is required to do an individual research project on a topic of special academic interest or professional relevance under the direction and supervision of a faculty member and subject to the approval of the program director.

Courses that satisfy the program requirements listed above are offered regularly during the Fall and Spring semesters. Although Summer Session will have some graduate courses that can be applied toward the School District Administration certificate, students should plan on meeting critical course requirements during either the Fall or Spring semesters.

Any students seeking to enter the program with deficiencies will be advised how to meet admission requirements through prerequisite study.

SDA Admission Requirements

Applicants for admission to the School District Administrator Certificate program are expected to have a thorough grounding in an academic subject area as well as professional courses in teacher education. They must possess the intellectual skills to do advanced graduate course work (at least a B average in their prior graduate studies) and must display interest and ability to become an effective administrator as evidenced by an essay to be included in the student's application packet.

All students must complete the following in order to be considered for admission to the program:

1. An official School of Professional Development application form;

2. An essay (no more than two typewritten, double-spaced pages) outlining the student's background, goals and objectives, and philosophy of leadership;

3. Three letters of recommendation, at least two of which must be from school supervisory personnel or administrators who have a thorough knowledge of the individual with regard to temperament and disposition to become an effective leader;

4. One official copy of all previous college transcripts from regionally accredited institutions; transcripts of candidates for admission to the SDA program must show conferral of a master's degree;

5. Letter from employer stating that the candidate has three years of teaching, administrative, supervisory, or pupil personnel services experience excluding civil service;

6. A nonrefundable application fee in the amount of $50;

7. Proof of immunity from measles, mumps, and rubella.

For additional information about this graduate program, please address inquiries to: SAS/SDA Program, School of Professional Development, University at Stony Brook, Stony Brook, NY 11794-4310; or telephone (631) 632-7055.

Psychology (PSY)

Chairperson: Grover J. Whitehurst, Psychology B 154 (631) 632-7805
Graduate Program Director: Harriet Waters, Psychology B 152 (631) 632-7814
Graduate Secretary: Debbie Campani, Psychology B 150 (631) 632-7814

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. There are typically about 155 doctoral students in the department. More than 565 Ph.D. degrees have been awarded since the program began more than 40 years ago. The population of students is generally about 60 percent female, 15 percent minority, and 10 percent foreign students.

The department is administratively organized into four program areas: Clinical Psychology, Social/Health Psychology, Experimental/Cognitive, 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 and the Department of Psychiatry, interdisciplinary training is offered in behavioral neuroscience. 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. The doctoral program is registered for licensure in psychology with the New York State Education Department, and Stony Brook's specialization in clinical psychology 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

In addition to the faculty's individual research laboratories for human and animal research, a number of other facilities are utilized in research and graduate training. The Psychological Center is the training, research, and service unit for clinical psychology, providing psychological services and consultation to the community and a site for graduate practicum and internships. The Point of Woods Laboratory School houses a small special education class for elementary school students with attention-deficit disorders or hyperactivity, as well as assessment and treatment projects for other children. 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 Developmental Disabilities Institute, a private school for autistic, retarded, aphasic, and developmentally delayed children, is located in the local community. 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, in addition to the Developmental Disabilities Institute, for clinical neuropsychology.

Microcomputers are available in departmental laboratories, in addition to those used for sponsored research and undergraduate laboratory courses. In addition to departmental CRT terminals, there are terminals and printers for use with the central campus computer in the Social Science Data Laboratory, as well as an extensive microcomputer facility in the Ward Melville Social and Behavioral Sciences Building for use in both graduate and undergraduate instruction.

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 all graded 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. Results from the Graduate Record Examination (GRE) General Test are required; Advanced Test results are recommended for undergraduate psychology majors.

F. Foreign nationals must provide 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 materi-

als for fall admission is January 15. There is no fixed deadline for applications for spring admission, but to receive fullest consideration applications and supporting materials should be received by November 1 (October 20 for foreign nationals).

Faculty

Distinguished Professors

O'Leary, K. Daniel, 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, Ph.D., 1965, Harvard University: How organisms allocate their time under various restrictions such as time limitation, removing or adding the possibility of an activity, or making one activity contingent on another; relation of human decision to animal choice.

Professors

Aron, Arthur, Ph.D., 1970, University of Toronto, Canada: Motivation and cognition in close relationships; methodology.

Birns, Beverly[1], Ph.D., 1963, Columbia University: Psychology of women; abused women and children; child care and development; social psychology; children and social policy; health policy.

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

Carr, Edward G., Ph.D., 1973, University of California, San Diego: Analysis and treatment of child behavior problems; developmental disabilities; communication disorders.

D'Zurilla, Thomas, *Director of the Psychological Center.* Ph.D., 1964, University of Illinois: Social problem solving; problem-solving therapy; preventive 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., 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: Psychotherapy process research; cognitive behavior therapy; delineation of common therapeutic principles across theoretical orientations.

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

Klein, Daniel N., Ph.D., 1983, University at Buffalo: Psychopathology; mood and personality disorders; assessment, classification, course, 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 Oriental and western views of human nature.

Liebert, Robert M., Ph.D., 1966, Stanford University: Affective liability.

Loney, Jan[5], Ph.D., 1961, University of Illinois: Assessment of hyperactivity; long-term follow-up studies of hyperactive children and long-term effect of medication on them.

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, University at Stony Brook: Theoretical and applied research on discipline practices in the home; prevention and early intervention vis-a-vis oppositional and conduct-disordered children.

Samuel, Arthur, Ph.D., 1979, University of California, San Diego: Perception, psycholinguistics, and attention; perception of speech and music as domains of study in cognitive psychology.

Squires, Nancy K., 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.

Stone, Arthur[5], Ph.D., 1978, University at Stony Brook: Stress, coping, and illness; immune system functioning and health.

Wang, Rex[5], Ph.D., 1975, University of Delaware: Neuropsychopharmacology; the mode of action of antipsychotic drugs and hallucinogens; physiology and pharmacology of dopamine and serotonin systems.

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

Weidner, Gerdi, Ph.D., 1981, Kansas State University: Experimental and epidemiological research on psychosocial aspects of coronary risk; sex differences; lifestyle and illness; cardiovascular reactivity to stress.

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

Wolf, Gerrit, Ph.D., 1967, Cornell University: Public policy and management; social policy; decision and organizational behavior.

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

Associate Professors

Brennan, Susan, Ph.D., 1990, Stanford University: Psycholinguistics; reference and lexical choice; communication; human/computer interaction; computational linguistics; caricature and face recognition.

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.

Fischel, Janet[7], Ph.D., 1978, University at Stony Brook: Behavioral and developmental pediatrics; developmental language disorders and emergent literacy skills; psychological management of disorders of elimination.

Franklin, Nancy, Ph.D., 1989, Stanford University: Human memory; spatial cognition; mental models of physical systems; reality monitoring.

Krupp, Lauren[4], 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.

Lobel, Marci, Ph.D., 1989, University of California, Los Angeles: Stress, coping, and physical health; psychosocial factors in pregnancy and birth outcomes; social comparison processes.

Morin, Lawrence P.[5], Ph.D., 1974, Rutgers University, Institute of Animal Behavior: Biological rhythms; environment and reproduction; endocrine system and behavior.

Rajaram, Suparna, Ph.D., 1991, Rice University: Human memory and amnesia; implicit and explicit memory distinctions; repetition priming; experimental investigation of remembering and knowing the past.

Sprafkin, Joyce[5], Ph.D., 1975, University at Stony Brook: Child psychopathology; AHDH; tic disorders; effects of television on child behavior.

Waters, Harriet Salatas, *Graduate Program Director.* Ph.D., 1976, University of Minnesota: Cognitive development, particularly the development of learning and memory strategies, encoding, and retrieval processes in memory; comprehension and production of prose; problem solving and computers.

Assistant Professors

Anderson, Brenda J., Ph.D., 1993, University of Illinois: Neural mechanisms of learning and memory; the effects of motor-skill learning vs. physical activity on formation of synapses and changes in the central nervous system vasculature and metabolism.

Conrad, Patricia, Ph.D. 1998, McGill University, Canada: Alcohol and drug abuse and dependence; classification, development, psychbiology and treatment of substance use disorders.

Levy, Sheri, Ph.D., 1998, Columbia University: Development, maintenance, and reduction of prejudice among adults and children; social cognition and prosocial behavior.

Robinson, John, Ph.D., 1991, University of New Hampshire: Rodent models of learning and memory disorders; behavioral actions of neuropeptides and anandamidergics.

Strassberg, Zvi, Ph.D., 1992, Vanderbilt University: Etiology, sequelae, and treatment/prevention of child and parent aggression, including physical abuse; construct validity of aggressive and oppositional behavior in early childhood, and the identification of "at-risk" children.

Weisberg, James, *Associate Director, Pain Center.*[5] Ph.D., 1992, Ferkauf Graduate School of Psychology, Albert Einstein College of Medicine, Yeshiva University: Pain Management, personality disorders in chronic pain, coping with chronic pain.

Westmaas, Lee, Ph.D., 1996, University of California, Irvine: Cognitive and social influence on health related beliefs and behavior.

Zelinsky, Gregory, Ph.D., 1994, Brown University: Perceptual constraints on attention; dynamics of visual search as revealed by eye movements; perception of objects in realistic scenes.

Adjunct Faculty

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

Eisenstein, Edward, *Assistant Professor.*[2,3,4] Ph.D., 1962, University of California, Los Angeles; M.D., 1978, Michigan State University: Learning and memory mechanisms in insects; human learning and memory changes with age.

Perterson, 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.*[1] Ph.D., 1973, Stanford University: Human ethology; sex roles; social learning theory; female academic and career success.

Research Faculty

Heyman, Richard, *Associate Professor.* Ph.D., 1982, University of Oregon: Escalation and de-escalation of marital conflict; observation of marital interactions; assessment and treatment of spouse abuse; prevalence of partner abuse.

Slep, Amy Smith, *Assistant Professor.* Ph.D., 1995, University at Stony Brook: 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, University at Stony Brook: 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.

