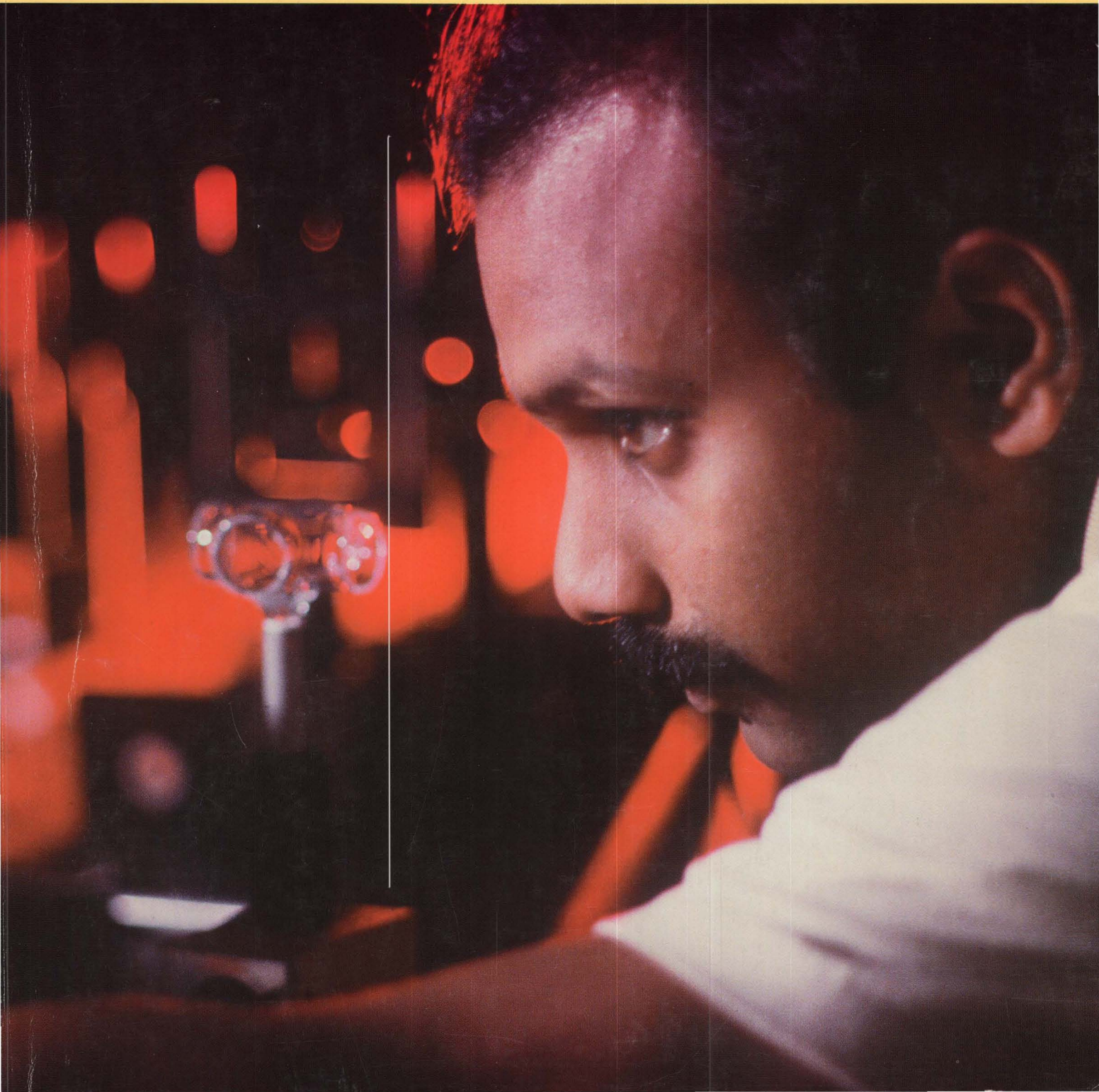


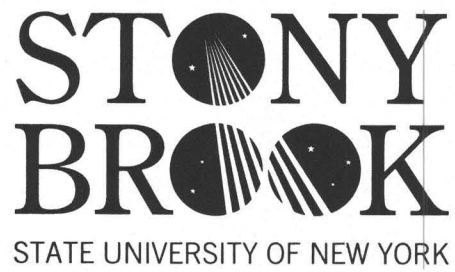
STONY BROOK

STATE UNIVERSITY OF NEW YORK

1996/1998 GRADUATE BULLETIN







1996/1998 GRADUATE BULLETIN

Shirley Strum Kenny, President

A Message from the Provost

Graduate school can be one of the most rewarding times of your professional life. It is an opportunity to learn in depth about disciplines that intrigue you and to 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 university that has quickly become recognized as one of the best in the nation. The combination of excellent faculty and staff, the traditional arts and sciences disciplines, an extensive health sciences center, marine sciences, engineering and applied sciences creates an atmosphere that results in excellence across a diverse set of disciplines and many opportunities for exciting and rigorous interdisciplinary scholarship.

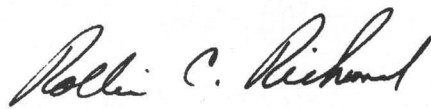
Many graduate students become junior colleagues of their professors by providing instruction for undergraduates. Stony Brook recognizes the importance of helping graduate students to learn to teach and the significance of their contribution to the education of our undergraduates. A full and rewarding 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.

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 and teacher is the prime goal of graduate education at Stony Brook.

Your professional success frequently will depend upon the quality of the graduate education you receive. As you consider graduate schools, explore the relationships that faculty have with their students and the opportunities for interdisciplinary interactions. 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 goal against which to judge your future achievements.

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. The Cold Spring Harbor Laboratory to the west similarly is 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 geographic area.

Come and visit our campus and the 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 come, I would welcome the opportunity to meet you. Whatever your educational future holds, I wish you well.



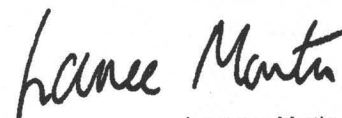
Rollin Richmond

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 section about their own program. They are expected to be familiar with, and of course 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 run into problems or difficulties during your studies, deal with them promptly and completely. If you cannot find the solution, contact the Graduate School; we can usually correct any problem that is brought to us in good time.



Lawrence Martin



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Graduate Bulletin, Volume XXIV

Editorial Coordinator: Eric Deeble

Cover Design: Tom Giacalone

The University represents that the information in this publication is accurate as of July 1996. 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 promulgated by the board of trustees of the State University of New York. Fees and charges are set forth 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
(516) 632-7040

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 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:

Gary Matthews
Special Assistant to the President
for Diversity and Opportunity
Administration Building 474
University at Stony Brook
Stony Brook, New York 11794-0251
(516) 632-6280

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



An Introduction to the University at Stony Brook

As students, staff, and faculty members of the Stony Brook community, we affirm our belief that our university, like our nation, is neither black nor white, minority nor majority, male nor female, but rather a pluralistic society made up of a dynamic array of diverse yet united ethnic and cultural groups.



Background

Stony Brook was established in 1957 at Oyster Bay, Long Island as a State University college to prepare secondary school teachers of mathematics and science. The University has grown at a prodigious rate, and is now recognized as one of the nation's finest universities. In 1960, the State Board of Regents and the late Governor Nelson Rockefeller established Stony Brook's mandate as a comprehensive university center to "stand with the finest in the country." The young school moved in 1962 to its present location on Suffolk County's north shore.

Now, only 39 years after its founding, the University at Stony Brook is New York's comprehensive university center for the downstate metropolitan area. The University offers excellent programs in a broad spectrum of academic subjects and conducts major research. Funded support for research programs has grown faster than at almost any other university. Stony Brook is classified by the Carnegie Foundation as a Type I research university, a designation that reflects the University's volume of federally sponsored research, high percentage of doctoral students, and emphasis on scholarship. Internationally renowned faculty members offer courses from the undergraduate to the doctoral level for more than 17,500 students through more than 100 undergraduate and graduate degree programs. Extensive resources and support services help foster intellectual and personal growth.

The quality of Stony Brook's programs was praised by a distinguished national team of scholars in the 1984 Middle States Association of Colleges and Secondary Schools Reaccreditation Report, which recognized Stony Brook's spectacular achievements in so quickly becoming "an institution of national stature. The University is in an excellent position to make major contributions in policy and problem-oriented research of regional as well as national importance." The most recent Middle States Report confirms that "Stony Brook has made outstanding progress 'in becoming' one of the nation's top most research universities".

Stony Brook has expanded to encompass 121 buildings on 1,100 acres. The faculty has grown from about 175 to 1,617, the student body from 1,000 to 17,665, and the annual budget from about \$3 million to \$700 million.

One of Long Island's largest employers, Stony Brook serves this complex, growing region through research into area problems; through cooperative programs with governmental agencies at the federal, state, and local levels; and by responding to the region's extraordinary demand for higher education opportunity. Stony Brook strives to develop programs of the highest quality in areas of great public need, including health sciences, engineering and applied sciences, public policy, marine and environmental sciences, and the arts.

Location

Stony Brook is located about 60 miles east of Manhattan on the wooded north shore of Long Island, convenient to New York City's cultural life and Suffolk County's tranquil, recreational countryside and seashores. The internationally recognized research facilities of Brookhaven National Laboratory and Cold Spring Harbor Laboratory are not far away. Located near the historic village of Stony Brook at the geographical center of Long Island, the campus is some 60 miles west of Montauk Point. It is within minutes of New York State's richest farmland and clam beds, its spectacular Atlantic beaches along Fire Island, the craggy coastline and cliffs of Long Island Sound, and picturesque village greens and gracious country homes. Long Island's hundreds of miles of magnificent coastline attract many swimming, boating, and fishing enthusiasts from around the world.

Campus

Stony Brook's bustling academic community is situated amid fields and woodland. Bicycle paths, an apple orchard, park benches, a duck pond, and spacious plazas complement modern laboratories, classroom buildings, and a performing arts center.

Surrounding the Frank Melville, Jr. Memorial Library at the center of the campus are the major 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, and other service and activities buildings. Stony Brook's Staller Center for the Arts provides superb performing arts facilities and

houses the departments of Theatre Arts, Music, and Art. A spacious outdoor plaza in which concerts are held connects the Melville Library, Stony Brook Union, and Staller Center in the middle of the campus. The 350-bed Long Island State Veterans Home was completed in the fall of 1991. In October 1992 the Long Island High Technology Incubator opened its doors to 20 start-up companies in biotechnology and other high-technology fields.

Encircling the academic buildings are six residential quadrangles with living space for 1,000 students each. The quads are the basic social units for on-campus students, providing residence halls, dining rooms, and a diversity of student-sponsored enterprises and social facilities. Each quadrangle consists of three to five coeducational "colleges," or residence halls, housing 200 to 400 students each. 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 west campus.

The architecturally striking Health Sciences Center comprises academic and support areas for five professional schools and University Hospital, a 504-bed facility that admitted its first patients in 1980.

South of the academic cluster is the 26-acre Ashley Schiff Nature Preserve. Beyond these woods and linked by shuttle bus service to the rest of campus are 11 functionally adaptable single-story buildings housing the Marine Sciences Research Center and the School of Dental Medicine. Expanded dental medicine facilities on south campus opened in June 1992.

Parking

All vehicles parked on campus are required to have a valid parking permit. Commuter students with a valid permit may park at any of the three commuter lots. South "P" Lot is located at the south entrance to campus on Stony Brook Road. North "P" Lot is located near the north entrance, next to the L.I. Rail Road commuter lot. There is also a commuter lot by the Health Sciences Center. Bus service is available from the commuter lots to various areas of West Campus.

Parking is available in any of three parking garages, located by the Administration Building, the Health Sciences Center, and the hospital. The hourly rate is \$1.50 up to a maximum \$7.50 for the day.

After 4 p.m. commuters with a valid permit can park in any lot on campus except those posted as 24-hour faculty/staff lots, the Sports Complex lot, and the Chapin and Schomburg apartment lots.

Parking is available in the Administration and Health Sciences Center garages after 4:30 p.m. at \$3.00 per day or at the special evening student rate of \$7.00 plus tax per month. A commuter permit is required to purchase a monthly garage pass.

Commuter buses leave the South "P" Lot every five minutes between 7:30 a.m. and 6:10 p.m. After 6:15 p.m. there is one bus every fifteen minutes until 9:00 p.m., Monday through Friday. The University also provides access services to persons with disabilities. Bus passes can be obtained for \$25.00 per semester at the Traffic Office during regular office hours. Otherwise, the cost is \$.50 per ride.

Students

Stony Brook's enrollment is 17,665 students. Graduate students number 6,180 (3,212 full time, 2,968 part time) while undergraduate students number 11,485 (10,082 full time, 1,403 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 traditionally under-represented 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 1,617 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 Middle States Association had high praise for Stony Brook's faculty in its 1984 campus reaccreditation report, noting that "several departments rank among the top in the country and most are of a very high level of quality as measured in terms of professional reputation and scholarly activities." The faculty-student ratio is about one faculty member for every 17 students.

Eminent faculty members include Einstein Professor C.N. Yang, Nobel laureate in Physics; University Professor John H. Marburger in Physics and Electrical Engineering, former president of the University at Stony Brook; Distinguished Professors K. Daniel O'Leary in Psychology, John Milnor in Mathematics, Gerald E. Brown in Physics, James Glimm in Applied Mathematics and Statistics, Benjamin Chu in Chemistry, Robert Sokal in Ecology and Evolution, Edward Reich in Pharmacological Sciences, Iwao Ojima in Chemistry, Theodosios Pavlidis in Computer Science, Felix T. Rapaport in Surgery, Louis W. Ripa, Jr. in Children's Dentistry, H. Blaine Lawson, Jr. in Mathematics, Janos Kirz in Physics, and Robert Cess in the Marine Sciences Research Center; Distinguished Professors Emeriti Lewis Coser in Sociology, Louis Simpson in English, Charles Rosen in Music and Thomas Flanagan in English; Distinguished Teaching Professors Norman Goodman in Sociology, Elof Carlson in Biochemistry and Cell Biology, Barbara Eling in Germanic and Slavic Languages and Literatures, Judith Tanur in Sociology, Alan Tucker in Applied Mathematics and Statistics, Jonathan F. Levy in Theatre Arts, and Shi Ming Hu in Social Sciences Interdisciplinary; Distinguished Teaching Professors Emeriti John Truxal in Technology and Society and Homer Goldberg in English; Distinguished Service Professors Sidney Gelber in Philosophy, Barry

S. Collier in Medicine and Pathology, Robert Cess in the Marine Sciences Research Center, Norman Goodman in Sociology, Velio Marsocci in Electrical Engineering, Lester Paldy in Technology and Society, Peter Paul in Physics, Eli Seifman in Social Sciences Interdisciplinary; and Distinguished Service Professors Emeriti, Marvin Kuschner, former dean of the School of Medicine, and J.R. Schubel, former dean and director of the Marine Sciences Research Center.

Stony Brook's distinguished faculty is also proud to include nine members of the American Academy of Arts and Sciences, ten members of the National Academy of Sciences, and one member 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 38 areas, the M.A.T. in 9 areas, the M.A. in 28 areas, and the M.S. in 20 areas. Also offered are a 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 twenty three departments: Anthropology, Art, Biochemistry and Cell Biology, Chemistry, Comparative Studies, Earth and Space Sciences, Ecology and Evolution, Economics, English, French and Italian, Germanic and Slavic Languages, Hispanic Languages and Literature, History, Linguistics, Mathematics, Music, Neurobiology and Behavior, Philosophy, Physics, Political Science, Psychology, Sociology, and Theatre Arts.

Biochemistry and Cell Biology, Ecology and Evolution, and Neurobiology and Behavior, offer the Ph.D. degree 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 Department of English. The foreign language departments all offer the D.A. and M.A. 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 M.A., and Music offers, in addition to the Ph.D. and M.A., the D.M.A. and M.M.

The departments of Anthropology, Chemistry, Earth and Space Sciences (which includes programs in Astronomy and Geological Sciences), Economics, History, Mathematics, Physics, Political Science, Psychology, and Sociology all offer the 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. 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. His office is in the Melville Library, Room E 3320; telephone (516) 632-6991.

College of Engineering and Applied Sciences

The College of Engineering and Applied Sciences consists of six academic units: Applied Mathematics and Statistics, Computer Science, Electrical

Engineering, Materials Science and Engineering, including the program in Technology & Society, Mechanical Engineering, and the W. Averall Harriman School for Management and Policy; four of the units offer programs leading to the Master of Science and Doctor of Philosophy degrees; the Harriman School and Technology and Society both offer a Master of Sciences Degree.

Each department has its own laboratories for teaching and research; in addition, collaborative research programs are carried out utilizing the facilities in the Health Sciences Center, Division of Physical Sciences and Mathematics, 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 students with professional goals in industrial and governmental occupations requiring an advanced degree.

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

The dean of the College of Engineering and Applied Sciences is Yacov Shamash. His office is in Engineering Building, Room 100; telephone (516) 632-8380.

Health Sciences Center

The Health Sciences Center comprises five professional schools. University Hospital and Medical Center is the major teaching facility for the educational programs of the center. 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.

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 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 504-bed hospital has nine intensive care units dedicated to anesthesia, burn, cardiovascular, coronary, neonatal and transplant patients. The 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.

Other services include cardiac catheterization, angioplasty and electrophysiological studies, complete renal services, endoscopy, hematology studies, detailed analysis of allergic and immune disorders, and diagnostic and interventional radiology, including powerful MRI scanning.

A full range of psychiatric services for children and adults is available. Psychiatric emergency care is provided 24 hours a day. Advanced services such as lithotripsy, laser surgery, ophthalmic laser treatment, and nuclear medicine are provided. Multidisciplinary teams care for adults and children with chronic conditions such as diabetes, cystic fibrosis, multiple sclerosis, and the physical and psychosocial aspects of headache and pain.

University Hospital serves many regional roles. The emergency medicine department operates as the trauma center for Suffolk County. The hospital has designations as a perinatal center and regional transplant center, a cardiac diagnostic center, a comprehensive center for total cancer care, 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. It also offers adult and pediatric surgery and comprehensive orthopaedic services, including a comprehensive pain and rehabilitation program.

University Hospital cares for and treats more than 510,000 patients a year through its ambulatory care programs and 25,000 hospitalized patients a year. The Emergency Room receives more than 46,000 visits annually.

The hospital is the educational resource for students enrolled in the schools of the Health Sciences Center. It provides training for more than 400 residents in 45 approved specialty programs (including subspecialties) and the general practice/dental medicine program.

The Health Sciences schools share instructional space, multidisciplinary laboratories, lecture halls, and the support services of the Division of Laboratory Animal Resources, the Health Sciences Center Library, Media Services, and the Office of Student Services.

Opened in October, 1991, the Long Island State Veterans Home is a 350-bed nursing home that 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. 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.

Students who wish detailed information on the extensive laboratory facilities available for various academic programs are encouraged to address their inquiries to the appropriate school or department.

At present more than 2,500 skilled professionals from the Long Island region have faculty appointments and participate in 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. Continuing education for many health professions is offered by the schools. The Health Sciences Center also sponsors conferences, workshops, and lectures on major health issues 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. The exceptions to this generalization are the Graduate Programs in Basic Health Sciences (Anatomical Sciences, Molecular

Microbiology, Oral Biology and Pathology, Pathology, Pharmacological Sciences, and Physiology and Biophysics), which are described in detail in this bulletin.

The *Health Sciences Center Bulletin* can be obtained by writing to or telephoning the Health Sciences Center Office of Student Services, (516) 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 coastal oceanography and its only Ph.D. program in marine environmental sciences.

School of Professional Development

The School of Professional Development (SPD) offers several opportunities for part-time graduate study. Among them is the University's largest part-time graduate program, the Master of Arts in Liberal Studies. Other degrees offered by SPD are the M.A.T. in Chemistry, Earth Science, English, French, Italian, German, Physics, Russian, and Social Studies and the Master of Professional Studies in Labor/Management Studies, Public Affairs, and Waste Management Studies.

Students can also receive a number of advanced graduate certificates through SPD. Programs include those in coaching, educational computing, environmental/occupational health and safety, Long Island regional studies, school administration and supervision, school district administration, software engineering and waste management.

Wide-ranging noncredit study opportunities are also offered by the School of Professional Development's Center for Corporate Continuing Education and Training, Center for Education on Substance Abuse, and Superintendents Center. Courses offered by these centers are structured to address individual career goals and to complement, where appropriate, many of the University's credit and degree programs.

For a *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; (516) 632-7050.

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 1994-95, Stony Brook attracted \$95.6 million in external research support. About 80 percent of these funds derive from grants and contracts with the federal government. The balance comes from private foundations, voluntary health organizations, state and local government, and industry. 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 brochures describing their research and scholarly activities in detail.

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 Care 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 a myriad of 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 bicoounty-metropolitan New York region, Stony Brook plays a major role in the Long Island community. With 8,846 people (full time and part time) on a campus payroll of \$381 million annually, Stony Brook is Long Island's fifth largest employer. It is estimated that the University generates approximately a billion dollars 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 campus is home to the Long Island High Technology Incubator, a non-profit corporation established to provide a nurturing setting for start-up businesses. The facility presently is home to over 30 companies in the 65,000 square foot building; another 10 companies reside in available space in campus facilities, and another 21 companies are enrolled in the affiliate 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 noncredit 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 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. 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 Alex Rosner, a Schindler Jew, Collette Avital, Israeli Consulate, Geraldine Ferraro, former Vice Presidential candidate, Rev. Al Sharpton, political activist, Kallid Muhammad, political activist.

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; usually admission is free for students.

With the installation of a 35 mm motion picture system featuring a 40'x25' 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 presents over a score of live professional events and an eclectic schedule of films throughout the year. World class artists and ensembles such as Midori, the Alvin Ailey Dance Company, 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. Additional performances produced by outside presenters such as the Long Island Philharmonic and the Seiskaya Ballet production of "The Nutcracker", are also on the calendar.

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.

Stony Brook fields 11 men's and nine women's intercollegiate athletic teams, which compete through the National Collegiate Athletic Association (NCAA), the Eastern College Athletic Conference (ECAC), the New York State Women's Collegiate Athletic Association (NYSWCAA), and the National Intercollegiate Squash Racquets Association (NISRA), along with various conferences for certain sports. Two sports at the University, women's soccer and men's lacrosse, compete at the NCAA Division I Level. Stony Brook teams have enjoyed success in recent seasons, with NCAA tournament appearances by the men's and women's basketball teams, members of the men's and women's track and cross-country teams, and the men's and women's swimming teams. Stony Brook student-athletes have earned All-American honors in football,

men's and women's basketball, men's and women's track, and men's and women's swimming, and squash.

The student newspaper, *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* and *Stony Brook Weekly*, student weeklies; *Blackworld*, a newspaper focusing primarily on news of interest to the black community on campus; *Stony Brook Shelanu*, a monthly Jewish newspaper; *Soundings*, a literary magazine; and *Specula*, the campus yearbook.

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 (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 meets 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 public order appropriate to a university campus without unduly limiting or restricting the 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.

Any questions regarding the Conduct Code, the judiciary process, or procedures for filing a complaint should be directed to the University Hearing Officer, 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.

It is impossible to separate the concept of student freedom or rights from student responsibility. The Student Conduct Code guarantees the right of students to pursue their legitimate interests on the campus. To this end, it is imperative that students desiring respect for their rights must also accord other segments of the community the same respect.

All students are expected to know and understand the provisions contained in the Student Conduct Code to help ensure a successful academic and residential experience on the Stony Brook campus.

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 University Hearing Officer in the Office of the Student Judiciary, 347 Administration Building, or call 632-6705.

Telephone Directory

It is the policy of the University at Stony Brook to publish a campus telephone directory including student name, campus address, home address, and telephone number. If a student does not wish to be listed in the directory, or, in the case of a student who is a minor, if a parent does not wish such listing, he or she will be required to so indicate at the time of registration by filing SUSB Form 503-B at the Office of Records/Registrar.



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 3,900 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 equipped for hydro- and electrotherapy. 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; two Universal weight rooms and a free 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 Patriot Field, the home of football and lacrosse; 20 tennis courts; a six-lane, 400-meter track; four single-wall handball/paddleball courts; and recently renovated fields for varsity soccer, baseball, and softball. The intramural fields, also recently renovated, 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 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.

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 Monday through Friday from 7 a.m. to 11 p.m.

and weekends from 8 a.m. to 11 p.m. It is closed on all major holidays. For further information, call (516) 632-7205.

Bookstores

Textbooks, trade books, supplies, and clothing are stocked in the University bookstores at two locations on campus: ground level of the Melville Library (opposite the Stony Brook Union) and L-2 Health Sciences Center. Books are priced according to the manufacturer's list price. Shop early to obtain any available used books. Books may be returned within the first ten days of classes providing they are in the same condition as when purchased. Refunds can be made only during the first two weeks, and a receipt is required. During the first two weeks of each semester, the bookstores hold extended hours.

A selection of reference and general reading books is available, and titles not in stock can be ordered. The clothing department sells custom-printed T-shirts and sweat shirts. Art and engineering supplies are stocked in addition to regular stationery items. The stores also carry a selection of greeting cards, gifts, and health and beauty aids.

For more information, call the University bookstores at 632-6550 (West Campus) or 444-3685 (East Campus).

Campus Community Advocate

The services of the Campus Community Advocate are available to all students, faculty, and staff. The office is a comfortable, receptive place to turn if a student is having trouble getting through a bureaucratic maze or needs help resolving a dispute with someone or in solving a problem.

Matters handled by the Advocate's Office remain confidential. Depending on the nature of the question or problem, the Advocate's Office might direct a student to the appropriate place to get it resolved, help directly to get the needed information, or offer specific advice or mediation. If a student is simply looking for someone who can listen impartially and privately and suggest a course of action, the Advocate's Office is the place to come.

The Campus Community Advocate Office is located in 114 Humanities. Hours are 9 a.m. to 5 p.m., Monday through Friday. Walk-in visits are possible, but appointments in advance will keep waiting to a minimum. Call 632-9200.

Career Placement Center

The Career Placement Center of the Student Affairs Department assists students and alumni with all types of career planning concerns while acting as a resource by hosting employer recruitment visits and offering information on full-time permanent employment. Individual and group consultation with students is emphasized while periodic critical self-examination assists students in relating academic expertise to aspirations for future professional involvement and advancement.

Students are invited to access the Career Center's World Wide Web Page at <http://www.sunysb.edu/career> where there is a wealth of career and employment information available. Two computerized guidance services, DISCOVER and SIGI Plus, are also available for students to utilize as part of their career decision-making process.

During the fall and spring semesters job fairs and interview activities enable students to meet with prospective employers to discuss job opportunities. The JOBTRAK computerized job matching system gives students access to hundreds of employers across the country. A credentials service supports students in their application for jobs or advanced study by maintaining letters of recommendation that can be copied and sent directly to employers and schools.

Students are encouraged to participate in the Student Volunteer Service Program (VITAL), in which they may gain experience in specific career areas by working with agencies and institutions seeking volunteers.

The Job Search Preparation Program includes group workshops that assist students and alumni in writing resumés, interviewing effectively, and developing job search strategies. As part of the Career Placement Center's Outreach Program, career counselors visit residence halls and academic programs on a special request basis in order to provide exposure to career-related information.

The Career Placement Resource Library has information pertaining to employment opportunities in areas such as business, government, social service, and education. Notices are updated weekly and organized in binders for convenient access. The Self-Service Career Center provides relevant materials on career planning, teaching certification, health careers, graduate and

professional school admissions testing, graduate school and financial aid information, and recruitment options.

Other services include information and applications for examinations required by various graduate and professional programs (i.e., the GRE, LSAT, GMAT, DAT, NTE, Actuarial Exam, MCAT, TOEFL, OAT, AHPAT, and Pharmacy Test) and a growing collection of videotapes on a variety of career topics. In addition, the Career Advisor's Network (CAN) enables students to contact Stony Brook alumni for information on specific career areas (e.g., social work, business management, etc.). Students are encouraged to pick up the handout "Career Planning for Graduate Students" for information on specific resources and services in the office.

It is suggested that students visit the Career Placement Office and become familiar with the services it provides. The office, located in W-0550 Melville Library, is open weekdays from 8:30 a.m. to 4 p.m. The telephone number is 632-6810.

Child Care Services

The University provides day-care services for children ranging in age from two months to five years old. There are four on-campus facilities staffed with professionals who are assisted by students enrolled in coursework practice. Two of the centers, Toscanini and Clark, are for children from 2 months to 3 years old, and the other two, Early Childhood Center (ECC) and Benedict, are for children three to five years old. Hours vary by location. Fees are charged on a sliding fee scale based on income.

There are extensive waiting lists for these centers; therefore, it is wise to call for an application well before you will need the service. Call the executive director's office at 632-6930.

Computing Services

The University's computing 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 all students, individual programs offer a wide variety of facilities for their own graduate students.

The Stony Brook Instructional Networked Computing (SINC) sites are located throughout the campus in HSC Library, Life Sciences Library, SBS,

Computer Science, Engineering, Math Tower, Chemistry, Humanities, and the Main Library room S-1460. These sites have a variety of computers, IBM compatible PCs, Macintoshes, and UNIX workstations.

Central computing provides a distributed UNIX environment composed of multi-user servers, graphics workstations or PCs as X-terminals. This system provides the campus e-mail, news, Internet and World Wide Web services for students. Any registered student can obtain a computer account in the Library, room S-1460 or in the Computing Center.

The UNIX system is accessible from campus offices, dormitories, and student apartments through the ROLM telephone switch via a data control module that can be rented for a monthly fee.

Consulting services are provided by various offices within the Division of Information Technology. Refer to the campus phone directory or SBNEWS for specific services.

Discounts on IBM and Apple Macintosh personal computers are available to all full-time students of the University through the Computer Store. Instructional Computing has site licenses for PC Solve and True BASIC. Copies can be obtained in the Library SINC site.

For more information, contact Instructional Computing in the Library SINC site, room S-1460, 2-8050 or the student consultants, 2-9602.

Counseling Center

The University Counseling Center provides crisis intervention, brief psychotherapy, group and couple's therapy for full-time students including matriculated SPD students. Counseling services are available year-round.

All information about counseling at the Center is strictly confidential, except in situations where there is imminent threat or danger. A student does not have to be confronting desperate or overwhelming difficulties in order to benefit from a visit to the Center. Understanding a situation before it reaches the crisis stage often allows for greater freedom when making choices. The center's staff encourages students to come in and talk, even if they are not sure that counseling is what they need. With a counselor's help, a student can discuss alternatives and decide the best way to proceed. For many students, dealing effectively with emotional and

social issues increases their success with academic work. Some students have an unrealistic image of college life, which minimizes or overlooks the significant life changes required. Even those students who are flexible and resilient can feel the stress associated with being a University student. For example, the transition from home to college is sometimes difficult. Residents must cope with the pressures of residence hall life. Commuting students may need help in juggling competing priorities. Academic requirements are usually more rigorous and competition keener than previously experienced. Other students experience major life crisis, losses, family or relationship problems, and self-esteem and identity issues such as these and for help with growth and development.

The Counseling Center also has mental health and outreach programs designed to enhance personal growth and skill development including programs such as stress management, assertiveness training, and study skills. Any group may call the Counseling Center to request an outreach presentation. In addition to workshops, the University Counseling Center sponsors a weekly radio show, "Taking Care of Yourself", which focuses on health and mental health issues.

The University Counseling Center realizes the need to understand the diverse mix of cultural and social groups that make up the campus community. Through its liaisons, the Counseling Center works cooperatively with the following groups: EOP/AIM, the Mentor Program, Campus Residences, Undergraduate Studies, academic programs, the Foreign Students Services and the Disabled Students Services.

The Center is open from 8 a.m.-5 p.m. on Monday, Wednesday, Thursday and Friday, and from 8 a.m.-7 p.m. on Tuesday during the school year, and from 8 a.m.-4 p.m. during intersession, summer, and spring break. Appointments for an initial visit are made on a same-day or next-day basis by calling (516) 632-6720. In emergency situations, students will be seen right away without a scheduled appointment. The Counseling Center is located on the second floor of the Student Health Center. 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 the University Hospital. Those students who are not experiencing an emergency but want to speak to someone after hours and on weekends can call the Response Hotline at 751-7500 or the University Response Hotline at 632-HOPE.

Disabled Student Services

Disabled Student Services is organized as part of the Student Affairs Department. The office staff provides support services and acts as an advocate for students with a disability. These services, available to all disabled students who request them, deal with transportation; information and referrals; recruitment of readers, note-takers, interpreters, aides, and attendants; removal of architectural barriers; counseling; and assistance with University requirements and procedures.

Disabled Student Services also serves as advisor to Students Toward an Accessible Campus (STAC), a Polity-sponsored club for disabled and non-disabled students dedicated to increasing campus awareness of architectural and attitudinal barriers that prevent participation by students with a disability. STAC is also a social organization.

A learning disabilities specialist refers students to diagnostic services and provides individualized educational programming, support services, and in-service education. The specialist also works with the University community identifying and accommodating the needs of students with learning disabilities.

All students with a disability are encouraged to contact Disabled Student Services, 133 Humanities Building, (516) 632-6748/9, TDD also available at (516)632-6947.

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 conferences. The GSO also distributes program allocations, cash grants to the graduate student body in each program to be used as the students see fit (to purchase equipment and supplies, sponsor a visiting scholar, or throw a party).

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.

In February 1994 the GSO opened the doors to its graduate student lounge, called "The Spot," which is located above the Fanny Brice Theatre. The lounge offers light food and snacks, beverages (including imported beers), a bar, billiards, darts, and a jukebox, and regularly hosts parties and live music performances. The lounge's operating hours are Thursday to Saturday, 6 p.m. to 2 a.m.

Intensive English Center

The Intensive English Center (IEC) offers an intensive English language program for potential Stony Brook students who need full-time instruction prior to matriculation. The program offers a minimum of 15 hours per week of English language courses that include reading,

writing, listening, and speaking. Elective courses include TOEFL Preparation, American Studies, Grammar, Conversation, and Business English. IEC students also have the option of auditing University courses or registering for a course with the permission of the IEC director. The IEC program is also open to people who do not plan to enroll at Stony Brook after completing the language training, but who wish to improve their English for personal purposes. Participants are eligible to receive a student visa (F-1), may live on campus, and may use all University facilities.

In the summer, the IEC offers a four-week summer program. Students attend English classes and join excursions to places of cultural and historic interest. A three-day trip to Washington, D.C. affords students the opportunity to visit our nation's capital. Admission is open to all foreign students who have completed the equivalent of a secondary school education.

For additional information prospective students may call or visit the Intensive English Center, E5320 Melville Library, telephone (516) 632-7031.

International Student and Scholar Services

International Student and Scholar Services (ISSS) is the part of the University that counsels students from other countries concerning finances, housing, government regulations (including immigration and tax concerns), and cross-cultural differences. The foreign student advisor is the Designated School Official (DSO) on campus responsible for F-1 visas. Questions relating to academics are usually handled by academic advisors within the individual's program.

ISSS supervises the SUNY Health Insurance Plan for Foreign Students and Scholars as well as the International Outreach Program, a community service group. In addition, ISSS works with community groups and student organizations to provide access to a varied program of activities, including tours and trips, discussion groups, home hospitality, speaking engagements, and other events. ISSS also provides a liaison for students with the community host family group.

An F-1 or J-1 foreign student must take a full course of study of 12 credits, must attend a mandatory orientation program, and must consult a foreign

student advisor (1) before accepting employment, (2) before leaving the United States either permanently or temporarily, (3) when transferring to another institution, (4) when withdrawing from the University, (5) when extending his or her entry permit, (6) before leaving the University, (7) before changing his or her address for any reason, (8) when anticipating a status change (for example, from "F" to "permanent resident"), or (9) to change his or her major or level of study. To maintain status, a student must have a valid passport and valid visa documents.

ISSS is located in the Graduate School. The telephone number is (516) 632-7040.

Libraries

The Stony Brook campus is endowed with 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 Melville building are collections serving the social sciences, humanities, fine arts, and music. 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, audio-visual, and legal materials. Other facilities of note are a music listening center, a student lounge, and a variety of individual study carrels. The full range of library services, including open stack privileges and access to databases, are available to all students.

There are seven branch science libraries. Six of these—chemistry, computer science, earth and space sciences, engineering, marine and atmospheric sciences, and mathematics/physics—are located in departmental buildings. The seventh, life sciences, is located in its own building. There is also a Health Sciences Library in the Health Sciences Center. Collectively, the University libraries contain over 1.7 million bound volumes and 3 million publications in microformat.

Other library resources of note are the Senator Jacob K. Javits collection of papers and memorabilia, and the William Butler Yeats Archives.

Library Hours

During the academic year, the main 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 8:30 a.m. to 5 p.m., Monday through Friday, and closed weekends. The library is usually closed on those 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 branch libraries as well as at the main library.

Off-Campus Housing Service

Off-Campus Housing Service maintains an up-to-date list of available rentals in the local area. All landlords, listing their properties, have signed an agreement assuring nondiscriminatory rental practices. The University does not become a party in private landlord-tenant disputes.

Each posting on the available computer generated printouts includes the following information: type of housing (i.e. house to rent, house to share, apartment to rent, apartment to share, studio apartment, and room to rent), rental charges, lease information, whether utilities are included or if units are furnished, duration of tenancy, and availability dates. Also available from the OCH office: basic legal advice regarding landlord/tenant's rights and obligations, local area maps, public transportation schedules, energy conservation material, information regarding local hotels/motels, bed & breakfast accommodations, as well as other short-term housing. The Off-Campus Housing Service office is located in room 104 in the Administration Building, and is open Monday-Friday during the hours of 10 am to 3 pm. The telephone number is 632-6770.

Stony Brook Union

The Stony Brook Union is the campus center for hundreds of activities planned for and by students. Its nine meeting rooms, auditorium, ballroom, art gallery, spacious lounges, and courtyards provide space for all registered University groups.

The union is also a gathering place for students between classes. Some students gravitate to the arcade or the billiards and ping-pong room, while others

prefer to relax, watch television, read, or mingle with friends and other members of the campus community in the lounges. Hungry students, whether looking for a quick snack or a complete meal, can satisfy their appetites in one of the union's eateries—a cafeteria, a delicatessen, a pizzeria, a coffeehouse, a cookie-candy counter, and a restaurant. For information call the University Information Center at 632-6830.

The building houses many vital campus services: check cashing, locker rentals, and the University Information Center, which is a campus-wide resource center. Campus directory information, campus maps, bus and train schedules, and concert, film, and other social events information are available. The Information Center's phone number is 632-6830.

The Union Crafts Center offers workshops in ceramics, photography, silk-screening, leatherwork, bartending, cooking, and many other crafts and skills. These noncredit classes are taught by professional instructors and are open to all. Fees are nominal. For information call 632-6822.

The union serves as headquarters for many student groups. In addition, the student newspapers; WUSB-FM (90.1), the University radio station; and SCOOP, a student-operated audio-visual service, are housed in the union.

The Faculty Student Association (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.

Weekends at Stony Brook are filled with concerts, plays, movies, speakers, sporting events, and parties. Past concerts have included the Ramones, Eddie Murphy, Bob Dylan, and George Carlin, to name only a few. Craft fairs, club fairs, and special cross-cultural exhibits are popular weekend activities on campus.

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, 8:00 a.m. to 5:30 p.m. and is closed New Year's Day, Easter Sunday, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas Day.

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

Student Health Service

The Student Health Service, located in the Infirmary Building, provides health care to all registered students, and to faculty and staff on an emergency basis only. There is a mandatory fee of \$70 for full-time students and \$7.00 per credit for part-time students. The health service is open Monday through Friday, 8 a.m. to 5:30 p.m. The hours during intersession and in the summer are 8 a.m. to 4:00 p.m. When the Student Health Service is closed, students are requested to use the Emergency Department of University Hospital. The health fee does not cover the cost of any medical services outside the Student Health Service Building.

The walk-in clinic at the health service is staffed by physicians, physician's assistants, and nurses. Students need only "walk in" to the Infirmary Building, register, and they will be seen by the medical staff. Some prescriptions can be filled and laboratory work completed as part of the mandatory fee. There is a gynecology clinic (Women's Center), wart clinic, rheumatology/orthopaedic clinic, health educator, psychiatrist, and social worker.

If you are not a GA, TA, or RA covered by GSEU or Research Foundation insurance, the University strongly recommends a voluntary health insurance plan because 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 632-6740.

Study Abroad

The Office of Study Abroad and International Programs administers faculty exchanges with foreign universities. These scholarly agreements facilitate collaboration and communication with many universities and often provide the basis for international study and research by graduate students and faculty in a variety of disciplines. The presence on the Stony Brook campus of faculty and students from many countries is often due to exchange agreements with universities in Germany, Great Britain, China, Israel, Spain, South Korea, Argentina, Chile, France, Italy, Mexico, and Japan. The Office of International Programs is working to expand these contacts.

For more information, call (516) 632-7030 or visit the office in E5340 Melville Library.

Veterans Affairs

The Office of Veterans Affairs, offers counseling and advice to veterans and eligible dependents of veterans. Students are provided with information and assistance in preparing applications for V.A. educational benefits and other financial aid programs for veterans and dependents of veterans. A resource collection containing information on a wide variety of topics concerning veterans is available to interested individuals visiting the office.

Students seeking information and assistance are encouraged to contact the Office of Veterans Affairs as soon as possible. The office is located in 348 Administration Building. The telephone number is (516) 632-6701.

Writing Center

The College of Arts and Sciences' Writing Center offers individual tutoring to all members of the Stony Brook community including undergraduate and graduate students, faculty, and staff. Tutors provide guidance in all stages of writing from getting started to revising, and for all types of projects from research papers to resumes. In addition, tutors provide general writing instruction for those interested in improving their skills apart from work on assigned writing tasks. Throughout the semester, tutors conduct workshops on various aspects of writing. The schedule of workshops is available in the Writing Center, 198 Humanities.

The Writing Center is open from 9 a.m. to 5 p.m., Monday through Friday and selected evenings that change from semester to semester. Appointments are recommended (632-7405), since last-minute requests cannot always be accommodated.



Financial and Residential Information



Financial Information

Tuition and Fees

Charges are due and payable by the first day of classes unless properly deferred. **All fees and charges are subject to change without notice.**

Application Fee \$50.00

Tuition

Full-Time Graduate Students G1 or G3—12 credits

	<i>First Semester</i>
N.Y. State resident	\$2,550.00
Nonresident	4,208.00

	<i>Second Semester</i>
N.Y. State resident	\$2,550.00
Nonresident	4,208.00

	<i>Year</i>
N.Y. State resident	\$5,100.00
Nonresident	8,416.00

Full-Time Graduate Students G2 or G4—9 credits

	<i>First Semester</i>
N.Y. State resident	\$1,917.00
Nonresident	3,159.00

	<i>Second Semester</i>
N.Y. State resident	\$1,917.00
Nonresident	3,159.00

	<i>Year</i>
N.Y. State resident	\$3,834.00
Nonresident	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
Nonresident	\$351.00 per semester credit hour

Professionals (Medicine and Dental Medicine)

Full-Time Graduate Students

	<i>First Semester</i>
N.Y. State resident	\$5,420.00
Nonresident	10,970.00

	<i>Second Semester</i>
N.Y. State resident	\$5,420.00
Nonresident	10,970.00

	<i>Year</i>
N.Y. State resident	\$10,840.00
Nonresident	21,940.00

College Fee

	<i>First Semester</i>
Full-time graduate student (12 or more credits)	\$12.50
Part-time graduate student (11 or fewer credits, per credit)	.85

	<i>Second Semester</i>
Full-time graduate student (9 or more credits)	\$12.50
Part-time graduate student (per credit)	.85

	<i>Year</i>
Full-time graduate student (9 or more credits)	\$25.00

Activity Fee

	<i>First Semester</i>
Full-time graduate student (except professional)	\$18.50
Part-time graduate student	5.00
Dental student	37.50

	<i>Second Semester</i>
Full-time graduate student (except professional)	\$18.50
Part-time graduate student	5.00
Dental student	37.50

	<i>Year</i>
Full-time graduate student (except professional)	\$37.00
Part-time graduate student	10.00
Dental student	75.00

Lost Identification Card	\$10.00
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Late Registration Fee	\$30.00
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Transcript Fee	\$5.00 each
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Returned Check Fee	\$20.00
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Late Payment Fee	\$30.00
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Add/Drop Fee	\$15.00
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Health Insurance Fee	Various
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Payment of Tuition and Fees

Tuition and fees for a given academic session must be paid in full or properly deferred prior to the first day of classes. All checks must be payable to SUNY at Stony Brook. Postdated checks are not accepted. Visa, MasterCard, or Discover payments may be made in person or by mail. Credit card payments by mail must include an Authorization for Use of Visa/MasterCard/Discover form, which is enclosed in the billing package. Mail payments should be sent to P.O. Box 619, Stony Brook, NY 11790.

The Registrar's Office/Student Services Center offer a Time Option Payment Program (TOPP) which allows for the budgeting of expenses on a monthly basis. This is not a loan of any sort; therefore, no interest will be charged. The only cost is a \$30.00 per student annual processing fee to help defray the administrative expenses of the program. For further information please contact the Registrar's Office/Student Services Center.

Students making payment after the due date specified on their bill will be subject to a \$30.00 late payment fee. Payments postmarked after the due date printed on the bill are also subject to the late payment fee. **Late payment fees are cumulative up to \$90.00 per semester.** Students initially registering on or after the first day of classes of a given semester will be subject to a \$30.00 late registration fee. These fees may not be waived or deferred. The late registration period ends at the close of the second week of classes.

Students failing to meet financial obligations incurred while in attendance at Stony Brook may be subject to additional fees or fines for collection agency 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. Documented proof of the award must be received by the University Student Service Center to apply the deferment to an account. Only current awards are deferrable; only tuition, room, and board charges are deferred. Deferments are granted to students for the following types of awards;

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)
8. Graduate students employed on teaching assistantships, graduate assistantships, or research assistantships can defer charges up to one-half of their term salary

Refund Policy

All requests for refund of tuition must be submitted in writing to:

Bursar's Office
 261 Administration Building
 P.O. Box 619
 State University of New York
 at Stony Brook
 Stony Brook, NY 11794-1301

The college fee, late registration fee, and lost ID card fee are not refundable.

Schedule of Tuition Liability

A student who withdraws from the University shall be liable for payment of tuition in accordance with the following schedule:

<i>Liability during</i>	<i>Semester</i>
First week	0%
Second week	30%
Third week	50%
Fourth week	70%
Fifth week	100%

Liability during

First week	
Second week	
Third week	

*Six-Week
Summer Session*

0%
70%
100%

Please note that zero percent liability will be in effect for the first week of classes only. Students must officially cancel/ withdraw their registration at the Student Service Center. Students who cancel or withdraw after the first week of classes shall be liable according to the schedule above. Nonattendance does not constitute the cancellation of registration or of financial charges.

Certification of the effective date of withdrawal must be made by the Office of Records/Registrar. A withdrawal card available at the Registrar's Office must be completed and returned to the office on the date of withdrawal. No money shall be refunded unless application for refund is made within one year after the end of the term for which the tuition requested to be refunded was paid to the University.

There is no tuition fee liability established for a student who withdraws to enter military service before the end of an academic term. This only includes courses in which he or she does not receive academic credit. Acceptable proof must be submitted to request a refund.

Housing

Request to cancel housing and refund related fees must be made in writing to:

Division of Campus Residences
 Mendelsohn Quad
 State University of New York
 at Stony Brook
 Stony Brook NY 11794-4444

Once a student has registered and occupied a room, prorated refunds may be granted for room payment made that semester. Apartment residents are financially responsible for their entire agreement period unless they provide 30 days prior written notice. Refund requests for room payment must be accompanied by the Division of Campus Residences' verification of the move-out date. The cooking fee will be refundable if the student enrolled in the meal plan within two weeks after checking into the residence hall. The amount of the refund is determined by university policy in effect at the time of the request.

Meal Plan

Meal plan refunds must be made in writing to:

Faculty Student Association
 Stony Brook Union
 Room 282
 State University of New York
 at Stony Brook
 Stony Brook, NY 11794-3209

Student Activity Fee

The Graduate Student Organization grants full refunds to students who withdraw within the first week of classes. No refunds will be granted after the first week of classes.

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 in maximizing financial aid opportunities by providing information about available grants, work opportunities, and student loan programs. To receive maximum financial aid consideration students should read the instructions on all forms and follow them carefully. Deadline dates should be strictly adhered to, as timely submission of forms will enable the office to process requests in time for the start of classes. **In order to begin applying for financial aid, students must complete the following forms:**

1. The *Free Application for Federal Student Aid (FAFSA)* should be mailed to the processor in Kentucky in the envelope provided before the March 1 deadline. Students must include Stony Brook's college code, **002838**, and the correct name of the institution, **SUNY Stony Brook**.

2. The *Tuition Assistance Program (TAP)* application form must be completed by all New York State residents. The TAP application must be mailed to the New York State Higher Education Services Corporation in Albany in the envelope provided. Stony Brook's TAP code is **5430** for graduate students.

3. A *financial aid transcript* must be sent to Stony Brook's Office of Financial Aid from each postsecondary institution

previously attended, whether or not the student received financial aid. The Office of Financial Aid must have these transcripts before eligibility for financial aid can be confirmed.

The student should not send any income documentation such as tax forms at the time of application. However, if income verification is necessary, the Office of Financial Aid will request at a later time other documentation and information.

Upon receipt of the completed FAFSA (via electronic tape from the federal processor), the Office of Financial Aid and Student Employment will conduct an analysis of eligibility for financial aid based on the student's personal and family resources. The Office of Financial Aid will then send the student an **award letter** describing the financial aid programs and amounts for which he or she is eligible. Priority for campus-based aid is given to the neediest students who meet the deadline date to apply.

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 received by the federal processor on or before March 1.

Applicants seeking financial assistance are strongly advised to make sure that all application materials, including letters of recommendation and transcripts, have been received by the University no later than March 1 of the academic year prior to their entrance (e.g., March 1, 1996 for fall 1996 assistance). To be eligible for campus-based aid, the FAFSA must be received by the federal processor on or before March 1 of the preceding academic year. TAP applications are accepted until May 1 of the academic year in which aid is required; loans are granted for a given semester until the last day of classes. However, students seeking priority deferments (for the summer as well as the academic year) based upon TAP and loan money should file in the preceding year.

Financial Aid Eligibility

Financial assistance is available as a resource to help students and their families meet educational costs. Students and their families are ultimately responsible for paying all educational expenses and for completing all financial aid processes required. Financial aid eligibility is based on financial need. Financial need is the difference between the "Expected Family Contribution" and the "Estimated Cost of Education" (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 Education" 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 includes 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 money while attending school.

Institutional Aid

University Tuition Scholarship

University tuition scholarships are defined as either full or partial 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 in the following cases:

- a) foreign students
- b) all first-semester out-of-state students
- c) U.S. nationals or resident alien students without New York State residency who have been granted an exemption by the Graduate School because obtaining residency would be impractical.

For students in categories a, b, and c, a full tuition scholarship covers the cost of the University required full-time credit load charged at the out-of-state rate. Partial scholarships are of a specified value.

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. The Graduate School will assist incoming students with the process of establishing New York State residency.

Graduate School Traineeships (Teaching Assistantships, Graduate Assistantships)

Graduate traineeships are awarded on a competitive basis (judged by such criteria as academic achievement,

Estimated Student Expenses 1996-1997

	Full time / On campus	Full time / Off Campus
Direct Costs:		
Tuition	\$5,100	\$5,100
Fees	258	258
Room	3,294	
Board	2,056	
Total Direct Costs:	\$10,708	\$5,358
Indirect Costs:		
Books	\$750	\$750
Transportation	600	1,920
Personal	1,126	8,591*
Total Indirect Costs:	\$2,476	\$11,261
Total Cost:	\$13,184	\$16,619

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

* Includes a \$7,465 allowance for room and board

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 Spring 1996, a full assistantship averaged \$9,572 for the full 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 from discipline to discipline but usually average \$500-\$1,000 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 Spring 1996 a Graduate Council fellowship carried a stipend of \$13,520 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 cut-off 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 fifteen 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 Spring 1996 a Turner fellowship for a doctoral candidate carried a total stipend of \$13,520 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.

Madeline Fusco Fellowship Award

The Madeline Fusco Award, endowed in 1991, is presented to a minority or female student in financial need, for use in completing the dissertation. This award was presented for the first time in Spring 1992 and will be presented thereafter on an annual basis.

Dr. Madeline M. Fusco Fellowship for Women

The Fusco fellowship for women was established in 1994. It is awarded annually to one or more women graduate students. The Graduate Council Fellowships and Awards committee reviews and ranks candidate files submitted by each graduate program. Until such time as the fellowship principal increase to a level in line with other academic year fellowships, the Fusco Women's fellowship is currently a one time commencement award.

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, including a special program for minorities, 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. Closing date for applications is established by the NSF, usually late November or early December. For further information write to the Fellowship Office, National Academy of Sciences, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418.

National Science Foundation Minority Graduate Fellowships

The National Science Foundation (NSF) sponsors three-year Minority Graduate

Fellowships for minority individuals who have demonstrated ability and special aptitude for advanced training in science or engineering. These fellowships are awarded for study or work leading to the master's or doctoral degree in the mathematical, physical, biological, engineering, and social sciences and in the history or philosophy of science. Candidates must be citizens or nationals of the United States. Closing date for applications is established by the NSF, usually late November or early December. For further information write to the Fellowship Office, National Research Council, 2101 Constitution Avenue, N.W., Washington, DC 20418.

Veterans Educational Benefits

Veterans Educational Benefits are available to veterans who were in the U.S. Armed Forces between 1955 and 1977. Aid for children, spouses, and survivors, if the veteran suffered a service-connected death or disability or is missing in action, is also available. Students who are eligible for veterans benefits should obtain an application form from the Veterans Affairs Office, Room 348, Administration Building, (516) 632-6701. Students are advised to contact the Veterans Affairs Office concerning veterans benefits as soon as possible.

Deferments based upon veterans benefits may be obtained by submitting a copy of the deferment form prepared and signed by the Stony Brook Veterans Affairs Office to the Office of Student Services.

Other programs available to veterans are the Montgomery G.I. Bill, Survivors and Dependents Educational Assistance, Post-Vietnam-Era Veterans Educational Assistance Program

(VEAP), Regents Awards for Children of Deceased or Disabled Veterans, and Vocational Rehabilitation for Disabled Veterans.

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 afterward. Graduate yearly limits are \$8,500 with a total cumulative limit of \$65,500, including undergraduate loans. The maximum rate of interest charged is 9 percent; the current rate is 6.22 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 approval of the guaranteeing agency and the participating lender after verification by the college of 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. 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 six 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 \$3,000.

Tuition Assistance Program (TAP)

This state-funded grant is available to New York State residents for attendance at accredited New York State campuses. It provides tuition assistance for matriculated undergraduate and graduate students enrolled full time. TAP award amounts are based on New York State taxable income. The awards range from \$75 to \$1125 each semester for graduates and may be received for up to eight semesters. Students must complete the FAFSA and the TAP application forms available at the Financial Aid Office.

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 must 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.

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

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

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.

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

There is a variety of funding available to graduate students 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 U.S. The Office of Financial Aid assists students in locating and securing these resources.

Information

For further information at Stony Brook, visit or call the Office of Financial Aid and Student Employment at (516) 632-6840. The office is open Monday, Wednesday, Thursday, and Friday from 10 a.m. to 4 p.m. and Tuesday from 10 a.m. to 7 p.m. Telephone service hours are Monday, Tuesday, Wednesday, and Friday from 9 a.m. to 4 p.m. and Thursday from 10 a.m. to 4 p.m. Appointments are available. Other useful phone numbers are those for the Bursar's Office (516) 632-9316, Office

of Records/Registrar (516) 632-6885 and the Veterans Affairs Office (516) 632-6810.

For further information from agencies other than the University, call the New York State Higher Education Services Corporation at 1-800-642-6234, Stafford Loans information at 1-800-842-6238, and Tuition Assistance Program (TAP) at (518) 474-5642.

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 residence halls and University apartment complexes offer single and double rooms, studios, and one-, two-, three-, and four-bedroom apartments.

All housing assignments are made on a first-come, first-served basis, according to the date the housing application and advance deposit are received by the Division of Campus Residences. 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 (516) 632-6750.

University Apartments

The University Apartments at Stony Brook are comprised 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 242 apartments. The one- and two-bedroom apartments are assigned mainly to families. The two-bedroom apartments often house 2 couples, one in each bedroom. Three-bedroom apartments house single students, usually two per bedroom, though a limited number of single-occupancy bedrooms may be provided when vacancies exist. A pilot project to renovate apartments into four bedroom single units is currently under way. 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 commons area. 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 commons. 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. Couples must present a marriage license or a union certificate, participate in an interview with residential programs staff, or display two documents demonstrating that a partnership of the following kind has existed for six months or more:

- joint credit card
- joint bank account
- joint ownership of property
- joint income tax return
- joint utility bill
- lease verifying cohabitation for at least six months
- joint legal custody or guardianship
- durable power of attorney (for health care, finance, etc.)
- assignment of life insurance documents
- will drawn up by an attorney bequeathing personal property to one another

3. Single graduate students
4. Undergraduate Health Sciences Center students
5. Specified categories of nonstudents, such as international exchange visiting scholars and resident doctors.

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 and basic cable TV service. All charges are subject to change without notice. The monthly rents pertaining to the various apartment/room arrangements are as follows.

Chapin Apartments

Studio	\$372
Large Studio	\$593
Full one-bedroom	\$690
Full large one-bedroom	\$718
Full two-bedroom	\$1046
Two-bedroom, shared (each bedroom)	\$523
Three-bedroom, shared:	
A or C room (single occupancy)	\$364
B room (single occupancy)	\$343
A or C room shared (each bed)	\$243
B room shared (each bed)	\$228.50

Schomburg Apartments

Full one-bedroom	\$760
Four-bedroom, shared (each bedroom)	\$339

Facilities

Each bedroom in the apartments comes fully equipped with a digital ROLM phone with free, unlimited incoming and on-campus calling. Additional services, e.g., off-campus, long-distance, and international calling; computer hook-ups (regular modems will not work); and voice mail 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 basic cable TV service.

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 over cam-

pus. 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 commons 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.

Residence Halls

A limited number of single-occupancy rooms and a larger number of double rooms are available for graduate students in the University residence halls. Stimson International College, located in Eleanor Roosevelt Quad, is committed to the integration of foreign and American graduate and undergraduate students. Stimson College houses a large population of graduate students.

It is important to note that only a limited number of residence halls are open for occupancy during the intersession. If accommodations are required during this period, it must be stated on the housing application so that appropriate arrangements can be made.

Residence Hall Housing Charges

The cost of a single room in a residence hall is approximately \$1,894 per semester. The cost per person is approximately \$1,647 per semester for a double room. There is an additional \$100 premium in renovated buildings.

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. That is, 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 (516) 632-6770, Monday-Friday, 10 a.m. to 3:00 p.m.

Student Health Service

The Student Health Service provides for the health needs of registered students. The mandatory health fee is \$70.00 per semester for all full-time registered students and \$7.00 per credit for part-time students. Students enrolled only in an 800 course for no credit during the summer pay a \$50 fee.

Note: Part-time SPD students are exempt from the mandatory health fee but may use the service on a fee-for-service basis.

Student Health Insurance

Subsidized Insurance Plan

Domestic and Foreign Students

As a result of negotiations between the State University of New York and the Graduate Student Employees Union (GSEU), a comprehensive health insurance plan, including hospitalization, medical/surgical services, and prescription drug coverage, is offered to eligible GAs and TAs (and eligible family members); SUNY contributes 90% of the cost of individual coverage and additional 75% of the cost of dependent coverage. The Research Foundation of SUNY, a private educational corporation, offers a similar plan, with the same contribution levels, to eligible RAs (and their families). Each year, at the start of the semester, there is a 30 day enrollment period.

To be eligible, graduate assistants (GAs) and teaching assistants (TAs) must be carrying at least a half assistantship, have an annualized minimum salary of \$3,500, and be in active pay status. Resident assistants (RAs) must hold the title of research project assistant or project instructional assistant, and must be appointed for at least one semester or the equivalent, have a minimum salary of \$3,500 per year or \$134.25 biweekly, and be in active pay status.

F1 visa GAs and TAs are required to enroll in the GSEU plan unless they can show proof to the Foreign Student Services that they have adequate coverage under another policy.

F1 visa RAs may enroll in the Research Foundation's health insurance plan or the International Students and Scholars plan. If they enroll in the International Student Plan, the Research Foundation will not contribute toward the premium cost of that plan.

J visa holders must enroll in the health insurance plan for International Students and Scholars; however, SUNY and the Research Foundation will contribute toward the premium cost of that plan for all eligible students and their dependents.

Graduate student employees interested in signing up for this insurance coverage should attend an Employee Services-Benefits Orientation. Detailed information will be provided, questions answered, and enrollment applications supplied. Dates, times, and locations of the orientations will be listed in a memorandum sent to each student at his or her department address.

Unsubsidized Insurance Plan

Domestic Students

This is an optional plan, designed to become effective where the mandatory health fee coverage leaves off. The plan is tailored to the needs of domestic Stony Brook students, both part and full time, and covers a broad range of services on and off campus, including hospitalization, physician visits, emergency room care, X-rays, and lab tests. The student selects the medical provider(s). The premiums for 1996-1997 ranged from \$248 to \$523 for students, and from \$406 to \$2,234 for dependents, depending on the period of coverage selected and the number of dependents enrolled. Two enrollments are held each year; coverage begins either on August 16 or January 22. For further information visit the Student Health Insurance Office, Room 149, Infirmary Building; (516) 632-6054, Monday-Friday, 10 a.m. to 2 p.m.

Foreign Students

All students on nonimmigrant visas who are registered at Stony Brook, whether full or part time, are required by state law to take the health insurance policy provided by the State University of New York. The charge is automatically added to the student's account. The insurance policy is a good one: it covers pre-existing conditions and for 1995-1996, it paid 100 percent of the first \$1,000, 80 percent of \$1,001 to \$10,000, and 100% of \$10,001 to \$75,000 for most medically necessary expenses, provided the student's initial visit was to the Student Health Center (Infirmary). Benefits and costs subject to change each academic year. The plan does not cover well-care, dental care, and eye care. Within strict limitations, waivers can be granted for all or part of the cost of purchasing the insurance plan, but there is a deadline for applying for a waiver. Application must be made by directly contacting the health insurance coordinator in the Foreign Student Services. Instructions

for enrolling in the insurance plan or applying for a waiver can be obtained at the Foreign Student Services, the Office of the Graduate School. Monday-Friday, 8:30 a.m. to 5 p.m.

The fee for 1995-1996 was \$632. New students enrolling for the spring term are charged a spring/summer fee (\$369 for 1995-1996) The cost of summer registration alone is \$158.25.

Foreign students who take GA, TA or RA insurance will be automatically billed only for the Medical Evacuation/Repatriation portion of the foreign student insurance (\$44.50 in 1995-1996), and for any months not covered by GA, TA or RA insurance (\$52.75/month in 1995-1996). RA's who prefer to take the foreign student insurance rather than the RA insurance benefit should consult the health insurance coordinator in Foreign Student Services regarding this choice.

Other Expenses

Food

The University, through food service contractors, provides several meal plan options. Meals are served at two all-you-can-eat dining locations, "H" and Kelly Cafeterias, and on the Itza Italian Line in Roth Food Court. The meal card options include the following:

Plan A: 16-19 meals per week

Plan B: 11-15 meals per week

Plan C: 9-10 meals per week

Plan D: 6-8 meals per week

Plan E: Standard Declining

Balance

ODB: Optional Declining Balance

BP: Budget Plan

Kosher Plan

The cost of all meal plans with a *standard declining balance* for the fall semester is \$964, and the cost for the spring semester is \$944. The cost of all meal plans with an *optional declining balance* for both fall and spring semesters is \$797 per semester.

To eat at the resident dining halls, which feature unlimited helpings, the student may pay cash or draw from his or her bank of purchased meals or declining balance. If the student uses the declining balance option or pays cash, meals will cost from \$3.08 to \$7.24, depending on the meal or event.

Resident students who do not live in a mandatory meal plan residence hall are required to pay a cooking fee of \$208 per semester if they reside in a corridor-style hall and \$134 per semester if they reside in a suite-style hall.

Students in cooking dorms who sign up for the optional declining balance plan can have their cooking fee waived.

In addition to the dining halls in H and Kelly Quads, the food service contractor operates a restaurant and several a la carte locations. The End of the Bridge Restaurant in the Stony Brook Union is open for lunch and dinner, Monday through Friday; prices range from \$3.25 to \$5.95. Also located in the Stony Brook Union are Papa Joe's, featuring pizza, the Bleacher Club, and the Union Station Deli. The Roth Quad Food Mall features a kosher dining area as well as Burger King and Itza Italian. Other a la carte dining locations include the Humanities Cafe, the Tree House Cafe in the Health Sciences Center, University Hospital Cafeteria, and Harriman Cafe. Prices at these locations are generally comparable to those given above.

Dining halls are open daily but hours of operation vary. Students should consult dining hall staff for hours or call (516) 632-MEAL for information on daily menus.

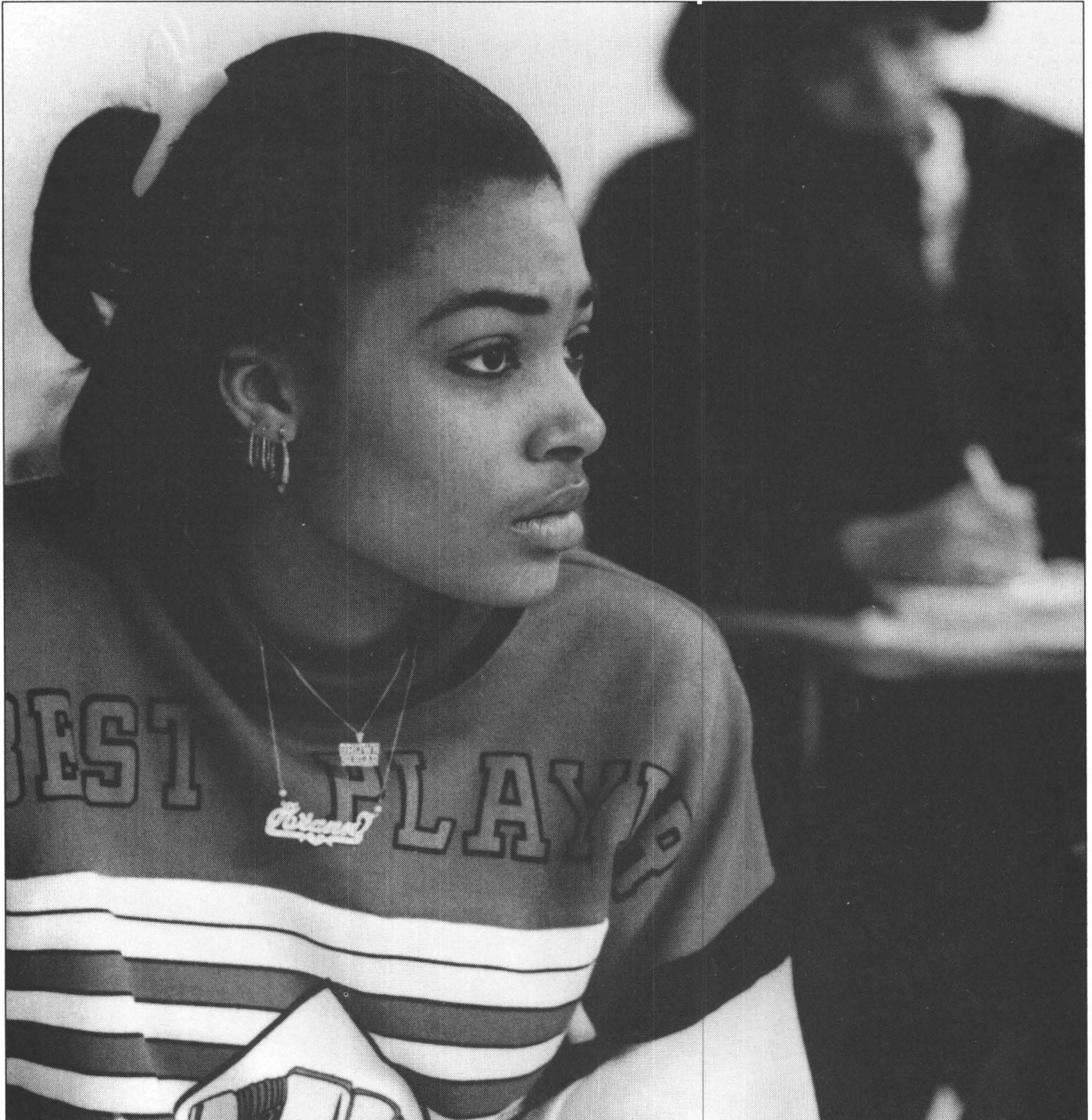
The area immediately around the campus has several a la carte locations. Graduate students should refer to the *GSO Survival Guide* published by the Graduate Student Organization for helpful information on the surrounding area.

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 \$1607 for a comparable period of time.



Admission to Graduate Study



Requirements for Admission

Applicants may be admitted to the Graduate School to pursue the M.A., M.F.A., M.M., M.S., D.A., D.M.A., or Ph.D. degree. To be considered for admission, 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 the advanced test).

E. A nonrefundable application fee of \$50.00.

F. Proficiency in English for foreign students (see Foreign Students section).

G. After acceptance, each student is required to file with the Student Health Service a completed and satisfactory health history and physical examination form. 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 him or her to progress satisfactorily in a degree program. A United States equivalent bachelor's degree is required, 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 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. Admission decisions are made by pro-

grams 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 Graduate School or the appropriate program.

Waiver of Application Fee

All applicants are required to pay the application fee except those students who reapply for admission within one academic year. The application fee may be waived for a U.S. citizen in cases where there is documentation from a financial aid administrator or other appropriate college or university official substantiating that a particular student is needy and that the payment of the application fee would create a financial hardship. Complete financial information must be provided, including total cost of education and amount and types of financial aid received.

Students with an exceptionally high overall GPA may also be eligible for a waiver. To qualify for this waiver a student must have an overall undergraduate GPA of 3.75 or better from a U.S. institution. 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 is made to a particular program for a designated degree. Additional admission requirements are listed in each program's section of this publication. Application forms and additional program information may be obtained by writing to the appropriate program.

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

An offer of admission to graduate study at Stony Brook is for a specific term. If for good reason the applicant is unable to enroll for the term specified, he or she should request a deferment of admission. If the request is granted by the program, the student will be sent a new offer of admission for the subse-

quent term 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 term of the original offer of admission must submit a new application and a new application fee. Foreign students must submit a new foreign student financial affidavit and have necessary immigration papers processed if they do not enroll in the original term of offer of admission.**

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 submitted to the Graduate School along with an unofficial Stony Brook transcript. Foreign students must also submit a new financial affidavit and be cleared by the Foreign 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 and/or the Graduate School may set specific requirements to be fulfilled by the readmitted student during the first year of readmission.

Provisional 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 provisionally.

Program recommendation and Graduate School approval are required for provisional admission. The programs may set conditions that the student must satisfy during the early period of graduate work. Normally these conditions include at least two graduate courses in which the student must obtain grades of B or better in the first semester for part-time students, or an overall B average for full-time students.

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 provisionally 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 Library. For computer-based testing administration 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 a nondegree student. Enrollment is limited to those courses for which the student can obtain permission to register, taking into consideration the student's background and course enrollment limitations. If a nondegree student later wishes to pursue a graduate degree, this student will need to make a formal application for admission to a degree program. **For those students who are admitted into degree programs, a maximum of 12 graduate credits from nondegree graduate status can be transferred to matriculated graduate degree status at Stony Brook (see Transfer of Credits section).**

Admission of Undergraduates to Graduate Courses

Undergraduates of exceptional ability, upon the request of the graduate program director and of the instructor to the dean of the Graduate School, may be admitted to graduate courses. 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 the University at Stony Brook. Undergraduate students who have been admitted to the Graduate School at Stony Brook may apply a maximum of six graduate credits toward the graduate degree for courses taken after admission to the Graduate School. Credits approved for a graduate degree may not be applied to the undergraduate degree.

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.

Student Status

Part-Time Students

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, G4, or G5, depending on the program to which they have been admitted and their previous graduate training. If the 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 graduate credits before being admitted, he or she will be classified as G2 in a master's program or G4 in a doctoral program. 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.

Full-Time Students

Students admitted for full-time study to the Graduate School will normally register for 12 or more credit hours per semester. Responsibility for certifying the full-time status of graduate students rests with the Office of Records/ Registrar. A graduate traineeship is consid-

ered 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 will register for nine regular graduate credits in addition to the participation in teaching and research.

Full-time graduate students are classified as either G1, G2, G3, G4, or G5, 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 who complete the necessary requirements for the doctoral degree except for the writing of the dissertation are classified as G5 upon advancement to candidacy.

Foreign Students English Proficiency

Students from non-English-speaking countries 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 240 on the Test of Spoken English (TSE) or a score of 550 on the Test of English as a Foreign Language (TOEFL). Students who wish to be considered for a teaching assistantship must either have a TSE score of 240 or a TOEFL score of 600. These tests are given at centers throughout the world several times each year. Further information is available by writing to the Educational Testing Service, Princeton, New Jersey, 08540, USA.

Admission to the Graduate School is contingent upon satisfactory fulfillment of the English proficiency requirement. Students who fail to meet the requirement must attend a session of the Intensive English Center and achieve satisfactory grades, or take a SPEAK test upon arrival. Depending on his or her performance in the Intensive English Center or 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 approxi-

mately 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 also provide the University with verification that the necessary funds are available for financing their education at Stony Brook and for living expenses. The University form SUSB 103R2, included in the application material, must be submitted for this purpose before immigration documents will be sent to the students.

I-20 Documentation

Government regulations require that every foreign student attend the institution that issued the I-20 used for entry into the United States. Transfers are 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. Foreign students on student visas must register as full-time students and maintain status according to U.S. regulations. Students are urged to contact Foreign Student Services for complete information.

Transfer of Credit from Other Universities

Graduate credits earned at other accredited institutions may be transferred (up to certain limits) to the University at Stony Brook with the approval of the program and the Graduate School, provided that they have not been used toward the satisfaction of any degree requirements at the other institution.



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 of the Graduate School and the administrative staff of the Graduate School in conjunction with the Graduate Council, which is composed of faculty, students, and administrators.

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 core campus nonteaching 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 Central Office and the State Department of Education.

The Department

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 comprising 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, and assistantships, 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 hold graduate traineeships, research assistantships, or predoctoral fellowships must be registered as full-time students. Neither programs nor individual faculty members 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 two weeks of the semester, but will be charged a late registration fee of \$30.00. Registration is not permitted after the end of the second week of classes.

Maintaining Matriculated Status

The requirement that 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) applies even to those who are using the library, laboratories, or computer facilities; to those who are consulting with the faculty while working on their dissertations; and to those who are preparing for or taking qualifying or oral examinations at the master's or doctoral level.

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

During the first four weeks of classes (as noted in the academic calendar) graduate students may add or drop courses by completing the request form available from the Office of Records/Registrar, provided the proposed change does not alter the student's status as defined in the sections titled "Registration" and "Maintaining Matriculated Status." Courses dropped in the first week of the term are deleted from the student's record. Courses dropped after the first week will be assigned a withdrawal grade of W. For courses dropped during the first four weeks, tuition is charged at the rates specified in the schedule of tuition liability. A late add/drop fee of \$15.00 is assessed for each course dropped in the second through fourth weeks of the semester. After the fourth week of classes no course may be added or dropped. Should it become impossible for a student to complete a course for a reason such as illness or accident, he or she may petition the appropriate dean for a waiver of the deadline. Such petitions must be approved by both the program chairperson and the graduate program director. If a petition is approved, a charge of \$15.00 is assessed, courses remain on a student's record, and a withdrawal grade of W is recorded.

Leave of Absence

Leaves are 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 reenrollment is subject to conditions imposed by the Graduate School and his or her 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 currently registered or must have been registered for the preceding semester. Students who are admitted to graduate study but never register are not eligible for leaves. 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 and the chairperson of the program approve the request for leave, they recommend approval to the dean of the Graduate School.

Students who have either preregistered or are currently registered must also submit a withdrawal form.

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 obtain a withdrawal form (SUSB 810-G) from the Office of Records/Registrar. 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 and the student has the responsibility for initiating it. 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.

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.

Dissertation Research Away from Campus

It is expected that a graduate student's dissertation will normally be conducted at Stony Brook under the direct guidance of the faculty of the program in which the degree is sought and with the facilities available here or close by, such as, for example, at Brookhaven National Laboratory, Cold Spring Harbor Laboratory, the hospitals and institutions on Long Island, or the libraries of New York City. However, there may be circumstances in which the student's work would be facilitated at an off-campus location such as another institution or research facility. In such cases, the program must present to the dean of the Graduate School a letter containing the following:

1. The reasons for the request.
2. The conditions under which the student's work away from campus is to be performed, supervised, and evaluated.
3. Confirmation that the student is registered as a graduate student at Stony Brook and has paid the necessary fees. If the student is supported by a stipend or grant from state funds or from university-monitored federal and private sources, he or she must be registered as a full-time student. If the student is employed elsewhere, in a position not under the University's jurisdiction, matriculation may be maintained by registering for at least one credit of research each semester providing all degree requirements have been fulfilled except for the writing of the thesis or dissertation.
4. For students with financial support, a statement by the chairperson of the program attesting that permission for the student to do work away from campus will not

diminish the program's capability to fulfill its instructional commitments.

5. A statement from the institution where the student's work is to be performed in which responsibility for supervision is accepted by that institution. In the case of archival research or fieldwork, a statement of authorization for the student to use such resources must be submitted.
6. Approval of the graduate program committee and the chairperson of the program concerned.

Advancement to Candidacy

A student may be advanced to candidacy after having completed Graduate School and program requirements other than the dissertation or its equivalent. Students on academic probation cannot be advanced to candidacy. Advancement to candidacy is granted by the dean of the Graduate School upon recommendation of the graduate program director.

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 chairperson of his or her 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 chairperson should be approved by 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 waiver of tuition at Stony Brook, that waiver 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.

Transfer of Credit

A. From Other Universities

1. A candidate for the master's degree may petition to transfer a maximum of 20 percent of the total graduate credit requirement for the degree toward his or her master's degree requirements.
2. These credits must be from an institution authorized to grant graduate degrees by recognized accrediting commissions.
3. **Credits must not have been used to fulfill the requirements for either a baccalaureate or another advanced degree.**
4. Credits must not have been earned more than *five years before* the time the student is admitted to graduate study at Stony Brook. Credits earned more than five years before admittance to Stony Brook will be accepted only in rare circumstances.
5. Credits must clearly be graduate level. A course listed as both graduate and undergraduate level will not be considered for transfer.
6. Credits must carry the grade of A or B. "Pass" or "Satisfactory" grades are not transferrable unless these grades can be substantiated as B or higher by the former institution. Grades earned in transferred courses are not counted as part of the overall grade point average at Stony Brook.
7. Work in one master's degree is not transferrable to a second master's degree.
8. A candidate for the doctoral degree may transfer graduate credits that are allowed by the appropriate program committee.

Students who wish to petition for transfer of credit should submit the Transfer Credit Request Form (SUSB 1343) along with an official copy of the transcript to their program committee for review. Program recommendation is needed before submission to the Graduate School for final approval.

B. Acceptance of Credits from the School of Professional Development (SPD) or Non-Matriculated Status (GSP)

1. **A maximum of 12 graduate credits from non-degree graduate status at Stony Brook** can be applied toward degree requirements at the discretion of the academic

program and with the approval of the Graduate School. Some programs may only allow 6 credits to be transferred.

2. A maximum of six credits of SPD courses not crosslisted with program offerings may be applied at the discretion of the academic program and with the approval of the Graduate School.
3. Certain degree programs offer courses that are crosslisted with those offered through SPD. The number of such credits permitted toward those required for the program varies from program to program. The stipulation in paragraph 1 above also applies to credits earned in crosslisted courses. For more information see the descriptions of individual programs under the appropriate program heading or contact the appropriate graduate program director.

Grading System

The following grading system will be used for graduate students in both graduate and undergraduate 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. Plus and minus grades are not applicable for courses taken before fall 1981.

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 but only at the student's request and upon evidence that good cause, such as serious illness, prevented the student's completion of course requirements. **The grade of I must be resolved by March 15 for courses taken in the preceding fall semester and by November 1 for courses taken in the preceding spring semester..** However, the instructor may require that the work be completed at any time prior to the end of the Incomplete extension period. In granting a grade of I the instructor signifies a willingness to receive student work and prepare grades in accordance with these deadlines. 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. Students should confer with their professors to establish

how far in advance of the deadline work must be completed. Extension to the end of the succeeding term may be requested by written faculty petition to the Graduate School; 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.

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, the grade of F will be recorded.

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 normal mode of evaluation is impracticable.