Number of teaching, graduate, and research assistants, fall 2000: 110

1) Joint appointment, Social Sciences Interdisciplinary Program

2) Staff Radiologist, VA Medical Center, Northport

3) Joint Appointment, Radiology

4) Joint Appointment, Neurology

5) Joint appointment, Department of Psychiatry and Behavioral Sciences

6) Joint appointment, Faculty Instructional Support Office

7) Department of Pediatrics

8) Joint appointment, Department of Political Science

Degree Requirements

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

A. Course Requirements

A student must maintain a graduate G.P.A. of at least 3.0 and successfully complete an approved program of study with a grade of at least B in each required course. Two semesters of quantitative methods and three core courses selected from at least three areas 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. Some areas of the department have additional requirements. Following admission, students with graduate training elsewhere can petition to satisfy course requirements on the basis of their previous graduate work. Typically, no more than two or 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 Psychology Graduate Office. Petitions concerning area requirements should be addressed to the student's area director.

B. First-Year Evaluation

Progress of each first-year graduate student is reviewed at the end of the academic year by the entire faculty. The purpose of this review is to allow the student to withdraw without an excessive investment of time when, in the opinion of the faculty, the student would not pass the preliminary examination at the Ph.D. level or produce a suitable dissertation. Any student whose performance is below the standards established by the department for the Ph.D. 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. 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 (which need not be presented in the form of a thesis), upon the recommendation of the faculty in the student's area of graduate studies.

D. Preliminary Examination

This examination should be completed by the end of the fifth semester of study and consists of two parts. The general examination includes the completion of certain courses (see item A) and a second-year review/research paper suitable for submission to a refereed journal. The second-year paper requirement must be satisfied prior to the specialty examination. The form of the specialty examination depends upon the student's area of graduate studies, but all areas require its completion before the end of the third year.

E. Advancement to Candidacy

Upon successful completion of the preliminary examination and 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.

F. Research and Teaching

Supervised teaching and research experience from the time of admission through the fourth year is required. The program requires both research and instructional experience each semester, rather than having students serve either as teaching assistant or as research assistant. This requirement can be waived or modified for students holding fellowships, serving as full-time interns or as graduate instructors, or being supported by a research grant.

Two semesters of substantial direct instruction in classroom or laboratory is required. During these semesters, graduate students must receive teaching evaluations from their students.

G. 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, residents must register for full-time study until advanced to candidacy. Full-time study is at least 12 credits during the first year of graduate study and nine thereafter.

H. Dissertation

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

Within Area Course Requirements

Experimental: Cognitive

Complete three of the following:

PSY 513 Attention and Thought
PSY 514 Sensation and Perception
PSY 518 Memory
PSY 519 Problem Solving
PSY 520 Psycholinguistics

Experimental: Judgment and Choice

Complete three of the following:

PSY 511 Learning
PSY 513 Attention and Thought
PSY 514 Sensation and Perception
PSY 518 Memory
PSY 519 Problem Solving
PSY 520 Psycholinguistics
PSY 546 Measurement and Scaling
PSY 560 NeuroPsychology
PSY 561 Cognitive and Behavioral NeuroScience I
PSY 562 Cognitive and Behavioral NeuroScience II
PSY 564 NeuroPsychopharmacology

** All Experimental students sign up for PSY 583, 584 Experimental Colloquium sequence each year.*

Social/Health Psychology

Complete the following courses (required of all students):

PSY 555 Social Psychology
PSY 558 Social Psychology: Health Applications
PSY 548 Program Evaluation

BioPsychology

Complete the following courses (required of all students):

PSY 561 Cognitive and Behavioral NeuroScience I
PSY 562 Cognitive and Behavioral NeuroScience II
BNB 560 Laboratory in Neuroanatomy

Sign up for the following sequence each year (required of all 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 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 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 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.
Prerequisite: PSY 501
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, no credit
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

PSY 508 Introduction to Computer Applications in Statistics
Computer protocol and introduction to statistical packages and necessary utility programs.
Co-requisite: PSY 501 or 502
Fall and spring, 0-1 credits, repetitive
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.
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, 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.
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, alternate years, 3 credits
ABCF grading

PSY 519 Problem Solving
Both traditional and more contemporary theories of problem solving are reviewed. The literature on expertise and the role of knowledge in problem solving is also examined.
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.
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, 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, 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 and 502
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.
Prerequisites: PSY 534; clinical doctoral student
Fall, 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.
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.
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.
Spring, alternate years, 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, alternate years, 3 credits
ABCF 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, 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, 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, alternate years, 3 credits
ABCF grading

PSY 561, 562 Cognitive and Behavioral Neuroscience I, 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.
Section 1: Fall, 3 credits
Section 2: 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.
Spring, alternate years, 3 credits
ABCF grading

PSY 564 Neuropsychopharmacology
The theme of the course is to discuss the mechanisms and actions of psychotropic drugs and transmitters at receptors and how these processes cause changes in different facets of behavior. The application of this knowledge to the use of psychoactive drugs in man is included in the discussion.
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. This sequence is required of all students in the cognitive and behavioral neuroscience program.
Section 1: Fall, 3 credits
Section 2: Spring, 3 credits
ABCF grading

PSY 581, 582 Cognitive and Behavioral Neuroscience Colloquium I, 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.
Section 1: Fall, 0-3 credits, repetitive
Section 2: Spring, 0-3 credits, repetitive
S/U grading

PSY 583, 584 Experimental Psychology Colloquium
Seminars on current research problems directed by students, staff, and invited scientists. Required of all experimental students.
Section 1: Fall, 0-3 credits, repetitive
Section 2: Spring, 0-3 credits, repetitive
S/U 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, no credit
S/U grading

PSY 602 Assessment Practicum
Exposure to the application of clinical assessment procedures.
Co-requisite: 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.
Prerequisites: PSY 537 and 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 credit
ABCF 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, 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, repetitive
ABCF grading

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, 3 credits, repetitive
ABCF grading

PSY 696 Readings
Prerequisite: Permission of instructor
Variable and repetitive credit
S/U grading

PSY 698 Research
Prerequisite: Permission of instructor
Variable and repetitive credit
S/U grading

PSY 699 Doctoral Research
Prerequisite: Advancement to candidacy
Variable and repetitive credit
S/U grading

School of Social Welfare

Dean: Frances L. Brisbane, Health Sciences Center, Level 2, Room 093 (631) 444-2139
Graduate Program Director: Michael Lewis, Health Sciences Center, Level 2, Room 093 (631) 444-3166
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. 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.

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. Some courses are offered in concentrated form during the semesters, intersession, and summer session.

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.

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. Students choose the school at which they spend the first year. 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 separate bulletin is available describing the M.S.W. program and the M.S.W./J.D. dual degree, 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
University at Stony Brook
Stony Brook, NY 11794-8230
(631) 444-3141

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 dissemiate 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 15 required classroom courses (45 credits) as follows:

Statistics I and II

Research Methods I and II

Research Practicum I and II

Social Welfare Policy Analysis I and II

Organizational Theory and Social Welfare Administration

Knowledge Building in Social Work: The Philosophy of Applied Social Research

Theories of Social Work Intervention

Seminar in Social Work Education

Teaching Practicum

Dissertation Seminar I and II

Also required are 3 electives (9 credits), oral and written qualifying examinations, a scholarly paper of publication quality, and the production and defense of a scholarly dissertation. The total number of credits required for graduation is 54.

For full-time students, the program is designed to be completed in four years. 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.

Comprehensive examinations are given when 36 credits of coursework have been completed. Students are admitted to formal candidacy after finishing 54 credits and all departmental requirements except the dissertation, which is completed in the fourth year.

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. They follow the "Sample Curriculum for Part-Time Students." Part-time students sit for their comprehensive examinations at the end of the semester when 36 credits of required course work are completed (usually the second semester of the third year).

At the end of the third year, part-time students select a dissertation committee and submit a research paper of publication quality. In the fourth year, they develop an approved dissertation proposal. They begin dissertation research 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. If possible, one letter should come from someone familiar with your 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 your 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 in which you have received a grade of B or better.

I. Beginning computer literacy.

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 demonstrate a high potential for success in the program.

Requirements for the Ph.D. Degree

A. One year in residence.

B. Satisfactory completion of required and elective courses (54 credits).

C. Satisfactory completion of research and teaching practica.

D. Submission of a research paper of publication quality prior to the qualifying examination.

E. Satisfactory performance on the written comprehensive qualifying examination.

F. Admission to candidacy by vote of the doctoral committee.

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.

A separate application and bulletin are available describing in more detail the Ph.D. program, its curriculum, and the 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

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.

Lefferts, Robert, Ph.D., Brandeis University: Program evaluation; market research; advocacy research; health and mental health service delivery.

Lurie, Abraham, Ph.D., New York University: Mental health; case management; the aged.

Marcus, Esther S., Ph.D., New York University: Teen pregnancy; developmental disabilities; adult children of alcoholics; preventive intervention with families.

Associate 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.

Berger, Candyce S., Ph.D., University of Southern California: Health and health policy research.

Campos, Angel P., 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.

Assistant Professors

Colson, Paul, Ph.D., University of Chicago: Homelessness; HIV prevention; psychosocial models of tuberculosis and HIV treatment; service delivery in impoverished communities.

Francis, Linda E., Ph.D., University of Indiana: Mental health; health services research; qualitative methods.

Lewis, Michael, *Graduate Program Director.* Ph.D., City University of New York Graduate

Center: Poverty and social policy; the application of sociology, economics, and 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.

Lecturer

Peabody, Carolyn, Ph.D., University at Stony Brook: 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 Professors

Robbins, Charles, *Associate Dean and Director of Social Work, University Hospital.* D.S.W., Yeshiva University: Violence in intimate relationships and as public health problem; health-care policy; social work and health care; the use of complementary medicine.

Scully, E. Jean, *Associate Professor.* M.S.W., University at Stony Brook: Bereavement counseling; death and dying; critical incident stress debriefing; trauma crisis counseling; intervention with adults and children; care of the caregiver; clinical supervision; grief support groups.

Vidal, Carlos M., *Associate Professor and Assistant Dean.* 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.

Courses

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.
3 credits

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
3 credits

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.
3 credits

HWC 603 Research Methods II

A continuation of HWC 602 Research Methods I.
3 credits

HWC 606 Research Practicum I

Students undertake independent 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.
3 credits

HWC 607 Research Practicum II

A continuation of HWC 606 Research Practicum I.
3 credits

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.
3 credits

HWC 609 Social Welfare Policy Analysis II

A continuation of HWC 608 Social Welfare Policy I.
3 credits

HWC 610 Social 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.
3 credits

HWC 611 Knowledge Building in Social Work: The Philosophy of Applied Social Research

The nature and purpose of inquiry and theory is examined. Inductive and deductive methods for knowledge-building are considered. The course content draws from the philosophy of science, as well as empirical and phenomenological research.
3 credits

HWC 612 Theories of Social Work Intervention

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 sanction, as well as some 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.
3 credits

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.
3 credits

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.
3 credits

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.
3 credits

HWC 616 Dissertation Seminar II
A continuation of HWC 615 Dissertation Seminar I.
3 credits

Sociology (SOC)

Chairperson: Diane Barthel, Ward Melville Social and Behavioral Sciences Building S-409 (631) 632-7755
Graduate Program Director: Ian Roxborough, Ward Melville Social and Behavioral Sciences Building S-445 (631) 632-7718
Graduate Secretary: 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 that include but are not limited to Global Studies.