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.

Courses that are normally 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. If a final grade is not reported by the deadline in the academic calendar, the grade of N/F will be recorded. The entry of an I, NR, 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 for credit only those courses for which an F or U grade is recorded, or which are specifically designated for repetitive credit. No other courses may be repeated.

Change of Grade

Grades appearing on a student's academic record **may not be changed after one calendar year from the end of the term in which the grade was incurred.** Final grades appearing on a student's academic transcript at the time of his or her graduation cannot be changed to any other grade subsequent to the graduation date. A final grade may not be changed on the basis of work completed after a term has ended.

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 normally not be permitted to reenroll.

At the 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 in considering possible waiver of academic probation. 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.

Similarly, at the discretion of the program, a passing grade earned for a course that was failed and retaken may be substituted unofficially for the F in considering a request for waiver of probation. This option may be exercised for one F grade only.

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

If admitted on probation, a student must earn an overall graduate average of at least B (3.0) during the first semester of enrollment to be permitted to reenroll 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 normally not be permitted to reenroll.

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

Standards of Academic Conduct

The University expects of all its students cooperation in developing and maintaining high standards of scholarship and conduct.

Students are expected to meet academic requirements outlined in this *Bulletin* and financial obligations as specified in *Financial and Residential Information* in this *Bulletin* in order to remain in good standing. Certain nonacademic 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

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 of the judiciary processes are available in the Graduate School.

Grievance Procedures

Students encountering difficulties with program or Graduate School policy or procedure should discuss the problem first with their advisor and their graduate program director. They may also contact the Graduate Student Advocate. If difficulties continue to be unresolved, the student should follow the guidelines for further appeal, available in the Graduate School.

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 the request by mail, address a letter to P.O. Box 619, Stony Brook, NY 11790. Include 1) your full name; 2) your ID (social security) number; 3) your complete current address; 4) your 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 \$5.00 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 sent should so 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 of any kind 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 four o'clock post meridiem 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. In effectuating the provisions of this section, 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 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 by the Office of Records/Registrar, and is made available to students along with class schedules and various other publications.



Degree Requirements



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

Education at the graduate level clearly implies the amassing of knowledge beyond that gained in an undergraduate degree, but the nature of the knowledge and the ways in which it is gained and used are 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, we at the University at Stony Brook 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 1996-97 and 1997-98. 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 Fine Arts, Master of Music, and Master of Science

The degrees of Master of Arts, Master of Science, Master of Fine Arts, and Master of Music 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 credits of graduate work is required to receive a master's degree.

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

Similarly, at the discretion of the program, a passing grade earned for a course that was failed and retaken may be substituted unofficially for the F in calculating the GPA. This option may be exercised for one F grade only.

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

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.

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. The University at 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. If enrollment status changes at a later time, this policy is determined by the student's initial entrance status. In rare instances, the dean of Graduate School will entertain a petition bearing the endorsement of the graduate program director for an extension of this time limit. In such instances, the student may be required to repeat certain examinations or present evidence that he or she is still prepared for the thesis or the final examination.

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" is 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. An appreciation of the ethical questions and adherence to the highest ethical standards of the discipline are required. 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, both 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. Additional 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 grade point average in graduate courses taken at Stony Brook in order to receive a doctoral degree.

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

Similarly, at the discretion of the program, a passing grade earned for a course that was failed and retaken may be substituted unofficially for the F in calculating the GPA. This option may be exercised for one F grade only.

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 normally 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 sig-

nificant 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 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.

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 upon 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.*** The University at 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 make-up of the committee is a dissertation supervisor, defense chairperson, and 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

At the discretion of the program approval of the dissertation may or may not involve a formal oral defense. If a formal defense is required, it will be conducted by the dissertation committee and will not be chaired by the supervisor of the dissertation. The formal defense is open to all interested faculty members and graduate students.

In the absence of a formal defense, the student will present the results of the dissertation research at an informal dissertation colloquium convened for that purpose by the program and open to interested faculty and graduate students.

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 rare instances, the dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the chairperson of the graduate program. The dean or the program 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 before being permitted to continue work.

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. Additional requirements may be set by the individual graduate 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 grade point average in graduate courses taken at Stony Brook in order to receive a doctoral degree.

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

Similarly, at the discretion of the program, a passing grade earned for a course that was failed and retaken may be substituted unofficially for the F in calculating the GPA. This option may be exercised for one F grade only.

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.

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, and 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 rare instances, the dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the chairperson of the graduate program. The dean or the program 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 comprehensive examination again before being permitted to continue work.

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. Additional requirements may be set by the individual graduate programs.

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

Similarly, at the discretion of the program, a passing grade earned for a course that was failed and retaken may be substituted unofficially for the F in calculating the GPA. This option may be exercised for one F grade only.

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.

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 chairperson or 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 rare instances, the dean of the Graduate School will entertain a petition to extend this time limit provided it bears the endorsement of the chairperson of the graduate program. The dean of the program may require evidence that the student is still properly prepared for the completion of work.

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. The requirements for the M. Phil. are identical to those for the Ph.D. in every respect except two: the 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 spring commencement. 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 chairperson of the program and the graduate program director, who shall append their reasons for believing that the requested waiver would not result in a breach of the spirit of the regulations.



Degrees and Advanced Graduate Certificates



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. HEGIS numbers can be found in the index of this publication.

Note: The codes shown in this list are abbreviations for the disciplines in which a student can receive a degree or advanced graduate certificate and are designators for courses offered by the program.

Graduate Programs	Codes	Concentrations/Graduate Studies
Anatomical Sciences Ph.D. in Anatomical Sciences	HBA	
Anthropological Sciences Ph.D. in Anthropology	DPA	Archaeology Cultural Anthropology Physical Anthropology
Anthropology M.A. in Anthropology	ANT	Archaeology Physical Anthropology Socio-Cultural Anthropology
Applied Mathematics and Statistics M.S. and Ph.D. in Applied Mathematics and Statistics	AMS	Biomathematical Modeling Computational Applied Mathematics Operations Research Statistics
Art M.A. and Ph.D. in Art History and Criticism M.F.A. in Studio Art	ARH, ARS	
Biomedical Engineering Advanced Graduate Certificate in Biomedical Engineering	BME	
Cellular and Developmental Biology Ph.D. in Cellular and Developmental Biology	BCD	

Graduate Programs	Codes	Concentrations/Graduate Studies
Chemistry M.A.T. in Chemistry 7-12 M.S. in Chemistry Ph.D. in Chemistry	CHE, TCH	Chemical Biology Chemical Physics Chemistry
Coaching Advanced Graduate Certificate in Coaching	GSP/CCH	
Comparative Literature M.A. and Ph.D. in English	CLG	Comparative Literature
Computer Science M.S. and Ph.D. in Computer Science	CSE	
Dental Medicine Advanced Graduate Certificate in Dental Medicine D.D.S. in Dentistry		Orthodontics Periodontics General Dentistry Children's Dentistry Dental Health Oral and Maxillofacial Surgery Periodontics Restorative Dentistry
Earth and Space Sciences M.A.T. in Earth Science 7-12 M.S. and Ph.D. in Earth and Space Sciences	AST, ESS, GEO, GEO/HYDRO, TES	Astronomy 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 M.A. in Biological Sciences Ph.D. in Ecology and Evolution	BEE, BIO	Applied Ecology
Economics M.A. and Ph.D. in Economics	ECO	
Educational Computing Advanced Graduate Certificate in Educational Computing		
Electrical	ESE	

Graduate Programs	Codes	Concentrations/Graduate Studies	Graduate Programs	Codes	Concentrations/Graduate Studies
Engineering M.S. and Ph.D. in Electrical Engineering			Italian M.A.T. in Italian 7-12 M.A. in Romance Languages and Literatures	ITL, DLI, TAL	Italian Italian and French Languages Italian and French Literatures Italian and Spanish Italian Language/Linguistics
English M.A.T. in English 7-12 M.A. in English Ph. D. in English	EGL, TEN	Creative Writing Literature	D.A. in Foreign Language Instruction		
Environmental/Occupational Health and Safety Advanced Graduate Certificate in Environmental/Occupational Health and Safety	GSP/EOH		Labor/Management Studies M.P.S. in Labor/Management Studies	CES	
French M.A.T. in French 7-12 M.A. in Romance Languages and Literatures D.A. in Foreign Language Instruction	FRN, DLF, TFR	French French and Italian Languages French and Italian Literatures French and Spanish	Liberal Studies M.A. in Liberal Studies	CED	
Genetics Ph.D. in Genetics	BGE		Linguistics M.A. in Teaching English to Speakers of Other Languages M.A. and Ph.D. in Linguistics D.A. in Foreign Language Instruction	LIN, ESL, DLT TESOL	
German M.A.T. in German 7-12 M.A. in Germanic Languages and Literature D.A. in Foreign Language Instruction	GER, DLG, TGR		Long Island Regional Studies Advanced Graduate Certificate in Long Island Regional Studies	CAS	
Health Technology and Management Advanced Graduate Certificate in Health Care Management M.S. in Health Care Policy and Management	MSHS		Management and Policy Advanced Graduate Certificate in Health Care Management Advanced Graduate Certificate in Information Systems Management Advanced Graduate Certificate in Labor/Management Studies M.S. in Management and Policy	MGT	Business Management Government Management Nonprofit Management Technology Management
Hispanic Languages and Literature M.A. in Hispanic Languages and Literature M.A. in Romance Languages and Literatures D.A. in Foreign Language Instruction Ph.D. in Hispanic Languages and Literature	SPN, DLS	Hispanic Linguistics Spanish/French Spanish/Italian	Marine Sciences M.S. in Marine Environmental Sciences Ph.D. in Coastal Oceanography	MAR, OCN	Atmospheric Sciences Coastal Oceanography
History M.A.T. in Social Studies 7-12 M.A. and Ph.D. in History	HIS, TSS		Materials Science and Engineering M.S. and Ph.D. in Materials Science and Engineering	ESM	
			Mathematics M.A. in Mathematics 7-12 M.A. in Mathematics Ph.D. in Mathematics	MAT	
			Mechanical Engineering M.S. in Mechanical Engineering	ESC	Manufacturing Mechanical Engineering

Graduate Programs	Codes	Concentrations/Graduate Studies
Molecular Microbiology Ph.D. in Molecular Microbiology	HBM	
Music M.A. and Ph.D. in Music	MUS	Composition Music History Music Theory
M.M. in Music Performance D.M.A. in Music		Performance
Neurobiology and Behavior Ph.D. in Neurobiology and Behavior	BNB	
Nursing Advanced Graduate Certificate in Addictions Nursing Advanced Graduate Certificate in Adult Health Practitioner Advanced Graduate Certificate in Child Health Nurse Practitioner Advanced Graduate Certificate in Mental Health Nurse Practitioner Advanced Graduate Certificate in Neonatal Nurse Practitioner Advanced Graduate Certificate in Nurse Midwifery Advanced Graduate Certificate in 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 M.S. in Basic Health Sciences Ph.D. in Oral Biology and Pathology	BHS, HDO	Oral Biology and Pathology
Pathology Ph.D. in Cellular and Molecular Pathology	HBP	

Graduate Programs	Codes	Concentrations/Graduate Studies
Pharmacological Sciences Ph.D. in Molecular and Cellular Pharmacology	HBH	
Philosophy M.A. in Philosophy Ph.D. in Philosophy	PHI	Philosophical Perspectives Philosophy
Physics M.A.T. in Physics 7-12 M.A. in Physics M.S. in Physics Ph.D. in Physics	PHY, TPH	Scientific Instrumentation Astrophysics Biophysics Chemical Physics
Physiology and Biophysics Ph.D. in Physiology and Biophysics	HBY	
Political Science M.A. in Political Science Ph.D. in Political Science	POL	American Politics Political Economy and Public Policy Political Psychology/ Behavior
Psychology M.A. in Psychology Ph.D. in Biopsychology Ph.D. in Clinical Psychology Ph.D. in Experimental Psychology Ph.D. in Social/Health Psychology	PSY, BIP, CLP, EXP, SCP	
Russian Language and Literature M.A.T. in Russian 7-12 M.A. in Slavic Languages and Literatures D.A. in Foreign Language Instruction	DLR, SLV, TRU	Russian
School Administration and Supervision Advanced Graduate Certificate in School Administration and Supervision		

Graduate Programs	Codes	Concentrations/Graduate Studies
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Slavic Languages and Literatures	SLV	
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M.A. in Slavic Languages and Literatures

School District Administration		
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Advanced Graduate Certificate in School District Administration

Social Welfare	HWA, HWG, HWM, HWO, HWT	
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M.S.W. in Social Work
Ph.D. in Social Welfare

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

Software Engineering		
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Advanced Graduate Certificate in Software Engineering

Technology and Society	EST	
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M.S. in Technological Systems Management

Educational Computing
Environmental and Waste Management
Industrial Management

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

Waste Management	CEY	
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Advanced Graduate Certificate in Waste Management Studies
M.P.S. in Waste Management Studies

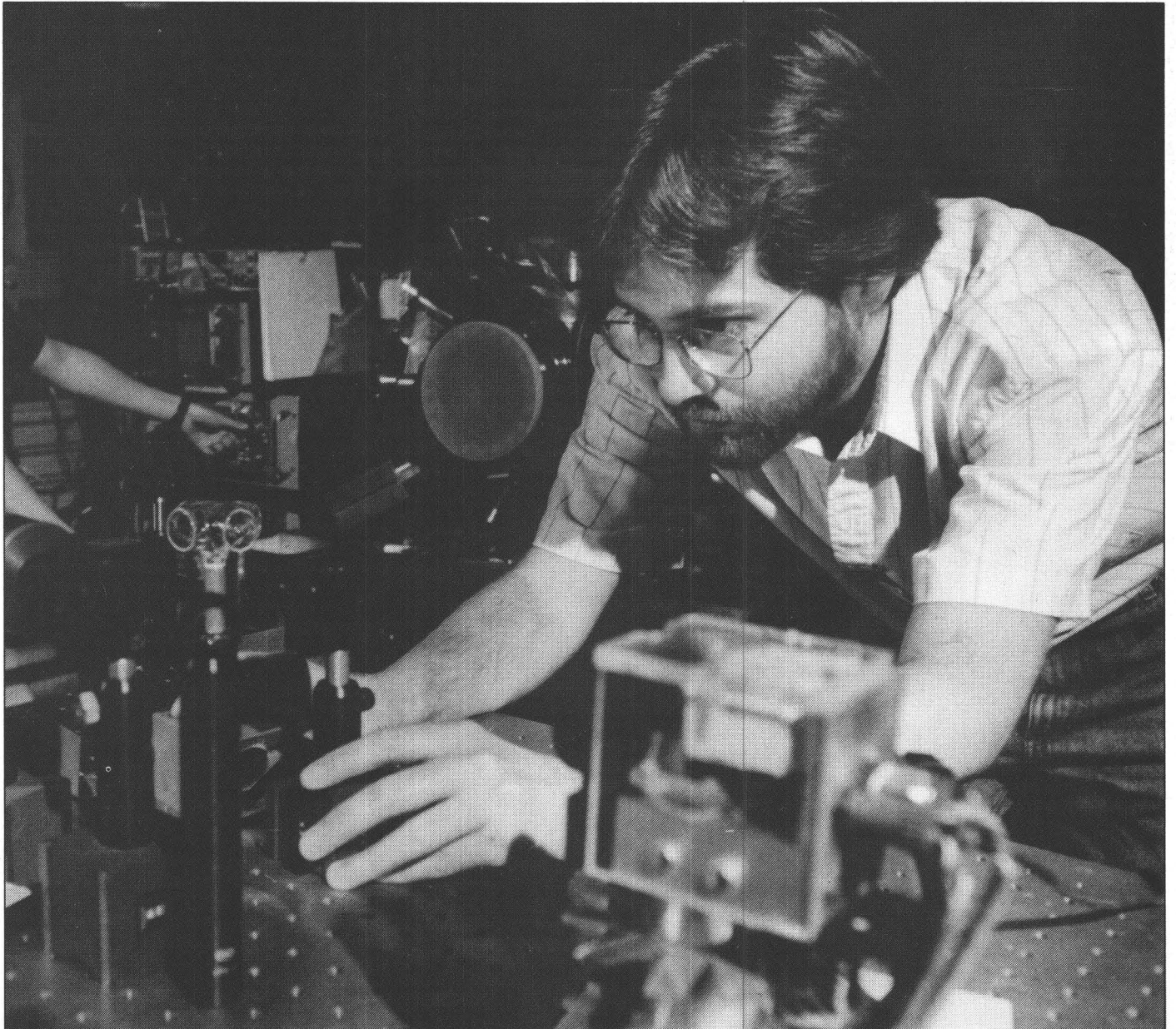
Women's Studies	WNS	
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Advanced Graduate Certificate in Women's Studies





Degree and Advanced Graduate Certificate Program Descriptions



Anatomical Sciences (HBA)

Chairperson: Jack T. Stern

Health Sciences Center T-8, Room 040 (516) 444-2350

Graduate Program Director: Brigitte Demes

Health Sciences Center T-8, Room 084 (516) 444-3119

Staff Associate: Christine Johnson

Health Sciences Center T-8, Room 040 (516) 444-3114

Degree awarded: Ph.D. 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 and numerical taxonomy, 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; 3-dimensional reflex microscope; 2-dimensional and 3-dimensional sonic digitizers; original fossil collections; extensive cast collection; paleontological field projects in the western interior of North America, Argentina, Africa, and Madagascar; and a behavioral field project in Zaire on pygmy chimpanzees. 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, the Advanced Area Test, and TOEFL for foreign 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

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

Demes, A. Brigitte, Associate Professor and Graduate Program Director. Ph.D., 1982, University of Bochum, Federal Republic of Germany: Biomechanics; functional morphology; scaling effects on locomotion.

Doran, Diane M., Assistant Professor.¹ Ph.D., 1989, State University of New York at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

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

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

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

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

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

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

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

Martin, Lawrence B., Professor and 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.

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

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

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

Stern, Jack T., Jr., Professor and 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., Professor. Ph.D., 1976, University of Chicago: Functional morphology and behavior of primates; evolution of apes and humans; gross anatomy.

Number of teaching, graduate, and research assistantships, fall 1996: 7

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

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 selected by the graduate committee in the third semester. In the fourth semester the student will make an oral presentation of that essay to faculty and students of the department. Depending on the area of specialization, students will 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), each student is given an oral preliminary examination. Depending on the area of concentration, the examination covers human anatomy, embryology, and either neuroanatomy, principles of 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 by the end of the third year of study.

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.

Anatomical Sciences

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

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

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; possible molecular mechanisms of the clock. Crosslisted with BCD 536.
Prerequisite: Permission of instructor
Spring, 3 credits

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

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

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 and spring, 3-8 credits

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

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

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

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

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 uti-

lized. Lecture/seminar series can be taken separately as HBA 581. Crosslisted with DPA 580/DPA 581.

Prerequisites: Permission of instructor
Spring, alternate years, 4 credits

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

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

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

HBA 690 Graduate Seminar

Seminars by graduate students on current literature in the areas of the anatomical sciences.
Prerequisite: Permission of instructor
Fall and spring, 1 credit, repetitive

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

HBA 694 Dissertation Research

Original investigation under supervision of dissertation advisor and committee.
Prerequisite: Permission of dissertation advisor
Fall and spring, 1-9 credits, repetitive

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

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

Anthropological Sciences (DPA)

Director: Frederick E. Grine

Ward Melville Social and Behavioral Sciences Building, N-549 (516) 632-7622

Codirector: William L. Jungers

Health Sciences Center, T8, Room 022 (516) 444-3122

Graduate Secretary: Eileen Zappia

Ward Melville Social and Behavioral Sciences Building, S-501 (516) 632-7606

Degree awarded: Ph.D. in Anthropology

Doctoral Program in Anthropological Sciences

The Doctoral Program in Anthropological Sciences (DPAS), 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, Social Sciences, and Comparative Literature, as well as from the American Museum of Natural History. The goal of the DPAS 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.

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

Admission to the Ph.D. Program

Application procedures and requirements determined by the State University of New York at Stony Brook, as set forth in this bulletin, must be followed. Applications will be reviewed by the admissions committee of the DPAS, and successful applicants will be considered for financial assistance through the award of a teaching assistantship (TA) by the TA committee of the DPAS. All rules, regulations, and requirements of the Graduate School, State University of New York 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 Doctoral Program in Anthropological Sciences 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 DPAS and the Graduate School.

Faculty

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

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

Anthropological Sciences

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

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

Doran, Diane M., Assistant Professor.² Ph.D., 1989, State University of New York at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

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

Forster, Catherine A., Assistant Professor.¹ Ph.D., 1990, University of Pennsylvania: Evolution of dinosaurs; paleobiogeography; mesozoic faunas.

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

Grine, Frederick Edward, Associate Professor and Director of Doctoral Program.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, Professor.² D.Phil., 1972, Oxford University, England: Symbolism; Indonesia.

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

Jungers, William L., Professor and Codirector of the Doctoral Program.¹ Ph.D., 1976, University of Michigan: Primate and human evolution; functional morphology; biomechanics.

Krause, David W., Professor.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, Associate Professor.¹ Ph.D., 1982, University of Wisconsin, Madison: Functional morphology; primates; biomechanics.

MacPhee, Ross, Adjunct Associate Professor.^{2,4} Ph.D., 1977, University of Alberta, Canada: Mammalogy; primate evolution; mammalian systematics; Madagascar; Caribbean.

Marean, Curtis, Associate Professor.² Ph.D., 1990, University of California, Berkeley: Old World prehistory; paleoecology; hominid origins.

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

Mittermeier, Russell Alan, Adjunct Professor.^{1,6} Ph.D., 1977, Harvard University: Primate ecology; primate conservation.

Ross, Callum F., Assistant Professor.¹ Ph.D., 1993, Duke University: Primate evolutionary morphology; craniofacial biomechanics; anthropoid origins; Cretaceous and Tertiary fossil record of Africa.

Ruf, Gregory A., Assistant Professor.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.

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

Sokal, Robert, Distinguished Professor Emeritus.³ Ph.D., 1952, University of Chicago: Numerical taxonomy; modern human variation; geographic variation; spatial models in ecology and evolution.

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

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

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

Number of teaching assistants, fall 1995: 19

Number of graduate fellows, fall 1995: 8

¹ Anatomical Sciences

² Anthropology

³ Ecology and Evolution

⁴ American Museum of Natural History

⁵ Comparative Literature

⁶ President, Conservation International

⁷ Interdisciplinary Social Sciences

Degree Requirements

Requirements for the Ph.D. Degree in Anthropology

For a full description of DPAS requirements and deadlines, please request "DPAS 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 530 Physical Anthropology, (b) DPA 564 Primate Evolution, (c) DPA 565 Human

Evolution, (d) DPA 567 Primate Behavior and Ecology. DPA 530 and at least two of these other 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 cul-

tural anthropology program include (a) DPA 620 Research Seminar in Topical Problems, (b) DPA 640 Research Seminar in Ethnography and Ethnology, and (c) three additional credits of DPA 540 Readings in Ethnography and Ethnology. Other courses that may be taken at the discretion of the student's guidance committee include DPA 509 Seminar in European Ethnography, DPA 561 Peasant Societies and Cultures, and a statistics course.

B. Qualifying Exam

The qualifying examination must be taken after three semesters of study and passed at an appropriate level. The qualifying examination is administered to each student by the examination committee of the DPAS. The examination takes the form of written 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 examination, comprising three essays, will be written in one day. One of the three essays will be mandatory, while the other two may be chosen from a list of three questions. At least two of the three essay questions must be passed in order to pass the examination. 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 (1) by members of the DPAS faculty, (2) by special arrangements, or (3) 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 DPAS 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 DPAS. 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 DPAS faculty membership), which is comprised of at least three DPAS faculty members and an external member. The dissertation proposal submitted to the committee will be defended orally at a seminar open to the academic community and to which all DPAS 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 DPAS 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 DPAS 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

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, census. Crosslisted with ANT 505.

Prerequisite: One year of graduate study
3 credits

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

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

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

Anthropological Sciences

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 will focus upon theories of the formation of complex societies and will cover 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

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

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

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

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 non-civilized Bronze Age cultures of Europe, Africa, and Asia. The specific topics may vary from year to year. Crosslisted with ANT 516.

3 credits, repetitive

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

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

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

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

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. 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

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

DPA 530 Physical Anthropology

A course in the fundamentals of physical anthropology that serves as an introduction to the subject and a basis for advanced and specialized work.

Fall, 4 credits

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

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

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

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

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

Anthropological Sciences

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 neural systems. Includes utilization of comparative anatomical material and extensive cast and slide collections. Crosslisted with ANT 565 and HBA 565.

Fall, odd years, 4 credits

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

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

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

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

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

DPA 600 Practicum in Teaching

Variable and repetitive credit

DPA 602 Research Seminar in Anthropological Theory

Crosslisted with ANT 602.

Variable and repetitive credit

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

DPA 620 Research Seminar in Topical Problems

Crosslisted with ANT 620.

Variable and repetitive credit

DPA 630 Research Seminar in Physical Anthropology

Crosslisted with ANT 630.

Variable and repetitive credit

DPA 640 Research Seminar in Ethnography and Ethnology

Crosslisted with ANT 640.

Variable and repetitive credit

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

DPA 699 Dissertation Research

1-9 credits, repetitive

DPA 800 Summer Research

Crosslisted with ANT 800.

No credit, repetitive

DPA 850 Summer Teaching

No credit, repetitive

Anthropology

(ANT)

Chairperson: William Arens

Ward Melville Social and Behavioral Sciences Building S-511 (516) 632-7610

Director of M.A. Program: Elizabeth C. Stone

Ward Melville Social and Behavioral Sciences Building S-559 (516) 632-7627

Graduate Secretary: Eileen Zappia

Ward Melville Social and Behavioral Sciences Building S-501 (516) 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 either 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 survey 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 paleontological, archaeology, and ethnology.

M.A. in Anthropology

The MA 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 which must be members of the Anthropology Department, which 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

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

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

Doran, Diane M., Assistant Professor. Ph.D., 1989, State University of New York at Stony Brook: Behavior and ecology of African apes; relationship of positional behavior and morphology.

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

Grine, Frederick E., Associate Professor. 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, Professor. D.Phil., 1972, Oxford University, England: Symbolism; Indonesia.

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

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

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

Newton, Dolores, Associate Professor. Ph.D., 1972, Harvard University: The relation of material culture to social organization; museum training and techniques; Brazil; North America.

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

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

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

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:

<u>Archaeology</u>	<u>Credits</u>
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 MA 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.

<u>Social/Cultural Anthropology</u>	<u>Credits</u>
1. ANT 520 Principles of Social and Cultural Anthropology	4
2. ANT 540 Readings in Ethnography and Ethnology	3
3. ANT 599 MA 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

<u>Physical Anthropology</u>	<u>Credits</u>
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 MA 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

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

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

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

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

Anthropology

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

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

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

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

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

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

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

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

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

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

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

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

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

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 neural systems. Includes utilization of comparative anatomical material and extensive cast and slide collections. Crosslisted with DPA 565.

Fall, odd years, 4 credits

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

ANT 602 Research Seminar in Anthropological Theory

Crosslisted with DPA 602.
Variable and repetitive credit

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

ANT 620 Research Seminar in Topical Problems

Crosslisted with DPA 620.
Variable and repetitive credit

ANT 630 Research Seminar in Physical Anthropology

Crosslisted with DPA 630.
Variable and repetitive credit

ANT 640 Research Seminar in Ethnography and Ethnology

Crosslisted with DPA 640.
Variable and repetitive credit

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

ANT 800 Summer Research

Crosslisted with DPA 800.
No credit, repetitive

Applied Mathematics and Statistics (AMS)

Chairperson: James Glimm
Mathematics Building P-137 (516) 632-8370

Graduate Program Director: Woo Jong Kim
Mathematics Building 1-122 (516) 632-8360

Graduate Secretary: Loretta Bellantoni
Mathematics Building 1-122 (516) 632-8360

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, diffusion processes, and control theory. Most Ph.D. 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 in Applied Mathematics and Statistics, 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.

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

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

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

Baxter, Laurence, Associate Professor. Ph.D., 1980, University College, London, England: Applied statistics; stochastic processes; reliability.

Beltrami, Edward J., Professor. Ph.D., 1962, Adelphi University: Optimization techniques; models for public systems analysis.

Chen, Yung Ming, Professor. Ph.D., 1963, New York University: Numerical analysis and methods; numerical methods for solving inverse problems; large-scale numerical simulations.

Deng, Yuefan, Associate Professor. Ph.D., 1989, Columbia University: Computational fluid dynamics; parallel computing.

Dicker, Daniel, Professor Emeritus. D. Eng. Sc., 1961, Columbia University: Boundary value problems of solids and fluids; aeroelastic analysis of suspension bridges.

Dolezal, Vaclav, Professor. Ph.D., 1955, D.Sc., 1966, Czechoslovak Academy of Sciences, Prague, Czechoslovakia: Network theory; control theory; applications of distribution theory.

Dubey, Pradeep, Professor. Ph.D., 1975, Cornell University: Game theory; mathematical economics.

Feinberg, Eugene, Professor.³ 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.

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

Frey, Robert, Assistant Professor.² Ph.D., 1987, State University of New York at Stony Brook: Systems analysis; financial models; artificial intelligence.

Glimm, James, Distinguished Professor and Chairperson. Ph.D., 1959, Columbia University: Nonlinear equations, conservation laws; computational fluid dynamics; mathematical physics.

Goldstein, Charles I., Professor.⁸ Ph.D., New York University: Numerical methods for solving partial differential equations.

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

Grove, John, Associate Professor. Ph.D., 1984, Ohio State University: Conservation laws; front tracking.

Kim, Woo Jong, Professor and 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, Professor. Ph.D., 1981, Cornell University: Computational fluid dynamics; reservoir modeling.

Mendell, Nancy, Associate Professor. Ph.D., 1972, University of North Carolina at Chapel Hill: Biostatistics.

Mitchell, Joseph, Associate Professor. Ph.D., 1986, Stanford University: Operations research; computational geometry; combinatorial optimization.

Neyman, Abraham, Professor. Ph.D., 1977, Hebrew University, Israel: Game theory; mathematical economics.

Peierls, Ronald, Professor.⁸ Ph.D., 1959, Cornell University: Parallel computing; particle physics.

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

Sharp, David, Adjunct Professor. Ph.D., 1969, California Institute of Technology: Mathematical physics; computational fluid dynamics.

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

Skorin-Kapov, Darko, Associate Professor. Ph.D., 1989, University of British Columbia, Canada: Combinatorial optimization; mathematical programming.

Skorin-Kapov, Jadranka, Associate Professor. Ph.D., 1988, University of British Columbia, Canada: Mathematical programming; production management.

Sobel, Matthew, Professor.³ Ph.D., 1965, Stanford University: Stochastic models; game theory; production management.

Sokal, Robert R., Distinguished Professor Emeritus.¹ Ph.D., 1952, University of Chicago: Numerical taxonomy; theory of systematics; geographic variation; spatial models in ecology and evolution.

Srivastav, Ram P., Professor. 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, Professor. Ph.D., 1979, Cornell University: Stochastic models; diffusion theory.

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

Tanur, Judith, Distinguished Teaching Professor.⁵ Ph.D., 1972, State University of New York at Stony Brook: Application of statistics in social sciences; survey methodology.

Tewarson, Reginald P., Leading Professor. 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.

Applied Mathematics and Statistics

Tucker, Alan, Distinguished Teaching Professor.⁶ Ph.D., 1969, Stanford University: Graph theory; combinatorial algorithms.

Webster, Frank, Assistant Professor.⁹ Ph.D., 1987, University of Chicago: Computational quantum dynamics in gases and liquids.

Zemanian, Armen H., Professor. Eng.Sc.D., 1953, New York University: Network theory; food system modeling.

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

Number of teaching, graduate, and research assistants, fall 1995: 56

¹ Department of Ecology and Evolution

² Institute for Pattern Recognition

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

⁹ Department of Chemistry

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
 - a. AMS 501 Differential Equations and Boundary Value Problems
 - b. AMS 503 Applications of Complex Analysis
 - c. AMS 504 Foundations of Applied Mathematics

- d. AMS 505 Applied Linear Algebra
 - e. AMS 526 Numerical Analysis I
 - f. AMS 527 Numerical Analysis II
 - g. AMS 595 Fundamentals of Computing
2. Operations Research
 - a. AMS 505 Applied Linear Algebra or AMS 510 Analytical methods for Applied Mathematics and Statistics
 - b. AMS 507 Introduction to Probability
 - c. AMS 540 Linear Programming
 - d. AMS 550 Stochastic Models
 - e. AMS 554 Queuing Theory or AMS 553/CSE 529 Simulation and Modeling or AMS 542/CSE 548 Analysis of Algorithms
 - f. One course in statistics
 - g. AMS 595 Fundamentals of Computing
 3. Statistics
 - a. AMS 504 Foundations of Applied Mathematics
 - b. AMS 505 Applied Linear Algebra
 - c. AMS 507 Introduction to Probability
 - d. AMS 570 Mathematical Statistics I
 - e. AMS 572 Exploratory Data Analysis I
 - f. AMS 575 Internship in Statistical Consulting
 - g. AMS 578 Regression Theory
 - h. AMS 582 Design of Experiments
 - i. 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 the dissertation 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

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 solu-

tion matrix. Reduction to canonical forms and the matrix exponential. Sturm-Liouville theory and eigenfunction expansion. Green's functions.

Prerequisite: AMS 505

Recommended prerequisite: AMS 504

Spring, 3 credits

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

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

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

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

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

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

AMS 508 Applied Mathematical Methods I

Linear algebra: linear vector spaces, inner products and norms, orthogonal projection and least-square approximation, linear transformations and matrices, eigenvalues and singular values, generalized inverses, Schur and Jordan decomposition, quadratic forms,

and min-max principles. Ordinary differential equations: existence, uniqueness, continuation, linear systems, fundamental solutions, phase-plane analysis, two-point boundary value problems, series solutions, Sturm-Liouville theory for self-adjoint equations, Green's functions, and eigenfunction expansions.

Prerequisite: AMS 361 or equivalent

Fall, 3 credits

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, Fourier transform. Approximation of functions: Interpolation by polynomials and splines, numerical integration and differentiation, variational principles, finite element and boundary integral equation techniques, spectral methods.

Prerequisite: AMS 361 or equivalent

Spring, 3 credits

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

AMS 516 Special Functions of Applied Mathematics

A study of the more common higher mathematical functions required for the analytical solution of engineering and scientific problems. Topics include orthogonal sets of functions, recursion formulas, series solution of linear differential equations, Fourier-Bessel expansions, functional equations, application to boundary value, and initial value problems.

3 credits

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

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

Applied Mathematics and Statistics

AMS 521 Mathematical Models in Physiological Sciences

Mathematical models of blood flow and renal function. Numerical solution of the counter-current 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

AMS 523 Control Theory

Introduction to optimal control via the calculus of variations. Discussions of functional minimization from optimal control viewpoint. Introduction of state variable form for linear differential equations used to solve linear, quadratic cost, optimal control problem, and time-minimum control for some simple systems. Derivation of matrix Riccati equation. Presentation of linearization on nonlinear differential equations using perturbation techniques.

Prerequisite: AMS 501

3 credits

AMS 524 Theory of Approximation

A survey of various solutions that present special problems in approximation theory. Topics covered include smoothing of data, least squares methods, Chebyshev approximation by rational functions, orthogonal functions. Hilbert space methods and general aspects of approximation in normed linear spaces.

3 credits

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

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

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

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

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

AMS 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 MGT 540.

Corequisite: AMS 505

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

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

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

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

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

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

AMS 548 Nonlinear Programming

Necessary and sufficient conditions for unconstrained and constrained optima. The geometric background is developed using tangents and cones in finite dimensional spaces. Computational methods, including interior (penalty function), boundary (gradient projection), and exterior (cutting plane) approaches. Crosslisted with MGT 548

Prerequisite: AMS 540 or permission of instructor

Spring, 3 credits

AMS 549 Combinatorial Analysis

Permutations, combinations, generating functions, linear recursions, matching theory, Ramsey's theorem, block designs, orthogonal Latin squares, finite geometries, extremal problems, chromatic numbers, probabilistic methods. Crosslisted with MAT 580.

3 credits

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

AMS 551 Applied Stochastic Processes and Their Optimization

Regenerative processes, Markov renewal processes, queuing systems, Markov decision processes, Brownian motion, stochastic control, and their applications to telecommunication and manufacturing. Crosslisted with MGT 568.

Prerequisite: AMS/MGT 550 or equivalent
Fall, 3 credits

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, the Shapley and Banzhaff power indices. Crosslisted with ECO 604.

3 credits

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

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

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

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

AMS 557 Inventory Theory

Nature of inventory systems. Design and control. Continuous and periodic review policies. Economic order quantities and the optimality of policies.

Prerequisite: AMS 507
Fall, odd years, 3 credits

AMS 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 MGT 558.

Prerequisites: AMS 504; AMS 507 or equivalent
Spring, 3 credits

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, 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

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

AMS 566 Compressible Fluid Dynamics

Physical, mathematical, and computational background in compressible fluid flows. Integral and differential forms of the conservation equations, one-dimensional flow, shocks and expansion waves, steady supersonic flow, hypersonic flow, and high temperature gases.

Spring, 3 credits

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

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

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, 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

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 such as stem and leaf plots, straightening regression lines, and techniques to establish equal variance.

Prerequisite: AMS 312 or permission of instructor
Fall, 3 credits

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

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

Applied Mathematics and Statistics

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

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

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

AMS 580 Reliability Theory

Monotone failure rates, renewal theory, availability theory, classes of life distributions, coherent structures and systems, general stochastic models for failure, maintenance policies, redundancy optimization.

Prerequisite: AMS 558 or equivalent
3 credits

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

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

AMS 584 Sequential Methods

Sequential decision problems in statistics. Two-armed bandit, selection by relative rank, and other examples. Optimal stopping and sequential analysis. Empirical Bayes and compound decision problems. Fixed-width confidence intervals, confidence sequences, and tests of power. Adaptive least squares and stochastic approximation.

Prerequisite: AMS 570
3 credits

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, two-stage sampling.

Prerequisite: AMS 312 or equivalent
Fall, 3 credits

AMS 586 Time Series

Analysis in the frequency domain. Periodograms, approximate tests, relation to regression theory. Pre-whitening and digital filters. Common data windows. Fast Fourier transforms. Complex demodulation, Gibbs' phenomenon issues. Time-domain analysis.

Prerequisites: AMS 507 and AMS 570
3 credits

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

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

AMS 589 Quantitative Genetics

Definition of relevant terminology. Statistical and genetic models for inheritance of quantitative traits. Estimation of effects of selection, dominance polygenes, epistasis, environment. Linkage studies, threshold characteristics.

Spring, odd years, 3 credits

AMS 591 Topics for M.S. Students

Various topics of current interest in applied mathematics will be offered if sufficient interest is shown is shown. Several topics may be taught concurrently in different sections. Crosslisted with AMS 491.

Prerequisite: Permission of instructor
3 credits, repetitive

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

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

AMS 595 Fundamentals of Computing

Introduction to UNIX operating system, C language, graphics, and parallel supercomputing.

Fall, 1 credit

AMS 599 Research

Variable and repetitive credit

AMS 605 Probability Theory II

Advanced probability. Conditional sigma-fields, stochastic processes, Brownian motion, Markov property, weak convergence, infinitely divisible distributions, martingales, stochastic integrals, stochastic differential equations, stochastic approximation.

Prerequisite: AMS 569 or permission of instructor
3 credits

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

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

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, limit cycles. Theory of bifurcation. Stability theory, 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

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

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, stability; solutions of linear, nonlinear steady-state, and dynamic problems; implicit, explicit time integration; equivalence of finite-element and finite-difference methods.

Prerequisite: AMS 502 or equivalent

3 credits

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

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, spectral theory for symmetric kernels. Volterra equations of the first and second kind, equations with weakly singular kernels, simultaneous systems, applications.

Prerequisites: AMS 504 and AMS 505

3 credits

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

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, applied graph theory, and applied combinatorics may be offered concurrently.

Prerequisites: AMS 540 and permission of instructor

3 credits, repetitive

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

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

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

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

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

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

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

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

AMS 698 Practicum in Teaching

3 credits, repetitive

AMS 699 Dissertation Research

Variable and repetitive credit

Art

(ARH, ARS)

Chairperson: James H. Rubin
Staller Center 2221 (516) 632-7260

Graduate Program Director: Michele H. Bogart
Staller Center 4213 (516) 632-7270

Graduate Secretary: Kathy Contegni
Staller Center 2229 (516) 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's 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 work in or make contacts in other fields in addition to art history and criticism or studio. 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. 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 art. In addition to these goals, the M.A. in Art History and Criticism can 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 permissible 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. It offers courses in drawing and painting, printmaking, sculpture, ceramics, and ceramic sculpture. In addition, courses

are offered through the Art Department and/or other departments in photography, stage and costume design, film studies, and computer art. The degree is especially suitable for students who aim at 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. In addition, the Department of Art publishes the respected semi-annual journal, *Art Criticism*.

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 non-studio 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 nineteenth and twentieth century 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 program on a part-time basis.

Facilities

Since 1976, the Department of Art has enjoyed the resources of the Staller Center for the Arts. This grand structure of 226,026 square feet includes numerous studio facilities, classrooms for lectures and seminars, a slide library, and a magnificent art gallery space devoted primarily to exhibitions of contemporary art. In addition, the department has more than 7,000 square feet of studio space available at other locations on

the campus. Campus libraries include extensive collections of recent exhibition catalogs and criticism. The department publishes a journal titled *Art Criticism*, devoted to the study and practice of art criticism. The department is also the seat of the Association of Historians of American Art. 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, L.I. 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 program 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 undergraduate or even graduate backgrounds and require considerable individual structuring of their programs of study to accommodate their specific needs. In addition to the requirements of the Graduate School cited in the preceding paragraph, applicants to the M.A. and Ph.D. program should ordinarily have a bachelor's degree with an art history major or minor. The requirement that the degree be in art history may be waived at the discretion of the graduate program committee. If a student with no art history major or minor wishes to enter the program, he or she would be allowed to demonstrate basic competency through the comprehensive examination, or by taking a specified

number of undergraduate courses in the department prior to full admission to the program.

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 for the fall semester only. Admission into the M.F.A. program is at the discretion of the departmental graduate program committee with final approval from 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.

It is recognized that M.F.A. applicants may come from a wide variety of undergraduate or even graduate backgrounds (B.A., B.S., B.F.A., M.A., or foreign certification) and require considerable individual structuring of their program of studies to accommodate their specific needs.

A. Prerequisites

In addition to the requirements of the Graduate School, applicants to the M.F.A. program should fulfill the following prerequisites:

1. 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.

2. 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.

3. 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.

B. Deficiencies

Deficiencies in any of the above areas may be cause for deferment of entry into the M.F.A. program until they are made up—without credit toward the M.F.A. itself—before resubmission by the student for entrance to the program.

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Such deficiencies and exceptions are subject to evaluation by the graduate art faculty in the 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.

Averbuch, Ilan, Assistant Professor. M.F.A., 1984, Hunter College: Sculpture.

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

Bogart, Michele H., Associate Professor and Graduate Program Director (1995-96). Ph.D., 1979, University of Chicago: American art and material culture.

Buonagurio, Toby, Professor. M.A., 1971, City College of New York: Ceramics; ceramic sculpture; drawing.

Cooper, Rhonda, Director of the Staller Center Art Gallery and Adjunct Lecturer. M.A., 1972, University of Hawaii.

Edelson, Michael, Associate Professor. B.A., 1987, State University of New York Empire State College: Photography; history and criticism of photography.

Frank, Barbara, Assistant Professor. Ph.D., 1988, Indiana University: African, Oceanic, ancient Mesoamerican, and Native American art history.

Gibson, Ann, Associate Professor. Ph.D., 1984, University of Delaware: 20th-century art theory; feminism and multiculturalism.

Guilmain, Jacques Professor. Ph.D., 1958, Columbia University: Medieval art; archaeology.

Harrison, Helen, Adjunct Lecturer and Director of the Pollock-Krasner House and Study Center. M.A., 1975, Case Western Reserve University: American art.

Johnson, Deborah J., Adjunct Lecturer.¹ M.A., 1983, University of Minnesota: American art history.

Kuspit, Donald B., Professor. Ph.D., 1971, University of Michigan; D.Phil., 1960, University of Frankfurt, Germany: Art criticism; aesthetics; 20th-century and Northern Renaissance art.

Larese, Steven, Technical Specialist and Adjunct Lecturer. M.F.A., 1975, University of Cincinnati: Slide curator; painting and drawing.

Levine, Martin, Assistant Professor. M.F.A., 1972, California College of Arts and Crafts: Printmaking.

Mallory, Nina M., Professor Emeritus. Ph.D., 1965, Columbia University: Renaissance, baroque, and 18th-century art, architecture, and connoisseurship.

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

Moskowitz, Anita, Professor. Ph.D., 1978, New York University: Medieval and Renaissance art and connoisseurship.

Nash, Stephen, Associate Professor. M.A., 1982, Royal College of Art, London, England: Anatomical and biological illustration.

Netter, D. Terence, Director of the Staller Center and Adjunct Associate Professor. M.F.A., 1965, George Washington University: Drawing; painting; art and philosophy.

Pekarsky, Melvin H., Professor. M.A., 1956, Northwestern University: Drawing; painting; public art.

Pindell, Howardena, Professor. M.F.A., 1967, Yale University: Painting and drawing.

Rubin, James H., Professor and Chairperson. Ph.D., 1972, Harvard University: 18th- and 19th-century art; art and politics.

Thompson, Thomas, Technical Specialist and Adjunct Lecturer. M.F.A., 1969, Ohio University: Photography and film making.

Part-Time Faculty

Badalamenti, Fred, Visiting Artist. M.F.A., 1967, Brooklyn College: Painting and drawing.

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

Christen, Barbara, Adjunct Lecturer. M. A. 1986, State University of New York at Stony Brook: Architecture.

Futral, Ronald, Adjunct Lecturer. M.S., 1988, M.C.G. Augusta: Medical Illustration, Computer graphics, design and photography.

Goldblum, Michael, Adjunct Lecturer. M.Arch., 1984, Columbia University: Modern and contemporary architecture.

Hassinger, Maren, Visiting Artist. M.F.A., 1973, University of California, Los Angeles: Conceptual art and sculpture.

Leslie, Richard, Adjunct Lecturer. M.A. 1995, State University of New York at Stony Brook: 20th Century, Northern Baroque and History of Photography.

Luljak, David, Lecturer. Ph.D, 1993, State University of New York at Stony Brook: Philosophy.

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

Number of teaching, graduate, and research assistants, fall 1994: 17

¹ Director of Curatorial Affairs at the Museums at Stony Brook

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, Theory, 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 will include questions examining the student's knowledge of particular periods in the history of art and individual artists and works of art, as well as essay questions designed to test the student's knowledge of the theoretical and critical issues at stake in a particular art. 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, ceramics, and ceramic sculpture. In addition, courses are offered through the Art Department and/or other departments in photography, stage and costume design, film studies, computer art, etc.

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.

D. Final Year and One-Person Exhibition

During the final year, in addition to regular coursework, the student will prepare a final one-person exhibition of work. As part of this requirement, the student will submit to the department for its files a 35mm color slide record of the exhibition and a written commentary. This written commentary should be an articulation of the candidate's thoughts and objectives regarding the work, and might also include discussion of arts and ideas generally, as they relate to the work and thought of the candidate. (Together, these are commonly known as the M.F.A. thesis.)

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 item 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 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, while not required, are encouraged.
4. Three graduate studio courses outside the area of concentration (3 credits per course, total 9 credits).
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)

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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 591 Practicum in the Writing of Art Criticism (3 credits)

ARH 699 Directed Readings [Criticism & 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 690 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) 20th century (including contemporary)
- 2) American (1620-present)
- 3) Architectural History (not available 1996-7)
- 4) 19th century European (1760-1900)
- 5) Baroque (1600-1750)
- 6) Renaissance (ca. 1260-1600)

7) Medieval (ca. 400-ca.1500)

8) Ancient (Greek, Roman, and Early Christian)

9) African

The specific format of the exam will vary according to student and major/minor area, but each exam will cover in some way a) objects, b) issues, and c) bibliography. The choice of the examiners is made by the graduate program director in consultation with the student and 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 graduate program committee for its approval. The graduate program committee, 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 stu-

dent 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 examining 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 chairperson of the department.

Art History and Criticism Courses

ARH 501 History of Renaissance and Baroque Art Criticism and Theory

An examination of theoretical treatises and other writings on art during the Renaissance and Baroque periods. 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

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

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

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

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

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

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

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

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

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

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

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

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

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 addresses are: architectural theory and the theories of language; the history of proportion and the construction of gender; Orientalism.

3 credits

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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

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. 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

ARH 592 Practicum in Teaching

Instruction in the department under the supervision of the faculty. (This course may not be included more than once in the courses taken in fulfillment of the 36 credit hour requirement.)

Fall and spring, 3 credits

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

ARH 598 Thesis

Prerequisite: Completion of all degree requirements

Fall and spring, 1-3 credits, variable and repetitive

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

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 2D design, computer visuals, graphics, etc., is desirable.

Fall and spring, 3 credits

ARS 530 Professional Experience Internship

Internship in the professional art world of New York City and its environs. Depending on the professional 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

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

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)

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, industrial.

Prerequisites: Demonstration of appropriate level of proficiency, permission of instructor
Fall and spring, 3 credits

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

Once every three semesters, 1½ credits

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 or spring, 3 credits

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

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

ARS 561 Graduate Ceramics and/or Ceramic Sculpture Studio

Theory and practice of ceramics and ceramic sculpture for the graduate student with emphasis on individual development as an artist. Advanced studio instruction in hand-building: coil, slab, pinch; wheelthrowing; casting, inclusive of multi-piece plaster pour-molds; various firing techniques: reduction, oxidation, raku, and high- and low-fire glaze techniques.

Prerequisites: Permission of instructor; accepted candidate for M.F.A. or permission of department

Fall and spring, 3 credits

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

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

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

Fall and spring, 3 credits

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

ARH 690 Dissertation Research

Fall and spring, variable and repetitive credit

ARH 699 Directed Readings for Doctoral Candidates

Fall and spring, variable and repetitive credit

Astronomy (AST)

Associate Chairperson: James Lattimer
Earth and Space Sciences Building 255 (516) 632-8200

Graduate Program Director: Amos Yahil
Earth and Space Sciences Building 461 (516) 632-8224

Graduate Secretary: Iris Roth
Earth and Space Sciences Building 255 (516) 632-8554

Degrees awarded: M.S. in Earth and Space Sciences; Ph.D. in Earth and Space Sciences

The Department of Earth and Space Sciences, in the College of Arts and Sciences, includes program concentrations in areas of astronomy. Research, in close collaboration with one or more faculty members is emphasized as the chief ingredient of graduate training and students are encouraged to do short research projects before deciding on a topic for their dissertations.

In the astronomy program, which averages about 15 Ph.D. students, interests range from planetary science to cosmology. Current research includes extragalactic astronomy and cosmology, radio observations of molecular clouds, infrared observations of star-forming regions, theoretical models of supernova explosions and neutron stars, Earth and planetary atmospheres, rings, and formation. Brochures describing the program in detail are available from the department.

The Department of Earth and Space Sciences offers courses of study leading to M.S. and Ph.D. degrees. Included under this program are astronomy, astrophysics, and planetary sciences.

Graduate Program in Astronomy

Astronomy courses of study are offered in both observational and theoretical areas of astronomy, astrophysics, and planetary sciences. Concentrations are available in galactic astronomy, including infrared astronomy, star formation, the interstellar medium, and molecular clouds; cosmology and extragalactic astronomy; stellar astronomy; nuclear astrophysics; and solar system astronomy, including planetary rings, planet formation, and solar system dynamics. The organization of the Graduate

Program in Astronomy provides interdisciplinary curricula in meteoritics and solar system evolution.

A low student-to-faculty ratio is maintained and early in the course of study students are encouraged to begin research in close contact with faculty members. Those students who enter the program without a strong physics background take upper-level undergraduate physics courses early in the program.

Facilities for Astronomy

Stony Brook astronomers make regular use of the wide array of instrumentation available to contemporary astronomy. Stony Brook faculty and graduate students are particularly frequent users of the facilities of the National Optical Astronomy Observatories, the National Radio Astronomy Observatories, and the observatories at Mauna Kea. They also use data obtained by space observatories, most notably Einstein, the Infrared Astronomical Satellite (IRAS), and the International Ultraviolet Explorer (IUE), and have been assigned observing time with the Hubble Space Telescope. Stony Brook astronomers use millimeter wave facilities at the FCRAO 14-meter antenna.

Excellent modern computing facilities for support of data analysis and theoretical work are available at Stony Brook. The program has a large number of networked VAX stations and DEC stations and is developing an image processing center. Researchers also have direct access to the Cornell, Pittsburgh, and Princeton supercomputer centers and use the computing facilities at the Brookhaven, Los Alamos, and Lawrence Berkeley National Laboratories.

Research in Astronomy Cosmology and Extragalactic Astronomy

The cosmological and extragalactic research focuses on providing the theoretical framework needed 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, such as the IRAS and Center for Astrophysics galaxies. Work to date first determined the gravitational field in the surveyed volume (out to 500 million light years). Comparisons are being made with the fast-growing body of data on large-scale flows generated by this gravitational field, using extensive N-body hydrodynamical simulations of the large-scale structure.

Millimeter wave mapping of the distribution of interstellar molecules, including CO, CS, and their isotopes, is performed in order to understand the role played by giant molecular clouds in the star formation rate and evolution of spiral galaxies. Recent exciting results include the detection of CS emission from the luminous infrared galaxy Arp220, which indicates the presence of ten billion solar masses of very dense molecular gas; it is this material that feeds the trillion solar luminosity starburst. The maps are also vital to understanding the effects of galaxy collisions on the star formation process and the initiation of starbursts.

Molecular Clouds and Interstellar Matter

Observations of interstellar molecular clouds provide the focus of radio astronomical investigations at Stony Brook.

Stony Brook researchers discovered giant molecular clouds in 1977. These huge clouds, the most massive objects in the galaxy, were found in CO surveys of the galactic plane. Current research concentrates on determining the star formation rates associated with these clouds. Extensive use of IRAS and millimeter wave observations determines distances and hence infrared luminosities. High spatial resolution observations of the actual star-forming cores are carried out with the world's most powerful millimeter wave telescope, the IRAM 30-meter antenna.

Infrared spectroscopy is used to study grains in the interstellar medium. Theoretical models of grain formation in novae and supernovae are also explored.

Star Formation and Pre-Main Sequence Evolution

An important area of research undertaken at Stony Brook concerns star formation. This research has demonstrated that most pre-main sequence stars are not T Tauri objects. Studies of the typical low-mass pre-main sequence object include its evolutionary path toward the main sequence and the true "initial mass function" in this mass range. Also investigated is the role that multiplicity plays on pre-main sequence evolution. IR lunar occultation techniques are used to study the true frequency of binaries and the effects that companions have on pre-main sequence evolution and the evolution of circumstellar disks.

Nuclear Astrophysics

Research in nuclear astrophysics focuses on the high-density nuclear and neutron star matter equations of state and their role in massive star evolution, supernovae, and neutron stars. The equations of state being developed at Stony Brook are considered to be the best available, with inputs from a wide variety of nuclear experimental information. Simultaneously, hydrodynamical simulations of supernovae and the formation of neutron stars are carried out. Special interest is taken in the role of neutrinos, since neutrinos are the only direct probe of collapse and the early dynamical phases. SN 1987A spectacularly confirmed predictions of neutrino fluxes and energies from these supernovae models. In addition, current research includes the role of rotation in the dynamics and neutrino signature of supernovae, neutron star cooling, and the decompression of neutron star matter from tidal disruption of neutron stars in binaries.

Stellar Astronomy

Ground-based optical and radio telescopes and UV and X-ray observations from spacecraft are used to probe the chromospheric and coronal activity associated with cool stars. RS CVn systems, FK Comae stars, and the transition region emission in late A and F dwarfs are being characterized via Doppler imaging techniques. The question of whether the unusual ionization structure and the significant X-ray emission detected from the massive stellar winds of certain hot stars can be accounted for by a large, radiatively driven drift velocity of the ions in the flow is being investigated. Also, models for circumstellar disks around the epsilon Aurigae secondary and those detected around nearby stars by IRAS are being studied.

Planetary Science

One aspect of the planetary science concentration concerns dynamical problems in the solar system, with particular emphasis on elucidating the structure of Saturn's rings and the ring-moon interactions. The rings of Uranus and Neptune are also studied using Voyager stellar occultation data. The formation of the solar system is constrained by observations of planetary rings and the cratering record on moons. The planetary accretion process in the early solar system is also studied.

Another key aspect of the planetary science program combines analytic and numerical simulations with ground-based IR spectroscopy, radio observations, and data obtained from extraterrestrial probes such as Voyager and Galileo to study planetary formation.

Astronomical Techniques Applied to Atmospheric Research

The techniques of millimeter-wave astronomy are used to investigate the Earth's ozone layer by measuring the concentration of chlorine oxide, the most important tracer of the chlorofluorocarbon destruction of the ozone layer. This project, begun in 1977, was responsible for the first detection of high concentrations of chlorine oxide in the Antarctic Ozone Hole, and demonstrated that the hole was caused by man-made chemicals. As part of the NASA Network for the Detection of Stratospheric Change, Stony Brook will set up several stations around the world to monitor the chlorine problem with new millimeter-wave instru-

ments. This network will be one of the most important research initiatives on the global ozone problem.

Cooperative AST-Physics Astrophysics Concentration

AST and the Physics department participate in a cooperative Ph.D. program with a concentration in astrophysics. The basic degree and examination requirements are set by the department in which the student is enrolled. A research advisor is chosen from either faculty subject to the approval of the department chairpersons. Physics students must, in addition, meet the Astronomy requirements regarding a thesis proposal in order to advance to candidacy. See also the description in the Department of Physics section in this publication.

Admission

For admission to the Graduate Program in Astronomy, 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. The advanced exam in physics is also required.

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 provisional basis. Upon admission, the student will be informed of the requirements that must be satisfied for termination of provisional status.

Faculty

Lanzetta, Kenneth M., Assistant Professor. Ph.D., 1988, University of Pittsburgh: Formation and evolution of galaxies; evolution of the intergalactic medium.

Lattimer, James M., Professor and Associate Chairperson. Ph.D., 1976, University of Texas: Nuclear, neutrino, and high-energy astrophysics: supernovae, neutron stars, dense matter; geochemistry: grain formation, isotopic anomalies, chemical condensation in early solar nebulae.

Lissauer, Jack J., Associate Professor. Ph.D., 1982, University of California, Berkeley: Formation of the solar system; ring dynamics; cratering on satellite surfaces.

Astronomy

Peterson, Deane M., Associate Professor. Ph.D., 1968, Harvard University: Stellar atmospheres; radiative transfer; Bp stars; lunar and asteroid occultations; high-time resolution photometry.

Simon, Michael, Professor. Ph.D., 1967, Cornell University: Infrared astronomy; physics of the interstellar medium; star formation; solar astronomy.

Solomon, Philip, Professor. Ph.D., 1964, University of Wisconsin: Interstellar molecules; radio astronomy; physics of interstellar medium; galactic structure; stellar mass loss; quasistellar objects.

Walter, Fredrick M., Associate Professor. 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.

Yahil, Amos, Professor and Graduate Program Director. Ph.D., 1970, California Institute of Technology: Galaxies; clusters of galaxies; physical cosmology; accretion processes; stellar collapse; supernovae; nuclear astrophysics.

Number of teaching, graduate, and research assistants, fall 1995: 15

Degree Requirements (AST) Requirements for the M.S. Degree in Earth and Space Sciences

A. Formal Coursework

For the M.S. degree, it is necessary to successfully complete, with an overall B average, an approved course of study consisting of 24 graduate credits with no more than six credits of Practicum in Teaching and no more than three credits of Research.

B. Qualifying Examination

Astronomy students must either pass a written qualifying exam or write a satisfactory master's thesis.

C. Language

There is no language requirement.

D. Departmental Recommendation

When all program requirements are completed, the chairperson may recommend to the dean of the Graduate School that the M.S. degree be granted.

E. Residence

There is no residence requirement.

F. Time Limit

All requirements for the M.S. degree are expected to be completed within two years of the student's first registration at Stony Brook as a graduate student. This time limit may be waived by the graduate committee under exceptional circumstances.

Requirements for the Ph.D. Degree in Earth and Space Sciences-Astronomy

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

A. Formal Coursework

Successful completion of an approved course of study is required. A student normally takes nine credit hours per semester, not counting AST 600 Practicum in Teaching. A student must achieve an overall 3.0 grade point average in all courses taken at Stony Brook to receive a degree.

B. Qualifying Examinations

Acceptable performance on the written and oral Ph.D. qualifying examinations is required. These exams are normally given during the fourth semester, but may be attempted during the second semester. Successful completion of qualifying examinations in the Department of Physics also satisfies this requirement.

C. Preliminary Examination

Successful defense of a thesis proposal is required. The student, in conjunction with a faculty advisor, prepares a written thesis proposal and submits it to a committee of the faculty two weeks in advance of the preliminary examination. The committee will review the written proposal for its suitability as a thesis topic within a week. The preliminary examination consists of an oral presentation of the proposal and an oral examination on the proposal and related topics.

The chairperson of the preliminary examination committee will inform the student of the committee's decision and submit a written report of the examination (signed by all committee members) to the graduate committee. If the student does not pass the examination, the preliminary examination committee will recommend further action to the graduate committee. This recommendation will be implemented by the graduate committee, in consultation with the faculty.

The student is expected to complete the proposal by the end of the fifth semester. This time limit may be waived by the graduate committee if circumstances justify a delay.

D. Language

There is no language requirement.

E. Advancement to Candidacy

Upon successful completion of the preliminary examination, including any associate qualifications and requirements of the course of study, the student will be considered for advance-

ment to candidacy. This recommendation is made by the graduate committee, through the department chairperson, to the dean of the Graduate School. Candidacy signifies that the student has successfully completed all Graduate School and program requirements for the Ph.D. degree except the thesis.

F. Dissertation

The Ph.D. dissertation is the document summarizing the original scientific research in recognition of which a 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 that the thesis is ready to be defended, the graduate committee selects a Ph.D. thesis defense committee consisting of at least three members of the department and at least one member from outside the department or University. One defense committee member, other than the thesis advisor, is appointed as committee chairperson by the graduate committee. The dissertation must be presented to the defense committee at least two weeks prior to the oral defense.

G. Ph.D. Oral Defense

The student makes a public presentation of the major results of the thesis. A closed session follows in 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.

Courses in Astronomy

AST 501 The Planetary System

An introduction to our current understanding of the solar system, excluding the sun. Topics include orbits and bulk properties of the planets, moons, asteroids, and comets; physics and chemistry of comets; bombardment histories; composition, dynamics, structure, and evolution of planetary and satellite atmospheres; dynamics of satellites and rings, including resonance and tidal heating. The latter part of the course focuses on cosmogonic theories, including planetary and satellite accretion, and the formation of planetary atmospheres.

Fall, alternate years, 3 credits

AST 503 Planetary Dynamics

A survey of processes responsible for the motions of solar system bodies and techniques used to study them. Specific topics include an introduction to celestial mechanics, planetary perturbations, orbits about an oblate planet, resonances, the orbital distribution of asteroids (Kirkwood gaps and Trojan asteroids), tidal heating, planetary ring dynamics, and ring-moon interactions.

Prerequisite: AST 501 or PHY 501 or permission of instructor

Spring, every fourth year, 3 credits

AST 504 Planetary Cosmogony

The solar nebular theory and the planetesimal hypothesis. We discuss various aspects of planetary accretion, including meteorite constraints on conditions within the protoplanetary disk, orbital stability, and models of planetary growth. The course also covers satellite formation and constraints on other planetary systems.

Prerequisite: AST 501 or permission of instructor

Spring, every fourth year, 1-3 credits

AST 505 Planetary Aeronomy

This course focuses on the chemical and thermal structures of planetary atmospheres, especially upper atmospheres. We discuss the ways that solar energy is absorbed and how it relates to the composition (both neutral and ionic), temperatures, and airglow features. We also look into the escape of species from the top of the atmosphere and atmospheric evolution. Crosslisted with ESC 547.

Prerequisite: Permission of instructor

Spring, alternate years, 3 credits

AST 510 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

AST 511 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 dwarfs are studied and compared to observations. The evolution of single stars up to supernovae and the peculiar evolution of close binary systems are also studied.

Fall, alternate years, 3 credits

AST 512 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.

Spring, every fourth year, 3 credits

AST 513 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 dwarfs 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.

Spring, every fourth year, 3 credits

AST 521 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.

Fall, alternate years, 3 credits

AST 522 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.

Spring, every fourth year, 1-3 credits

AST 523 High-Energy Astrophysics

Physical processes that occur at high temperatures and pressures, including X-ray and gamma ray emission, cosmic rays, bremsstrahlung, synchrotron, inverse Compton radiation, and gravitational radiation. Topics also include stellar and galactic accretion processes and jets, including relativistic effects and superluminal expansion. We discuss applications to stellar coronae, supernova remnants, X-ray binaries, pulsars, and compact extragalactic objects.

Spring, every fourth year, 3 credits

AST 531 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.

Fall, alternate years, 3 credits

AST 533 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: AST 531 or permission of instructor

Fall, alternate years, 3 credits

AST 535 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.

Spring, 3 credits

AST 541 Advanced Astrophysics I

An introduction to the properties of stars at an advanced mathematical level. Topics include radiative transfer, stellar interiors, atmospheres, and evolution. May be taken independently of AST 542.

Prerequisite: Permission of instructor

Fall, 3 credits

AST 542 Advanced Astrophysics II

Study of the properties of galaxies and the universe at an advanced mathematical level. Topics include such subjects as the ISM, galactic structure, cosmology, and nucleosynthesis. May be taken independently of AST 541.

Prerequisite: Permission of instructor

Spring, 3 credits

AST 543 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

Astronomy

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

AST 598 Master's Thesis Research

Independent research for the M.S. degree
Fall and spring, variable and repetitive credit

AST 599 Research

This course is designed to acquaint pre-candidacy graduate students with current research in the department and to develop basic techniques of research in astronomy. Students work directly with one or more faculty members on short research projects that may involve using the astronomical literature, computer programming, or instrumentation in one of the laboratories.

Fall and spring, variable and repetitive credit

AST 600 Practicum in Teaching

Fall and spring, 0-3 credits, repetitive

AST 601 Advanced Topics in Astronomy-Astrophysics

Designed to treat specific subject areas in depth, either extending material introduced at the 500 level or covering topics not presented there. Topics recently offered or anticipated in the near future include observational cosmology, atomic and molecular processes, planetary atmospheres, interstellar molecules, advanced topics in radiative transfer, interstellar grains, quasars, and galactic nuclei.

Fall, alternate years, 1-3 credits, repetitive

AST 696 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

AST 697 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

AST 698 Astronomy Special Seminar

A weekly series of specialized seminars in which graduate students and faculty discuss specific topics within the astronomy subgroups. Research is reviewed, and these are discussed.

Fall and spring, no credit, repetitive

AST 699 Dissertation Research

Independent research for the Ph.D. degree. Open only to candidates for the Ph.D. who have passed the preliminary examination.

Fall and spring, variable and repetitive credit

Biomedical Engineering (BME)

*Director: Clinton T. Rubin
Health Science Center T18-030 (516) 444-2215*

*Graduate Program Director: Kenneth T. McLeod
Health Science Center T18-030 (516) 444-3847*

*Administrative Secretary: Anne Marie Dusatko
Health Science Center T18-030 (516) 444-2302*

Advanced Graduate Certificate awarded: Advanced Graduate Certificate 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 Biomechanics, Biomaterials, Medical Imaging and Computational Modeling. These disciplines thrive through active interdisciplinary collaborations between the faculty in the College of Engineering and Applied Sciences (CEAS), the School of Medicine (SOM), 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, have helped distinguish Stony Brook as a superb resource for education in both the engineering and health sciences. The Graduate Program in Biomedical Engineering (PIBE), is structured to promote a unique, interdisciplinary training environment for SUNY students.

The Graduate Program in Biomedical Engineering at the University at Stony Brook trains individuals with baccalaureate degrees in engineering, mathematics, physics and related areas to provide them with the synthesis, design, and analysis skills necessary to effectively contribute to the advancement of technology in health and medical care. The Advanced Graduate 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 cre-

ative, versatile biomedical solutions. 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.

Faculty

Beltrami, Edward, Professor. Ph.D., 1962, Adelphi University: Optimization techniques; models for public systems analysis.

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

Berndt, Christopher, Professor and Codirector. Ph.D., 1980, Monash University: Modification of material surface properties through thermal spray coating.

Button, Terry, Assistant Professor. Ph.D., 1989, State University of New York at Buffalo: High resolution computer aided tomography.

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

Deng, Yuefan, Associate Professor. Ph.D., 1989, Columbia University: Computational fluid dynamics; parallel computing

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

Fritton, Susannah P., Assistant Professor. Ph.D., 1994, Tulane University: Adaptive response of bone to mechanical loading; finite element modeling of tissue.

Gindi, Gene, Associate Professor and Codirector. Ph.D., 1982, University of Arizona: Algorithm development for medical imaging.

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

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

Hadjiargyrou, Michael, Assistant Professor. Ph.D., 1992, City University of New York: Effects of biophysical stimuli on gene expression in skeletal tissue.

Hitzemann, Robert, Professor. Ph.D., 1975, University of California at San Francisco: Neuropathological consequences of substance abuse and alcoholism.

Biomedical Engineering

Huntington, Donald P., Professor. M.D., 1966, Marquette University: Real-time medical image retrieval systems.

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

Jacobsen, Chris, Associate Professor. Ph.D., 1988, State University of New York at Stony Brook: X-ray microscopy and holography.

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

Kaufman, Arie E., Leading Professor. Ph.D., 1977, Ben-Gurion University: Computer graphics; visualization; interactive systems; computer architecture.

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

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

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

Luryi, Serge, Leading Professor. Ph.D., 1978, University of Toronto: Solid state electronic devices.

Marsocci, Velio A., Distinguished Professor. Ph.D., 1964, New York University: Solid-state electronics; integrated electronics; biomedical electronics.

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

Mishra, Prateek, Associate Professor. Ph.D., 1985, University of Utah: Program generators: compiler construction; programming language semantics.

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

Preston, Anne, Associate Professor. Ph.D., 1983, Harvard University: Technological change, careers of engineers and scientists.

Rafailovich, Miriam, Professor. Ph.D., 1980, State University of New York at Stony Brook: Polymeric liquids; phase transitions; thin film wetting phenomena; atomic force microscopy

Rastegar, Jahangir, Associate Professor. Ph.D., 1976, Stanford University: Mechanical design, robotics, biomechanics.

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

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

Rubin, Clinton T., Professor and Director. Ph.D., 1983, Bristol University: Tissue adaptation, biophysical treatment of musculoskeletal disorders.

Sexton, Thomas, Associate Professor. Ph.D., 1979, State University of New York at Stony Brook: Health care delivery systems.

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

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

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

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

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

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

Wagshul, Mark E., Assistant Professor. Ph.D., 1992, Harvard University: Magnetic resonance imaging.

Weiner, Harry, Associate Professor. Ph.D., 1970, Massachusetts Institute of Technology: Business-government relations.

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

Wolff, Gerrit, Professor. Ph.D., 1967, Cornell University: Entrepreneurship, organizational behavior.

Admission

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.

Stipends and tuition waivers 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.

Courses

The critical goal of the Program in Biomedical Engineering is to actively promote the development of a versatile engineering graduate. This not only requires exposing the engineering student to biological concepts, but also to engineering concepts outside of their 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. The courses listed below make up the core of the Biomedical Engineering program.

BME 501 Engineering Principles in Cell Biology

Course content is directed towards describing the microscopic physical interactions between cells and their environment as a continuum of electrical, chemical, and mechanical processes, as well as providing an overview of basic molecular biology and cell physiology. Emphasis is placed on introducing the concepts of non-linear behavior, self assembly, and adoption into analyses of biological systems.

Fall, 3 credits

BME 502 Engineering Principles in Tissue/Organ Systems

Course content is directed toward describing and analyzing the macroscopic physical interactions within tissues as an extension of the engineering concepts learned in BME 501, while providing a fundamental overview of tissue structure and function and organ physiology.

Spring, 3 credits

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 which permit signal acquisition, 2) Acquisition and detection of the signal, and 3) Analysis/computational steps which facilitate the use of diagnostic data.

Fall, 3 credits

Biomedical Engineering

BME 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, including an overview of microbiology and immunology. Emphasis on identifying and eliminating surface contamination, corrosion, and optimizing material properties and compatibility.

Spring, 3 credits

BME 505 Seminar Series in Biomedical Engineering

Seminars by internationally renowned bioengineers, including Stony Brook faculty, covering diverse issues in biomedical engineering. Topics related to the impact of technology on medicine are also addressed. The schedule of upcoming seminars is provided by the program at the beginning of each academic year. A critical educational component of the Seminar course is a Journal discussion held in the format of a Journal club, to precede the formal presentation.

Each speaker is asked to submit a paper within their discipline and lead a discussion on that topic with the students and faculty. The goal of this course is to expose the student, as well as the University faculty and student body, to the cutting edge of many diverse fields in biomedical engineering. This course continues over two semesters.

Fall and spring, 1 credit

Cellular and Developmental Biology (BCD)

Graduate Program Director: James P. Quigley
Life Sciences Building 350 (516) 632-8533

Senior Staff Assistant: Janet Koenig
Life Sciences Building 350 (516) 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 Cellular and Molecular Pathology. A student may choose the Cellular and Developmental Biology Program upon applying or may indicate no preference. Once accepted, a student can change programs as his or her interests dictate. The object is to provide the student with the widest range of research possibilities.

The Graduate Program in Cellular and Developmental Biology, leading to the Ph.D. degree in Biological Sciences, 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 faculty is young, active, and interactive, and the facilities are excellent. The prospective student can expect a high-quality education in a stimulating setting.

Facilities

The Biological Sciences Division and Health Sciences Center are well equipped for work in developmental and cellular biology. The modern laboratory facilities include constant temperature rooms and equipment for continuous and synchronized cell culture, as well as equipment for all major molecular biological and biochemical analyses. The electron microscope facility houses two transmission scopes and one scanning scope along with all accessory equipment. Besides coursework and seminars, students in the program have an early opportunity to work in the laboratories of selected faculty members to gain laboratory experience and help them decide which area of cellular and developmental biology they wish to pursue further.

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 in biology or a related area including the following preparation: one year of general chemistry; one year of organic chemistry, including organic chemistry laboratory; one semester of physical chemistry or physical biochemistry (regulatory biology and biochemical laboratory techniques courses taken at Stony Brook may be substituted for the physical chemistry requirement); two semesters of college mathematics, including at least one semester of calculus; and two semesters of physics. Students may be admitted without some of the above 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

Andersen, Janet, Assistant Professor.¹¹ Ph.D., 1989, State University of New York at Stony Brook: Steroid regulation of connexin43 in human uterine smooth muscle.

Bar-Sagi, Dafna, Associate Professor.² Ph.D., 1984, State University of New York at Stony Brook: The role of *ras* oncogenes in cell proliferation.

Beach, David, Sr. Staff Scientist.¹⁵ Ph.D., 1977, University of Miami: Cell cycle control.

Berrios, Miguel, Assistant Professor.⁴ Ph.D., 1983, Rockefeller University: Architecture and function of nuclear pore complexes; fertilization and pronuclear formation.

Bingham, Paul M., Associate Professor.¹ Ph.D., 1979, Harvard University: Developmental control of gene expression and genetic control of development in the multicellular animals.

Bogenhagen, Daniel F., Professor.⁴ M.D., 1977, Stanford University: Synthesis of 5S RNA and mitochondrial nucleic acids in *Xenopus*.

Brown, Deborah, Assistant Professor.¹ Ph.D., 1987, Stanford University: Membrane protein trafficking in polarized epithelial cells.

Citovsky, Vitaly, Assistant Professor.¹ Ph.D., 1987, Hebrew University, Israel: Nuclear targeting and intercellular communication in plants.

Dean, Neta, Assistant Professor.¹ Ph.D., 1988, University of California, Los Angeles: Intracellular protein traffic.

Deutsch, Dale, Associate Professor.¹ Ph.D., 1972, Purdue University: Marijuana: biochemistry, cell biology, and biochemical toxicology.

Dingwall, Colin, Assistant Professor.⁴ Ph.D., 1985, University of Newcastle upon Tyne, England: Nuclear-cytoplasmic transport, nuclear pore complex biogenesis.

- Dunn, John**, Microbiologist.¹³ Ph.D., 1970, Rutgers-The State University: Structure and functional analysis of bacteriophage T7 RNA polymerase.
- Edmunds, Leland N.**, Professor.¹² Ph.D., 1964, Princeton University: Cell division cycles and circadian oscillators in *Euglena*.
- Engbrecht, JoAnne**, Assistant Professor.⁴ Ph.D., 1986, University of California, San Diego: Genetic analysis of meiosis.
- Enrietto, Paula**, Associate Professor.² Ph.D., 1980, University of Colorado: The oncogene *rel* in avian hematopoietic cells.
- Fisher, Paul A.**, Associate Professor.⁴ Ph.D., M.D., 1980, Stanford University: Karyoskeletal structure and function; DNA replication in eukaryotic cells.
- Fleit, Howard B.**, Associate Professor.⁵ Ph.D., 1980, New York University: Leukocyte Fc receptors; macrophage differentiation and physiology; plasma membrane receptors.
- Freundlich, Martin**, Professor.¹ Ph.D., 1961, University of Minnesota: *In vivo* and *in vitro* studies on regulation of gene expression in bacteria.
- Frohman, Michael A.**, Assistant Professor.⁴ M.D./Ph.D., 1986, University of Pennsylvania: Early mammalian development; gene regulation.
- Furie, Martha B.**, Associate Professor.⁵ Ph.D., 1980, Rockefeller University: Cell-cell interactions; interactions between leukocytes and endothelium.
- Galan, George**, Associate Professor.² Ph.D., 1986, Cornell University: Molecular/genetic analysis of *Salmonella* invasion of epithelial cells.
- Gergen, J. Peter**, Associate Professor.¹ Ph.D., 1982, Brandeis University: Molecular biology and genetics of embryonic development in *Drosophila*; segmentation genes and the mechanism of body pattern formation.
- Greider, Jorge**, Sr. Staff Scientist.¹⁵ Ph.D., 1987, University of California, Berkeley: telomere regulation; cell senescence.
- Grollman, Arthur P.**, Professor.⁴ M.D., 1959, The Johns Hopkins Medical School: Molecular aspects of chemical carcinogenesis, mutagenesis, and DNA damage and repair.
- Habicht, Gail S.**, Professor.⁵ Ph.D., 1965, Stanford University: Immunobiology of aging; comparative immunology; lymphokines.
- Halegoua, Simon**, Associate Professor.³ Ph.D., 1978, State University of New York at Stony Brook: Role of second-messenger pathways and proto-oncogenes in nerve growth factor-induced neuronal differentiation.
- Haltiwanger, Robert**, Assistant Professor.¹ Ph.D., 1986, Duke University: Structure, biosynthesis, and function of nuclear and cytoplasmic glycoproteins.
- Hayman, Michael J.**, Professor.² Ph.D., 1973, Institute for Medical Research, England: Viral and cellular oncogenes; differentiation of avian erythroid cells.
- Helfman, David M.**, Senior Staff Investigator.¹⁶ Ph.D., 1981, Emory University: Regulation of tissue-specific alternative RNA splicing and cellular function of cytoskeleton protein diversity.
- Hernandez, Nouria**, Sr. Staff Scientist.¹⁵ Ph.D., 1983, University of Heidelberg, Federal Republic of Germany: Transcription of snRNA genes and HIV-1.
- Herr, Winship**, Assistant Director.¹⁵ Ph.D., 1982, Harvard University: Control of eukaryotic transcription.
- Holdener, Bernadette C.**, Assistant Professor.¹ Ph.D., University of Illinois: Genetic regulation of early mammalian development.
- Hollingsworth, Nancy**, Assistant Professor.¹ Ph.D., 1988, University of Washington, Seattle: Meiotic synapsis, recombination, and segregation in yeast.
- Jesty, Jolyon**, Professor.⁸ Ph.D., 1972, Oxford University, England: Biochemistry of control mechanisms in coagulation.
- Johnson, Roger A.**, Professor.⁶ Ph.D., 1968, University of Southern California, Los Angeles: Cell initiated regulation of transmembrane signal transduction.
- Kaplan, Allen P.**, Professor.⁸ M.D., 1965, State University of New York Health Science Center at Brooklyn: Biochemical mechanisms of immunologic tissue injury.
- Katz, Eugene R.**, Professor.^{2,14} Ph.D., 1969, University of Cambridge, England: Biochemical genetics and development in cellular slime molds.
- Kernan, Maurice**, Assistant Professor.³ Ph.D., 1990, University of Wisconsin: Molecular basis of mechanical senses.
- Konopka, James**, Assistant Professor.³ Ph.D., 1986, University of California, Los Angeles: Hormone signal transduction; yeast cell development.
- Krainer, Adrian R.**, Sr. Staff Scientist.¹⁵ Ph.D., 1986, Harvard University: mRNA splicing; gene expression.
- Krikorian, Abraham D.**, Professor.¹ Ph.D., 1965, Cornell University: Control of the morphogenetic potential of cultured plant cells; biochemical differentiation in cultured cells of angiosperms.
- Lazebnik, Yuri A.**, Sr. Staff Scientist.¹⁵ Ph.D., 1986, St. Petersburg State University, Russia: Molecular mechanisms of apoptosis.
- Lennarz, William J.**, Professor and Chairperson.¹ Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in development.
- Levine, Joel M.**, Associate Professor.³ Ph.D., 1980, Washington University: Cell-surface molecules of the developing nervous system; cellular basis of neuronal differentiation.
- London, Erwin**, Associate Professor.¹ Ph.D., 1979, Cornell University: Lipid-protein and protein-protein interactions in membranes; membrane protein folding and translocation.
- Lyman, Harvard**, Associate Professor.¹ Ph.D., 1960, Brandeis University: Control mechanisms in the biogenesis, development, and replication of chloroplasts.
- Ma, Hong**, Staff Investigator.¹⁵ Ph.D., 1988, Massachusetts Institute of Technology: Functional analysis of transcription factors in plant development and studies of G proteins in plant signal transduction, using *Arabidopsis thaliana* as an experimental system.
- Malbon, Craig C.**, Professor.⁴ Ph.D., 1976, Case Western Reserve University: Neurotransmitter receptors; G proteins.
- Mandel, Gail**, Professor.³ Ph.D., 1977, University of California, Los Angeles: Regulation of sodium channel genes.
- Marcu, Kenneth B.**, Professor.^{1,2,5} Ph.D., 1975, State University of New York at Stony Brook: Regulation and properties of the *c-myc* proto-oncogene and "myc-like" genes; recombination mechanisms of lymphoid antigen receptor genes; lymphoid cell transformation.
- McKinnon, David**, Assistant Professor.³ Ph.D., 1987, John Curtin School of Medical Research, Australia: Molecular physiology of the sympathetic neurons and cardiac muscle.
- McLaughlin, Stuart G.**, Professor.⁶ Ph.D., 1968, University of British Columbia, Canada: Biophysics of membranes; the calcium/phospholipid second-messenger system.
- Miller, W. Todd**, Assistant Professor.⁶ Ph.D., 1989, Rockefeller University: Phosphorylation; signal transduction; RNA; protein recognition.
- Morris, Andrew J.**, Assistant Professor.⁴ Ph.D., 1988, University of Birmingham, England: Signal transduction mechanisms involving lipids.
- Prives, Joav, M.**, Associate Professor.⁴ Ph.D., 1969, McGill University, Montreal, Canada: Regulation of surface membrane and synaptogenesis; control of acetylcholine receptor synthesis and topological distribution; role of peripheral cytoskeleton in the regulation of cell surface properties.
- Quigley, James P.**, Professor and Graduate Program Director.⁶ Ph.D., 1970, The Johns Hopkins University: Role of proteolytic enzymes and extracellular matrix in normal cell migration and tumor cell invasion and metastasis.
- Raleigh, Daniel**, Assistant Professor.⁹ Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and of amyloid formation.
- Reich, Nancy C.**, Associate Professor.⁶ Ph.D., 1983, State University of New York at Stony Brook: Cellular and oncogenic control of interferon-induced gene expression.
- Sampson, Nicole**, Assistant Professor.⁹ Ph.D., 1990, University of California, Berkeley: Enzyme mechanism; protein-protein interactions.
- Scarlatta, Suzanne**, Assistant Professor.⁶ Ph.D., 1984, University of Illinois: Structure and oligomerization of membrane proteins.