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.

M.A. Degree Program with an Emphasis in Global Studies

This program provides an overview of the emerging sociology of global studies, including research on global economic patterns, the impact of globalization on the nation-state, the rise of new technologies and communications systems, and the varied manifestations of global culture, among other topics. The required thirty hours of graduate work can be completed in a calendar year, or can be spread over a year and a half or longer, depending on the needs of the student.

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

Coser, Lewis A., *Emeritus.* Ph.D., 1954, Columbia University: Theory; conflict and violence; intellectual life; knowledge.

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, University at Stony Brook: 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, *Graduate Program Director.* 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

Chase, Ivan, Ph.D., 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.

Assistant Professors

Arias, Elizabeth, Ph.D., 1998, University of Wisconsin: Demography; family; quantitative methods.

Auyero, Javier, Ph.D., 1997, The New School for Social Research: Culture; urban poverty and social inequality; Latin American studies; social and cultural theory.

Isvan, Nilufer[8], Ph.D., 1994, University of Michigan: Rural sociology; gender; comparative; social change.

Kurthen, Hermann, *Visiting Assistant Professor.* Ph.D., 1984, Freie University, Berlin, Germany: Immigration and the welfare state; globalization; comparative political sociology; work and labor markets; ethnicity.

Moran, Timothy, Ph.D., 2000, University of Maryland: Comparative; social inequality; economic; political; stratification; quantitative methods.

Smith, Jackie, Ph.D., 1995, University of Notre Dame: Global politics; institutions, social movements, environment and development.

Research Faculty

Schwartz, Joseph, *Associate Professor.*[9] Ph.D., 1978, Harvard University: Quantitative methods; social stratification; sociology of work and occupations; social networks.

Adjunct Faculty

Burg, Mary Ann, *Assistant Professor.* Ph.D., 1986, University of Florida: Medical sociology; research methods; community medicine.

Hunt, Morton, *Professor.* B.A., 1941, Temple University: Social science writing; human sexuality; criminology; marriage and family life.

Number of teaching, graduate, and research assistants, fall 1999: 29

1) Joint appointment, Department of Psychology

2) Recipient of State University Chancellor's Award for Excellence in Teaching, 1976

3) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990. Recipient of the President's Award for Excellence in Teaching, 1990

4) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1989. Recipient of the President's Award for Excellence in Teaching, 1989

5) Recipient of the President's Award for Excellence in Teaching, 1992

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

7) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975

8) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1996. Recipient of the President's Award for Excellence in Teaching, 1996

9) Joint appointment, Departments of Psychiatry and Behavioral Sciences

Degree Requirements

Requirements for the M.A. Degree Program in Global Studies

In order to receive the M.A. degree with an emphasis in Global Studies, a student must complete:

1. Thirty hours of graduate work while maintaining a 3.0 grade point average. The curriculum consists of four required and six elective courses. The four required courses include one in statistics, one in methods, one in sociological theory, and one introduction to global sociology. Two of the electives must be seminars including at least one from the global studies curriculum, and the remaining three courses may be taken as either seminars or independent studies. It is assumed that in most cases, these latter three courses will be taken as independent studies in order to begin working with a faculty member on a required M.A. paper.

2. An M.A. paper within the area of global studies and which takes one of the three alternatives described under the writing option (Section D, Option 2) for the Ph.D. program.

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

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.
Fall, 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.
Spring, 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 Social Research
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.
Fall, 3 credits
ABCF grading

SOC 505, 506 Sociological Theory
A review of the intellectual development of the discipline, its epistemological foundations, current major theoretical orientations, and newly developing perspectives.
3 credits each semester
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.
Spring, 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.
Fall, 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 514 Sociological Methods
An introduction to the logic of research and data analysis. Emphasis on concepts of association, elementary causal analysis, sampling, and problems of measurement. Applications to the interpretation of data encountered in the school curriculum and the mass media.
4 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, and hospitals.
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 impact of technological, generational, and cultural forces on social organization from historical /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; 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 580/581 Practicum in Applied Sociology
Sociological inquiry into aspects of American life and social problems, with emphasis on evaluation studies and policy planning in education, race relations, mass communications, deviance, environment, and community issues. During the spring semester students design a teaching unit or a research project on a topic of their own choice.
4 credits
ABCF grading

SOC 590 Independent Study
Intensive reading, under supervision of one or more instructors, of material not covered in the formal curriculum.
Variable and repetitive credit
S/U grading

SOC 591, 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.
1-3 credits each semester
ABCF grading

SOC 598 Research
Execution of a research project under the supervision of one or more faculty members.
Variable and repetitive credit
S/U grading

SOC 603 Advanced Topics in Quantitative Analysis
Mathematical and statistical methods in the analysis of quantitative data.
Prerequisites: 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 each semester
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.
Fall, 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
Spring, 3 credits
ABCF grading

SOC 699 Dissertation Research
Prerequisite: Advancement to candidacy
Variable and repetitive credit
S/U grading

Technology and Society (EST)

Chairperson: Thomas T. Liao, Harriman 347 (631) 632-8770
Graduate Program Director: Sheldon J. Reaven, Harriman 343-A (631) 632-8770
Assistant to the Chairperson: Catherine Bardrams, Harriman 347A (631) 632-8770
Graduate Secretary: June Parpan, Harriman 347A (631) 632-8765

Advanced Graduate Certificate awarded: Advanced Graduate Certificate in Educational Computing
Degree awarded: M.S. in Technological Systems Management (concentrations: Industrial Management, Environmental and Waste Management, Educational Computing); M.S. Program in Technological Systems Management

Individuals increasingly depend upon modern technology, which helps mold every facet of life. Governmental and individual decisions require overall understanding of the characteristics, capabilities, and limitations of modern technology. Industrial and government employees and teachers at all levels and in all disciplines increasingly find that a more than superficial knowledge of technology is of critical importance.

The master's degree in Technological Systems Management is designed to provide professionals in all fields with the expertise to use technological concepts and devices to enhance the performance and management of specific systems.

Students can focus on one of three areas of concentration: Educational Computing, Environmental and Waste Management, or Industrial Management. Students take a common core of six credits, a block of 15 credits specific to their concentration, and nine credits of electives. In addition, students in the Educational Computing and Environmental and Waste Management concentrations are required to carry out a master's project. Both part-time and full-time students are accepted, with teaching or research assistantships available for 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 develop and teach computer applications to employees, with multimedia technologies and computer-based documentation. Students elect the school track or the business/industry track.

Facilities

Graduate students enrolled in the Department of Technology and Society have access to a variety of computing facilities. Besides the University's mainframe and personal computer laboratories, the program has its own computing facilities used to enhance the graduate experience. There are two state-of-the-art computer laboratories within the program. The first lab consists of 20 Pentium PCs with CD-ROM drives. The lab is networked in a LAN that is integrated into the campus WAN. This lab offers Internet access and is stocked with a wide variety of software. The second laboratory consists of 20 Macintosh iMacs, networked as above, and is dedicated to modeling and simulation as well as a multimedia development platform. Both labs are designed for classroom work and as open laboratories to give our students the maximum advantage in using information technologies to enrich their learning experience.

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 Industrial Management concentration, an introductory calculus course (MAT 123 or equivalent) is required.

B. A minimum undergraduate grade point average of 2.75.

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 but 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 2.75. Students with lower averages may be admitted as non-matriculated, a status that may be changed upon earning six or more graduate credits applicable to the Certificate with a GPA of 3.0 or higher.

Faculty

Distinguished Service Professors

Ferguson, David L.[1], 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., *Chairperson.*[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

Piel, Emil J., *Emeritus.* Ed.D., 1960, Rutgers University: Decision making; technology-society issues; human-machine systems.

Visich, Marian, Jr., *Emeritus.* Ph.D., 1956, Polytechnic Institute of Brooklyn: Aerospace engineering; technology-society issues.

Associate Professors

Hogan, Joseph S., Ph.D., 1968, New York University: Planetary atmospheres; environmental satellites; climate change.

Kaplan, Edward, *Visiting Associate Professor.* Ph.D., 1973, University of Pennsylvania: Environmental systems engineering.

Morris, Samuel C., *Visiting Associate Professor.* Sc.D., 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; waste management, recycling and pollution prevention.

Assistant Professors

Brooks, Jacqueline G., M.S., 1979, University at Stony Brook; Ed.D., 1987, Columbia University: Science education; discover teaching laboratory.

Smith, Glenn G., Ph.D., 1998, Arizona State University: Computer games and spatial visualization; distant education.

Lecturers

Daly, Joanne English, M.S. 1994, University at Stony Brook: Internet technology; computers in learning environments.

Schiller, Herb., M.S., 1973, Polytechnic University; M.S.M.E., 1966, California Institute of Technology: Operations management; manufacturing systems.

Research Faculty

Hacker, Michael, *Associate Professor.* M.S., 1968, City University of New York: Technology education; curriculum design and development; teacher enhancement projects.

Adjunct Lecturers

Cope, Randolph H., M.E.E., 1958, Polytechnic Institute of Brooklyn: Engineering management; electronic systems.

Darnel, David H., M.S., 1987, University at Stony Brook: Biomedical engineering; medical information systems.

Decker, Todd P., M.S., 1999, University at Stony Brook: Electronic communications technology.

Farmer, Carol A., C.P.A., M.B.A., 1998, University of Connecticut: Hospital finance and reimbursement; small business finance and taxation.

Fiore, Michael V., B.S., 1997, University at Stony Brook: Biochemistry with student teaching.

Kelly, Robert F., Ph.D., 1991, New York University: Electronic commerce and Internet technology development.

Kruger, Matthew I., M.S., 1996, University at Stony Brook: Internet technology; computers in learning and business environments; information technology.

Laspina, Peter J., M.S., 1978, C.W. Post College; M.S., 1987, University at Stony Brook: Computers in education.

Leonhardt, Nina, M.S., 1978, University at Stony Brook: Computer literacy.

McHugh, Paul, M.A., 1998, University at Stony Brook: Educational computing; Internet technology; authoring software.

Palm, Astrid, M.S., 1999, University at Stony Brook: Computers in learning environments; interactive information design.

Scarlatos, Tony, M.A., 1995, Adelphi University: Multimedia computer systems and graphics.

Schmid, Glenn, M.S., 1981, University at Stony Brook: Quantitative aspects of management.

Tawfik, Lorraine M., M.S., 1996, University at Stony Brook: Computer-based educational technologies.

Number of teaching, graduate, and research assistants, fall 1997: 6

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.

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.

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 508, EMP 511, EMP 512, EMP 518, EST 520, EST 525, EST 586, EST 587, EST 588, EST 589

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, 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 584, EST 586, EST 588, EST 591, EST 592, EST 599, EMP 509, EMP 512, EMP 518, 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/CEJ 591

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.
Fall, 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. Crosslisted with MGT 535.
Fall, 3 credits
ABCF grading

EMP 503 Legal and Regulatory Aspects of Management
This course is a survey of business and regulatory law. Topics include contracts, sales, and forms of business organizations. An overview is provided of antitrust, environmental, and civil rights legislation and their impact on business.
3 credits
ABCF grading

EMP 504 Quantitative Methods in Management
This course is a rapid introduction to the application of modern mathematical concepts and techniques in management science. Algebraic operations, mathematical functions and their graphical representation, and model formulation are reviewed. Topics covered include the following: mathematics of interest, annuity, and mortgage; algebraic and graphic methods of linear programming; PERT, CPM, and other network models; and inventory theory. Simple management-oriented examples are used to introduce mathematical formulations and extensions to more general problems. The computer laboratory is used to give students experience with PC software packages that solve problems in all course topics. Interpretation of computer outputs is also stressed.
Prerequisite: MAT 123 or equivalent
Fall, 3 credits
ABCF grading

EMP 506 Production and Operations Management
This course is a managerial approach to the concepts, issues, and techniques used to convert an organization's resources into products and services. 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 the use of teamwork and Total Quality Management (TQM). Operational problems in producing goods and services are reviewed. Crosslisted with MGT 589.
Prerequisite: EMP 504 or permission of instructor
Spring, 3 credits
ABCF grading

EMP 507 Research and Special Topics in Industrial Management
This is 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 508 Enterprise Resource Planning
This course covers planning and controlling the enterprise operations and resources needed to take, make, ship, and account for customer orders. The latest Manufacturing Resource Planning (MRP II) and Enterprise Resource Planning (ERP) technology will be used for hands-on simulations and "what if" analyses. Actual implementation of the concepts learned in EMP 506. Emphasis on uniting people through information to coordinate activities and achieve corporate customer-focused goals.
Prerequisite: EMP 506
Fall, 3 credits
ABCF grading

EMP 509 Management Information Systems
This course covers the flow of data in industrial and governmental organizations; how information is stored, analyzed, and disseminated for various management tasks; physical and logical organization of computer data processing systems; principles of file processing, database management, and information systems design.
Spring, 3 credits
ABCF grading

EMP 511 Starting the High Technology Venture I
This course covers what is necessary to start a business venture based on a high technology product or service. Topics include: turning a concept into a new venture; developing a business plan; identifying and evaluating the product and market; financing the venture; management and organizational issues unique to technological ventures. Guest speakers lecture in their area of business expertise. Students should have strong background in science or engineering. Co-scheduled with EST 421.
Fall, 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
Spring, 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.
Spring, 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.
Spring, 3 credits
ABCF grading

EST 520 Computer Applications and Problem Solving
A problem-solving course for professionals who use applications software to address such managerial problems as planning, forecasting, and MIS requirements. The major applications software packages used are Excel, Access, and Visual Basic. Students learn to create spreadsheets and data files that optimize solutions to problems.
3 credits
ABCF grading

EST 525 Management of Computer-Integrated Manufacturing
This course covers the operational and managerial concepts associated with distributed information processing systems. The course focuses on the development of a set of general purpose conceptual models of enterprise-wide information processing in the manufacturing environment. Emphasis is placed on the use of those models to determine system requirements, system design, and evaluation of overall system performance. Examples and case histories are used to demonstrate concepts and enhance understanding.
Fall, 3 credits
ABCF grading

EST 530 Internet Electronic Commerce
This course is intended for students interested in understanding management and technical issues in electronic commerce using the Internet. Concepts include security financial transactions, advertising models, and content ownership. Each student will develop a plan for an electronic commerce business.
Summer, 3 credits
ABCF grading

EST 565 Personal Computers in Learning Environments
This course examines issues in teaching and learning, focusing on 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 and Macintosh 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 and spring, 3 credits
ABCF grading

EST 570 Design of Computer Courseware
The purpose of this course is to enhance the student's capability 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 selects topics for courseware development from his or her discipline and concentrates 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 Evaluation of Educational Technology
This course is an evaluation of educational uses of computer technology. Course goals include understanding research methodology and the research literature, conducting a research study of educational technology, and learning about micro-worlds and constructivism. Through hands-on computer experience, class discussions 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 teachers, library-media specialists, and educational administrators interested in exploring the Information Highway, a rich resource for educators. The course prepares teachers to "mine" these resources, creating learning opportunities for their students. Topics include: introduction to Web design, webquest development, searching techniques, site evaluation, and uses of the Internet in the classroom. Crosslisted with CEJ 591.
Prerequisite: Participants must have computer experience
Spring, 3 credits
ABCF grading

EST 573 Design of Multimedia Courseware
This course is for individuals, such as schoolteachers and corporate trainers, who are interested in the use of computers in instruction. The class is 50 percent lecture and 50 percent hands-on training in multimedia production tools. Students have a term project for which they have to create a courseware program.
Fall and spring, 3 credits
ABCF grading

EST 574 Web-based Educational Environments
The uses of Web-based distance learning applications are growing rapidly in 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 who would like to enhance their educational systems by designing and implementing effective modes of distance learning.
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.
Fall, 3 credits
ABCF grading

EST 582 Systems Approach to Human-Machine Systems
Systems concepts (feedback, stability, chaos, ergonomics) and analytical tools are 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 technologies, regional planning. Students prepare a systems design study of an industrial, educational, or environmental device, technology, or management system.
Spring, 3 credits
ABCF grading

EST 583 Computer Literacy for Teachers
This course has two objectives: First, students 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, artificial intelligence, virtual reality, virtual environments, robotics, medicine, and government.
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 enhance instruction. Both conventional as well as innovative and nonconventional learning situations 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 discussion of future educational uses of technology as well as present applications. Students are exposed to various educational technologies and work on a professional presentation highlighting the applications of a technology of their choice 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 preparation of a proposal. A final product of this seminar is an approved master's project proposal. Each student also leads a discussion about an important technology-society problem or issue such as safety of nuclear power plants, impact of video games, or the censorship of the Internet. 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
Fall and spring, 1-3 credits
ABCF grading

EST 592 Energy-Environmental Technology Assessment
Case studies of technologies for energy production and use, emphasizing their "cradle to grave" impacts on the environment and on waste generation. Typical topics: nuclear power and radioactive waste; electricity generation from fossil fuels; solar energy and energy conservation technologies; energy-environmental aspects of transportation technologies; energy balance analysis; energy and Long Island.
Spring, 3 credits
ABCF grading

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.
Prerequisite: EST 581 or permission of instructor
Spring, 3 credits
ABCF grading

EST 594 Diagnosis of Environmental Disputes
Diagnosis of disagreements about environmental and waste problems. Tools for evaluating disputes about (a) scientific theories and environmental models, (b) definitions and analytical methodologies for estimating risk, "real" cost, net energy use, and life-cycle environmental impact, (c) regulatory and legal policy, (d) siting of controversial environmental facilities, and (e) fairness and other ethical issues. These diagnostic tools are brought to bear upon case studies of pollution prevention, recycling, nuclear waste disposal, and climate change. Crosslisted with CEY 594.
Prerequisite: Permission of instructor
Pre- or co-requisite: EST 581
Fall, 3 credits

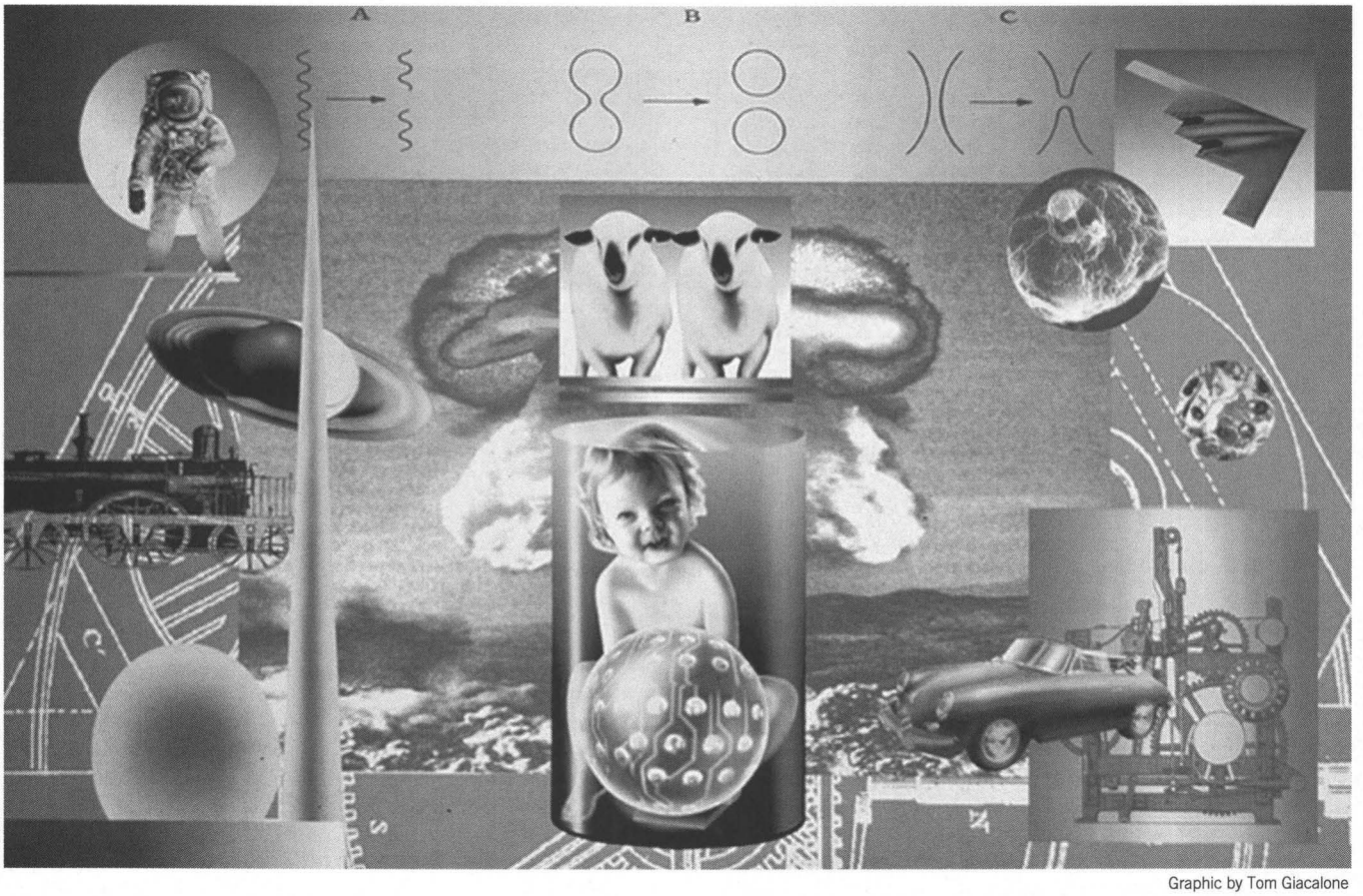
EST 595 Principles of Environmental Systems Analysis
This course is intended for students interested in learning systems engineering principles relevant to solving environmental and waste management problems. Concepts include compartmental models, state variables, optimization, and numerical and analytical 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. Crosslisted with CEY 596.
Prerequisite: EST 595 or permission of instructor
Spring, 3 credits
ABCF grading