Cellular and Developmental Biology

Schechter, Nisson, Professor.^{1,7} Ph.D., 1971, Western Michigan University: Molecular basis of nerve development, growth, and regeneration.

Schmidt, Jakob, Professor.¹ M.D., 1966, University of Munich, Federal Republic of Germany; Ph.D., 1970, University of California, Riverside: Structure, function, and regulation of nicotinic acetylcholine receptors in muscle and brain.

Setlow, Richard B., Adjunct Professor and Associate Director for Life Sciences.^{1,3} Ph.D., 1947, Yale University: DNA damage and repair; carcinogens and radiation.

Simon, Sanford R., Associate Professor.^{1,5} Ph.D., 1967, Rockefeller University: Regulation of extracellular matrix degradation by neutrophil proteases; role of lipoproteins in cholesterol transport; liposomes as drug and metabolite delivery systems.

Spector, David L., Senior Staff Investigator.^{1,5} Ph.D., 1980, Rutgers-The State University: Structural and functional organization of the cell nucleus; RNA transport.

Spector, Ilan, Associate Professor.⁶ Ph.D., 1967, University of Paris, France: Regulation of cell shape and mobility by cytoskeletal proteins and second messengers.

Stenlund, Arne, Sr. Staff Investigator.^{1,5} Ph.D., 1984, Uppsala University, Sweden: DNA replication of bovine papillomas.

Sternglanz, Rolf, Professor.¹ Ph.D., 1967, Harvard University: DNA topoisomerases; DNA replication, chromatin structure, and gene regulation in yeast.

Stillman, Bruce, Senior Scientist.^{1,5} Ph.D., 1979, Australian National University: Eukaryotic DNA replication and its regulation in mammalian cells and in yeast.

Strickland, Sidney, Professor.⁴ Ph.D., 1973, Michigan State University: Biochemistry of differentiation and development.

Studier, F. William, Adjunct Professor¹ and Senior Biophysicist.^{1,3} Ph.D., 1963, California Institute of Technology: Genetics and physiology of bacteriophage T7; control of gene expression; replication of T7 DNA.

Taichman, Lorne B., Professor.¹⁰ M.D., 1965, University of Toronto, Canada; Ph.D., 1971, University of Wisconsin: Differentiation of epidermal keratinocytes in skin and use of genetically altered keratinocyte grafts for epithelial gene therapy.

Theurkauf, William E., Assistant Professor.¹ Ph.D., 1988, Brandeis University: Role of the cytoskeleton in early development.

Thomsen, Gerald H., Assistant Professor.¹ Ph.D., 1988, Rockefeller University: Molecular embryology and cell signaling by growth factors.

Tonks, Nicholas K., Sr. Staff Scientist.^{1,5} Ph.D., 1985, University of Dundee, Scotland: Characterization of protein tyrosine phosphatases.

Trimmer, James S., Assistant Professor.¹ Ph.D., 1987, University of California, San Diego: Molecular neurobiology; regulation of the abundance, distribution, and function of voltage-sensitive ion channels in mammalian nerve and muscle.

Tseng, Linda, Professor.¹¹ Ph.D., 1968, University of North Dakota: Cellular molecular biology of reproductive endocrinology in uterus.

Van Nostrand, William E., Associate Professor.⁸ University of California, Irvine: Vascular functions of the Alzheimer's disease amyloid beta-protein precursor.

Viola, Michael B., Professor.^{2,8} M.D., 1964, McGill University, Canada: Molecular genetics of cancer susceptibility in humans.

Wigler, Michael H., Staff Scientist.^{1,5} Ph.D., 1978, Columbia University: Growth control in eukaryotes, utilizing two model systems; the yeast *Saccharomyces cerevisiae* and cultured mammalian cells.

Williams, David L., Professor.⁴ Ph.D., 1972, University of Illinois: Hormonal control of gene expression; molecular biology of atherosclerosis.

Wimmer, Eckard, Professor.² Ph.D., 1962, University of Göttingen, Germany: Structure and function of cellular and viral nucleic acids and proteins; the replication of poliovirus.

Zieve, Gary W., Associate Professor.⁵ Ph.D., 1977, Massachusetts Institute of Technology: Structure and function of the snRNP particles; mechanisms of autoimmunity.

Number of teaching, graduate, and research assistantships, fall 1995: 34

¹ Department of Biochemistry and Cell Biology

² Department of Microbiology

³ Department of Neurobiology and Behavior

⁴ Department of Pharmacological Sciences

⁵ Department of Pathology

⁶ Department of Physiology and Biophysics

⁷ Department of Psychiatry

⁸ Department of Medicine

⁹ Department of Chemistry

¹⁰ Department of Oral Biology and Pathology

¹¹ Department of Obstetrics and Gynecology

¹² Department of Anatomical Sciences

¹³ Brookhaven National Laboratory

¹⁴ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975

¹⁵ Cold Spring Harbor Laboratory

Degree Requirements

Requirements for the M.A. Degree

The Graduate Program in Cellular and Developmental Biology normally does not accept a student whose goal is a master's degree. In exceptional instances, a student already enrolled 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 a 3.0 overall grade point average in all courses taken at Stony Brook to receive a degree.

Requirements for the Ph.D. Degree

A. Course Requirements

1. Cell Biology at the graduate level (BCD 656).
2. Developmental Biology at the graduate level (BCD 657).
3. Molecular Genetics (HBM 503).
4. Biochemistry (BMO 520).
5. Student seminar for at least four semesters (BCD 531, 532). One acceptable seminar is to be given each semester until advancement to candidacy, and attendance at all research seminars (BCD 621, 622) is required.
6. Two semesters of research (BCD 530) in staff laboratories. The students generally must work in four different laboratories during the two semesters. The particular laboratories involved will be decided in consultation with the student and with approval of the executive committee.
7. One approved elective graduate course.
8. Students who have not had an undergraduate course in physical chemistry or physical biochemistry may take HBH 545 and HBH 560, which will fulfill the requirement as well as count toward the elective course.

Students must achieve a B or better in all required courses and must maintain a B average in undergraduate and graduate 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

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 cellular and developmental terms, and devises hypothetical experiments designed to test the proposal. The proposition may be in any area of cellular and developmental 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 appointed 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 cellular and developmental biology, 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

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

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 genetical and biochemical analysis.

Fall, alternate years, 3 credits

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

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

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

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

BCD 537 Physiology and Biochemistry of the Cell Cycle

An integrated view of the cell development cycle in prokaryotes and eukaryotes. Topics considered include cell cycle anatomy, cell population dynamics, 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, cell cycle clocks, the cyclin oscillator, and the control of cell division. Crosslisted with HBA 537.

Fall, 3 credits

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

BCD 599 Research

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

Fall and spring, credit to be arranged

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 cell organelle structure and function in specialized cells in tissues. The organization and interaction of cells in tissues is also covered. The course is comparative and includes examples of tissues from vertebrates, invertebrates, plants, and prokaryotic systems. Crosslisted with HBA 656.

Spring, 4 credits

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

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

Chemistry

(CHE)

Chairperson: William J. le Noble
Chemistry Building 104 (516) 632-7884

Graduate Program Director: Philip Johnson
Chemistry Building 562 (516) 632-7912

Student Affairs Assistant: Diane Godden
Chemistry Building 104 (516) 632-7886

Degrees awarded: M.S. in Chemistry; Ph.D. in Chemistry

Degree Programs

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 non-teaching 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 under way 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 , ^{13}C , ^{19}F , ^3H , etc.) and X-ray crystallography. Molecular modeling programs, such as Macromodel, are operated on the departmental computer cluster via color graphics workstations in order to rationalize and predict the conformations and reactivities

of molecules under study. Variable-temperature ^1H and ^{13}C 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. All the advanced instrumentation required for modern studies on molecules as small as inorganic ions to those as large as polymeric aggregates is readily available within the program and the immediate community. Expertise in structural identification and synthesis of biologically active molecules is applied to problems ranging from chemical communication to therapeutic protocols. A number of research programs are characterizing the catalytic mechanisms of enzymes by kinetic and substrate analog approaches, integrating the use of nonphysiological turnover, affinity labels, and mechanism-based inactivators. Multienzyme action is identified for understanding the biosynthesis and catabolism of pheromones, steroids, and hormones. Additional topics under active investigation are improving our understanding of the dynamic structure and reactivity of DNA and proteins particularly as they relate to conformation, drug action, and mutagenesis.

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 5 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, and a multinuclear 250 MHz (5.88 T) standard bore magnet spectrometer that is also available for routine NMR spectroscopy.

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

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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 electrons with visible and ultraviolet light.

Surface Chemistry

Catalysis, corrosion, and friction are just 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 under way 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 combina-

tion 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

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

Chu, Benjamin, Distinguished Professor. 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.

Fowler, Frank W., Professor.⁹ 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., Leading Professor 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., Professor.⁴ 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.

Grey, Clare P., Assistant Professor. D.Phil., 1991, University of Oxford, 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 fluorides.

Haim, Albert, Professor.⁵ Ph.D., 1960, University of Southern California: Kinetics and mechanisms of inorganic reactions.

Hanson, David M., Professor. 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; replacing lectures with process workshops in General Chemistry.

Herley, Patrick, Professor.² Ph.D., 1964, D.Sc., 1982, Imperial College, University of London, England: Physical (nucleation) processes occurring in the decomposition of inorganic solids.

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

Johnson, Francis, Professor.¹ 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., Professor and Graduate Program Director. Ph.D., 1967, Cornell University: Optical molecular spectroscopy and the electronic structure of molecules; development of spectroscopic techniques using high powered lasers; multiphoton ionization spectroscopy.

Jona, Franco P., Leading Professor.² 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., Professor.⁶ Ph.D., 1965, Purdue University: Synthesis of organotransition metal complexes, mechanisms of their reactions; complexes of fulvenes, other polyenes; chemical education.

Khokhlov, Alexei, Adjunct Professor. Ph.D., 1979, Moscow State University, Russia: Polymer physics; statistical physics of macromolecules; physical chemistry of polyelectrolytes and ionomers.

Koch, Stephen, Professor. Ph.D., 1975, Massachusetts Institute of Technology: Synthesis and structure in transition metal coordination chemistry; metal ions in biological systems; early transition metal catalysts.

Lacey, Roy A., Associate Professor. Ph.D., 1987, State University of New York at Stony Brook: Nuclear chemistry; intermediate and relativistic energy heavy ion reaction studies.

Lauher, Joseph W., Professor.⁷ Ph.D., 1974, Northwestern University: Structural chemistry; design and synthesis of new inorganic and organic materials; hydrogen bonding; molecular graphics.

le Noble, William J., Professor and Chairperson. 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.

London, Erwin, Associate Professor.¹⁰ Ph.D., 1979, Cornell University: Lipid-protein and protein-protein interactions in membranes; membrane protein folding and translocations.

Mayr, Andreas, Associate Professor. Ph.D., 1978, University of Munich, Federal Republic of Germany: Synthesis, reactivity, and physical properties of new transition metal compounds.

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

Newton, Marshall D., Adjunct Professor. 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.

Ojima, Iwao, Distinguished Professor. Ph.D., 1973, University of Tokyo, Japan: Development of new and effective methodologies for the syntheses of physiologically active compounds based on organic and organometallic chemistry.

Parise, John B., Associate Professor.⁸ Ph.D., 1980, University of North Queensland, Australia: Synthetic solid-state chemistry; structural chemistry; crystallography; materials research.

Porter, Richard N., Professor. 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.

Raleigh, Daniel P., Assistant Professor. 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., Assistant Professor. Ph.D., 1990, University of California, Berkeley: Enzyme mechanisms and protein-protein interactions; the use of organic synthesis and kinetics to probe the structure and function of enzymes and cell-surface recognition proteins.

Schneider, Robert F., Associate Professor. Ph.D., 1959, Columbia University: Chemical education; university administration; client/server information systems.

Seltzer, Stanley, Adjunct Professor. Ph.D., 1958, Harvard University: Organic reaction mechanism; enzyme- and photocatalyzed cis-trans isomerization; model systems for enzymatic reactions; free radical reactions; isotope effects.

Sieburth, Scott McN., Associate Professor. Ph.D., 1983, Harvard University: New synthetic methods and strategies; the design of probes for small molecule-receptor interactions; new chemistry for enzyme inhibition; biologically active organosilanes.

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Springer, Charles S., Professor. Ph.D., 1967, Ohio State University: Biophysical chemistry; *in vivo* nuclear magnetic resonance; physical properties and mediated cation transport; hyperfine shift NMR studies.

Stell, George R., Leading Professor.³ Ph.D., 1961, New York University: Statistical thermodynamics; molecular theory of fluids; theories of gelation and polymerization.

Thomann, Hans, Adjunct Assistant Professor. Ph.D., 1982, State University of New York at Stony Brook: Magnetic resonance in disordered heterogeneous and amorphous condensed matter; development and application of EPR techniques to conducting polymers, active sites in biological systems, and heterogeneous catalysis; microscopic NMR imaging techniques.

Tonge, Peter J., Assistant Professor. 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, Associate Professor. Ph.D., 1957, New York University: Physical chemistry of biological macromolecules; structure and function of ribosomes; membrane model systems; applications of nuclear magnetic resonance.

Number of teaching, graduate, and research assistants, fall 1995: 135

¹ Joint appointment, Department of Pharmacology

² Joint appointment, Department of Materials Science

³ Joint appointment, Department of Mechanical Engineering

⁴ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1979

⁵ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1981

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, 1990; Recipient of the President's Award for Excellence in Teaching, 1990

⁸ Joint appointment, Department of Earth and Space Sciences

⁹ Recipient of the State University Chancellor's award for Excellence in Teaching, 1995

¹⁰ Joint appointment, Department of Biochemistry

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, 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, 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. in chemistry described above, with the following exceptions:

A. Courses

CHE 531, 532, two semesters of CHE 610, 611, and six formal 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 the Chemical Physics Program 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 formal graduate courses are required, including the following:

1. Four courses from among CHE 501-530. The choice of courses must be distributed amongst 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) 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 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, CHE 503, or CHE 504
Spring, 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- $\frac{1}{2}$ (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

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(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 526 Chemistry on Solid Surfaces

Modern picture of the bonding of molecules on solid surfaces. Electronic and geometric structure of surfaces and effects on adsorbates. Surfaces in stoichiometric and catalytic reactions.

3 credits

CHE 527 Chemical Dynamics

Experimental and theoretical aspects of reaction dynamics. Emphasis on the link between experimental observations and reaction mechanisms. Topics include kinematics; potential scattering; differential and integral cross sections; elastic, inelastic, and reactive collision; angular momentum; and angular distributions.

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 529 Nuclear Chemistry

Topics include the properties of radioactive substances and their use in the study of chemical problems; nuclear structure; nuclear reactions; radioactive decay and growth; interactions of radiation with matter; detection and measurement of radiation; application of radioactivity to chemical problems such as kinetics, structure, and analysis; artificially produced elements.

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 dichroism, 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 542 Physical Methods in Chemistry

Subject matter and prerequisites vary and are announced in advance. Possible subjects include nuclear magnetic resonance (NMR), molecular spectroscopy, and X-ray crystallography. May be repeated as the subject matter varies.

Fall or spring, 3 credits

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. A sound background in organic synthetic methods (e.g., CHE 503) is a prerequisite.

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

Discussions of current issues in inorganic chemistry.

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 (516) 632-7460

Graduate Program Director: Louise O. Vasvari

Frank Melville, Jr., Memorial Library E4317 (516) 632-7460

Graduate Secretary: Mary Moran-Luba

Frank Melville, Jr., Memorial Library N4308 (516) 632-7460

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, Graduate Program in Comparative Literature

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 from a recognized institution. The degree should be in one of the following:

1. English or American literature
2. Foreign languages and literatures
3. The fine arts: art history, theatre, music, etc.
4. History or philosophy

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 also 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, Graduate Program in Comparative Literature

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

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

Brennan, Timothy, Associate Professor. Ph.D., 1987, Columbia University: Postcolonial literature and theory; world literatures; cultural studies.

Brown, Russell E., Professor. Ph.D., 1962, Harvard University: Modern German literature; modern Polish literature; modern Scandinavian and Dutch literatures; 18th- and 19th-century German literature; literature of East Germany.

Chittick, William C., Professor. Ph.D., 1973, Tehran University, Iran: Sufism; Islamic thought; Persian literature; Arabic literature; Islam in India; comparative mysticism.

De la Campa, Román, Associate Professor. Ph.D., 1975, University of Minnesota: Latin American literature; contemporary theories of criticism.

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

Goldenberg, Robert, Associate Professor.¹ Ph.D., 1974, Brown University: Jewish history and religion in late antiquity; rabbinic literature and exegesis; history of Jewish thought; rabbinic hermeneutics.

Haviland, Beverly, Associate Professor. 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.

Hoberman, Robert, Associate Professor. Ph.D., 1983, University of Chicago: Linguistic theory; Hebrew; Aramaic; Arabic; Hebrew literature.

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

Manchester, Peter, Associate Professor. Ph.D., 1972, Graduate Theological Union: New Testament; early Christian literature; religion in the Graeco-Roman world; Neoplatonism and philosophical religion; hermeneutics.

Martinez-Pizzaro, Joaquin, Associate Professor. Ph.D., 1976, Harvard University: Medieval literature; classical and medieval backgrounds.

Murata, Sachiko, Assistant Professor. Ph.D., 1971, Tehran University, Iran: Islamic law; Persian literature; feminine spirituality; Islamic thought; Japanese religions; Confucianism and Taoism.

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

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

Rashkow, Ilona N., Associate Professor. 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., Associate Professor. Ph.D., 1978, Northwestern University: Aesthetics; literature and philosophy; Proust; Hegel; mystery and detective fiction.

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

Silverman, Hugh J., Professor. Ph.D., 1973, Stanford University: Contemporary literary theory; the philosophical essay; interdisciplinary studies in philosophy and literature; 20th-century continental philosophy and criticism; theory and method in comparative literature; history of literary and aesthetic theory.

Siskin, Clifford, Associate Professor. Ph.D., 1978, University of Virginia: Romanticism; 18th century literature; literary theory.

Sprinker, Michael, Professor. Ph.D., 1975, Princeton University: History and theory of criticism; Marxism; aesthetics; history of the novel; colonial and postcolonial literature.

Vasvari, Louise O., Professor and Graduate Program Director.² 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.

Wang, Ban, Associate Professor. Ph.D., 1993, University of California, Los Angeles: Chinese and English literature; cultural studies; literary theory; aesthetics.

Number of teaching, graduate, and research assistants, fall 1995: 14

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, 1976

Degree Requirements

Requirements for the M.A. Degree, Graduate Program in Comparative Literature

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 CLT 500 Literary Theory, CLT 501 Comparative Literature Methodology, CLT 502 Theory and Practice of Translation, CLT 601 Seminar in Literary Theory, and CLT 602 Interdisciplinary Seminar. The remaining courses may be distributed among graduate courses 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 course taken at Stony Brook to receive a degree.

B. Minor Options: Korean Studies and Religion and Literature

Graduate students in Comparative Literature may declare an official minor as part of their course of study. This minor will indicate a concentration with-

in 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 a 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.

M.A. Minor Option in Religion and Literature

Thirty credits of graduate work, including:

1. Comparative literature core courses (15 credits).
2. Five additional courses, at least four of which should have a direct bearing on religion and literature. CLT 530, 531, 532, and 533 deal specifically with religion and literature topics fulfilling the requirements of the minor.

Other courses may also be approved by the director of the religion and literature minor and the graduate program director if the subject matter warrants. The M.A. reading list and examination will be modified to reflect the student's minor.

M.A. Minor Option in Korean Studies

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 (15 credits).
2. Five additional courses, at least four of which should have a direct bearing on Korean studies (15 credits).

The M.A. reading list and examination will be modified to reflect the student's minor and special area of interest.

C. Diagnostic Test

All incoming graduate students will be asked to take a short test early in their first semester. They will be given two and a half hours to write an essay on a subject related to one of the required courses. The purpose of the test is to evaluate writing skills.

Comparative Literature

D. 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.

E. 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 a passing grade on the Diagnostic Test of Writing Skills in the first fall semester of graduate study.
3. Receive an acceptable first-year evaluation in the spring semester of the first year of study.

F. 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 (nonnative 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 or language course

such as CLT 520 or a graduate translation course in a foreign language department or (2) passing a CLT examination to be taken with a dictionary. (For details see the department handbook.)

G. M.A. Examination

The student will take a written master's examination in the first or 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, Graduate Program in Comparative Literature

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

A. Course Requirements

1. CLT 500 Literary Theory
2. CLT 501 Comparative Literature Methodology
3. CLT 502 Theory and Practice of Translation
4. CLT 601 Seminar in Literary Theory
5. CLT 602 Interdisciplinary Seminar

A minimum of 48 credits of graduate work are required for the Ph.D. Students who hold an M.A. in Comparative Literature or a related discipline can request that their transcript 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 five required courses listed for the M.A., unless the graduate program committee accepts comparable courses taken previously, in which case other courses may be substituted. In addition, 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 Options: Korean Studies and Religion and Literature

See requirements for the M.A. degree.

C. Diagnostic Test

See requirements for the M.A. degree.

D. First-Year Evaluation

See requirements for the M.A. degree.

E. 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.
5. Students must satisfy all requirements for the Ph.D. within seven years after completing 24 credits of graduate work at Stony Brook.

F. 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.

G. 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).

H. 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.

I. Teaching Assistantships

All students are asked to acquire some experience in teaching. Guidelines permit a graduate student to be supported as a teaching assistant (T.A.) for a maximum of four years. However, in exceptional cases the Graduate School may grant permission for accomplished T.A.s who work in areas of program need to be considered for support after four years in the program. 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.

J. 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 or can be requested by mail.

Courses

CLT 500 History of Literary Theory

An introduction to basic texts in literary criticism. Stress is placed on the ethical and mimetic approach of classical theory, its transformation in the Renaissance and neo-classical periods, and its reformulation in subsequent theory. The course includes an introduction to important developments in literary theory in the 20th century, with particular attention to the influence of other disciplines. Attention is paid where appropriate to materials drawn from non-Western traditions. *Fall, 3 credits*

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*

CLT 502 Translation Theory

After an overview of the history of translation theory and practice, students gain familiarity with current theories of translation and analyze significant representative translations in a variety of languages in the light of theoretical developments. *Fall or spring, 3 credits*

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. *Prerequisite: CLT 502*
Fall or spring, 3 credits

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*

CLT 597 Directed Readings for M.A. Students

Fall and spring, variable and repetitive credit

CLT 599 Independent Study

Fall and spring, 1-3 credits each semester, repetitive

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*

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, etc. *Fall and spring, 3 credits each semester, repetitive*

CLT 602 Interdisciplinary Seminar

Specific problems in the relations between literature and other disciplines. *Fall and spring, 3 credits each semester, repetitive*

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*

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*

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*

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*

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*

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*

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*

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*

CLT 650 Seminar in Korean Literature

A seminar on special topics in Korean literature, investigating an author, period, genre, or movement. *3 credits*

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 Toeogye and his successors. Korean Christianity, Korean Shamanism, and other Korean religious systems are also discussed. *3 credits*

CLT 690 Dissertation Research

Fall and spring, variable and repetitive credit

CLT 698 Practicum in Teaching

The course is divided into two parts: one half is normally given in the fall, one in the spring. The first part deals primarily with matters of pedagogy. The second part is designed to help students plan their own undergraduate courses. The practicum is required of all teaching assistants during their first year of teaching comparative literature. May be repeated, but students may receive credit toward degree requirements only once. *Fall and spring, 3 credits total*

CLT 699 Directed Readings for Doctoral Candidates

Fall and spring, variable and repetitive credit

Computer Science (CSE)

Chairperson: David S. Warren
Computer Science Building 1424 (516) 632-8454

Graduate Program Director: David R. Smith
Computer Science Building 1413 (516) 632-8443

Graduate Program Administrator: Pat Saccaro
Computer Science Building 1418 (516) 632-8462

Degrees awarded: Graduate Certificate in Software Engineering; M.S. in Computer Science; 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. With either the thesis or the project option, 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, in government, or in commercial research laboratories. The program gives students a rigorous and thorough knowledge of a broad range of theoretical and practical research subject areas and helps them develop 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.

The Graduate Certificate in Software Engineering is aimed at prospective stu-

dents from the surrounding area and industry. This includes those with degrees in other technical disciplines who want to gain computer expertise, those who have been away from the discipline for a period, perhaps due to raising a family or changes in the job market, and those with some amount of computer expertise who want to bring themselves up to date in some particular sub-areas. The program provides bridge courses, if necessary to make students' backgrounds current, and then provides a choice of some of the regular courses from the M.S. program. With an 18 credit requirement, the program offers to part time students the prospect of timely completion, while leaving open the possibility of transferring the credits to the regular MS degree later. To accommodate working professionals the graduate program offers a rotating set of courses at or after 5pm.

For more information on the graduate program in computer science, browse the department's website at <http://www.cs.sunysb.edu>.

Computing Environment

The department computing environment has 12 subnetworks, all 10Mb/sec Ethernet, with two ATM connections to the campus ATM switch. Connected to these are some 190 machines including 41 SUN SLC/ELC, 26 Sparc IPC, 13 Sparc20, 1 Sparc 1000, 23 HP9000, 5 SGI machines, 18 Macintosh and 41 386/486 color PCs. There are also two Intel Paragon 64-128 node parallel computer (shared with applied mathematics). Among the specialized laboratories supported by the department are ones

dedicated to computer aided design, image processing, language design, systems experimentation, transaction processing, and visualization and multimedia.

Library

The Engineering Library annex for the Department of Computer Science, located within the Computer Science Building, provides a pleasant environment for serious study and houses a collection of over 10,000 books, bound volumes of journals, conference proceedings, and technical reports. A full range of library services are available, including research assistance, internet access, interlibrary loan, and STARS, the Stony Brook Automated Retrieval Systems. 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

Admissions to the three programs (Graduate Certificate, M.S., and Ph.D.) are all handled separately. The minimal requirements for admission to graduate study in computer science are listed below. Exceptionally talented students with nonstandard backgrounds (see item A below) or who lack certain requirements may be considered for admission by making up their deficiencies in preparation. For students applying to the Graduate Certificate Program, experience in the work place may substitute for some of the requirements.

Other students may need to take some undergraduate level courses to prepare themselves for application for admission to the program. When in doubt, such students should consult with the graduate program director for guidance.

A. Bachelor's degree in a physical science, biological science, computer science, mathematics, or engineering.

B. Three semesters of college-level calculus, including linear algebra, and a course in probability theory (or probability and statistics).

C. A year of a college-level natural science.

D. College-level courses in computer science covering:

1. Fundamental computer science concepts (e.g., design, complexity analysis, and correctness of algorithms.)
2. Software development in a high-level language, such as Pascal, Modula-3, C, C+, and data structures (e.g., tree graph and list structures.)
3. Computer organization (e.g., machine representation of information, instruction set architecture, computer organization, memory management, input/output assembly, and linking.)
4. Advanced software development techniques (e.g., data abstractions, information hiding modules and modular decomposition; software testing.)

E. A grade average of at least B in all undergraduate coursework and in science, mathematics, and engineering courses.

F. Acceptance by the Computer Science Department and Graduate School.

G. All applicants to the graduate 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 their undergraduate major field as well.

In addition to the above requirements, it is recommended that students seeking admission to the graduate program have completed undergraduate computer science courses in digital systems design, finite mechanics, automata theory, operating systems, and compilers. Ph.D.-bound students, in particular, will be handicapped without preparation in these areas of computer science and mathematics.

Students of exceptional promise who are deficient in preparation will be considered for admission to the program on a provisional basis. Prior to entrance the student will be informed of the requirements that must be satisfied for termination of the provisional status.

Faculty

Arkin, Ester M., Associate Professor. Ph.D., 1986, Stanford University: Algorithms; networks; graph theory; computational geometry; optimization.

Bachmair, Leo, Associate Professor. Ph.D., 1987, University of Illinois, Urbana-Champaign: Computational logic; automated deduction; symbolic computation.

Badr, Hussein G., Associate Professor. Ph.D., 1981, Pennsylvania State University: Computer communication networks and protocols; stochastic processes and queuing theory; simulation; performance evaluation, modeling, and analysis.

Bernstein, Arthur J., Professor. Ph.D., 1962, Columbia University: Distributed algorithms; design and correctness of operating systems; concurrent programming.

Chiueh, Tzi-cker, Assistant Professor. Ph.D., 1992, University of California, Berkeley: Experimental computer systems; computer architecture; database systems; VLSI hardware design/CAD.

Gelernter, Herbert, Professor. Ph.D., 1956, University of Rochester: Artificial intelligence; knowledge-based heuristic problem-solving systems; scientific applications.

Golden, Barbara J., Lecturer. M.S., 1983, Polytechnic Institute of Brooklyn; M.S., 1963, Adelphi University: Software development; testing and documentation; software interfaces.

Heller, Jack, Professor Emeritus. Ph.D., 1950, Polytechnic Institute of Brooklyn: Database systems; office automation; visualization.

Henderson, Peter B., Professor. Ph.D., 1975, Princeton University: Software engineering; programming environments; computer science education.

Hsiang, Jieh, Professor. Ph.D., 1983, University of Illinois, Urbana-Champaign: Automated deduction; program correctness; computational logic.

Kaufman, Arie, Professor. Ph.D., 1977, Ben-Gurion University, Israel: Computer graphics; visualization; interactive systems; computer architecture; computer vision.

Kifer, Michael, Associate Professor. Ph.D., 1984, Hebrew University of Jerusalem: Database systems; logic programming; knowledge representation; artificial intelligence.

Ko, Ker-I, Professor. Ph.D., 1979, Ohio State University: Computational complexity; theory of computation; computational learning theory.

Lewis, Philip M., Leading Professor and Chairperson. Ph.D., 1956, Massachusetts Institute of Technology: Computational complexity; automata theory; compiler design; concurrent systems.

Mishra, Prateek, Associate Professor. Ph.D., 1985, University of Utah: Functional programming; type inference; programming language semantics; user interfaces; applications.

Mitchell, Joseph S. B., Associate Professor. Ph.D., 1986, Stanford University: Computational geometry; algorithms; computer graphics.

Pavlidis, Theo, Leading Professor. Ph.D., 1964, University of California, Berkeley: Image analysis; document processing, including OCR; computer graphics.

Ramakrishnan, I.V., Professor. Ph.D., 1983, University of Texas at Austin: Declarative programming; rewrite systems.

Skiena, Steven, Associate Professor. Ph.D., 1988, University of Illinois, Urbana-Champaign: Computational geometry; algorithms; discrete mathematics.

Smith, David R., Professor and Graduate Program Director. Ph.D., 1961, University of Wisconsin: Hardware description languages and synthesis; VLSI design tools; experimental chip architectures.

Smolka, Scott A., Professor. Ph.D., 1984, Brown University: Semantics of concurrency; design of distributed languages and algorithms; visual environments for concurrent systems.

Stark, Eugene, Associate Professor. Ph.D., 1984, Massachusetts Institute of Technology: Programming language semantics; theory of concurrency; formal specifications; verification; distributed algorithms.

Varshney, Amitabh, Assistant Professor. Ph.D., 1994, University of North Carolina at Chapel Hill: Interactive 3D computer graphics; scientific visualization; parallel graphics algorithms; geometric modeling; computational geometry.

Warren, David S., Professor. Ph.D., 1979, University of Michigan: Logic programming; database systems; interactive systems; artificial intelligence; natural language and logic.

Wasilewska, Anita, Associate Professor. Ph.D., 1975, Warsaw University, Poland: Logic; knowledge representation; artificial intelligence.

Wittie, Larry D., Professor. 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.

Number of teaching, graduate, and research assistants, fall 1995: 46

Computer Science

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. without thesis. 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 language requirement.

C. Proficiency Requirements

These represent fundamental knowledge expected of any Computer Science graduate by the time of M.S. certification or Ph.D. qualification. They must be satisfied with a grade of B or better in equivalent courses, challenge exams, or certain M.S. courses. The proficiency requirements are enumerated below with alternatives for satisfying them at Stony Brook.

1. Discrete Mathematics (AMS 301 or CSE 547)
2. Unix or "C" (CSE 230)
3. Digital System Design (ESE 318 or CSE 344/501)
4. Automata Theory (CSE 303)
5. Compiler Construction (CSE 304 or CSE 504)
6. Operating Systems (CSE 306 or CSE 506)

D. Course Requirements

There are no M.S. course requirements as such, other than the thesis or project. M.S. students may select from a suite of "basic" courses and from the remainder of the courses listed in this bulletin, with the only stipulation that the proficiency requirements be met. There must be at least four of the "non-basic" courses in an M.S. schedule and at least thirty graduate credits completed. For the list of courses in these categories, see the end of the course compendium which follows.

E. Grade Point Average

To be certified for graduation, a student must have a cumulative graduate grade point average of 3.0 or higher. The student must also receive, at least, the minimum passing grade (C-) for every graduate course taken.

F. No Thesis Option

Students choosing the no thesis option are required to take the Laboratory in

Computer Science CSE 523/524. The laboratory, which extends over two consecutive semesters, provides 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 (e.g., 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.

G. 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 9 credits of thesis can be used toward the M.S. degree.

H. Alternate M.S. Degree Requirements for Students Enrolled in the Ph.D. Program

Ph.D. students who elect to terminate with an M.S. degree must satisfy the usual requirements for the degree, i.e., 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 8 of their CSE 599/699 credits for an M.S. thesis.

Requirements for the Ph.D. Degree

A. Residence

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 be required to take only nine credits per semester for full-time status.

B. Qualifying Examination and Research Proficiency Examination

Students must satisfactorily pass a 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, in May, the week after the finals period, and the first week in October.

The exam consists of three parts, and is based on undergraduate material as described below. Stony Brook courses covering material in the exam are listed in parentheses. However, questions test not only routine knowledge but also the student's ability to use that material in a creative way.

1. *Theory and Mathematics*: theory of computation, analysis of algorithms, abstract algebra, graph theory and combinatorics, probability and statistics (CSE 303 or CSE 540, CSE 371 or CSE 541, AMS 301 or CSE 547, CSE 373 or CSE 548, AMS 310)
2. *Software*: programming languages, compilers, databases, operating systems (CSE 304, CSE 504, CSE 305, CSE 532, CSE 306, CSE 506, CSE 307, CSE 526)
3. *Hardware*: digital design, networks and communications, computer architecture (ESE 318 or CSE 301 or CSE 501, CSE or ESE 345 or CSE 502, ISE 310)

Each part consists of a three-hour written examination. The student is required to pass in all three subject areas. The results of the examination will be communicated to each student individually, following a meeting of the faculty that evaluates the results of the examination along with the student's ability to do research and the likelihood of his or her completing the program. Repetition of the qualifying examination, upon failure, may be permitted by consensus of the faculty. In general, a second repetition is not permitted. Failure to pass the qualifying examination by the second year without a formal extension (such as permission to repeat the examination) may be considered evidence of unsatisfactory progress toward the Ph.D. degree.

After a student passes the qualifying exam, a committee of three faculty members (including the advisor) will be selected, and their names submitted to the graduate program director for his or her approval. This committee supervises the student's progress toward the Ph.D. degree. The advisor may not also serve as chairperson of the committee.

C. Course Requirements

In the first year a student seeking the Ph.D. degree will normally register for a full time load of courses. These courses should be selected in conjunction with an advisor with the goal of filling any missing proficiencies and emphasizing the general areas required for the qualification examination. By the time of the preliminary examination, students should meet the following requirements:

1. At least 6 advanced (600 level) courses (not including seminars and special topics.)

2. A distribution of at least 2 courses from each of the general areas of theory, programming, hardware, and applications.

Grade requirements are the same as those for the M.S. degree above. 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 will normally be CSE 698 in conjunction with a TA in their first year.

D. Research Proficiency Examination (RPE)

Within approximately one year after passing the qualifier 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. Each Ph.D. student is required to meet with the entire committee at least once every 6 months; before January 15th and July 15th of each year (for this purpose the RPE and preliminary examinations will count as meetings), where the discussion will cover 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 towards the various exams. 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.

E. Preliminary Examination

Upon the approval of the student's research advisor, the student will take a preliminary examination. The purpose of the preliminary examination is to ascertain the breadth and depth of the student's preparation to undertake a significant original research investigation. The preliminary examination must be scheduled within 18 months of the time the student passes the research proficiency examination. Failure to pass the preliminary exam at that time without a formal extension is considered evidence of unsatisfactory progress toward the Ph.D. degree. Satisfactory progress is generally contingent upon passing the preliminary examination within 27 months after passing the qualifying examination.

The major requirement of the preliminary examination is a complete, detailed Ph.D. thesis research proposal. The student is expected not only to be thoroughly familiar with the background and current status of the intended research area, and to have clear and well-defined plans for pursuing the research objectives, but also to 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.