EST 597 Waste Management: Systems and Principles
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. Environmental impacts and economics of landfills, materials recovery 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 wastes. Crosslisted with CEY 597.
3 credits
ABCF grading

EST 598 Teaching Practicum
Designed to give graduate students teaching experience.
3 credits
(Note: These credits cannot be counted as part of the 30 credits required for the degree)
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 environmental or waste problem affecting Long Island (perhaps to provide an assessment to a regulatory agency).
Spring, 3 credits
ABCF grading



Graphic by Tom Giacalone

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 the electromagnetic spectrum, analog and digital signals, resonance, and redundancy are explored. Human and societal impacts of communications technology are also studied.
3 credits
ABCF grading

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 the 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
ABCF grading

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
ABCF grading

Theatre Arts (THR, DRM)

Chairperson: John Lutterbie, Staller Center for the Arts 3046 (631) 632-7300
Graduate Studies Director: Michael X. Zelenak, Staller Center for the Arts 3046 (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 focuses on multicultural study. Among our faculty are experts in Korean drama; classical Japanese drama; Western styles in acting; and cultural studies. Second, unlike other graduate programs in theatre in the New York area, our program offers graduate students the chance to produce their work in actual theatre productions. Graduate students create their own theatre pieces, serve as dramaturgs for the season's offerings, and actually engage in the designing of productions. Third, our program reflects the interdisciplinary nature of the theatre arts. Among the faculty are practicing designers, performers, playwrights, choreographers, and dramaturgs, all of whom work closely with graduate students. And finally, we have recently begun to develop an Art and Technology Laboratory in conjunction with the departments of Music and Art. Our graduate programs will now offer students training in computer design, interactive media studies, and computer instruction.

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 of the Department of Theatre Arts 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. Two additional theatre spaces are also available on campus. The department has a Laboratory for Technology in the Arts and an Electronic Classroom. The Theatre Arts Department also uses two spaces in Roosevelt Quad for productions. The Fannie Brice Theatre is a flexible intimate 75-seat performance space, which has been used for undergraduate productions, presentations, staged readings, and as a studio classroom space. The Cabaret at The Spot is located on the second floor of the Fannie Brice Theatre Building, inside the Graduate Student Lounge called The Spot, which is a social and cultural center for students and the Stony Brook community. The Cabaret at The Spot is run by the Stony Brook M.F.A. Dramaturgy program as a production space and theatrical laboratory. Each year, 8 to 12 productions are presented. Theatre Arts students in the M.F.A. program select the season and supervise the productions, act, direct, write, and serve as producing dramaturgs and literary managers. A major emphasis is put on new plays, experimental work, and performance pieces.

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 not meeting all the above requirements is admitted provisionally, he or she must complete the missing requirements within the first semester of graduate study.

I. 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. If a student not meeting all the above requirements is admitted provisionally, he or she must complete the missing requirements within the first semester of graduate study.

I. 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.

J. 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).

K. 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.

L. 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, *Chairperson.* Ph.D., 1983, University of Washington: Theatre history; performance theory and criticism; dramaturgy; directing.

Sullivan, Amy, M.F.A., 1980, University of North Carolina at Greensboro: Dance with emphasis on performance and choreography.

Zelenak, Michael X., *Director of Graduate Studies.* D.F.A., 1990, Yale University: Dramaturgy, criticism, and 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, University at Stony Brook: Broadcast management.

Faculty members from participating departments include:

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 1999: 6

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
THR 505 Dramaturgy I
THR 506 Dramaturgy II
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

In addition, students select from a range of courses in consultation with the graduate program director and a faculty advisor. Students must seek a balance between theoretical and practical coursework, based on prior background and experience. 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.

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

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
Every other year, 3 credits

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
Every other year, 3 credits

THR 507 Introduction to Dramaturgy

Students explore topics such as translation and adaptation of material, play selection and artistic development, production dramaturgy, literary management, impact of dramaturgy on playwriting, etc. May be repeated.
Fall or spring, 3 credits

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.
Fall or spring, 3 credits

THR 511 Non-Western Theatre History
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. May be repeated once.
Fall or spring, 3 credits

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. May be repeated once.
Fall or spring, 3 credits

THR 521 Non-Western Dramatic Literature
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. May be repeated once.
Fall or spring, 3 credits

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.
Fall or spring, 3 credits

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. May be repeated.
Prerequisite: Permission of instructor
Fall or spring, 1-3 credits

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. Repeatable.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits

THR 535 Theories of Theatre
Theories of the theatre, from the ancient to the contemporary, are read critically to develop a complex and varied conception of the philosophical basis underlying approaches to the theatre. Theorists read might include Aristotle, Plato, Diderot, Rousseau, Nietzsche, Artaud, Brecht, Stanislavski, Grotowski, Barba, Mnouchkine, Suzuki, and Zeami.
Subsequent years, 3 credits

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 or spring, 3 credits

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

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.
Fall or spring, 3 credits

THR 570 Directing Theory and Practice
Course surveys the field of directing–its history, formal principles, primary techniques, and contemporary practice. Students develop course papers and/or projects in conjunction with readings and instruction.
Fall or spring, 3 credits

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. Course may be repeated.
Fall and spring, 1-3 credits

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. May be repeated.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits

THR 625 Theory and Criticism
Study of major issues in dramatic theory and criticism and in performance theory. May be repeated.
Fall or spring, 3 credits

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. May be repeated.
Fall or spring, 3 credits

THR 635 Theories of Performance
This course explores what it means to perform in numerous contexts from the theatrical to the everyday. Issues discussed may include, but are not limited to, the body, contrasting performance and performativity, the relationship between subjectivity and performance, race and gender in performance, culture and performance, and performance and technology.
Subsequent years, 3 credits

THR 640 Theatre Design Workshop
Advanced assignments in theatre design. May include design work on departmental productions. May be repeated once.
Prerequisite: Permission of instructor
Fall or spring, 3 credits

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 or spring, 3 credits

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. May be repeated.
Prerequisite: Permission of instructor
Fall or spring, 3 credits

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. May be repeated once.
Prerequisite: Permission of instructor
Fall or spring, 3 credits

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. May be repeated.
Fall or spring, 3 credits

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

THR 691 M.F.A. Project
The student submits a proposal for a project to be undertaken at a professional theatre in which the student has major responsibilities as an assistant dramaturg on a production or an equivalent position, or in-depth research on a particular theatre company that includes investigating repertoires, production values, and the community. All proposals must be submitted in writing to the faculty supervisor and graduate program director for approval.
Prerequisite: Successful completion of all work for the M.F.A. or permission of the graduate studies director
Fall or spring, 3 credits

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. May be repeated.
Summer, no credit

THR 850 Summer Teaching
Supervised student teaching of undergraduate courses accompanied by a tutorial in methods and strategies of teaching theatre arts at the University level.
Summer, no credit

Women's Studies (WST)

Director: Temma Kaplan, Old Chemistry 105 (631) 632-7378
Associate Director: Sarah Hall Sternglanz, Old Chemistry 105 (631) 632-7365
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 Carribean literature, women in the Third World, and women in science and medicine.

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.

Professors

Allentuch, Harriet (French and Italian), Ph.D., 1962, Columbia University: 17th-century French literature.

Arens, William (Anthropology), Ph.D., 1970, University of Virginia: Africa; social anthropology.

Birns, Beverly (Social Sciences Interdisciplinary and Psychology), *Emerita.* Ph.D., 1963, Columbia University: Child development; psychology of women.

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.

Cowan, Ruth Schwartz (History), Ph.D., 1969, Johns Hopkins University: History of biology and technology; women in modern society.

Charnon-Deutsch, Lou (Hispanic Languages and Literature), Ph.D., 1978, University of Chicago: 18th- and 19th-century Spanish literature; feminist theory.

Hawkins, Robert, Jr. (Health Technology and Management), *Emeritus.* Ph.D., 1986, New York University: Sexual jealousy; sexual orientation issues; sexuality.

Kaplan, E. Ann (English and Humanities Institute), Ph.D., 1970, Rutgers University: 19th- and 20th-century British and American literature; women's studies; film.

Kaplan, Temma (Women's Studies and History), *Chairperson.* Ph.D., 1969, Harvard University: Comparative history; 20th-century social movements of women.

Kittay, Eva Feder (Philosophy), Ph.D., 1978, City University of New York: Philosophy of language; philosophy and feminism; modern philosophy.

Lemay, Helen (History), Ph.D., 1972, Columbia University: Medieval and Renaissance intellectual history; women in premodern Europe.

Munich, Adrienne (English), Ph.D., 1976, City University of New York: Victorian studies; 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), Ph.D., 1987, Northwestern University: 20th-century French philosophy; continental feminist theory; Nietzsche.

Rosenthal, Joel (History), Ph.D., 1963, University of Chicago: Medieval Europe; England; social history.

Taylor, William R. (History), *Emeritus.* 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.

Weinstein, Barbara (History), Ph.D., 1980, Yale University: Brazil; modern Latin America; industrialization and labor.

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.

Bogart, Michelle (Art), Ph.D., 1979, University of Chicago: 19th- and 20th-century American and European art and culture.

Cooper, Helen (English), Ph.D., 1982, Rutgers University: Victorian, Latin American and Carribean literature; creative writing; women's studies.

Haviland, Beverly (Comparative Literature), Ph.D., 1982, Princeton University: 19th- and 20th-century French literature; literary and feminist theory; psychoanalysis; the history of the novel; cultural studies; Henry James.

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.

Kimmel, Michael (Sociology), Ph.D., 1981, University of California, Berkeley: Comparative and historical development; social movements; gender and sexuality.

Larson, Brooke (History), Ph.D., 1978, Columbia University: Andean history; colonial and modern Latin America; women in Latin America.

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.

Lochhead, Judith (Music), Ph.D., 1982, University at Stony Brook: 20th-century music theory and history.

Man-cheong, Iona (History), Ph.D., 1991, Yale University: Modern China and Japan; modern Chinese and Japanese women.

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: The body: feminist bioethics; Hegel; Irigaray.

Rosen, Carol (Theatre Arts), Ph.D., 1975, Columbia University: Theory; criticism; modern drama.

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.

Weidner, Gerdi (Psychology), Ph.D., 1981, Kansas State University: Health psychology; personality.

Wilson, Kathleen (History), Ph.D., 1985, Yale University: Modern British history; 18th- and 19th-century social and cultural history.

Wishnia, Judith (Social Sciences Interdisciplinary and History), *Emerita.* Ph.D., 1978, University at Stony Brook: 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.

Cash, Floris Barnett (Africana Studies and History), Ph.D., 1986, University at Stony Brook: U.S. social and political history; African-American women.

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.

Isvan, Nilufer A. (Sociology), Ph.D., 1994, University of Michigan: Feminist theory; gender relations; family; development; political economy; quantitative methods.

Khan, Aisha (Africana Studies and Anthropology), Ph.D., 1994, City University of New York; Race and ethnicity; theory and method in diaspora studies; social inequality, postcolonial societies, colonialism; Caribbean, Central America, United States.

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.

Molette-Ogden, Carla (Political Science), Ph.D., 1997, Washington University in St. Louis: Judicial politics, specifically judicial decision making and the implications of demographic changes in courts' membership; gender issues and the law; law and politics.

Trigo, Benigno (Hispanic Languages), Ph.D., 1992, Yale University: Turn-of-the-century Spanish American literatures; modernism; literary theory.

Lecturers

Kuchner, Joan (Social Sciences Interdisciplinary), Ph.D., 1981, University of Chicago: Child development; motherhood; cross-cultural parenting.

Sternglanz, Sarah Hall (Women's Studies and Psychology), *Associate Graduate Program Director.* Ph.D., 1973, Stanford University: Psychology of women; sex role development; human ethology.

Adjunct Faculty

Bottigheimer, Ruth B. (Comparative Studies), *Associate Professor.* D.A., 1981, University at Stony Brook: Tale collections; children's literature; fairy tales; sociocultural analysis of literature.

Brand, Barbara (Library), *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. One course in feminist theory (WST 601 Feminist Theory, or WST 602 Social Perspectives on Feminist Theory).

B. 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.

C. The remaining nine credits may be chosen from the list of approved Women's Studies graduate courses, many of which are offered by faculty in other departments. Three credits may be earned through a directed readings course supervised by a faculty member affiliated with Women's Studies. Another three credits may be earned in an appropriate course in the student's home department, subject to the approval of the director of Women's Studies.

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

WST 559 Gender and Health

This course explores gender differences in physical and mental health through the study of psychology, sociology, medicine, and epidemiology. Crosslisted with PSY 559.
Spring, 3 credits
ABCF grading

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. Crosslisted with HIS 595.
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

WST 601 Feminist Theory

This course covers critical works of feminist theory in the humanities. Readings focus on the theory and practice of feminism and on feminist methods of scholarship.
Prerequisite: Admission to the Graduate Certificate Program in Women's Studies
Fall or spring, 3 credits
ABCF grading

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, 612 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. Course may be repeated as topic varies.
Fall or spring, 3 credits
ABCF grading

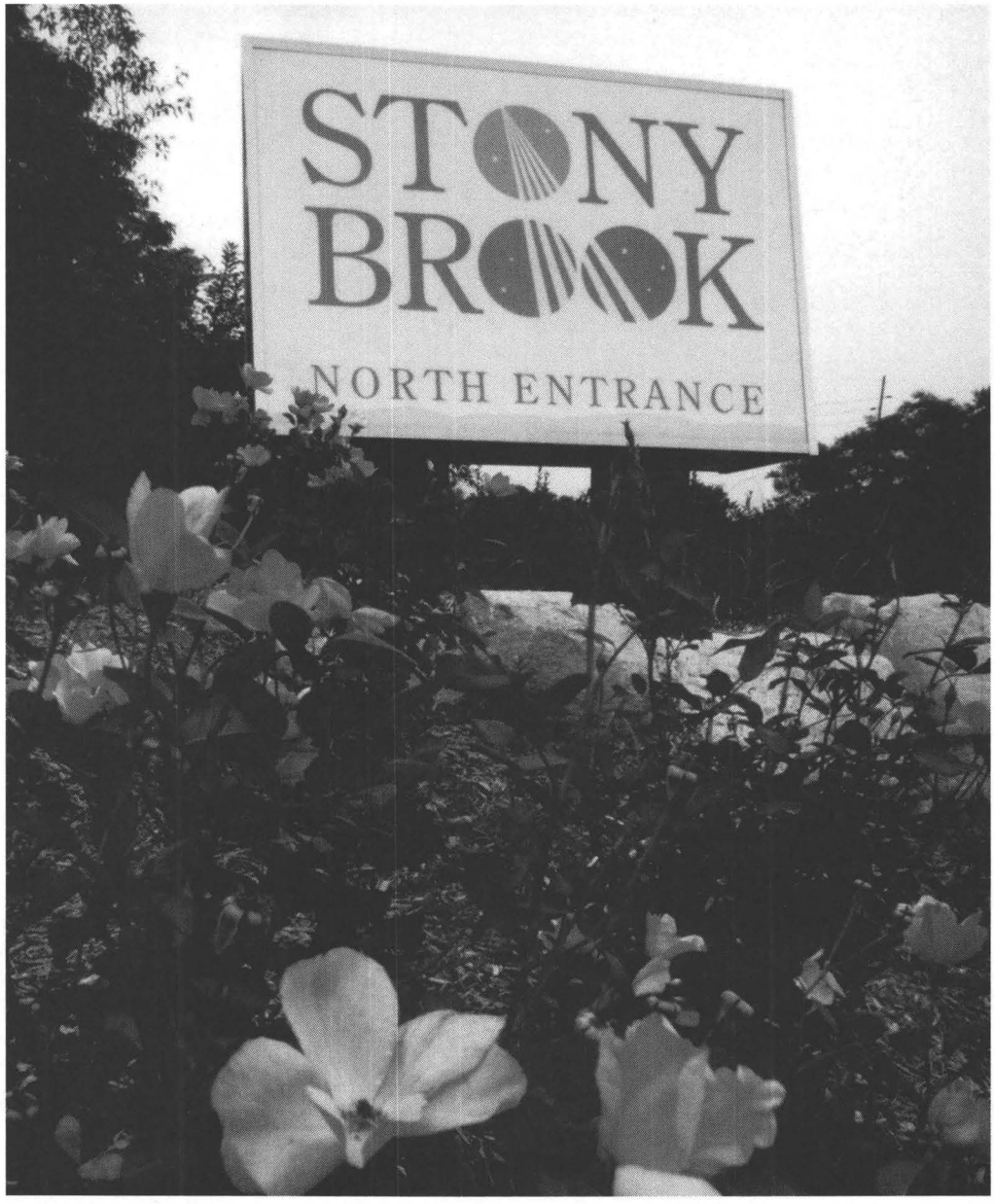
WST 690 Advanced Readings in Women's Studies

Advanced students read on any subject not normally covered by a course offering with any member of the Women's Studies Faculty Affiliates Network. Permission of the instructor and of the director of the Graduate Certificate Program in Women's Studies required.
Fall or spring, 1-3 credits
S/U grading

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

Directories, Maps, Index



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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STATE UNIVERSITY AT STONY BROOK

Members of the Council

Subject to the powers of State University trustees defined by law, the operations and affairs of the University at Stony Brook 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 July 1, 2000.

Mr. Richard T. Nasti, Chairperson

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Mr. Harry Gaffney

Mr. John C. Gallagher

Ms. Karan Kumar

Mr. Storm Morales

Mr. Frank Petrone

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All positions listed as of July 1, 2000.