This examination is customarily an oral one, but a supplemental written examination may be requested by the examining committee. This committee, which consists of no fewer than four members, is appointed by the dean of the Graduate School upon the recommendation of the program chairperson. The committee form submitted by the program for approval is filed by the graduate secretary 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 program and students are encouraged to include one or more members from outside the program. The presentation is open only to members of the committee, invited computer science faculty, and invited graduate students. Faculty members are free to question the student on any topics they deem relevant to the student's objectives and career preparation. In particular, the student should expect to be questioned on material covered by at least two advanced seminar courses in areas not directly related to the thesis research. Most of the questions will be directed towards probing the student's grasp of the intended speciality. The student is expected to show complete familiarity with the current and past literature of this area.

Results of the preliminary examination will be communicate to the student as soon as possible. Repetition of the exam, in the event of failure, may be scheduled at the discretion of the program. A second repetition, if recommended, must be approved by the dean of the Graduate School.

F. Advancement to Candidacy

After the student has 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 program.

G. 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.

H. 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 which are faculty members from the program), including the research advisor(s), at least one person from outside the program, and a committee chairperson. (Neither the research advisor nor an outside mem-

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ber may serve as the chairperson.) The committee form submitted by the program for approval is filed by the graduate secretary 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.

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 in the Department of Computer Science at Stony Brook. In rare instances, the dean 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 program 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.

Requirements for the Certificate in Software Engineering

A) Proficiency requirement: Unix and 'C' (May be satisfied with the undergraduate course CSE230 or equivalent.)

B) Required course: CSE 500 Concepts in Computer Science (see course description below.)

C) Required credits: 18 credits of graduate courses including CSE500.

D) Grade requirements are the same as those for the M.S. degree above.

Courses

Important Note: In addition to specified prerequisites, a student must have completed CSE 113, CSE 114, CSE 214, and CSE 220 (or the equivalent of these courses) to take any graduate computer science course.

Basic Courses

The following group of courses are considered fundamental. Not more than 4 can be taken for credit toward the M.S., but students will be expected to have these areas covered for the proficiency requirements and the qualifier examination.

CSE 500 Concepts in Computer Science (software certificate only)

Provides background in fundamental computer science concepts and software development skills sufficient for a technically trained person, without an undergraduate computer science degree, to take selected graduate courses in computer science. Introduces advanced software techniques for the development of quality and reliable software systems. Programming projects using C++ in a PC or UNIX environment reinforce these software development concepts. Important topics introduced include: data structures, object-oriented methodology, software specification, design, implementation and testing, and recursive techniques. This course is normally used as a bridge course for the Certificate in Software Engineering and is not accepted for credit toward the regular M.S. degree.

Prerequisite: 1/2 to 1 years programming experience in a high level programming language

Fall, 3 credits

CSE 501 Digital Systems Synthesis

Small to medium scale components (logic gates, registers, adders); Hardware description language (HDL); Introduction to commercial synthesis tools; Introduction to field programmable gate arrays (FPGA). There are laboratory sessions in which students use commercial synthesis and simulation tools. Currently these include a Verilog simulator, the Synopsys design analyzer and FPGA compiler, FPGA place and route, and low level (timing) simulation.

Prerequisite: CSE 220

Fall, 3 credits

CSE 502 Computer Architecture

Performance and cost, instruction set design, pipeline implementation, memory hierarchy, input/output architecture, interconnect technology. Students perform design and simulation exercises using a high-level computer hardware design language.

Prerequisite: CSE 220 and ESE 318 or CSE 301

Spring, 3 credits

CSE 504 Compiler Design

Topics studied include formal description of programming languages, lexical analysis, syntax analysis, symbol tables and memory allocation, code generation, and interpreters.

Prerequisites: CSE 214, CSE 220, and CSE 303

Fall, 3 Credits

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 is 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 and CSE 220

Fall and spring, 3 credits

CSE 506 Operating Systems

An introduction to the structure of modern operating systems. Topics include virtual memory, resource allocation strategies, concurrency and protection. The design and implementation of a simple system is performed.

Prerequisites: CSE 220, CSE 214, and AMS 310

Fall and spring, 3 credits

CSE 515 - Introduction to Transaction Processing Systems

Discusses transaction processing systems. Application generators are reviewed and the transactional aspects of SQL are discussed. Topics include ACID properties of transactions, concurrency control, and distributed database systems.

Fall, 3 credits

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 extends over two consecutive semesters, completed in CSE 524. Before the deadline date designated by the course instructor, the student prepares 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 is evaluated with reference to the implied promise contained. Amendments to the project description must be approved by the advisor.

Prerequisite: CSE graduate student status or permission of instructor.

Fall and spring, 3 credits

CSE 524 Lab in Computer Science II

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 and spring, or summer, 3 credits

CSE 526 Principles of Programming Languages

Programming language concepts and design, with emphasis on abstraction mechanisms. Topics studied include denotational semantics, imperative and functional languages, object-oriented programming, procedure call and parameter passing mechanisms, generic and polymorphic definitions, abstract data types, concurrent and distributed programming primitives, and efficiency issues. Several representative languages (such as ALGOL 60, Pascal, ALGOL 68, Euclid, CLU, SMALLTALK, LISP, FP, ADA) are studied in detail with emphasis given to design issues and interactions of features. Background in compiler construction and programming experience in a high-level language is required.

Prerequisite: CSE 303 or equivalent

Pre- or corequisite: CSE 304 or 504 or equivalent

Spring, 3 credits

CSE 532 Theory of Database Systems

The design of database management systems to obtain consistency, integrity, and availability of data. Storage and retrieval from large, well-structured databases. Relational model, deductive and object-oriented databases, query processing, concurrency control, database security and integrity. Students undertake a semester project that includes the design and implementation of a database system.

Prerequisite: CSE 303 or permission of instructor

Fall and spring, 3 credits

CSE 548 Analysis of Algorithms

Techniques for designing efficient algorithms, including choice of data structures, recursion, branch and bound, divide and conquer, and dynamic programming. Complexity analysis of searching, sorting, matrix multiplication, and graph algorithms. Standard NP-complete problems and polynomial transformation techniques. Some computing is required. Crosslisted with AMS 542.

Prerequisite: Some familiarity with data structures

Recommended: CSE 547

Fall and spring, 3 credits

Balance of M.S. Courses

The following are M.S. level courses not listed as basic. M.S. students must elect at least four courses from this section, or from the Advanced Courses section, with permission of the instructor.

CSE 520 Techniques of Software Design

Topics relevant to software design and development, especially those relating to the commercial/industrial programming environment. Includes system and module construction and decomposition methodologies (top down, bottom up, hierarchical), structured programming concepts, maintainability, reliability, program and system documentation

(design specs, implementation specs, user manual), management of software ("Mythical Man Month," etc.), and psychology of computer programming and programmers. This course is normally taken by students in the certificate program who have not had programming project experience.

Prerequisite: CSE 214 or equivalent

Fall, 3 credits

CSE 525 Fundamentals of Window Systems

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 - selections. Widget writing.

Prerequisites: Degree in Computer Science and experience in C programming

Spring, 3 credits

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; 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 implement a substantial application program for one of the graphic terminals available in the department.

Prerequisite: CSE 214 or equivalent

3 credits

CSE 529 Simulation and Modeling

A comprehensive course in formulation, implementation, and application of simulation models. Topics include data structures, simulation languages, statistical analysis, pseudo-random number generation and design of simulation experiments. Students apply simulation modeling methods to problems of their own design. Crosslisted with AMS 553 and PAM 553.

Prerequisite: CSE 214 and AMS 310 or 507, or equivalent; or permission of instructor

Fall, 3 credits

CSE 533 Computer Network Communication Protocols

This is a survey of network communication software and hardware techniques, especially the ISO reference model of layered protocols. Topics include connectivity and delay analysis, data transmission techniques, pipelined window protocols, virtual circuits and datagrams, routing, congestion control, local area network access, process-to-process message transport, inter-network gateways, encryption, and distributed application protocols.

Prerequisite: Course in operating systems or permission of instructor

Spring, 3 credits

CSE 536 Introduction to User-Interface Development

Introduction to user-interface systems. Survey of user-interface systems, including discussion of such topics as command language, windowing, multiple input/output devices, architecture of user-interface management systems, tool kits 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 is required.

Prerequisite: CSE 520 or two years experience

Spring, 3 credits

CSE 537 Artificial Intelligence

A comprehensive introduction to the problems of artificial intelligence and the techniques for attacking them. Topics include problem representation, problem-solving methods, search, pattern recognition, natural language processing, learning, expert systems, and AI programming languages and techniques. The course emphasizes both theoretical methods and practical implementations.

Fall, 3 credits

CSE 539 Expert Systems

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 participate in a class project in which an expert knowledge-based consultation system for a specific problem domain is specified and built.

Prerequisite: Permission of instructor

3 credits

CSE 540 Theory of Computation

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.

Prerequisites: CSE 303 or permission of instructor

Spring, 3 credits

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 corequisite: MAT 313 or CSE 314.

Spring, 3 credits

Computer Science

CSE 547 Discrete Mathematics

This course introduces such mathematical tools as summations, number theory, binomial co-efficients, generating functions, recurrence relations, discrete probability, asymptotics, combinatorics, and graph theory for use in algorithmic and combinatorial analysis.

Spring, 3 credits

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 548; or permission of instructor

Spring, 3 credits

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, case studies of sampled and computed data visualization, and visualization systems.

Spring, 3 credits

CSE 587 Independent Study in Computer Science

As in CSE 523, the student prepares a one to two page description of the work that is to be completed during the course. This description, reviewed and approved by the project sponsor, resides in the student's folder. This course is not accepted for credit toward the M.S. degree except in unusual circumstances.

Fall and spring, 1-3 credits

CSE 596 Internship in Research

Participation in private corporations, public agencies, or non-profit institutions. Students are 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 receive a copy of the final report.

Prerequisite: Permission of the instructor
Fall and spring, 1-3 credits, variable and repetitive

CSE 599 M.S. Research

An M.S. or pre-qualifiers Ph.D. student who wishes to enroll in CSE 599 for any number of credits must prepare a one- to two-page description of the work he or she expects to complete in order to earn those credits. The description must be reviewed and approved by the student's research faculty advisor, signed by both student and advisor, and reside in the student's file. Amendments to

the proposal are permitted; these must be approved by the advisor.

Variable and repetitive credit

CSE 600 Topics in Modern Computer Science

A survey of current computer science research areas and issues. This course comprises lectures by faculty members and visitors, selected readings, and introductory-level research problems. Possible topics include approximation algorithms for intractable problems, probabilistic algorithms, distributed systems, system design, expert systems, robotics, networks, VLSI, and multi-processor computers.

Prerequisite: Permission of instructor
1 credit

Advanced Courses

The following are courses normally considered appropriate for the Ph.D. program although they may be elected by M.S. students with permission of the advisor. Many of these courses are biennial only.

CSE 602 Advanced Computer Architecture

The focus of this course is on 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 proceed to memory hierarchy, storage systems, network hardware, graphics processor, and database machines. The emphasis is hands-on evaluation of architectural ideas, the exploration of software/hardware design tradeoffs, and the articulation of experimental procedures and performance analysis. A publication-quality class project is required.

Prerequisite: CSE 502 or consent of instructor
3 credits

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

CSE 612 Parallel Computer Architectures

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, programming tools.

Prerequisite: CSE 502 or permission of instructor
Fall, 3 credits

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

CSE 618 Parallel Programming

Algorithms and techniques for programming highly parallel computers. Sorting and counting algorithms; parallel arithmetic; matrix algorithms; 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 520, both not to be taken for credit.

Prerequisite: CSE 502; permission of instructor or CSE 612
Spring, 3 credits

CSE 627 Introduction to Image Analysis

Survey of methods used for the analysis of images by computer, including computer vision and pattern recognition. Topics covered are image formation, image segmentation and edge detection, binary images and shape analysis, shape from shading, motion field and optical flow, surface inference, and classification techniques.

Prerequisite: B.S. degree in computer science, engineering, or the mathematical and physical sciences
3 credits

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.

Prerequisites: CSE 328 and 528 or CSE 332 and 564
Fall, 3 credits

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 involves a substantial programming project to implement an immersive virtual reality system

Prerequisite: CSE 328 or 528 or 332 or 564
3 Credits

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: CSE532 or permission of instructor
3 Credits

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: A course in operating systems or permission of instructor
3 credits

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, and reliability and concurrent algorithms.

Prerequisite: A course in operating systems
3 credits

CSE 638 Natural Language Processing

A survey of computational approaches to natural language processing issues in phonology, morphology, syntax, semantics, and pragmatics. Topics 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 are investigated.

Prerequisite: CSE 537
3 credits

CSE 640 Theory of Computational Complexity

Machine-based polynomial complexity theory, including nondeterministic computation, probabilistic computation, time and space tradeoff, and complexity hierarchy; applications to related areas such as combinatorial algorithms and cryptography.

Prerequisite: CSE 540 or CSE 548 or permission of instructor
3 credits

CSE 641 Advanced Logic in Computer Science

The course may include the following: deductive theorem proving (resolution, servant-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
Spring, 3 credits

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.

Spring, 3 credits

CSE 646 Analysis and Synthesis of Computer Communication Networks

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, Asynchronous Transfer Mode (ATM).

3 credits

CSE 647 Program Semantics and Verification

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

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. The first half of the semester is dedicated to randomized algorithms. Material is selected which has little or no overlap with traditional introductory algorithms courses.

Prerequisite: CSE 548 or permission of instructor
3 credits

Seminars and Special Topics Courses

These courses are offered irregularly throughout the year and normally cater to the needs of Ph.D. students. The seminars are normally one credit and the special topics courses are two credits.

CSE 650 Seminar in Theory of Computing

CSE 651 Seminar in Logic in Computer Science

CSE 652 Seminar in Algorithms

CSE 653 Seminar in Concurrency

CSE 654 Seminar in Databases

CSE 655 Seminar in Languages

CSE 656 Seminar in Artificial Intelligence

CSE 657 Seminar in Image Processing

CSE 658 Seminar in Computer Graphics

CSE 659 Seminar in Operating Systems

CSE 660 Seminar in Architecture

CSE 661 Seminar in Computer Applications

CSE 662 Seminar in User Interfaces

CSE 663 Seminar in Virtual Reality

CSE 670 Special Topics in Theory of Computing

CSE 671 Special Topics in Logic in Computer Science

CSE 672 Special Topics in Algorithms

CSE 673 Special Topics in Concurrency

CSE 674 Special Topics in Databases

CSE 675 Special Topics in Languages

CSE 676 Special Topics in Artificial Intelligence

CSE 677 Special Topics in Image Processing

CSE 678 Special Topics in Computer Graphics

CSE 679 Special Topics in Operating Systems

CSE 680 Special Topics in Architecture

CSE 681 Special Topics in Computer Applications

CSE 682 Special Topics in User Interfaces

CSE 683 Special Topics in Virtual Reality

School of Dental Medicine

Dean: *Burton R. Pollack*
Rockland Hall 160 (516) 632-8950

Advanced Graduate Certificates awarded: Advanced Graduate Certificate in General Dentistry; Advanced Graduate Certificate in Orthodontics; Advanced Graduate Certificate in Periodontics
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 speciality care, public health, teaching and/or research. The school offers the Doctor of Dental Surgery Degree, in addition to postdoctoral education in orthodontics, 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 the schools 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, State University of New York at Stony Brook, Stony Brook, NY 11794-8709; (516)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: James D. Thomson
Life Sciences Building 650 (516) 632-8600

Graduate Program Director: Daniel Dykhuizen
Life Sciences Building 650 (516) 632-8591

Assistant to the Chairperson: Gwen Luke
Life Sciences Building 650 (516) 632-8600

Degrees awarded: M.A. in Biological Sciences; Ph.D. in Ecology and Evolution

Degree Programs

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 integra-

tion 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 spectrofluorimeters. 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.

Ecology and Evolution

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

Battley, Edwin H., Associate Professor. Ph.D., 1956, Stanford University: Thermodynamics of microbial growth; ecological energetics; microbial ecology; nitrification and denitrification in aquatic systems.

Bell, Michael A., Associate Professor. Ph.D., 1976, University of California, Los Angeles: Evolutionary biology; ichthyology; paleobiology and geographic variation.

Bingham, Paul, Associate Professor.² Ph.D., 1979, Harvard University: Regulation of transcription in developing multicellular organisms; the role of transposons in evolution and speciation.

Carpenter, Edward J., Professor.³ Ph.D., 1969, North Carolina State University: Nitrogen cycling in the marine environment; physiology of nitrogen incorporation by marine algae; phytoplankton ecology.

Chase, Ivan, Associate Professor.⁵ Ph.D., 1972, Harvard University: Social behavior; dominance hierarchies; cooperation; resource distribution.

Conover, David O., Associate Professor.³ Ph.D., 1981, University of Massachusetts: Ecology of fishes; fisheries biology.

Dykhuizen, Daniel E., Professor and Graduate Program Director. Ph.D., 1971, University of Chicago: Population genetics and molecular evolution, especially of bacteria.

Eanes, Walter F., Professor. Ph.D., 1976, State University of New York at Stony Brook: Population and biochemical genetics of *Drosophila*; molecular evolution.

Fleagle, John G., Professor.¹ Ph.D., 1976, Harvard University: Primate evolution; comparative anatomy; behavioral ecology.

Forster, Catherine A., Assistant Professor.¹ Ph.D., 1990, University of Pennsylvania. Vertebrate paleontology, systematics, functional morphology.

Futuyma, Douglas J., Professor.⁸ Ph.D., 1969, University of Michigan: Ecological genetics; coevolution of species, especially of plants and insects; evolutionary biology.

Ginzburg, Lev, Professor and Director of the Master's Program in Applied Ecology. Ph.D., 1970, Agrophysical Institute, St. Petersburg, Russia.: Theoretical and applied ecology.

Gurevitch, Jessica, Associate Professor. Ph.D., 1982, University of Arizona: Evolutionary ecology of plant populations and communities; plant physiological ecology.

Hechtel, George J., Associate Professor.⁷ Ph.D., 1962, Yale University: Systematics and zoogeography of marine demospongiae.

Janson, Charles H., Associate Professor. Ph.D., 1985, University of Washington: Social ecology of vertebrates; plant dispersal strategies.

Lerdau, Manuel T., Assistant Professor. Ph.D., 1993, Stanford University: Plant ecology and physiology; global change.

Levinton, Jeffrey S., Professor. Ph.D., 1971, Yale University: Marine benthic ecology; population genetics of bivalve mollusks; paleoecology.

Lopez, Glenn R., Professor.³ Ph.D., 1976, State University of New York at Stony Brook: Marine and freshwater benthic ecology; animal-microbe-sediment interactions; detritus.

Meyer, Axel, Associate Professor. Ph.D., 1988, University of California, Berkeley: Ecology, evolution, and behavior of cichlid fishes; phylogeny reconstruction via molecular techniques.

Morgan, Steven, Assistant Professor.³ Ph.D., 1986, University of Maryland at College Park: Larval ecology and evolution of life histories.

Richmond, Rollin C., Professor and Provost and Executive Vice President for Academic Affairs. Ph.D., 1971, Rockefeller University: Molecular evolutionary genetics.

Rohlf, F. James, Professor. Ph.D., 1962, University of Kansas: Multivariate data analysis techniques applied to problems in taxonomy and ecology; computer modeling; applied ecology.

Slobodkin, Lawrence B., Professor. Ph.D., 1951, Yale University: Evolutionary strategy and constraints; *Hydra*; ecotoxicology.

Sokal, Robert R., Distinguished Professor Emeritus. Ph.D., 1952, University of Chicago: Human population structure; spatial models in ecology and evolution; numerical taxonomy; theory of systematics.

Susman, Randall L., Professor.¹ Ph.D., 1976, University of Chicago: Primate ecology.

Thomson, James D., Professor and Chairperson. Ph.D., 1978, University of Wisconsin: Pollination biology; plant reproductive systems; community ecology.

Vedder, Amy L., Research Assistant Professor.⁹ Ph.D., 1989, University of Wisconsin-Madison: Mammalian ecology; tropical forest ecology; conservation biology, planning, and practice.

Williams, George C., Professor Emeritus. Ph.D., 1955, University of California, Los Angeles: Evolution of life-history strategies; ecology and population genetics of marine fishes.

Wray, Gregory A., Assistant Professor. Ph.D., 1987, Duke University: Evolution of developmental mechanisms; evolution and paleobiology of echinoderm larvae; origin and radiation of echinoderm body plans.

Wright, Patricia, Associate Professor.⁸ Ph.D., 1985, City University of New York: Primates and tropical conservation.

Yen, Jeannette, Associate Professor.³ Ph.D., 1982, University of Washington: Marine zooplankton ecology; predator-prey interactions; sensory perceptions, and lipid metabolism of copepods.

Number of teaching, graduate, and research assistants, fall 1995: 37

¹ Department of Anatomical Sciences

² Department of Biochemistry

³ Marine Sciences Research Center

⁴ Department of Chemistry

⁵ Department of Sociology

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

⁷ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1982

⁸ Department of Anthropology

⁹ 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 two essays that provide the student with experience in synthetic thinking. Usually the first paper is a review of the primary literature and the second, which is due in the second year, is a research paper. 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 Computer Modeling in Biology

A large number of elective courses are available to fulfill the degree requirements.

Ecology and Evolution

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*

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*

BEE 550 Principles of Ecology

Population dynamics, interactions of organisms, theoretical concepts of community structure and their biological and evolutionary implications. *Prerequisite:* Permission of instructor *Fall, 4 credits*

BEE 551 Principles of Evolution

Biological evolution, including the genetics of populations, speciation, evolution of higher taxa, and the fossil record. *Spring, 4 credits*

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. *Fall, 4 credits*

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*

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 *Fall, odd years, 3 credits*

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, stochastic processes. Examples from population biology, i.e., mathematical ecology and population genetics, are used throughout. *Fall, even years, 3 credits*

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*

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*

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, variable credit*

BEE 561 Macroevolution

This course emphasizes the processes generating large-scale evolutionary trends and patterns. Topics include rates of evolutionary change; patterns of speciation and extinction, including radiations and mass extinctions; the role of constraint and innovation in molding evolutionary patterns; adaptive landscapes and complex character evolution; development and evolution; the origin and importance of major body plans; and the role of biogeography and climate in evolution. *Fall, even years, 3 credits*

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*

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*

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*

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*

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, 4 credits*

BEE 587 Computer Modeling in Biology

An introduction for advanced biology, mathematics, and physics majors to the use of software as applied to ecology and conservation biology. This computer laboratory course uses packaged ecological software to teach analytical and simulation methods for ecological risk and endangered species evaluation. *Prerequisites:* A year of calculus; either a year of biology or a year of year of physics *Spring, even years, 3 credits*

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*

BEE 599 Research

Original investigation undertaken with the supervision of a member of the staff. *Fall and spring, variable and repetitive credit*

BEE 670 Informal Seminar

Presentation of preliminary research results and current research problems by students and faculty. *Fall and spring, no credit*

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

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, 2 credits, repetitive

BEE 690 Seminar on Evolutionary Processes

Seminars on selected topics concerning evolutionary processes.
Fall and spring, 2 credits, repetitive

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, 2 credits, repetitive

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, 2 credits, repetitive

BEE 693 Seminar on Population and Community Ecology

Student seminars on selected topics in population and community ecology.
Fall and spring, 2 credits, repetitive

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

Economics (ECO)

Chairperson: Warren C. Sanderson

Ward Melville Social and Behavioral Sciences Building N-605 (516) 632-7560

Graduate Program Director: Mark Montgomery

Ward Melville Social and Behavioral Sciences Building S-601 (516) 632-7530

Graduate Secretary: Mary Murray

Ward Melville Social and Behavioral Sciences Building S-601 (516) 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 internationally known Institute for Decision Sciences is housed in the department. It provides courses and a vigorous research atmosphere in game theory and its applications.

Admission

The Department of Economics admits only students who intend to complete the Ph.D. degree program. There is no M.A. program, but students are eligible to receive the M.A. degree if they have met the degree requirements listed later in this section.

Requirements for admission to the Ph.D. program, 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 Ph.D. 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

Aoki, Reiko, Assistant Professor. Ph.D., 1987, Stanford University: Industrial organization; game theory.

Aumann, Robert, Professor. Ph.D., 1955, Massachusetts Institute of Technology: Game theory; mathematical economics.

Cassou, Steven, Assistant Professor. Ph.D., 1989, University of Minnesota: Macroeconomics; monetary economics.

Dawes, William, Lecturer. Ph.D., 1972, Purdue University: Econometrics; economic history.

Dubey, Pradeep, Professor. Ph.D., 1975, Cornell University: Game theory; mathematical economics.

Hause, John C., Professor. Ph.D., 1962, University of Chicago: Industrial organization; microeconomics; econometrics.

Hillas, John, Assistant Professor. Ph.D., 1987, Stanford University: Game theory; microeconomic theory.

Hool, R. Bryce, Professor. Ph.D., 1974, University of California, Berkeley: Macro theory; general equilibrium theory.

Hurd, Michael D., Professor. Ph.D., 1972, University of California, Berkeley: Labor economics; econometrics.

Kamihigashi, Takashi, Assistant Professor. Ph.D., 1994, University of Wisconsin at Madison: Economic theory; macroeconomics; international economics.

Mitnik, Stefan, Associate Professor. Ph.D., 1987, Washington University: Econometrics; macroeconomics.

Montgomery, Mark, Associate Professor and Graduate Program Director. Ph.D., 1982, University of Michigan: Economic demography; development economics; econometrics.

Muench, Thomas J., Professor. Ph.D., 1965, Purdue University: Mathematical economics; econometrics; urban economics.

Neuberger, Egon, Professor. Ph.D., 1958, Harvard University: Comparative systems; Soviet and East European economics.

Neyman, Abraham, Professor. Ph.D., 1977, Hebrew University, Jerusalem: Game theory; mathematical economics.

Sanderson, Warren C., Professor and Chairperson. Ph.D., 1974, Stanford University: Economic demography; economic history; labor economics.

Tauman, Yair, Professor. Ph.D., 1978, Hebrew University, Jerusalem: Industrial organization; game theory.

Zschock, Dieter K., Professor. Ph.D., 1967, Tufts University: Economic development; labor economics.

Zweig, Michael, Professor. Ph.D., 1967, University of Michigan: Political economy; labor economics.

Number of teaching, graduate, and research assistants, fall 1995: 30

Degree Requirements

Requirements for the M.A.

Degree in Economics

The department does not admit students who seek only a master's degree, but it is possible to earn the M.A. degree on the basis of performance in the Ph.D. program.

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 598 or ECO 698) with an average grade of B or higher.

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 (1) the inclusion of up to two elective courses taken in another program, and/or (2) a waiver of part of the 15-course requirement in the case of 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 and macroeconomics 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. An econometrics requirement is to be satisfied by grades of B or higher in the core econometrics courses.

2. Elective Courses and Fields of Specialization

In addition to core courses, normally at least seven 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 grades 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 advanced micro theory, game theory, advanced macroeconomics, advanced econometrics, economic demography, international economics, 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. While there is some choice among workshops with respect to the subject areas covered, all are primarily concerned with the common methodological elements of research in economics.

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.

Economics

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.

Corequisite: ECO 520
Fall, 3 credits

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

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

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.

Corequisite: ECO 500
Fall, 3 credits

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
Corequisite: ECO 501
Spring, 3 credits

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

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

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

ECO 527 Operations Research I

Offered concurrently with AMS 530. Elementary maxima and minima problems and the Lagrange multiplier. Linear programming including the complex technique. The transportation problem. Queuing problems under different assumptions on input, service mechanism, and queue discipline. Dynamic programming. Basic ideas of inventory theory.

3 credits

ECO 528 Operations Research II

Offered concurrently with AMS 538. Nonlinear programming and programming under uncertainty. Introduction to statistical decision theory and game theory. Monte Carlo techniques. Applications such as inventory theory or traffic theory according to the interest of the class.

Prerequisite: ECO 527
3 credits

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

ECO 598 Economic Fundamentals

Directed work for individuals or groups on topics in which students are inadequately prepared at time of admission to the program. Typical focus is mathematical methods, as background for ECO 590. Course credits may not be counted toward degree requirements.

Variable and repetitive credit

ECO 599 Research in Special Topics

Variable and repetitive credit

ECO 600 Advanced Microeconomic Theory I

Topics in mathematical economic theory, including general equilibrium and welfare theory, stability theory, economic dynamics, game theory, imperfect information, allocation and incentive mechanisms. Mathematical concepts developed as needed.

Prerequisite: ECO 501

Corequisite: MAT 550 or MAT 321
3 credits

ECO 601 Advanced Microeconomic Theory II

Continuation of ECO 600.

3 credits

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 non-transferable utility games; Nash bargaining solution, two-sided markets, Crosslisted with AMS 552.

Fall, 3 credits

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

ECO 607 Production and Technology

Economic aspects of research, development, and technological change. Survey of historical and econometric literature and their relation to economic theory.

Prerequisite: ECO 501

Spring, 3 credits

ECO 608 Development of Economic Analysis

Detailed analytical study of the origin and development of the major schools and theoretical problems and approaches of economics. The physiocratic, classical, Marxist, and neoclassical economists and theories are studied, with emphasis on primary source material.

3 credits

ECO 609 Studies in Economic Theory

Prerequisite: ECO 501

3 credits, repetitive

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

ECO 611 Advanced Macroeconomic Theory II

A continuation of ECO 610.
Prerequisite: ECO 610
 3 credits

ECO 613 Business Cycles, Stabilization Policies, and Forecasting

Analysis of modern theories of the business cycle and the use of alternative stabilization policies. Emphasis will be on the selection of optimal policies and the role of forecasting in the implementation of policy.
Prerequisites: ECO 501, ECO 511
 3 credits

ECO 619 Studies in Macroeconomics

Prerequisites: ECO 501, ECO 511
 3 credits

ECO 620 Advanced Econometrics I

Foundations of econometric theory, emphasizing the problems of model formation, identification, estimation, hypothesis testing, and model evaluation. Topics are selected from the following areas: general linear models, nonlinear models, multivariate analysis, time series analysis, simultaneous equations systems.
Prerequisite: ECO 521 or permission of instructor
 3 credits

ECO 621 Advanced Econometrics II

A continuation of ECO 620.
 3 credits

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

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

ECO 629 Studies in Quantitative Methods

Prerequisite: ECO 521
 3 credits

ECO 630 Welfare Foundations of Public Sector Economics

This is a one-semester course designed to explore the micro basis of public sector economics. Emphasis is placed on the contrast between optimization in the private and public sectors, externalities, "second best" social optima, "public" goods, collective choice,

public investment criteria, and optimal pricing in the public sector.

Prerequisite: ECO 501
 3 credits

ECO 631 Seminar in Public Sector Economics

Analytical and econometric approach to selected issues in public sector economics drawn from the areas of urban economics, medical economics, environmental economics, welfare economics, and public finance. This course may be taken as a continuation of ECO 630, but 630 is not a prerequisite.

Prerequisite: ECO 501
 3 credits

ECO 633 Applied Welfare Analysis

Development of selected topics in advanced welfare theory, including intertemporal resource allocation, uncertainty, preference transformation, and collective choice. Theoretical aspects of income distribution. Efficiency and equity of alternative economic systems. This course may be taken as a continuation of ECO 630, but 630 is not a prerequisite.

Prerequisite: ECO 501
 3 credits

ECO 635 Public Finance

Analytical and econometric analysis of selected topics in public finance, such as optimal taxation and income distribution; optimal taxation and resource allocation; social security, retirement, and savings behavior; shifting and incidence of corporate, property, and payroll taxes.

Prerequisite: ECO 501
 3 credits

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

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

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

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
Corequisite: ECO 521
 3 credits

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
Corequisite: ECO 522
 3 credits

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

ECO 647 Selected Topics in U.S. Economic History I

This course applies advanced economic theory to issues concerning the contribution of institutional arrangements to the development of the U.S. economy from colonial times to the present. Among the topics studied are implications of the demise of the Second National Bank of the U.S., slavery and economic development, efficiency and equity of the National Banking System, economic institutions and business cycles, and the role of the Federal Reserve System in the Great Depression.

3 credits

ECO 648 Selected Topics in U.S. Economic History II

This course applies advanced economic theory to issues related to the growth of the U.S. economy from colonial times to the present. Among the issues studied are the character of modern economic growth in America, savings and growth, technical change, the interaction between growth and U.S. international economic relations, and the relation between population and economic growth.

3 credits

Economics

ECO 650 International Trade

A modern and thorough presentation of international trade theory including the classical theory (Ricardo), the neoclassical theory (Heckscher-Ohlin-Samuelson) and extensions, welfare aspects, trade and growth, the theory of tariffs and applications.

Prerequisite: ECO 501
3 credits

ECO 651 International Finance

Theories of balance of payments adjustment and exchange rate determination, including monetarist, Keynesian, and elasticity theories; disequilibrium macro models; policy analysis; international liquidity; and capital flows.

Prerequisites: ECO 501, ECO 511
3 credits

ECO 652 International Trade Policy

A modern analysis of trade under perfect and imperfect competition. Efficiency of tariffs and quotas is studied. The theory of endogenous protection is developed. Theoretical and empirical strategic trade policy is also studied.

3 credits

ECO 654 Foundations of Urban Economics

Analysis of the nature and functioning of urban areas. The theoretical foundations of urban economics are developed: theories of the consumer and housing producer in economic space, land rent and use, urban structure, and the size distribution and growth of urban areas. Emphasis is placed on methodology and hypotheses generated by the theories.

Prerequisite: ECO 501
3 credits

ECO 655 Problems in Urban Economics

The theories developed in ECO 654 are applied to specific urban problems such as poverty, housing, slums and urban renewal, urban transportation, financing local government, and environmental quality. Emphasis is also placed on methodology. ECO 654 is recommended although not a prerequisite.

Prerequisite: ECO 501
3 credits

ECO 660 Comparative Economic Systems

A systematic treatment of systems analysis, stressing decision making, information, and motivation. A conceptual framework is developed for analyzing market and planned market models, the model and the reality of Soviet-type centrally planned economies and the reforms in these economies, the model and reality of worker management, and measurement of the quality of system performance.

Corequisite: ECO 500
3 credits

ECO 661 Theory of Economic Systems

Introduction to the theory of social preference and choice functions. Voting systems. Informationally decentralized systems. Centralized and coercive systems. Team theory.

Corequisite: ECO 501
3 credits

ECO 662 Economic Development I

Analysis of the major issues in development and the principal theoretical contributions of economists to development problems. An effort will be made to examine the relevance of existing economic theories of development in the light of post-World War II experience, and with regard to the growth of multidisciplinary insights into widely variable institutional patterns of economic organization.

Prerequisites: ECO 501, ECO 510
3 credits

ECO 663 Economic Development II

A continuation of ECO 662, this course examines issues of development policy and plan formulation and implementation. Special attention is devoted to selected regional, national, and sectoral cases.

Prerequisite: ECO 662 or permission of instructor
3 credits

ECO 669 Studies in Economic Systems

1-6 credits

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

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

ECO 692 Research Workshop in Systems and Development

Preparation, presentation, and discussion of student and faculty research on theoretical and applied topics in the fields of comparative systems and economic development. Topics covered by student papers are usually related to students' long-term research interests.

1-6 credits

ECO 695 Research Workshops

Designed to direct students to the selection of dissertation topics. Oral and written presentation of student papers with active faculty participation. Several sections may be offered each semester in areas of broad research interest.

Prerequisites: Three semesters of coursework in the Ph.D. program
1-6 credits, repetitive

ECO 696 Dissertation Seminar

A seminar for students engaged in dissertation research. Students give presentations of their dissertation research.

1-6 credits, repetitive

ECO 698 Practicum in Teaching

1-6 credits

ECO 699 Dissertation Research

1-9 credits

Electrical Engineering (ESE)

Chairperson: Serge Luryi
Light Engineering Building 273 (516) 632-8420

Graduate Program Director: Chi-Tsong Chen
Light Engineering Building 239 (516) 632-8400/8407

Senior Staff Assistant: Maria Krause
Light Engineering Building 267 (516) 632-8400

Degrees awarded: M.S. in Electrical Engineering; Ph.D. in Electrical Engineering

The field of electrical engineering is in an extraordinary period of growth; new application areas and increased expectations are accelerating due to new technologies and decreased costs. The Electrical 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, magnetostatic waves, and VLSI. The department has laboratories devoted to research and advanced teaching in the following areas: computing, engineering design methodology, machine vision and computer graphics, microelectronics/VLSI, embedded systems design, microwave electronics, robotics, digital signal processing, and communications.

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 AT&T, Westinghouse, Intel Corporation, and Texas Instruments. With major support from the Intel Corporation, the department has established a state-of-the-art Embedded Systems Instructional Laboratory and instructional facility. A similar facility in

digital signal processing has been established with support from Texas Instruments.

The Department of Electrical 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. The department has graduate-level teaching and research laboratories in embedded systems, digital signal processing, robotics, microwave electronics, and telecommunications.

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, pattern recognition, artificial intelligence, robotics, optimal control and system theory, network theory, computer engineering, telecommunications, optical information solid-state phenomena, integrated circuits, VLSI, synthesis of logic networks, digital communications, biomedical electronics, quantum electronics, medical image processing, optical information processing, and microwave electronics. 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 engineering, the department participates in interdepartmental graduate programs in computer science, urban and policy sci-

ences, 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 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 relevant course sequence is 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 Information Science

Communications engineering has developed rapidly in recent years and this pattern is likely to continue. There have been important major advances in systems and techniques for computer networking, mobile communications, efficient modulation and coding, multisensor data fusion, satellite communications, and optical communications using

Electrical Engineering

fibers or unguided laser beams. Particular areas of emphasis in current research and instruction include digitized voice and speech processing, data transmission and computer communication networks, mobile radio and personal communication systems, satellite channels and communications traffic, digital signal processing, 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 533, ESE 535, ESE 544, ESE 546, ESE 547, ESE 550, ESE 552, 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 pattern recognition, and on both theoretical and practical problems associated with design and development. The department has a large number of powerful computers. The departments of Electrical 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 microwave devices. Important areas of research include high-power millimeter wave Gunn oscillators and the emerging microwave analog signal processing technology employing magnetostatic waves in thin films. 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 560-561, and ESE 610.

Biomedical Engineering

The 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, design of artificial organs, 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, design of prosthetic and orthotic devices, 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 Engineering operates six laboratories for both teaching and research:

1. *The Advanced IC Design and Simulation Laboratory* is equipped with a SUN SPARC station 2 and assorted electronic measurement equipment.

2. *The Computing Laboratory* is the general departmental computing facility equipped with a network of SUN workstations and servers and several other terminals and PCs. Most of these computers are connected by Ethernet and include a full complement of peripherals.

3. *The Computer-Aided Design Laboratory* provides a network of 386 based workstations. Advanced computer-aided design software for analog and digital systems design is available on these workstations.

4. *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.

5. *The Embedded Systems Instructional Laboratory* has excellent equipment for teaching and research in microprocessor-based systems. Equipment includes state-of-the-art development systems, in-circuit emulators, and logic analyzers.

6. *The Medical Image Processing Laboratory* is well equipped for research in medical image reconstruction and analysis. The lab is equipped with a DEC-Alpha 600, Sun Sparc 20, Sun Sparc 10, HP730, Sun Sparc 2, and numerous smaller machines. Access to scanners in the Radiology Department is available. Current projects focus on estimation theoretic approaches to image reconstruction.

7. *The Microwave Electronics Laboratory* is equipped for experimental work in the fabrication and testing of microwave components utilizing microstrip and stripline techniques. It includes low-temperature and electromagnet facilities, vacuum deposit equipment, photolithographic facilities, microwave equipment, a full range of microwave circuit components, and a microwave network analyzer system. The laboratory is presently active in research in the area of magnetostatic waves in epitaxial films of yttrium iron garnet (YIG) and their application to microwave signal processing devices.

8. *The Optical Signal Processing and Fiber Optic Sensors Laboratory* is equipped to perform research in the broad area of optoelectronics. Some of the current research projects include development of fiber-optic systems for real time process control in adverse environments, integrated fiber optics, fiber-optic sensors, and coherent optical processing.

Admission

For admission to graduate study in the Department of Electrical 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 Engineering and the Graduate School.

Faculty

Carlson, Bradley, Assistant Professor. Ph.D., 1991, Syracuse University: VLSI circuit design.

Chang, Sheldon S.L., Leading Professor Emeritus. Ph.D., 1947, Purdue University: Optimal control; energy conservation; information theory; economic theory.

Chen, Chi-Tsong, Professor and Graduate Program Director. Ph.D., 1966, University of California, Berkeley; CA systems and control theory.