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E. Anthony Hurley, Associate Dean for Underrepresented Student Affairs

Teng-fong Wong, Associate Dean for International Academic Programs

D. Ann Carvalho, Assistant Dean for Admissions and Records

Elizabeth Barnum, Assistant Dean for International Student/Scholar Services

John P. Schmidt, Assistant Dean for Finance and Budget

Phyllis Brenna, Assistant for Underrepresented Student Affairs

Rose Cohen-Brown, International Student Advisor

Paula Di Pasquale, Assistant for Finance and Budget

Nancy Lannak, Assistant for International Student/Scholar Services

Kent Marks, Assistant for Admissions and Records

Meredith Ash, Receptionist

Sheila Levine, Secretary I, Office of the Dean

Lucy Scuria, Keyboard Specialist

Carol Sliwkoski, Keyboard Specialist

Cara Zavlick, File Clerk

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

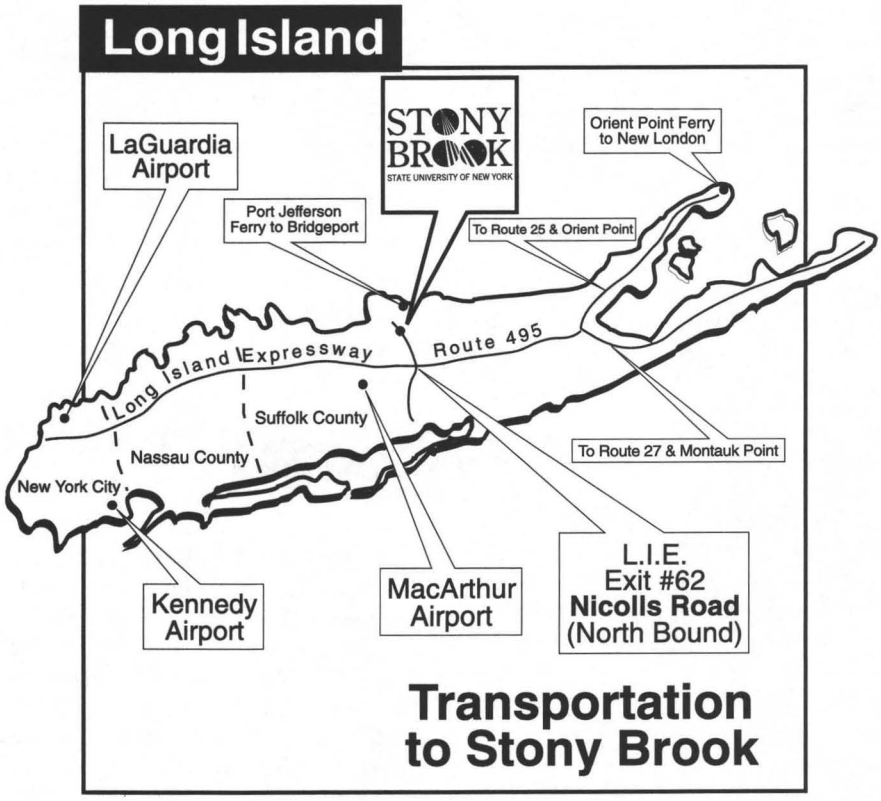
Take the Long Island Rail Road's Port Jefferson line to Stony Brook. Cross tracks for campus bus.

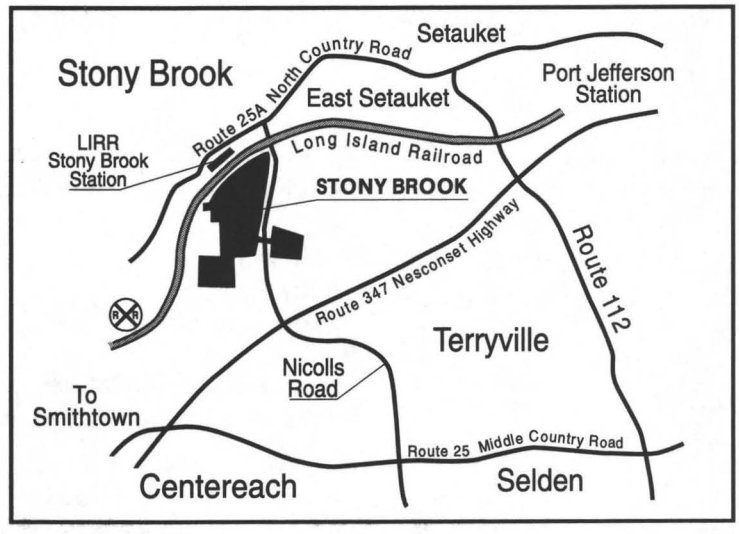
By Bus

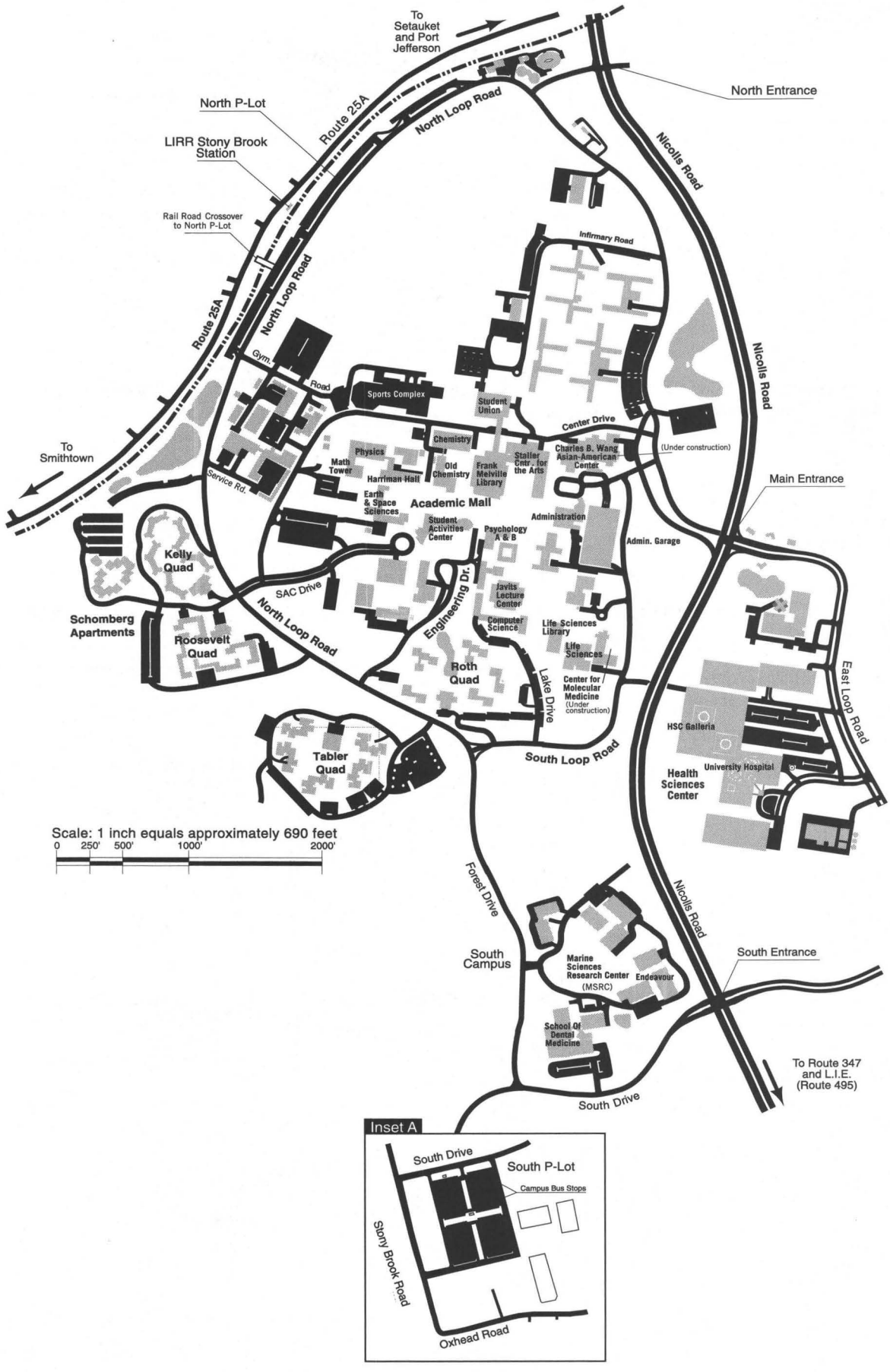
Call Suffolk County Transit (631-852-5200) for schedules, rates, and routes for buses to campus from many local towns.

By Air

Land at Kennedy or LaGuardia Airport, 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.






To Setauket and Port Jefferson
North P-Lot
LIRR Stony Brook Station
Rail Road Crossover to North P-Lot
Route 25A
North Loop Road
North Entrance
Nicolls Road
Infirmary Road
Gym.
Road
Sports Complex
Student Union
Center Drive
Chemistry
Physics
Math Tower
Harriman Hall
Old Chemistry
Frank Melville Library
Stalter Cntr. for the Arts
Charles B. Wang Asian-American Center
(Under construction)
To Smithtown
Service Rd.
Earth & Space Sciences
Academic Mall
Administration
Main Entrance
Student Activities Center
Psychology A & B
Admin. Garage
Kelly Quad
SAC Drive
Engineering Dr.
Javits Lecture Center
Schomberg Apartments
Roosevelt Quad
Computer Science
Life Sciences Library
Life Sciences
Roth Quad
Lake Drive
Center for Molecular Medicine (Under construction)
East Loop Road
HSC Galleria
University Hospital
Health Sciences Center
Tabler Quad
South Loop Road
Scale: 1 inch equals approximately 690 feet
0 250' 500' 1000' 2000'
Forest Drive
South Campus
Marine Sciences Research Center (MSRC)
Endeavour
School Of Dental Medicine
South Entrance
To Route 347 and L.I.E. (Route 495)
South Drive
Inset A
South Drive
South P-Lot
Campus Bus Stops
Stony Brook Road
Oxhead Road

INDEX

Included in the Index, in boldface type, are the offical degree programs that are registered with the New York State Department of Education. Enrollment on other than registered approved programs may jeopardize a student's eligibility for certain student aid awards.

A

Absence, Leave of .39
Absences, Religious .41
Academic Calendar .41
Academic Conduct, Standards of .40
Academic Honesty .40
Academic Level .36
Academic Probation .40
Academic Progress Standards, Federal .28
Academic Regulations and Procedures .37
Academic Units .8
Account Balances .24
Activity Fee .24
ADA Office .17
Add/Drop Fee .24
Administration, Officers of .327
Admission Process .34
Admission Requirements (see also Departmental listings) .34
Admission, Undergraduates to Graduate Courses .35
Advanced Graduate Certificates .49
Advanced Graduate Certificate Program Descriptions .53
Advancement to Candidacy .39
Affirmative Action .4
Anatomical Sciences, Ph.D. .54
Anthropology, M.A. .62
Anthropology, Ph.D. .57
Apartments .29
Application Fee .24
Application Fee, Waiver of .34
Applied Mathematics and Statistics, M.S., Ph.D. .66
Archaeology .63
Art, Studio, M.F.A. .75
Art Galleries .12
Art History and Criticism, M.A., Ph.D. .75
Arts and Sciences, College of .8
Assistantships .27
Astronomy .265
Athletics .12, 16
Atmospheric Sciences .198
Auditing .40
Award of Degree .48

B

Bachelor's/Master's Programs, Combined .36
Billing Statements .24
Biochemistry and Structural Biology .83, 227
Bioengineering .86
Biological Sciences, M.A. .124
Biology 7-12, M.A.T. .291
Biomedical Engineering, Advanced Graduate Certificate .86, 134, 208
Biomedical Engineering, M.A., Ph.D. .86
Biophysics .268, 275
Biopsychology, Ph.D. .296
Bookstores .16
Business Administration .90

C

Campus Description .7
Campus-Community Ties .11
Campuses, SUNY .326
Campus Map .329
Campus Resources .15
Career Center .16
Cellular and Devlopmental Biology, Ph.D. .99
Cellular and Molecular Pathology, Ph.D. .253
Cellular Pharmacology .257
Changing Courses .38
Chemical Physics .268
Chemistry, M.S., Ph.D. .103
Chemistry 7-12, M.A.T. .107, 291
Child Care Services .16
Clinical Psychology, Ph.D. .296
Coaching, Advanced Graduate Certificate .292
Coastal Oceanography, Ph.D. .198
College of Arts and Sciences .8
College of Engineering and Applied Sciences .8
Combined Bachelor's/Master's Programs .36
Community Health, Advanced Graduate Certificate .173
Comparative Literature .110
Computer Engineering .133
Computer Science, M.S., Ph.D. .114
Computing Services .17
Conditional Admission .35
Conduct, Standards of Academic .39
Conduct Code, Student .13
Counseling Center .17
Crafts Center .19
Credit, Transfer of .34
Cultural Anthropology .63

D

Dean of Students Office .20
Dean's Message .2
Deferments .25
Degree Opportunities .8
Degree Program Descriptions .53
Degree Programs, List of .50
Degree Requirements .43
Degree and Advanced Graduate Certificates Awarded .49
Dentistry, D.D.S. .123
Directions to Stony Brook .328
Disabled Student Services .17
Doctor of Arts in Foreign Languages .46, 147, 167, 174
Doctor of Musical Arts .47, 235
Doctor of Philosophy .45
Downtown Arcade .19
Dramaturgy, M.F.A. .317

E

Earth Science 7-12, M.A.T. .163, 291
Ecology and Evolution, Ph.D. .124
Economics, M.A., Ph.D. .129
Educational Computing, Advanced Graduate Certificate .292
Electrical Engineering, M.S., Ph.D. .133
Engineering and Applied Sciences, College of .8
English, M.A., Ph.D. .110, 141
English 7-12, M.A.T. .141, 290
English Center, Intensive .18
English Proficiency .36
Environmental/Occupational Health and Safety, Advanced Graduate Certificate .292
Equal Opportunity .4, 41
Equivalent Opportunity/Religious Absences .41
Evolution .124
Exchange Program, SUNY .39
Expenses, Other .31
Experimental Psychology, Ph.D. .296

F

Faculty .6, 7
Federal Academic Progress Standards .28
Federal Work Study .28
Fees .24
Fellowships and Awards .27
Financial Aid .26
Financial and Residential Information .23
Foreign Languages, D.A. .46, 147, 167, 174

French (see also Romance Languages and Literature) 147
French 7-12, M.A.T. 148, 290
Full-Time Students 36
Fusco Fellowship Awards 27

G

Genetics, Ph.D. 154
Geosciences, M.S., Ph.D. 158
German 167
German 7-12, M.A.T. 290
Germanic Languages and Literature, M.A. .167
Grade Changes 40
Grading System 39
Graduate Assistantships 27
Graduate Certificate Program Descriptions .53
Graduate Certificates, List of 50
Graduate Council 38
Graduate Education, Organization of 38
Graduate Record Examination (GRE) 35
Graduate School Administration 327
Graduate School Traineeships 27
Graduate Student Organization 18
Graduate Student Survival Guide 18
Graduate Studies, Areas of 50
Graduate Studies Codes 50
Grievance Procedures 40

H

Harriman, W. Averell School for Management and Policy 189
Heath Care Management, Advanced Graduate Certificate 173, 190
Health Care Policy and Management, M.S. 173
Health Insurance 30
Health Sciences 173
Health Sciences Center 9
Health Services, Student 20, 31
Health Technology and Management, School of 173
Hispanic Languages and Literature, M.A., Ph.D. 174
History, M.A., Ph.D. 180
Hospital 11
Housing, Off-Campus 18, 30
Housing, On-Campus 29
Humanities and Fine Arts, Division of 8
Human Resource Management, Advanced Graduate Certificate 189, 292

I

I-20 Documentation 36
Identification Card, Fee for Lost 24
Industrial Cooperative Ph.D. Program 208
Industrial Management, Advanced Graduate Certificate 293
Industrial Systems Management, Advanced Graduate Certificate 190, 293
Institute for Theoretical Physics 267
Institutional Aid 26
Intensive English Center 18
International Students 31, 36
International Services 18
Introduction to Stony Brook 5
Italian (see also Romance Languages and Literature) 147
Italian 7-12, M.A.T. 148, 290

J

Journals, Academic 11
Judiciary, Student 12

L

Late Payment Fee 24
Late Registration Fee 24
Leave of Absence 39
Liberal Studies, M.A. 289
Libraries 18
Linguistics, M.A., Ph.D. 185
Loans 28
Long Island, Map of 328
Long Island State Veterans Home 11

M

Management and Policy, M.S. 189
Management and Policy, W. Averell Harriman School for 189
Maps 328, 329
Marine Environmental Sciences, M.S. ...198
Marine Sciences Research Center 9, 198
Master of Arts 44
Master of Arts in Liberal Studies 45, 289
Master of Arts in Teaching 290
Master of Business Administration 44
Master of Fine Arts 44
Master of Music 44
Master of Philosophy 48
Master of Professional Studies 289
Master of Science 44
Materials Science and Engineering, M.S., Ph.D. 208
Mathematics, M.A., Ph.D. 214
Mathematics 7-12, M.A. 214
Matriculated Status, Maintaining 38
Mechanical Engineering, M.S., Ph.D. 219
Medicine, M.D. 226
Microbiology 231
Ministries, Campus 12
Molecular and Cellular Pharmacology, Ph.D. 257
Molecular Biology and Biochemistry, Ph.D. 83, 227
Molecular Microbiology, Ph.D. 231
Music, M.A., D.M.A., Ph.D. 235
Music Composition 238
Music History and Theory 237
Music Performance, M.M. 235

N

National Science Foundation (NSF) Fellowships 28
National Science Foundation (NSF) Minority Scholarships 28
Neurobiology and Behavior, Ph.D. 245
New York State Tuition Assistance Program 29
Non-Matriculated Status 35
Nursing, B.S./M.S., M.S. 249

O

Oceanography 198
Occupational Health and Safety Graduate Certificate Program 292
Oceanic Science, Advanced Graduate Certificate 198
Off-Campus Housing Service 18, 30
Ombuds Office 19
On-Campus Housing 29
Operations Research, Advanced Graduate Certificate 66, 293
Oral Biology and Pathology, M.S., Ph.D. ...250
Organization of Graduate Education 38
Overview of Stony Brook 6

P

Parking 12
Part-Time Students 36
Pathology 253
Payment of Tuition and Fees 24
Perkins Loan 28
Pharmacological Sciences 257
Philosophy, M.A., Ph.D. 261

Physical Anthropology 63
Physics, M.A., M.S., Ph.D. 265
Physics 7-12, M.A.T. 270, 291
Physiology and Biophysics, Ph.D. 275
Planetary Sciences 268
Planetary Studies 198
Policies and Procedures 12
Political Science, M.A., Ph.D. 280
Pope Fellowship in Italian Studies 27
Probation, Academic 40
Professional Studies 289
Provost's Message 2
Psychology, Clinical, Ph.D. 296
Psychology, Experimental, Ph.D. 296
Psychology, M.A. 296
Psychology, Social/Health, Ph.D. 296
Public Policy 280

R

Readmission 34
Records, Educational 41
Registration 38
Regulations, Waiver of 48
Requirements, Degree 43
Religious Absences 41
Research 6, 10
Research Assitantships 27
Residence Halls 29
Residency Requirement, New York State . .28
Residential Information 29
Resources, Campus 15
Returned Check Fee 24
Romance Languages and Literature, M.A. 147, 174
Russian 167
Russian 7-12, M.A.T. 290

S

Scholarships 27
School Administrator and Supervisor, Advanced Graduate Certificate 294
School District Administrator, Advanced Graduate Certificate 294
School of Dental Medicine 123
School of Health Technology and Management 173
School of Medicine 226
School of Nursing 249
School of Professional Development 287
School of Social Welfare 302
Sea Grant Scholar Awards 27
Slavic Languages and Literature, M.A. 167
Social/Health Psychology, Ph.D. 296
Social Studies 7-12, M.A.T. 291
Social Welfare, Ph.D. 302
Social Work, M.S.W. 302
Sociology, M.A., Ph.D. 306
Software Engineering, Advanced Graduate Certificate 293
Spanish 174
SPD 9, 287
Stafford Loan 28
Staller Center for the Arts 12
Standards of Academic Conduct 40
State University of New York 326
Statistics 66
Stony Brook Council 327
Stony Brook Union 19
Student Activities Center 20
Student Conduct Code 13
Student Educational Records 41
Student Expenses 26
Student Health Service 20, 30
Student Judiciary, Office of the 12
Student Life 12
Student Organizations 12
Student Services 15
Study Abroad 20
SUNY Exchange Program 39

T

TAP 28
Teaching, Master of Arts in 290
Biology 291
Chemistry 291
Earth Science 291
English 290
French 290
German 290
Italian 290
Physics 291
Russian 290
Social Studies 291
Teaching Assistantships 27
Teaching English to Speakers of Other Languages (TESOL), M.A. 185
Technological Systems Management, M.S. .311
Technology and Society 311
Technology Management, M.B.A., Executive M.B.A. 90
TESOL 185
Theatre, M.A. 317
Theoretical Physics, Institute for 267
Thermal Sciences 219
Traineeships 27
Transcript Fee 24
Transcripts 41
Transfer of Credit 35
Tuition and Fees 24
Tuition Assistance Program (TAP) 28
Tuition Liability Schedule 25
Tuition Scholarships 26

U

Undergraduates, Admission of to Graduate Courses 36
Union 19
University Hospital 11

V

Veterans Affairs 20
Veterans Educational Benefits 28
Veterans Home, Long Island State 11

W

Waiver of Regulations 48
Waste Management, Advanced Graduate Certificate 198, 293
Waste Management Studies 198, 293
Weisinger Fellowship Award 27
Wellness Center, Eugene Weidman 20
Withdrawals 25, 39
Women's Studies, Advanced Graduate Certificate 322
Work Study, Federal 28
Writing Center 21

STONY BROOK

STATE UNIVERSITY OF NEW YORK