Dhadwal, Harbans, Associate Professor. Ph.D., 1980, University of London, England: Laser light scattering; fiber optics; signal processing and instrumentation.

Djuric, Petar, Assistant Professor. Ph.D., 1990, University of Rhode Island: Signal processing and signal analysis.

Driscoll, Timothy J., Adjunct Associate Professor.¹ M.S., 1970, Polytechnic Institute of Brooklyn: Electrical power and distribution systems.

Gindi, Gene, Associate Professor. Ph.D., 1981, University of Arizona: Neural network modeling; medical image processing.

Gorfinkel, Vera, Associate Professor. Ph.D., 1980, A.F. Ioffe Physical-Technical Institute, St. Petersburg, Russia: Semiconductor devices, including microwave and optoelectronics.

Green, Michael, Assistant Professor. Ph.D., 1991, University of California, Los Angeles: Nonlinear circuit theory; computer-aided design; analog integrated circuits.

Kamoua, Ridha, Assistant Professor. Ph.D., 1992, University of Michigan: Solid-state devices and circuits; microwave devices and integrated circuits.

Luryi, Serge, Leading Professor and Chairperson. Ph.D., 1978, University of Toronto, Canada: Solid-state electronic devices.

Marburger, John H., University Professor and former President of the University at Stony Brook.² Ph.D., 1967, Stanford University: Theoretical laser physics.

Marsocci, Velio A., Distinguished Service Professor.³ Eng.Sc.D., 1964, New York University: Solid-state electronics; integrated electronics; biomedical engineering.

Murray, John, Associate Professor. Ph.D., 1974, University of Notre Dame: Signal processing; systems theory.

Parekh, Jayant P., Professor. Ph.D., 1971, Polytechnic Institute of Brooklyn: Microwave acoustics; microwave magnetics; microwave electronics; microcomputer applications.

Pavlidis, Theodosis, Professor.⁵ Ph.D., 1964, University of California, Berkeley: Machine vision pattern recognition; computer graphics; robotics.

Phamdo, Nam, Assistant Professor. Ph.D., 1993, University of Maryland at College Park: Digital communications; data compression and coding; speech processing.

Rappaport, Stephen S., Leading Professor. Ph.D., 1965, New York University: Communication theory; systems.

Robertazzi, Thomas G., Associate Professor. Ph.D., 1981, Princeton University: Computer communications; performance evaluation; parallel processing.

Shamash, Yacov., Professor and Dean of the College of Engineering and Applied Sciences. Ph.D., 1973, Imperial College of Science and Technology, England: Control system and robotics.

Short, Kenneth L., Professor.⁴ Ph.D., 1973, State University of New York at Stony Brook: Digital system design; microprocessors; instrumentation.

Smith, David R., Professor.⁵ Ph.D., 1961, University of Wisconsin: Logic design; computer architecture.

Subbarao, Murali, Associate Professor. Ph.D., 1986, University of Maryland: Machine vision; image processing; pattern recognition.

Sussman-Fort, Stephen E., Associate Professor. Ph.D., 1978, University of California, Los Angeles: VLSI; computer-aided circuit design; microwave circuits; active and passive filters; classical network theory.

Swartz, Jerome, Adjunct Professor.⁶ Ph.D., 1968, Polytechnic Institute of New York: Signal processing and laser technology.

Tang, K. Wendy, Assistant Professor. Ph.D., 1991, Rochester University: Parallel and distributed processing; massively parallel systems; computer architecture.

Truxal, John G., Distinguished Teaching Professor Emeritus.⁷ Sc.D., 1950, Massachusetts Institute of Technology: Control and systems engineering; science education.

Tuan, Hang-Sheng, Professor. Ph.D., 1965, Harvard University: Electromagnetic theory; integrated optics; microwave acoustics.

Zemanian, Armen H., Leading Professor. Eng.Sc.D., 1953, New York University: Network theory; computational methods; VLSI modeling.

Number of teaching, graduate, and research assistants, fall 1994: 21

¹ Long Island Lighting Company

² Joint appointment, Department of Physics

³ Clinical Professor of Health Science

⁴ Recipient of State University Chancellor's Award for Excellence in Teaching, 1985

⁵ Joint appointment, Department of Computer Science

⁶ Symbol Technologies

⁷ 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 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 Engineering. At least three of these five regular courses must be selected from the following five choices: (a) ESE 502, (b) ESE 503, (c) ESE 511, (d) ESE 520, and (e) either ESE 545, ESE 551, or ESE 580.

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 regular courses must be in the Department of Electrical Engineering. At least three of these four regular courses must be selected from the following five choices:

Electrical Engineering

(a) ESE 502, (b) ESE 503, (c) ESE 511, (d) ESE 520, and (e) either ESE 545, ESE 551, or ESE 580.

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 Engineering 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, in total, for all graduate degrees awarded by the Department of Electrical 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 compatible 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 hours 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

ESE 502 Linear Systems

Mathematical descriptions and correspondences between continuous-time and discrete-time linear systems. State variable and input-output formulation and the use of Laplace and z-transforms in analysis. Controllability, observability, minimal realization, and structural canonical forms. Assignment of system nodes, Rx state variable feedback, and the design of observers. Stability criteria and the Routh-Hurwitz test for asymptotic stability.

Fall, 3 credits

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

ESE 504 Performance Evaluation of Communications and Computer Systems

Traffic congestion, queuing, and delay in communication and computer systems. Important channel and queuing models. Message and circuit switching. Protocol analysis. Multiple access techniques. Blocking. Time-shared and multiprocessor computer models. Numerical algorithms: mean value analysis, convolution algorithm.

Prerequisite: ESE 503 or permission of instructor

Spring, 3 credits

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 cellular. 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

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

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

ESE 512 Bipolar Junction and Heterojunction Electronic Devices

A study of fundamental properties of homo-junction 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

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

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; Bloch equations—Kramers-Kronig relation, density matrix; rate equation and amplification; CO₂ lasers; discharge lasers; semiconductor lasers.
Fall, 3 credits

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

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

ESE 520 Electronics II—Fundamentals of Electromagnetics

Electro- and magnetostatics; Maxwell's equations; vector and scalar potentials; vector and tensor transformation properties. Lorentz transformation; derivation of Maxwell's equations from Coulomb's law and Lorentz transformation. Boundary value problems; Green's function, guided waves, traveling wave, and charged particle interactions. Radiation.
Spring, 3 credits

ESE 521 Applied Electromagnetic Theory

Advanced boundary value problems in electromagnetic and microacoustic wave propagation, guided wave, and radiation. Topics include variation and perturbation methods applied to cavity, waveguide discontinuity radiation from waveguide aperture and equivalent source theorem, mode theory of guided wave around the earth, microwave acoustic waveguide transducers.
Fall, 3 credits

ESE 522 Lightwave Communications

This course covers the essential components of a modern optical fiber communication system. Following a brief review of optical sources and characterization of optical fiber waveguides the remainder of the course examines the incoherent optical system currently in use. A complete analysis of optical receivers, modulation techniques, and optical receiver design is tackled. Finally, future coherent optical systems are examined.
Prerequisite: ESE 319
Fall, 3 credits

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

ESE 524 Microwave Acoustics

Continuum acoustic field equations. Wave equation, boundary conditions, and Poynting 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

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

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

ESE 529 Electrical Network Theory

Paradoxes and conundrums: infinite networks viewed classically. Infinite-power regimes. Finite-power regimes. Existence and uniqueness via contraction mappings, fixed-point theorems, and modular sequence spaces. Connections at infinity and transfinite networks. Infinite grids. Operator networks. Exterior problems and computational techniques. Application to VLSI design, geophysical exploration, electromagnetic and acoustic waves, random walks on infinite graphs, and infinite Markov chains.
Spring, 3 credits

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

Electrical Engineering

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

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

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

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

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

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

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, multi-rate 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

ESE 558 Digital Image Processing I

The material in this offering will constitute a first course introduction to the field of digital image processing. Image generation, electro-optical sensor characteristics, vision, and color perception/matching will be discussed with respect to image processing requirements followed by image sampling techniques, 2-D Nyquist theorem, aliasing effects, and scalar/vector quantization techniques. Linear image processing techniques will be treated from finite and infinite dimensional vector space approaches and will include Fourier, Haar, singular-value decomposition, Karhunen-Loeve transforms and their fast counterparts. Application of these techniques to image enhancement/restoration will follow and will include histogram equalization, deblurring, Weiner filtering, and pseudo-inverse restoration.

Prerequisites: Linear systems, probability theory

Fall, 3 credits

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. Super 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

ESE 560 Optical Information Processing I

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: Bachelor's degree in physical sciences

Spring, 3 credits

ESE 561 Optical Information Processing II

This course builds upon the fundamental concepts of optical information processing developed in ESE 560. The course begins with a discussion on the key devices that make real time processing and computing with optical signals possible. The discussion on spatial light modulators and detectors is followed by analysis of several hybrid-optical signal processors, photorefractive crystal signal processing, digital optical computing and optical neural networks.

Prerequisite: ESE 560

Fall, 3 credits

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

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

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

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

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

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

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

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

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

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

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

ESE 599 Research

Fall, spring, variable and repetitive credit, grading S, U

ESE 610 Seminar in Solid-State Electronics

Current research in solid-state devices and circuits and computer-aided network design.

Fall, spring, 3 credits

ESE 630 Seminar in Communication Theory

Fall, spring, 3 credits

ESE 640 Seminar in Systems Theory

Recent and current research work in systems theory.

Fall, spring, 3 credits

ESE 650 Advanced Topics in Digital Systems

Topics of special interest in the area of digital systems.

Fall, spring, 3 credits

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

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

ESE 691 Seminar in Electrical Engineering

This course is designed to expose students to the broadest possible range of the current activities in electrical engineering. Speakers from both on and off campus discuss topics of current interest in electrical engineering.

Fall, spring, 1 credit, repetitive, grading S, U

ESE 698 Practicum in Teaching

Fall, spring, variable and repetitive credit, grading S, U

ESE 699 Dissertation Research

Fall, spring, variable and repetitive credit, grading S, U

English (EGL)

Chairperson: Paul Dolan
Humanities Building 225 (516) 632-7420

Graduate Program Director: Joaquin Martinez-Pizarro
Humanities Building 194 (516) 632-7373

Graduate Secretary: Carol DeMangin
Humanities Building 194 (516) 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. Within the last six years faculty members have published more than 47 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 can pursue one of two courses of study. The first, 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. The second, devoted largely to creative writing workshops and culminating in a creative writing project, enables students to develop skills and experiment with styles. Both courses of study lead to the Master of Arts degree and require 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 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.

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. Mid-year admission to the Ph.D. program is not encouraged.

About the Graduate Record Examination

All applicants to the State University of New York at Stony Brook are required to take the *general aptitude portion* of the Graduate Record Examination. 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. Samples of the applicant's creative work (in the case of those applying for entrance to the Graduate Program in 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

Appelt, Ursula, Assistant Professor. Ph.D., 1994, University of Virginia: Renaissance literature; women in the early modern period; theories of history; literature of exploration.

Armstrong, Paul, Professor and 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.

Bashford, Bruce, Assistant Professor. 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, Associate Professor. Ph.D., 1982, New York University: The teaching of composition and literature; rhetoric; Old English.

Brennan, Timothy, Assistant Professor. Ph.D., 1987, Columbia University: Postcolonial literature and theory; World English (Central America and the Caribbean); cultures of modern Britain; cultural studies; intersections of gender and race; 20th-century literature.

Cooper, Helen, Associate Professor. Ph.D., 1982, Rutgers University: 19th-century British literature; feminist theory and women's studies; postcolonial theory and literatures in English from Africa, India, and the Caribbean; creative writing.

Dolan, Paul, Associate Professor and Chairperson. Ph.D., 1966, New York University: Modern British and American literature; Yeats; literature and politics.

Eady, Cornelius, Associate Professor and Director of Poetry Center: Poetry; creative writing; contemporary American poetry; Dickinson; Whitman; Black American poetry.

Fortuna, Diane, Associate Professor. Ph.D., 1967, The Johns Hopkins University: 20th-century British and American literature; 19th-century American literature.

Haralson, Eric, Assistant Professor. Ph.D., 1993, Columbia University: 19th and 20th century British and American literatures; men's studies; Henry James.

Harvey, James, Associate Professor Emeritus. A.M., 1953, University of Michigan: Film; the novel; drama; creative writing; journalism.

Henigman, Laura, Assistant Professor. Ph.D., 1991, Columbia University: Early American literature and culture; American studies; 19th-century American literature; literature and religion; women's studies.

Huffman, Clifford C., Professor. Ph.D., 1969, Columbia University: The Renaissance; Shakespeare.

Hutner, Heidi, Assistant Professor. Ph.D., 1993, University of Washington: Restoration and 18th century studies; feminist theory; colonial and postcolonial discourse; women writers.

Kaplan, E. Ann, Professor. 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, Professor and President of the University. Ph.D., 1964, University of Chicago: Restoration and 18th-century British drama.

Kranidas, Thomas, Professor. Ph.D., 1962, University of Washington: Milton; prose and poetry of the 17th century; the epic tradition; rhetoric and revolution.

Levin, Richard L., Professor Emeritus. Ph.S., 1957, University of Chicago: Renaissance drama; literary criticism.

Levine, Richard A., Professor. Ph.D., 1961, Indiana University: Victorian literature and 19th-century British culture; the novel; literature and society; fiction writing.

Livingston, Ira, Assistant Professor. Ph.D., 1990, Stanford University: Romanticism; literary and interdisciplinary theory; poststructuralism; cultural physics and poetics; literature and science.

Maresca, Thomas E., Professor. Ph.D., 1963, The Johns Hopkins University: Renaissance; Restoration and 18th century; critical theory; genre studies (satire, novel, epic, allegory).

Martinez-Pizarro, Joaquin, Professor and Graduate Program Director. Ph.D., 1976, Harvard University: Literary history of the Middle Ages; classical and medieval backgrounds; comparative studies.

Munich, Adrienne, Associate Professor. Ph.D., 1976, City University of New York: Victorian literature, art, and culture; feminist theory and women's studies.

Nelson, Gerald B., Associate Professor. Ph.D., 1969, Columbia University: American studies; 19th- and 20th-century American literature; contemporary experimental literature.

English

Olster, Stacey, Associate Professor.^{2,3} Ph.D., 1981, University of Michigan: American studies; 20th-century literature; Asian literature; literature in relation to history and politics; popular culture; Pynchon.

Pequigney, Joseph, Professor Emeritus. Ph.D., 1959, Harvard University: 17th-century literature; Shakespeare; Milton.

Robertson, Alice, Assistant Professor. Ph.D., 1988, Arizona State University: Composition theory and practice; American literature; Southern fiction; Faulkner; O'Connor; teaching practicum.

Rogers, Thomas, Associate Professor Emeritus. Ph.D., 1955, University of Pennsylvania: The Restoration and the 18th century; rhetoric; the teaching of composition and literature.

Scheps, Walter, Associate Professor.⁴ Ph.D., 1966, University of Oregon: Chaucer; English and Continental medieval literature; Middle English language; 15th-century English and Scottish literature; Old English language and literature; history and structure of English; English linguistics; narrative theory.

Sears, Sallie, Professor Emerita. Ph.D., 1963, Brandeis University; Modern British, American, and European poetry and prose; literature in relation to other disciplines; fiction from Flaubert to the present; theories of fiction; literature and the Holocaust; women and literature; Henry James.

Sheehan, David, Associate Professor. Ph.D., 1974, University of Wisconsin-Madison: Late 17th- and 18th-century British literature; contemporary Native American literature.

Siskin, Clifford, Associate Professor. Ph.D., 1978, University of Virginia: Romanticism; 18th-century British literature; literary theory and history; interdisciplinary and cultural studies.

Spector, Stephen, Professor. 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.

Stampfer, Judah, Professor Emeritus. Ph.D., 1959, Harvard University: The Renaissance and the 17th century; Shakespeare; literature and psychology.

Number of teaching, graduate, and research assistants, fall 1995: 50

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 President's Award for Excellence in Teaching, 1987.

³ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1988.

⁴ Joint appointment, Comparative Literature

Degree Requirements

Requirements for the M.A.

Degree in English

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 be distributed among 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 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, and Spanish. 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.

Requirements for the M.A. Degree, Graduate Program in Creative Writing

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

A. Course Requirements

Those admitted to the Graduate Program in Creative Writing must take three literature courses and four workshops. Each candidate must take workshops in at least two genres.

B. Master's Project

Students in the Graduate Program in Creative Writing are required to submit an extended work of substantial literary merit to be determined by the student's advisor and the creative writing area committee. One distinction of this curriculum is that the candidate begins the project under close supervision in the first rather than the second year. Students register for a total of nine credits toward completion of this project.

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 English

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, 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 non-canonical 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.

English

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 oral examination 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 to be no more than 12.

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 (including Graduate Programs in Comparative Literature and Creative Writing)

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.

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 and Comparative Literature departments.**

Advisement

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

All courses are for three credits, except where noted with an asterisk. Content varies each semester.

EGL 501	Studies in Chaucer	EGL 593	Problems in Teaching Literature
EGL 502	Studies in Shakespeare	EGL 594	Contexts of Literary Study
EGL 503	Studies in Milton	EGL 597*	Practicum in Methods of Research
EGL 505	Studies in Genre	EGL 599	Independent Study
EGL 506	Studies in Literary Theory	EGL 600	Proseminar: The Discipline of Literary Studies
EGL 509	Studies in Language and Linguistics	EGL 601	Problems in History and Structure of the English Language
EGL 510	Old English Language and Literature	EGL 602	Problems in Bibliography, Editing, and Textual Criticism
EGL 515	Middle English Language and Literature	EGL 603	Problems in Literary Theory and Criticism
EGL 520	Studies in the Renaissance	EGL 604	Problems in Literary Analysis
EGL 525	17th-Century Literature	EGL 605	Problems in Convention and Genre
EGL 530	Studies in the Age of Dryden	EGL 606	Period and Tradition
EGL 535	Studies in Neoclassicism	EGL 607	Individual Authors
EGL 540	Studies in Romanticism	EGL 608	Problems in the Relationship of Literature to Other Disciplines
EGL 545	Studies in Victorian Literature	EGL 611	Critical Theory
EGL 547	Late 19th-Century British Literature	EGL 612	Theories in Composition
EGL 550	20th-Century British Literature	EGL 613	Research in Composition
EGL 555	Studies in Irish Literature	EGL 614	Topics in Composition and Writing
EGL 560	Studies in Early American Literature	EGL 690*	Dissertation Research
EGL 565	19th-Century American Literature	EGL 695	Methods of Teaching English
EGL 570	20th-Century American Literature	EGL 697	Practicum in Teaching English Literature
EGL 575	British and American Literature	EGL 698	Teaching Practicum
EGL 580	Poetry Workshop	EGL 699*	Directed Reading
EGL 581	Fiction Workshop		
EGL 582	Drama Workshop		
EGL 583	Nonfiction Workshop		
EGL 585	Creative Writing Project		
EGL 592	Problems in Teaching Writing or Composition		

**Variable and repetitive credit*

French and Italian

(FRN, ITL, DLF, DLI, DLL)

Chairperson: Mario Mignone
Frank Melville, Jr., Memorial Library N4005 (516) 632-7440

Graduate Program Director: Robert Harvey
Frank Melville, Jr., Memorial Library N4020 (516) 632-7440

Secretary: Debbie DeBellis
Frank Melville, Jr., Memorial Library N4005 (516) 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 SPD 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 foreign 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.

Foreign 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 Record Examination (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

Allentuch, Harriet, Professor.² Ph.D., 1962, Columbia University: 17th-century French literature.

Blum, Carol, Research Professor of Humanities. Ph.D., 1966, Columbia University: 18th-century French literature; literature of the French Revolution.

Brown, Frederick, Professor. Ph.D., 1960, Yale University: 19th- and 20th-century French literature.

Fedi, Andrea, Assistant Professor. Dottore in Lettere e Filosofia, 1989, University of Florence, Italy; Ph.D., 1994, University of Toronto, Canada: Italian Renaissance literature; historiography; computer-assisted research.

Fontanella, Luigi, Associate Professor. Ph.D., 1981, Harvard University: Modern Italian literature.

Forti-Lewis, Angelica, Professor Emerita. Ph.D., 1984, University of Pennsylvania: 18th-century Italian literature; history of genres; comparative literature; film.

Franco, Charles, Associate Professor. Ph.D., 1977, Rutgers University: Medieval Italian literature.

Haddad, Gabriel, Assistant Professor. Ph.D., 1994, Columbia University: Medieval/Renaissance studies.

Harvey, Robert, Associate Professor and Graduate Program Director.⁵ Ph.D., 1988, University of California, Berkeley: Contemporary French literature; critical theory; film.

Hurley, E. Anthony, Assistant Professor. Ph.D., 1992, Rutgers University: French Caribbean literature; Francophone literature.

Ledgerwood, Mickle D., Assistant Professor and Director of Language Center. Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Mignone, Mario, Professor and Chairperson.⁴ Ph.D., 1972, Rutgers University: Contemporary Italian literature.

Petrey, Sandy, Professor. Ph.D., 1966, Yale University: 19th-century French literature; critical theory; comparative literature.

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

Repetti, Lori, Associate Professor. Ph.D., 1989, University of California, Los Angeles: Italian and Romance linguistics; medieval literature.

Rizzuto, Anthony, Associate Professor. Ph.D., 1966, Columbia University: 19th- and 20th-century French literature.

Tursi, Joseph A., Professor Emeritus.¹ Ph.D., 1965, New York University: Methodology.

Weinreb, Ruth Plaut, Associate Professor. Ph.D., 1966, Columbia University: Pedagogy.

Whitney, Mark, Professor. Ph.D., 1962, University of Pennsylvania: 16th-century French literature.

Zimmermann, Eléonore M., Professor.³ Ph.D., 1956, Yale University: 17th- and 19th-century French literature; comparative literature.

Number of teaching, graduate, and research assistants, fall 1995: 12

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 Alumni Association Outstanding Professor Award, 1991

⁴ Recipient of the New York State/United University Professions Excellence Award, 1991

⁵ Recipient of the President's Award for Excellence in Teaching, 1996. Recipient of the Chancellor's Award for Excellence in Teaching, 1996

French and Italian

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

	<u>Credits</u>
1. FRN 507 Stylistics (Syntax and Composition)	3
2. FRN 508 <i>Explication de Texte</i>	3
3. Six courses in French literature	18
4. Two electives; FRN 501 and FRN 502 are highly recommended	6
Total	<u>30</u>

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

	<u>Credits</u>
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	<u>30</u>

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

	<u>Credits</u>
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	<u>30</u>

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*

- FRN 501 or FRN 502
- FRN 507 Stylistics (Syntax and Composition)
- FRN 508 *Explication de Texte*
- At least 15 credits in French literature

Minor in Italian**

- ITL 501 Modern Culture
- ITL 508 Syntax and Composition
- Two Italian literature courses to be chosen with permission of advisor

Major in Italian*

- ITL 501 Modern Culture
- ITL 508 Syntax and Composition
- 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
- At least 15 credits in Italian literature

Minor in French**

- FRN 507 Stylistics (Syntax and Composition)
- One of the following:
FRN 501 Contemporary Culture and Civilization
FRN 502 French Civilization in Its Historical Perspective
FRN 508 *Explication de Texte*
- 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.

*Total of 24 major credits

**Total of 12 minor credits

Total credits required: 36

• 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

French and Italian

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:

	<u>Credits</u>
Field of Specialization	
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	<u>24</u>
Pedagogy	
Second Language Acquisition	3
Methods of Foreign Language Teaching	3
Practicum	3
Internship or Externship	3
Total	<u>12</u>

Individual consultation with the major advisor and the program director may result in a requirement to take additional courses.

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

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

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

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

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

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

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

FRN 514 Seminar in Medieval French Literature

This course may be repeated for credit when topic changes. Topic and credits to be arranged.

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

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

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

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 Laclous, other types of writing, such as Bayle's dictionary and the *Encyclopédie*, are examined.

Fall or spring, 3 credits

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'Épinay, Olympe de Gouges, and other revolutionaries such as Mirabeau, Saint-Just, Condorcet, and Robespierre.

Fall or spring, 3 credits

FRN 551 Studies in Romanticism

Reading and research in the background and manifestation of romanticism in French literature.

Fall or spring, 3 credits

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

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

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

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

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

FRN 581 Independent Individual Studies

Fall and spring, 1-6 credits, repetitive

FRN 599 Practicum in Teaching

Fall and spring, variable and repetitive credit

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

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

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 participants. 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

French and Italian

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

ITL 508 Syntax and Composition

This course is designed to analyze and discuss the finer points of Italian grammar and to investigate diverse styles in writing. Students are expected to develop grammatical drills from elementary through advanced levels. Literary masterpieces are translated from English to Italian in order to demonstrate types of style and possible alternatives in writing.

Fall or spring, 3 credits

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

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

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

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

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

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

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

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

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

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, Compagna, and Pasolini.

Fall or spring, 3 credits

ITL 571 Italian Autobiography

A study of the development of introspection and self-awareness in Italian autobiography from Petrarch to the 20th century.

Fall or spring, 3 credits

ITL 581 Independent Individual Studies

Fall and spring, variable and repetitive credit

ITL 599 Practicum in Teaching

Fall and spring, variable and repetitive credit

D.A. Courses

The following courses are available only to candidates in the Doctor of Arts program:

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

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

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

Language Learning and Research Center Courses

DLL 570 Introduction to Media for Language Teaching

(Course open to non-DA graduate students.) Gives students an introduction to all of the technology used in teaching languages: audio, video, computer, and internet. Emphasis is on hands-on use and practical applications.

Fall or spring, 3 credits

DLL 571 Technology and Education

(Course open to non-DA 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

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

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

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

Genetics (BGE)

Graduate Program Director: *Sidney Strickland*
Basic Science Tower T8, Room 125 (516) 444-3058

Staff Assistant: *Pam Apostle*
Life Sciences Building 280 (516) 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. All trainees take core courses in biochemistry, cell biology, and genetics in their first year. Incoming trainees will also take part in laboratory rotations in which the student will rotate into a total of four different laboratories where he or she will have the opportunity to gain hands-on knowledge of the methods and approaches taken by each laboratory. Each trainee will have a faculty advising committee that will aid in tailoring a set of specialty courses, from offerings both within and outside the program, to meet the student's particular needs. Seminars involving both internal speakers and outside visitors will ensure that the predoctoral students continually are exposed to the full range of interests represented in the Graduate Program.

Facilities

The training facilities are the University at Stony Brook, Cold Spring Harbor Laboratory, and Brookhaven National Laboratory. At Stony Brook the faculty is drawn from the departments of the College of Arts and Sciences and departments of the University Medical Center. The three Arts and Sciences biological sciences departments as well as the Department of Molecular Genetics and Microbiology from the University Medical Center are housed in the Life Sciences Building, which has excellent facilities and equipment. The other University Medical Center departments are situated directly across the road in the medical center. This ultra-modern structure contains the very latest equipment and facilities available. Cold Spring Harbor Laboratory provides a modern research facility and a unique environment for the trainees. Brookhaven National Laboratory provides an environment in which predoctoral trainees may carry out research in conjunction with program faculty.

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 level of support for the 1995-1996 academic year was \$14,500 plus full tuition scholarship. Health insurance is provided for all students.

Faculty

Andersen, Janet L., Assistant Professor.⁹ Ph.D., 1989, State University of New York at Stony Brook: Human leiomyomas; estrogen/progesterone regulation.

Anderson, Carl W., Geneticist.⁶ Ph.D., 1970, Washington University: Protein synthesis; molecular biology of transformation and productive infection by DNA tumor viruses.

Arndt, Kim A., Senior Staff Investigator.⁷ Ph.D., 1981, University of Pennsylvania: Protein phosphatases and regulation of transcription in yeast.

Bahou, Wadie, Assistant Professor.⁵ M.D., 1980, University of Massachusetts at Amherst: Gene therapy.

Beach, David H., Senior Scientist.⁷ Ph.D., 1977, University of Miami: Cell-division cycle control in fission yeast.

Bingham, Paul M., Associate Professor.² Ph.D., 1979, Harvard University: Regulation of differentiation; transposable elements.

Bliska, James B., Assistant Professor.³ Ph.D., 1987, University of California, Berkeley: Molecular and cellular basis of bacterial-host cell interactions.

Bogenhagen, Daniel F., Professor.¹⁰ M.D., 1977, Stanford University: Molecular development of oocyte development.

Genetics

- Burr, Benjamin**, Geneticist.⁶ Ph.D., 1969, University of California, Berkeley: Maize controlling elements; molecular cloning; storage protein genes of maize.
- Burr, Frances A.**, Botanist.⁶ Ph.D., 1968, University of California, Berkeley: Maize controlling elements; molecular cloning; storage protein genes of maize.
- Carlson, Elof A.**, Distinguished Teaching Professor.²⁸ Ph.D., 1958, Indiana University: Mutational mosaicism in human disorders; retinoblastoma; Apert's syndrome; achondroplasia; Marfan's syndrome.
- Carter, Carol**, Professor.³ Ph.D., 1972, Yale University: HIV replication and protein assembly.
- Cheng, Xiadong**, Senior Staff Investigator.⁷ Ph.D., State University of New York at Stony Brook: Protein crystallography.
- Citovsky, Vitaly**, Assistant Professor.² Ph.D., 1987, Hebrew University: Intracellular communication and transport of nucleic acids in plants.
- Cline, Hollis**, Senior Staff Investigator.⁷ Ph.D., 1985, University of California, Berkeley: Molecular control of neuronal plasticity.
- Dean, Neta**, Assistant Professor.² Ph.D., 1989, University of California, Los Angeles: Analysis of protein sorting in yeast.
- Delahas, Nicholas**, Professor.³ Ph.D., 1961, Yale University: Regulation of gene expression by small RNAs; mechanisms of RNA-protein recognition; structure and function of small RNAs.
- Dunn, John J.**, Senior Microbiologist.⁶ Ph.D., 1970, Rutgers-The State University: Synthesis, processing, and translation of mRNA.
- Dykhuisen, Daniel E.**, Professor.⁴ Ph.D., 1970, University of Chicago: Molecular evolution; population genetics; bacterial population biology.
- Eanes, Walter F.**, Professor.⁴ Ph.D., 1976, State University of New York at Stony Brook: Genetic variations in natural populations.
- Engbrecht, JoAnne**, Assistant Professor.¹⁰ Ph.D., 1986, University of California, San Diego: Genetic analysis of meiosis.
- Enrietto, Paula J.**, Associate Professor.³ Ph.D., 1980, University of Colorado: The interaction of the oncogene *rel* with hematopoietic cells.
- Fisher, Paul A.**, Associate Professor.¹⁰ M.D., Ph.D., 1979, Stanford University: Structure and function of the cell nucleus; enzymology of eukaryotic DNA synthesis.
- Freimuth, Paul**, Associate Biochemist.⁶ Ph.D., 1986, Columbia University: Adenovirus reproduction.
- Frohman, Michael**, Assistant Professor.¹⁰ M.D., Ph.D., 1985, University of Pennsylvania: Early mammalian development; homeobox genes; gene misexpression and inactivation; antisense.
- Futcher, A. Bruce**, Senior Staff Investigator.⁷ Ph.D., 1981, St. Catherine's College and the Botany School, Oxford University, England: Cell division cycle in yeast.
- Galan, Jorge E.**, Associate Professor.³ Ph.D., 1986, Cornell University: Salmonella invasion into epithelial cells; molecular pathogenesis.
- Gergen, Peter**, Professor.² Ph.D., 1982, Brandeis University: Genetic control of development using the fruit fly, *Drosophila melanogaster*.
- Greider, Carol**, Senior Scientist.⁷ Ph.D., 1987, University of California, Berkeley: Telomerase mechanism and regulation.
- Grodzicker, Terri**, Senior Scientist.⁷ Ph.D., 1969, Columbia University: Animal virus genetics, nonsense mutations, and suppression; genetic analyses of viral gene functions.
- Hayman, Michael J.**, Professor.³ Ph.D., 1973, Institute for Medical Research, London, England: Mechanism of transformation by retroviral oncogenes; erythroid differentiation.
- Hearing, Janet C.**, Assistant Professor.⁵ Ph.D., 1984, State University of New York at Stony Brook: Molecular analysis of latent Epstein-Barr virus DNA replication.
- Hearing, Patrick**, Associate Professor.³ Ph.D., 1980, Northwestern University: Viral molecular genetics; eukaryotic transcriptional regulation; gene therapy.
- Helfman, David M.**, Senior Scientist.⁷ Ph.D., 1981, Emory University: Molecular basis for tissue-specific alternative RNA splicing and the role of the cytoskeleton in cellular functions.
- Hengertner, Michael**, Senior Staff Investigator.⁷ Ph.D., 1994, Massachusetts Institute of Technology: Programmed cell death in *C. elegans*.
- Hernandez, Nouria**, Senior Scientist.⁷ Ph.D., 1983, University of Heidelberg, Federal Republic of Germany: Transcription initiation and termination in small nuclear RNA genes and HIV.
- Herr, Winship**, Assistant Director, CSHL.⁷ Ph.D., 1982, Harvard University: Transcriptional control of gene expression mechanisms in mammalian cells.
- Hirano, Tatsuya**, Staff Investigator.⁷ Ph.D., 1989, Kyoto University, Japan: molecular mechanisms of mitotic chromosome assembly.
- Holdener, Bernadette**, Assistant Professor.² Ph.D., 1990, University of Illinois at Chicago: Genetic analysis of mesoderm induction in mice.
- Hollingsworth, Nancy M.**, Assistant Professor.² University of Washington: Meiotic recombination and segregation in yeast.
- Jacobson, Ann B.**, Research Associate Professor.³ Ph.D., 1962, University of Illinois at Chicago: Comparative studies on related coliphage RNAs.
- Katz, Eugene R.**, Professor.³ Ph.D., 1969, University of Cambridge, England: Genetic control of development in *Dictyostelium discoideum*.
- Kernan, Maurice**, Assistant Professor.¹ Ph.D., 1990, University of Wisconsin at Madison: Molecular basis of the mechanical senses.
- Konopka, James**, Assistant Professor.³ Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.
- Krainer, Adrian**, Senior Scientist.⁷ Ph.D., 1986, Harvard University: Mammalian mRNA splicing mechanisms and regulation.
- Lacks, Sanford**, Senior Geneticist.⁶ Ph.D., 1960, Rockefeller Institute: Molecular genetics; bacterial transformation; DNA recombination; DNA mismatch repair; deoxyribonuclease and restriction enzymes.
- Lennarz, William J.**, Professor and Chairperson.² Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in development.
- Ma, Hong**, Senior Staff Investigator.⁷ Ph.D., 1988, Massachusetts Institute of Technology: *Arabidopsis* flower development.
- Mandel, Gail**, Professor.¹ Ph.D., 1977, University of California, Los Angeles: The control of gene expression in the nervous system.
- Marcu, Kenneth B.**, Professor.² Ph.D., 1975, State University of New York at Stony Brook: Gene regulation and function in normal and malignant B and T lymphoid cells.
- Marr, Thomas G.**, Senior Staff Investigator.⁷ Ph.D., 1981, New Mexico State University: Genome sequencing.
- Martiensen, Robert A.**, Senior Staff Investigator.⁷ Ph.D., 1986, Cambridge University, England: Plant developmental genetics; transposable elements; chloroplast biogenesis.
- Meyer, Axel**, Associate Professor.⁴ Ph.D., 1988, University of California, Berkeley: Molecular evolution.
- Reich, Nancy C.**, Associate Professor.¹² Ph.D., 1983, State University of New York at Stony Brook: Signal transduction and gene expression by cytokines.
- Setlow, Jane K.**, Senior Scientist.⁶ Ph.D., 1959, Yale University: Microbial DNA repair and recombination.
- Setlow, Richard**, Professor.⁶ Ph.D., 1947, Yale University: DNA damage and repair.
- Shanklin, John**, Scientist.⁶ Ph.D., 1988, University of Wisconsin: Plant biochemistry; lipid desaturation.
- Silva, Alcino J.**, Senior Staff Investigator.⁷ Ph.D., 1989, University of Utah: Genetics of learning and memory.

Skowronski, Jacek, Senior Staff Investigator.⁷ Ph.D., 1981, Lodz Medical School, Poland: HIV genes and signal transduction in T cells.

Spector, David L., Senior Staff Scientist.⁷ Ph.D., 1980, Rutgers—The State University: Functional organization of mammalian cell nucleus.

Stenlund, Arne, Senior Staff Investigator.⁷ Ph.D., 1984, Uppsala University, Sweden: DNA replication of bovine papillomavirus.

Sternglanz, Rolf, Professor.² Ph.D., 1967, Harvard University: Yeast molecular genetics

Stillman, Bruce W., Director.⁷ Ph.D., 1979, Australian National University: Eukaryotic DNA replication and its control.

Strickland, Sidney, Professor and Graduate Program Director.¹⁰ Ph.D., 1972, Michigan State University: Gene expression and hormonal control in mammalian development.

Studier, William F., Senior Biophysicist.⁶ Ph.D., 1963, California Institute of Technology: Genetic analysis of bacteriophage T7 gene regulation.

Sundaresan, Venkatesan, Senior Staff Investigator.⁷ Ph.D., 1982, Harvard University: Genetics of plants and their transposable elements.

Taichman, Lorne B., Professor.¹¹ M.D., 1965, Toronto University; Ph.D., 1971, University of Wisconsin: Keratinocyte biology; epithelial gene therapy.

Tegtmeyer, Peter, Professor.³ M.D., 1960, St. Louis University: Carcinogenesis and transcriptional regulation of oncogenes and antioncogenes.

Theurkauf, William, Assistant Professor.² Ph.D., 1987, Brandeis University: Microtubules and microfilaments in early development.

Tully, Timothy, Senior Staff Investigator.⁷ Ph.D., 1981, University of Illinois: Genetics of memory formation in *Drosophila*.

Vanaelst, Linda, Staff Investigator.⁷ Ph.D., 1991, University of Leuven, Belgium: Role of *ras* in mammalian cell transformation.

Viola, Michael V., Professor.⁵ M.D., 1964, McGill University School of Medicine, Montreal: Genetics of human cancer.

Wigler, Michael H., Senior Staff Scientist.⁷ Ph.D., 1978, Columbia University: Signal transduction and growth in eukaryotes.

Wimmer, Eckard, Professor.³ Ph.D., 1962, University of Göttingen, Federal Republic of Germany: Molecular biology of poliovirus replication and molecular basis of picomaviral pathogenesis; translational regulation of gene expression.

Yin, Jerry, Staff Investigator.⁷ Ph.D., 1986, University of Wisconsin at Madison: Genetics of memory.

Number of teaching, graduate, and research assistants, Fall 1995: 37

¹ Department of Neurobiology and Behavior

² Department of Biochemistry and Cell Biology

³ Department of Microbiology

⁴ Department of Ecology and Evolution

⁵ Department of Medicine

⁶ Brookhaven National Laboratory

⁷ Cold Spring Harbor Laboratory

⁸ Recipient of the Alumni Association Outstanding Professor Award, 1990

⁹ Department of Obstetrics-Gynecology

¹⁰ Department of Pharmacological Sciences

¹¹ Department of Oral Biology and Pathology

¹² Department of Pathology

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 521)
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. Two semesters of Laboratory Rotation in Genetics (BGE 530). The student will generally work in a total of four different laboratories in their first year. The particular laboratories will be determined by the graduate program director in conjunction with the student.

7. The faculty feels that each student will require advanced training appropriate to the student's area of specialization within genetics. Requirements for any specific student, in addition to those enumerated above, will be determined by the student's advisory committee.

B. Comprehensive (Preliminary) Examination

At the end of the third semester, the student 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 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 end of the fourth semester of graduate study.

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 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.

Genetics

Courses

BGE 510 Graduate Genetics

This introductory course for graduate students covers topics such as genetic recombination, mutation, and gene reorganization and explores each topic from different scientific perspectives, such as molecular genetics, developmental genetics, immunogenetics, evolutionary genetics, and human genetics.

Prerequisite: Permission of instructor; molecular genetics (HBM/BMO 503)
Spring, 3 credits

BGE 530 Laboratory Rotation

The student rotates through four professors' laboratories during the first year. The selection of laboratories is made by the student in consultation with his or her advisory committee. 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

BGE 531 Graduate Student Seminar in Genetics

Seminars are given by graduate students on the current literature in genetics or their own research.

Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester

BGE 550 Genetics Seminar

A weekly series of seminars in genetics given by outstanding visiting scientists, supplemented by members of the staff, postdoctoral students, and advanced graduate students.

Prerequisite: Permission of instructor
Fall and spring, 1 credit each semester

BGE 599 Research

Original investigation undertaken with the supervision of a member of the program.
Fall and spring, 1-8 credits, variable

BGE 691 Readings in Genetics

Readings in genetics literature and ethical questions.

Prerequisite: Permission of instructor
Fall, 1 credit

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

Geosciences (GEO)

Chairperson: Donald H. Lindsley
Earth and Space Sciences Building 255 (516) 632-8200

Graduate Program Director: Hanna Nekvasil
Earth and Space Sciences Building 240 (516) 632-8201

Graduate Secretary: Iris Roth
Earth and Space Sciences Building 255 (516) 632-8554

Degrees awarded: M.S. in Earth and Space Sciences; Ph.D. in Earth and Space Sciences

The Geosciences Program, in the Department of Earth and Space Sciences, includes concentrations in many of the geological subdisciplines. Research, in close collaboration with one or more faculty members, is emphasized as the chief ingredient of graduate training and students are encouraged to do short research projects before deciding on a topic for their dissertations.

Currently, research is focused in three somewhat overlapping areas: igneous, metamorphic, isotopic, and experimental geochemistry; sedimentary geology and low-temperature geochemistry; mineral physics, rock mechanics, seismotectonics, and geodynamics. A distinctive aspect of the geosciences program is its emphasis on quantitative approaches to problems in earth science, backed by comprehensive experimental and analytical facilities. Brochures describing the program in detail are available from the department.

The department occupies a modern, well-equipped building that houses the department library, experimental and analytical laboratories, faculty and graduate student offices, numerous VAX and DEC computers and workstations, a machine shop with four full-time machinists, a carpentry shop, and an electronics support group with two full-time technicians. The NSF Center for High-Pressure Research and Mineral Physics Institute, campus computing facilities, the Stony Brook Marine Sciences Research Center, and Brookhaven National Laboratory give excellent support for graduate studies in the Geosciences Program.

Graduate Program in Geosciences

Ph.D. and M.S. programs are offered with concentrations in three broad areas: 1) petrology, high-temperature geochemistry, and crystallography, 2) sedimentary geology, low-temperature geochemistry, and hydrogeology, and 3) geophysics (including mineral physics, rock mechanics, and seismotectonics/geomechanics). In addition, there is a non-thesis M.S. program with a concentration in hydrogeology. A Master of Arts in Teaching Earth Science is also offered. This latter program leads to provisional certification for teaching earth science in secondary schools in New York State.

Petrology, High-Temperature Geochemistry, and Crystallography

Of major importance in the geosciences is understanding the formation and evolution of the crust and upper mantle of the Earth. Advances in this fundamental area require study at widely varying scales, from the submicroscopic details of crystal structure and chemistry to the accretion of oceanic lithosphere onto stable cratons. Research efforts of five faculty members—Robert Dodd, Gilbert Hanson, Donald Lindsley, Hanna Nekvasil, and John Parise—are focused on these problems. These research efforts comprise a wide range of field, laboratory, and theoretical approaches, many aspects of which interface with tectonophysics, mineral physics, and sedimentary geochemistry.

Crustal studies on the formation of stable cratons at Stony Brook include research on the derivation of anatectic melts and depletion of the lower crust in volatiles and radiogenic elements. The evolution of silicic magmas is being

studied through the modeling of crystallization and melting processes based on the development of thermodynamic models for melts and solid solutions from experimental investigations. The evolution of the Archean crust is being studied using minor and trace elements and radiogenic isotopes to evaluate protoliths of ancient granitoid gneisses. Field and laboratory study of the structure, petrology, and geochronology of the lithologic assemblages formed at Phanerozoic active-plate margins complements studies of early crustal growth and maturation. Ongoing laboratory investigations (e.g., on oxides, pyroxenes, olivines, and feldspars) complement the field studies through the development of interpretive tools such as geothermometers and geobarometers. Current integrations of field, laboratory, and isotopic studies include investigation of the evolution of anorthosite and anorthosite-syenite suites, as well as the evolution of the Archean crust in southern India and the Phanerozoic crust in southwestern New England. Additional petrologic and geochemical studies include investigations of the chemistry and petrology of the early solar system through the chemical evolution of meteorites and their collisional and metamorphic histories.

With the formation of the Mineral Physics Institute, interdisciplinary projects involving mineral and melt chemistry and physics have become an important aspect of our petrology concentration. Links between high-temperature and pressure experimental studies conducted at Stony Brook, *in situ* spectroscopic studies conducted at Stony Brook and the Geophysical Laboratory, and *in situ* calorimetric investigations at Princeton University

give an unprecedented opportunity for involvement in major advances in our understanding of the fundamental properties and processes that govern the stability of minerals and melts.

Experimental, geochemical, and analytical work is supported at Stony Brook by a Cameca electron microprobe, a 200-kv STEM, two thermal emission mass spectrometers, a rare gas mass spectrometer, and a single-crystal and powder diffraction crystallography laboratory. Additionally, three experimental petrology laboratories permit investigations from 1 atm to 250 kbar and at temperatures up to 1700°C.

Sedimentary Geology and Low-Temperature Geochemistry

Major goals in sedimentary geology include understanding of the sources of sediments and of the physical, chemical, and biological processes involved in the accumulations of sediments and their diagenetic histories. Current research emphasis at Stony Brook is on the petrology, geochemistry, and crystal chemistry of sedimentary rocks and minerals, and on the geochemistry of natural waters. This area of research involves five faculty members—Gilbert Hanson, Scott McLennan, William Meyers, Richard Reeder, and Martin Schoonen—who are applying a wide range of approaches including field studies, petrography, geochemistry, crystallography, quantitative modeling, and laboratory experiments.

Carbonate sediments are particularly susceptible to major changes in mineralogy, fabric, and porosity during their diagenesis, and one of the prime aims of our research is to reconstruct the diagenetic environments and the physical and chemical characteristics of the paleohydrologic systems that affected diagenesis. To this end, we are carrying out regional studies of cementation and dolomitization in Paleozoic and Neogene carbonates. The foundation of any such study is careful field and petrographic work, which establish the stratigraphic, facies, and paragenetic sequence framework. The integration of these studies with geochemical investigations using trace elements and stable and radiogenic isotopes allows constraints to be put on compositions, flow directions, and sources of diagenetic fluids, and allows quantitative modeling of water-rock interactions.

Fundamental to understanding the behavior of carbonate minerals is the study of their crystal chemistry. A major research effort at Stony Brook is the

study of defect microstructures, cation substitutions, disorder, and structural refinements in low-temperature dolomites, calcites, ankerites, and other carbonate minerals. These studies are fundamental to our understanding of crystal growth mechanisms, mineral stabilities, recrystallization processes, and trace element incorporations. Of particular focus at present is the study of crystallographic controls of trace element incorporations and sector zoning in natural- and laboratory-grown calcites and dolomites. These studies are being carried out by integrated X-ray diffraction, TEM, SEM, microprobe, and petrographic approaches.

Another key component of the sedimentary geology concentration is the trace element and isotopic study of terrigenous sedimentary rocks. In particular, studies of REE; Th and Sc; and Nd, Pb, and Sr isotopes have proved to be powerful approaches in determining provenance age and composition, and in addressing broader problems of crustal evolution such as the role of sediment subduction in the origin of island arc and ocean island volcanics, growth rates of the continental crust and sedimentary mass, and the recycling history of sedimentary rocks. Studies are currently being conducted on modern deep-sea turbidite sands and on Proterozoic terrigenous sedimentary rocks.

An important part of the sedimentary geology research in carbonates and clastics is the development of innovative geochemical approaches. Recent examples include the use of Pb isotopes and B isotopes in dolomites and calcites, the use of Pb isotopes for dating quartz, and the use of REE and Nd isotopes in diagenetic carbonates.

Geophysics

Geophysical research at Stony Brook focuses on the investigation of the structure of the Earth, the physical properties of Earth materials, and the mechanical behavior of the Earth's crust and mantle. The principal research topics within this broad area comprise mineral physics and rock physics, seismology, tectonics, and planetary geophysics, and involve five faculty members—Daniel Davis, William Holt, Robert Liebermann, Donald Weidner, and Teng-fong Wong.

The physical and chemical properties of minerals control the state and the evolutionary processes of the Earth. The mineral physics and mineral chemistry research concentrations at Stony Brook are aimed at defining these prop-

erties and at evaluating their implications for the Earth's structure and composition. Stony Brook faculty and research associates have been leaders in measuring elastic properties of minerals, with particular emphasis on phases that are stable at great depths in the mantle. Another vital part of this research is the study of crystal structures as a function of pressure and temperature, including measurements that yield compressibility and thermal expansion characteristics, which in turn provide a basis for predicting the behavior of minerals deep within the Earth. This work interfaces closely with mineralogical and crystallographic research described above.

These studies are carried out in the geophysical laboratories in the Department of Earth and Space Sciences, which contain instrumentation for ultrasonic techniques and Brillouin spectroscopy, and high-pressure facilities for making *in situ* measurements of physical properties. A multi-anvil, high-pressure facility in which conditions of 250 kb and 2500° can be obtained is now in operation, and we are active in developing mineralogical applications of the synchrotron source at Brookhaven National Laboratory.

Our concentration in seismology spans a broad range of research topics, from a local to a global scale. Seismic waves provide key information about the earthquake source and its causes, as well as information about the Earth through which the waves have passed.

An important bridge between mineral physics and seismology is rock mechanics, particularly the study of the brittle fracture and frictional behavior of crustal rocks, as well as thermomechanical properties. Observational, experimental, and theoretical approaches to these problems are all being pursued at Stony Brook. Investigations of shear fracture energy and frictional instability are particularly important for understanding the mechanics of earthquake rupture. The rock mechanics laboratory contains a wide range of experimental tools for these studies, including a servo-controlled triaxial press interfaced with an IBM-PC-based data-acquisition system and high-speed digital oscilloscopes.

The mechanics of large-scale crustal deformation is being studied using a variety of modeling techniques. These include analytical, numerical, and laboratory scale modeling of thin-skinned deformation in fold-and-thrust belts and in

accretionary prisms. Such studies yield results and give insights into the state of stress in the earth and also have implications for seismic risk at plate margins.

M.S. Program with a Concentration in Hydrogeology

The concentration in hydrogeology is designed to offer those with a B.S. in physical sciences a broad foundation of theoretical and practical graduate training emphasizing the physical and chemical aspects of hydrogeology. The curriculum, leading to an M.S. degree, comprises coursework and research totaling 30 graduate credits. The curriculum is designed to accommodate the working professional in that all required and most elective courses are taught in the evening, and an M.S. thesis is not required.

Formal coursework for the hydrogeology curriculum includes the following subjects:

- Groundwater Hydrology
- Geochemistry of Natural Waters
- Rock and Soil Physics
- Hydrogeochemistry
- Numerical Hydrology
- Statistics and Probability
- Organic Contaminant Hydrology

In addition to formal coursework, the curriculum includes two short-term research projects carrying a minimum of three credits each. These research projects will be designed through consultation between the student and one or more of the participating faculty. The purpose of the research projects is to give the student experience in field, laboratory, or theoretical approaches. Each project will involve one or more semesters of work culminating in a written report.

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 provisional basis. Upon admission, the student will be informed

of the requirements that must be satisfied for termination of provisional status.

Faculty

Aller, Robert C., Professor.¹ Ph.D., 1977, Yale University: Marine geochemistry; early marine diagenesis.

Bokuniewicz, Henry J., Professor.¹ Ph.D., 1976, Yale University: Marine geophysics.

Cochran, J. Kirk, Professor.¹ Ph.D., 1979, Yale University: Marine geochemistry; use of radionuclides as geochemical tracers; diagenesis of marine sediments.

Davis, Daniel M., Associate Professor. 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.

Dodd, Robert T., Professor. Ph.D., 1962, Princeton University: Chondritic meteorites; metamorphic history of the Precambrian rocks in southeastern New York.

Gasparik, Tibor, Research Associate Professor. Ph.D., 1981, State University of New York at Stony Brook: Phase equilibria studies of candidate mantle materials at high temperatures and pressures.

Geller, Marvin, Adjunct Professor. Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric dynamics; upper atmosphere; climate variability; aeronomy; physical oceanography.

Hanson, Gilbert N., Professor. Ph.D., 1964, University of Minnesota: Application of radiometric and geochemical methods to petrologic and tectonic problems.

Holt, William E., Associate Professor. Ph.D., 1989, University of Arizona: Seismotectonics of continental collision zones; kinematics of continental deformation; regional waveform propagation.

Krause, David W., Adjunct Associate Professor.² Ph.D., 1982, University of Michigan: Vertebrate paleontology; mammalian evolution, including primates.

Liebermann, Robert C., Professor.³ Ph.D., 1969, Columbia University: Mineral physics; elastic and anelastic properties of rocks and minerals and their applications to the Earth's interior.

Lindsley, Donald H., Professor and Chairperson. Ph.D., 1961, The Johns Hopkins University: Application of phase equilibrium studies of silicate and oxide minerals to metamorphic and igneous petrology.

McLennan, Scott M., Professor. Ph.D., 1981, Australian National University: Geochemistry of sedimentary rocks; sedimentary petrology.

Meyers, William J., Professor. Ph.D., 1973, Rice University: Carbonate diagenesis; geochemistry; sedimentology.

Nekvasil, Hanna, Associate Professor and Graduate Program Director. Ph.D., 1986, Pennsylvania State University: Experimental and thermodynamic investigations of mineral/melt equilibria in silicic magmas.

Nittrouer, Charles, Professor.¹ Ph.D., 1978, University of Washington: Geological oceanography; physical processes of shelf sedimentation.

Parise, John, Professor. 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., Professor. Ph.D., 1980, University of California, Berkeley: Low-temperature geochemistry; mineralogy; mineral-solution equilibria.

Schoonen, Martin A.A., Associate Professor. Ph.D., 1989, Pennsylvania State University: Kinetics and thermodynamics of low-temperature and hydrothermal water-rock interaction; theoretical geochemical modeling; geochemistry of natural waters.

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.

Wong, Teng-fong, Professor. Ph.D., 1980, Massachusetts Institute of Technology: Experimental rock physics; fault mechanics.

Number of teaching, graduate, and research assistants, fall 1995: 39

¹ Joint appointment, Marine Sciences Research Center

² Joint appointment, Department of Anatomical Sciences

³ Distinguished Service Professor

Degree Requirements

The Department of Earth and Space Sciences 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 Earth and Space Sciences, 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 Earth and Space Sciences 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*.

Geosciences

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

CEN 534	Computer-Assisted Math Problem Solving
AMS 576	Statistical Methods for Social Scientists
EST 588	Technical Communi- cation for Management and Engineering

Category C

GEO 573	Hydromechanical Be- havior of Geomaterials
GEO 523	Isotope and Trace Element Geology-B
GEO 524/ MAR 524	Organic Contaminant Hydrology
EST 595	Principles of Environ- mental Systems Analysis
EST 596	Simulation Models for Environmental Waste Management
EST 597	Waste Management: Systems and Principles
CEY 503 CEY 509	Environmental Law Man, Environment, and Health

Research

In addition to formal coursework, the curriculum for the M.S. with concentra- tion in Hydrogeology includes a mini- mum 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 participat- ing faculty. The purpose of the research is to give the student experience at solv- ing 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 Earth and Space Sciences

The M.S. in Earth and Space Sciences 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 resi- dence or language requirements.

A. Course Requirements

Students must successfully complete a program of 30 graduate credits, includ- ing 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 com- pletion, 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 the- sis, the defense committee decides whether the thesis is defensible. If it is, then an oral thesis defense is sched- uled.

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 concen- trates 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 Earth and Space Sciences - Geosciences Program

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 consecu- tive 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 based upon his or her particular needs. 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 stu- dent'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 sem- inars. During their first fall semester all students must take GEO 500 Geosciences Research Seminar. In ad- dition, all graduate students must regis- ter for GEO 696 Geoscience Colloqui- um and GEO 697 Geoscience Seminar each semester and GEO 600 Practicum in Teaching at least once. Among the courses offered on a regular basis 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 523	Isotope and Trace Element Geology-B
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 521	Isotope and Trace Element Geology-A
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, if it is approved for that purpose by the graduate committee.

C. Ph.D. Preliminary Examination

The preliminary examination consists of the preparation and oral defense of a thesis proposal. There are three separate steps in this procedure: 1) submission of a proposal abstract to the graduate committee, who then select an examining committee, 2) submission of the thesis proposal to the examining committee for approval, and 3) oral defense of the proposal.

D. Thesis Proposal Abstract

A one-page document stating the most essential aspects of the student's proposed thesis, the thesis proposal abstract must be signed by three faculty members before being given to the graduate committee. One of the three faculty members must be identified as a potential sponsor, meaning that he or she is tentatively willing to be the student's thesis advisor. This implies no commitment, either on the part of the professor or the student.

Upon receipt of the abstract, the graduate committee selects the members of the student's Ph.D. preliminary examination committee and sets a deadline (usually six weeks) for the submission of the thesis proposal to the examination committee. This committee is to consist of 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 reevaluate 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. 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

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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.

H. 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 practi-

cal teaching experience in secondary schools. Individual programs will be tailored to the needs of the student, in consultation with the ESS 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 successfully 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 in Geological Sciences

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

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 non-ideal 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

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

GEO 506 Theoretical Petrology

Theory of phase diagrams, Schreinemaker's rules, heterogeneous equilibria, experimental systems of petrologic interest, properties of solutions.

Prerequisites: Metamorphic and igneous petrology and physical chemistry or thermodynamics; or permission of instructor
Spring, 3 credits

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

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

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

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

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

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

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

GEO 521 Isotope and Trace Element Geology-A

Application of trace element and radiogenic isotope systematics to the petrogenesis of igneous rocks, the provenance of sedimentary rocks, and the evolution of the crust and mantle. Evaluation of radiogenic techniques for determining the ages of rocks and minerals.

Fall, alternate years, 3 credits

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

GEO 523 Isotope and Trace Element Geology-B

Consideration of trace element, radiogenic isotopic, and stable isotope approaches to understanding fluid-rock interaction in weathering, groundwater, sedimentary, diagenetic, metamorphic, and hydrothermal systems.

Fall, alternate years, 3 credits

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 the instructor

Spring, 3 credits

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

Spring, 3 credits

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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

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

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, 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

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

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

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

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

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

GEO 599 Research

Fall and spring, variable and repetitive credit

GEO 600 Practicum in Teaching

0-3 credits, repetitive

GEO 603 Topics in Petrology

1-3 credits

GEO 605 Topics in Sedimentary Geology-Paleontology

1-3 credits

GEO 607 Topics in Geophysics

1-3 credits

GEO 609 Topics in Mineralogy and Crystallography

1-3 credits

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

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

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 these are discussed.

Fall and spring, no credit

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

Germanic and Slavic Languages and Literatures (GER, SLV, DLG, DLL, DLR)

Chairperson: Christina Y. Bethin

Frank Melville, Jr. Memorial Library N3011 (516) 632-7360

Graduate Program Director: Barbara Elling

Frank Melville, Jr. Memorial Library N3005 (516) 632-7358

Graduate Secretary: Patricia O'Brien

Frank Melville, Jr. Memorial Library N3009 (516) 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 wider 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 their 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.

Germanic and Slavic Languages and Literatures

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

Bailyn, John, Assistant Professor. Ph.D., 1995, Cornell University: Slavic linguistics; Russian linguistics and syntax.

Bethin, Christina Y., Professor and Chairperson.³ Ph.D., 1978, University of Illinois: Slavic linguistics; phonology; Russian, Polish, Ukrainian languages.

Bloomer, Robert K., Assistant Professor. Ph.D., 1990, University of Michigan: Germanic linguistics; morphology; etymology.

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

Brown, Russell E., Professor Emeritus. Ph.D., 1963, Harvard University: Modern German literature; film studies; women's literature; Trakt; Brecht; Kafka.

Czerwinski, Edward J., Professor Emeritus.² Ph.D., 1965, University of Wisconsin: Russian literature; comparative literature; Dostoevsky; Slavic and East European theatre and drama.

Dolezal, Stana, Lecturer. D.A., 1990, State University of New York at Stony Brook: East European literature and culture; Czech language.

Edmunds, Kathryn R., Assistant Professor. Ph.D., 1994, Princeton University: *Goethezeit*; Weimar classicism; culture studies.

Elling, Barbara E., Distinguished Teaching Professor and Graduate Program Director.¹ Ph.D., 1971, New York University: 19th-century German literature; literature and culture studies; methods of language teaching; stylistics; reader reception theory.

Gross-Middeldorf Viola, Birgit, Lecturer. D.A., 1990, State University of New York at Stony Brook: Business German.

Kerth, Thomas, Associate Professor.⁴ Ph.D., 1977, Yale University: German literature of the Middle Ages; paleography.

Ledgerwood, Mikle, Assistant Professor.⁵ Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Lekic-Trbojevic, Anita, Lecturer. Ph.D., 1989, University of Illinois, Chicago: Serbo-Croatian language, literature, and culture.

Marker, Gary, Associate Professor.⁶ Ph.D., 1977, University of California, Berkeley: Russian social and intellectual history.

Ruplin, Ferdinand A., Associate Professor Emeritus. Ph.D., 1965, University of Minnesota: Applied linguistics; Middle High German; historical linguistics.

Russell, John R., Associate Professor Emeritus. Ph.D., 1966, Princeton University: *Rokoko*; the novella; computer-assisted instruction.

Rzhevsky, Nicholas, Associate Professor. Ph.D., 1972, Princeton University: Russian and Soviet literature; ideology; Russian theatre; Russian intellectual history.

Sjoberg, Leif, Professor Emeritus. Ph.D., 1954, Uppsala University, Sweden: Scandinavian literature; Ibsen; Strindberg; Lagerkvist; Ekelof; Old Norse.

Vogel, Lucy, Associate Professor Emerita. Ph.D., 1968, New York University: 19th-century and early 20th-century Russian literature; symbolist poetry; Russian-Italian literary relations.

Westphalen, Timothy, Assistant Professor. Ph.D., 1991, Harvard University: Russian poetry; Russian symbolism; Russian literature of the 19th century; Bakhtin.

Number of teaching, graduate, and research assistants, fall 1993: 8

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

Germanic and Slavic Languages and Literatures

Degree Requirements Requirements for the M.A. Degree in Germanic Languages and Literatures

• Option I:

A. Course Requirements

	<i>Credits</i>
1. One 19th-century German literature course	3
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
2. Four additional offerings at the graduate level from courses within the department or, upon prior approval by the department, from those of other departments within the Graduate School	12
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:

	<i>Credits</i>
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, e.g., GER 558, GER 562, or GER 563	3
One course in 20th-century German literature, e.g., GER 545 or GER 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

	<i>Credits</i>
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 equivalent)
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

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-

Germanic and Slavic Languages and Literatures

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. 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 examina-

tion 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 towards the D.A. requirements.

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

Germanic and Slavic Languages and Literatures

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 Doctoral Dissertation

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 emigre 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 prose by Stanislavsky, Meyerhold, and contemporary directors will be studied as forms of aesthetic conjunction and as responses to the social-ideological context.
Spring, 3 credits

Germanic and Slavic Languages and Literatures

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 Doctoral 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.

1-9 credits

Language Learning and Research Center Courses

DLL 570 Introduction to Media for Language Teaching

(Course open to non-DA graduate students.) Gives students an introduction to all of the technology used in teaching languages: audio, video, computer, and internet. Emphasis is on hands-on use and practical applications.

Fall or spring, 3 credits

DLL 571 Technology and Education

(Course open to non-DA 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

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

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

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

School of Health Technology and Management

Chairperson: Alan Leiken

Health Sciences Center Level 2, Room 052 (516) 444-3243

Vice Chairperson and Graduate Program Director: Nanci Rice

Health Sciences Center Level 2, Room 052 (516) 444-3240

Graduate Secretary: Carol Callahan

Health Sciences Center Level 2, Room 052 (516) 444-3240

Advanced Graduate Certificate awarded: Advanced Graduate Certificate in Health Care Management
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, which is 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 unique experience and career goals in consultation with faculty advisors and program leaders. After selection of a concentration and completion of core requirements in medical 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, appropriate professional status, GRE General Test scores or those from an equivalent exam, at least one year of experience in a health related field.

For further information contact:
Prof. 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
(516) 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:
Prof. 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
(516) 444-3243
or
Prof. Thomas Sexton
W. Averell Harriman School for
Management and Policy
103 Harriman Hall
University at Stony Brook
Stony Brook, NY 11794-3775
(516) 632-7181

Hispanic Languages and Literature

(SPN, DLS, DLL)

Chairperson: Roman de la Campa
Frank Melville, Jr. Memorial Library N3015 (516) 632-6935/6959

Graduate Program Director: Antonio Vera-León
Frank Melville, Jr. Memorial Library N3019 (516) 632-6948

Graduate Secretary: Mareike Ludkewycz
Frank Melville, Jr. Memorial Library N3017 (516) 632-6935

Degrees awarded: M.A. in Hispanic Languages and Literature; M.A. in Romance Languages and Literature (Spanish); D.A. in Foreign Languages; 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, Doctor of Arts, and Master of Arts. A candidate for the Ph.D. degree engages in research leading to a dissertation; the D.A. is an interdepartmental degree especially devised for students interested in pedagogical methods. 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 General Test (GRE) (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.

Foreign applicants must score at least 550 on the Test of English as a Foreign Language (TOEFL) and must show that they have the necessary funds to finance their education (living

expenses plus tuition). It is strongly recommended that applicants take the TOEFL exam in their country of origin.

An applicant whose qualifications seem deficient may be admitted on a part-time basis as a Graduate School special student (GSP) through the School of Professional Development.

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

De la Campa, Román, Associate Professor and Chairperson. Ph.D., 1975, University of Minnesota: Latin American and Caribbean literature; contemporary critical theory.

Charnon-Deutsch, Lou, Professor.² Ph.D., 1978, University of Chicago: 18th- and 19th-century Peninsular literature; feminist theory.

Kaplan, Temma, Professor.⁴ Ph.D., 1969, Harvard University: Spanish and Latin American social history.

Klein-Andreu, Flora, Associate Professor. Ph.D., 1972, Columbia University: Linguistic meaning; language evolution and variation; relation between theory and research methods.

Lastra, Pedro, Professor Emeritus. Ph.D., 1967, Universidad de Chile: Modern and contemporary Spanish-American literature.

Ledgerwood, Mikle, Assistant Professor.⁵ Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

McKenna, James B., Associate Professor. Ph.D., 1965, Harvard University: 20th-century Hispanic culture and literature.

Monasterios, Elizabeth, Assistant Professor. Ph.D., 1992, University of Toronto, Canada: 20th-century Hispanic poetry; literary theory.

Nunes, Maria Luisa, Professor Emerita. Ph.D., City University of New York: 19th- and 20th-century Luso-Brazilian literatures; women's studies.

Read, Malcolm K., Professor. Ph.D., 1978, University of Wales: Spanish Golden-Age literature and linguistics; Marxist and psychoanalytic literary criticism.

Resina, Joan, Associate Professor. Ph.D., 1986, University of California, Berkeley: 20th-century Peninsular literature and culture; Catalán literature.

Rivers, Elias L., Professor Emeritus. Ph.D., Yale University: 16th- and 17th-century literature of Spain; sociolinguistic theory of literature.

Roncero-López, Victoriano, Associate Professor. Ph.D., 1977, University of Illinois, Champaign: 16th- and 17th-century literature of Spain; historiography; modern theory.

Sabat-Rivers, Georgina, Professor Emerita. Ph.D., The Johns Hopkins University: Spanish Golden Age and Spanish-American colonial literatures.

Vasvari, Louise, Professor.^{1,3} Ph.D., 1969, University of California, Berkeley: Medieval literature; translation theory; literature and linguistics; romance philology.

Vera-León, Antonio, Associate Professor and Graduate Program Director. Ph.D., 1987, Princeton University: 19th- and 20th-century Caribbean literature; cultural theory and critique.

Vernon, Kathleen, Associate Professor. Ph.D., 1982, University of Chicago: 20th-century Spanish narrative and film.

Number of teaching, graduate, and research assistants, fall 1995: 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 combi-

nation 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.

Master of Arts

M.A. in Hispanic Languages and Literature

The curriculum leading to the Master of Arts degree may be terminal or may be combined with the Doctor of Arts or 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, 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

Hispanic Languages and Literature

- 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

An interdepartmental M.A. in Romance languages is offered, based on 36 graduate credit hours of specified coursework in two different languages (Spanish/French, Spanish/Italian). Students must pass a comprehensive examination based on a special reading list. The M.A. examination consists of a written and an oral examination. A thesis is not required, but students may choose to take only 30 credits of coursework and then write a thesis with program approval. In such cases the M.A. examination consists of the general written exam and an oral exam based on a defense of the thesis.

The choice of courses will be determined by the student's previous experience, interests, and needs, in flexible interaction with program requirements. For students majoring in Spanish, the requirements are one course in Spanish linguistics, either SPN 509 Literary Theory or SPN 515 Graduate Spanish Composition and Stylistics, and either SPN 510 Hispanic Culture or SPN 582 Hispanic Tradition in the United States. The exact course requirements in French or Italian are available upon request from the graduate program director in the Department of French and Italian. Students are encouraged to broaden their knowledge by taking courses in linguistics, history, art, and other languages and literatures. A high level of language proficiency is stressed, and all classes are taught in the languages concerned. Incoming students are advised by the graduate program director of either the Department of French and Italian or the Department of Hispanic Languages and Literature. Students then choose another faculty member as advisor in their second or third semester.

Doctor of Arts

The curriculum leading to the Doctor of Arts degree is designed to train professionals on the secondary, junior college, and college levels. It also provides a basis in language training for lan-

guage education specialists, specialists in bilingual media and communications, and marketing consultants whose expertise in the foreign language(s) will aid in areas such as business or advertising. The program is flexible, based on competency, and, where possible, tailored to individual needs.

The program is open to full-time and part-time students who have the M.A. or its equivalent.

For the Spanish track, a minimum of 24 graduate credit hours are to be taken:
Syntax or Morphology (3 credits)
Phonetics or Phonology (3 credits)
Civilization or Culture (3 credits)
History of the Language (3 credits)
Stylistics or Literary Translation
(3 credits)
Electives (9 credits)

In addition, 12 credits of pedagogy are required:

- Second-Language Acquisition
(3 credits)
- Methods of Foreign Language
Teaching (3 credits)
- Practicum (3 credits)
- Internship or Externship (3 credits)

Upon completion of 24 credits, all candidates are expected to demonstrate proficiency in the language of specialization. D.A. students are required to pass a comprehensive examination that includes written and oral sections covering topics from all areas of the program based on a reading list. The comprehensive exam is divided into five (5) sections:

- I Second Language Acquisition
- II Methodology
- III Linguistics
- IV Technology and Education
- V Literature and Culture

It is the responsibility of each student to assemble an exam committee composed of five faculty members, one of whom will chair the exam. In conjunction with the committee, the student will prepare a reading list which includes 15 to 20 items (articles and/or books) per section. The student will have a total of fifteen hours to take the exam, three per section, during a three day period. Upon successful completion of the comprehensive examination, the student, in consultation with the dissertation director, must submit a dissertation proposal to be reviewed by his or her D.A. committee. Following approval of the proposal, two additional readers are appointed in consultation with the program director.

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)

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 (a) French and (b) another language among 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 French 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 3 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 (a) 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 (b) 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., D.A.) 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.

Hispanic Languages and Literature

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; 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

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

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

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

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, nonlinguistic factors that may affect learning in different groups in different situations.

Fall or spring, 3 credits, repetitive

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SPN 595 Directed Independent Individual Studies

For M.A., D.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

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

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

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

SPN 693 Practicum in the Teaching of Spanish Language

This course is to be taken in conjunction with the student's teaching assignment. Each week's discussion centers on problems of applied linguistics or grammar. Discussion will also be focused on methodology (audio-lingual method, pattern drills, language laboratory, and preparation of examinations).

Fall and spring, 3 credits, repetitive

Hispanic Languages and Literature

SPN 695 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; permission of the dissertation director, graduate program director, or department chairperson
Fall and spring, 1-9 credits, repetitive

Portuguese

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.

Prerequisite: Reading proficiency in Portuguese and permission of instructor
Fall or spring, 3 credits, repetitive

D.A. Courses

The following courses are available only to candidates in the Doctor of Arts program:

DLS 601 Internship in Foreign Languages: Spanish

Students in the Doctor of Arts program will assist an instructor in an undergraduate literature, culture, or language course.
Fall and spring, 1-3 credits

DLS 602 Externship in Foreign Languages: Spanish

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.
Fall and spring, 3-6 credits

DLS 699 Doctoral Research in Foreign Languages: Spanish

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

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

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

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

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, budget, and management in a Language Center as well as teach short courses and workshops relating to technology and languages.

Fall or spring, 3 credits

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

History (HIS)

Chairperson: Gary J. Marker

Ward Melville Social and Behavioral Sciences Building N-309 (516) 632-7510/7500

Graduate Program Director: Ned C. Landsman

Ward Melville Social and Behavioral Sciences Building N-313 (516) 632-7490/7497

Graduate Program Coordinator: Margaret Creedon

Ward Melville Social and Behavioral Sciences Building S-303 (516) 632-7490

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

The History Department, which is in the College of Arts and Sciences, consists of 24 full-time faculty and 106 full- and part-time graduate students. Faculty research and teaching interests cut across the usual demarcations of geography and chronology. Areas of concentration include U.S., European, and Latin American political, social, and cultural history; the history of women, sexuality, and gender; the history of science, technology, and medicine; imperialism; and theory and methods in history. Faculty members have strong ties with faculty and programs in the other social sciences, the humanities, the natural sciences, and medicine.

Students, too, have worked with professors in sociology, comparative literature, philosophy, women's studies, Africana studies, anthropology, and biochemistry. In addition, students continue to work in more traditional areas: American foreign policy, Irish history, 19th- and 20th-century Western European political and economic history, and Chinese and Russian history.

The master's program provides students with background in the literature of their chosen fields, basic knowledge of the historiography in these fields, and research techniques. Directed readings supplement the core seminars. There is no master's thesis. Students write a lengthy 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. Students choose a dissertation field covering the area of their proposed research and a comparative field related to the dissertation field but covering a problem that can be studied across national boundaries.

Full-time students spend about six semesters in seminars and directed readings in the Ph.D. program 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 Ph.D. and M.A. 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.

History

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

Barnhart, Michael, Associate Professor.^{1,2,3} Ph.D., 1980, Harvard University: U.S. foreign policy; 20th-century U.S. history; modern Japan.

Bottigheimer, Karl S., Professor. Ph.D., 1965, University of California, Berkeley: Tudor-Stuart England and Ireland; early modern Europe; modern Ireland.

Burner, David, Professor. Ph.D., 1965, Columbia University: 20th-century U.S. political and social history.

Cash, Floris B., Assistant Professor.⁵ Ph.D., 1986, State University of New York at Stony Brook: African-American history; African-American women's studies.

Cowan, Ruth S., Professor. Ph.D., 1969, The Johns Hopkins University: History of science; biology and technology; women in modern history.

Garber, Elizabeth, Associate Professor. Ph.D., 1966, Case Western Reserve University: Social and intellectual history of science; 19th- and 20th-century physics; European intellectual and social history.

Gootenberg, Paul, Associate Professor. Ph.D., 1985, University of Chicago: Colonial and modern Latin American history; Andean and Mexican history; comparative economic history.

Hong, Young-Sun, Assistant Professor. Ph.D., 1989, University of Michigan: Modern Germany; social theory; culture and politics in modern Europe; gender history.

Kaplan, Temma, Professor.⁷ Ph.D., 1969, Harvard University: Comparative history; 20th-century social movements of women.

Kuisel, Richard F., Professor. Ph.D., 1963, University of California, Berkeley: Contemporary Europe; political and economic history; modern France.

Landsman, Ned, Associate Professor and Graduate Program Director. Ph.D., 1979, University of Pennsylvania: U.S. colonial; intellectual and religious history; Anglo-American world.

Larson, Brooke, Associate Professor. Ph.D., 1978, Columbia University: Colonial Latin America; Andean rural history; peasant societies and women in Latin America.

Lebovics, Herman, Professor. Ph.D., 1965, Yale University: Modern Europe; intellectual and cultural history; Germany and France.

Lemay, Helen R., Professor.⁴ Ph.D., 1972, Columbia University: Medieval and Renaissance intellectual history; paleography; history of science and medicine; women's history.

Man-Cheong, Iona, Assistant Professor. Ph.D., 1991, Yale University: Modern China; political institutions; cultural and social history; gender in China.

Marker, Gary J., Associate Professor and Chairperson. Ph.D., 1977, University of California, Berkeley: Russian social and intellectual history; history of printing; European labor history.

McAdoo, William, Associate Professor.⁵ Ph.D., University of Michigan: U.S. urban, social, and institutional history; immigration historiography; African-American history.

Miller, Wilbur R., Professor. Ph.D., 1973, Columbia University: 19th-century U.S. social and political history; police and criminal justice; Civil War and Reconstruction.

Owens, Leslie H., Associate Professor.⁵ Ph.D., 1972, University of California, Riverside: African-American history; U.S. southern history.

Rilling, Donna J., Assistant Professor. Ph.D., 1993, University of Pennsylvania: Early national U.S. history; legal, economic, urban, and labor history.

Rosenthal, Joel T., Professor. Ph.D., 1963, University of Chicago: Medieval history; medieval England; social history.

Roxborough, Ian, Professor.⁸ Ph.D., 1977, University of Wisconsin: Sociology; social history of Latin America; modern Mexico.

Schäfer, Wolf, Professor. Dr. Phil., 1983, University of Bremen, Germany: Social and historical studies of science and technology; European intellectual and social history; global history.

Seifman, Eli, Professor.⁶ Ph.D., 1965, New York University: U.S. social history; history of education; the People's Republic of China.

Tomes, Nancy J., Associate Professor. Ph.D., 1978, University of Pennsylvania: 19th-century U.S. social history; medicine, nursing, and psychiatry; women and family.

Vaughan, Olufemi O., Assistant Professor.⁵ Ph.D., University of Oxford: African politics and history; international relations.

Weinstein, Barbara, Associate Professor. Ph.D., 1980, Yale University: Brazil; modern Latin America; slave societies; labor history.

Weinstein, Fred, Professor. Ph.D., 1962, University of California, Berkeley: Theory in history; Russian and European history.

Williams, John A., Associate Professor. Ph.D., 1963, University of Wisconsin: British Empire; Africa; the Commonwealth; expansion of Europe.

Wilson, Kathleen, Assistant Professor. Ph.D., 1985, Yale University: Modern British history; 18th- and 19th-century social and cultural history; gender studies.

Wishnia, Judith, Associate Professor.^{6,7} Ph.D., 1978, State University of New York at Stony Brook: Modern Europe; France; labor history; women's history.

Adjunct Faculty

Battley, Susan, Assistant Professor. Ph.D., 1981, State University of New York at Stony Brook: Early modern Europe.

Cassidy, David, Assistant Professor. Ph.D., 1976, Purdue University: Science; history of physics.

Chase, Paul, Assistant Professor. Ph.D., 1992, State University of New York at Stony Brook: Modern Germany.

Demuth, Karl, Assistant Professor. M.A., 1960, Harvard University: France; the French Revolution.

Donovan, Arthur, Associate Professor. Ph.D., 1970, Princeton University: Science; history of chemistry.

Stapleton, Darwin, Professor. Ph.D., 1975, University of Delaware: History of science and technology.

Wunderlich, Roger, Research Assistant Professor. Ph.D., 1986, State University of New York at Stony Brook: *Long Island Historical Journal*

Yahil, Jane, Assistant Professor. Ph.D., 1981, The Hebrew University, Israel: English medieval; the Crusades.

Number of teaching, graduate, and research assistants, fall 1995: 25

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 in which they will be examined at the conclusion of their coursework.

B. Courses

The M.A. curriculum consists of required courses that full-time students can complete in one academic year. These courses are as follows:

1. HIS 500 Historiography
2. HIS 501-502 or 521-522 or 541-542: Introductory field seminars surveying the literature and controversies in each of the major fields (U.S., Europe, and Latin America).
3. HIS 510-511 or 530-531: One-year sequence reading-research seminars to introduce students to the literature and methods of the broad areas of European, U.S., and Latin American history. The first semester includes introductory reading and discussion intended to lead the student to a profitable research topic. The second semester concentrates on production of a research paper.
4. HIS 583-586: Additional directed reading courses under faculty supervision.
5. Students holding teaching assistantships must register each semester for three credits of HIS 581 Supervised Teaching.

Students must complete 30 graduate credits from the courses listed above. For teaching assistants this would be three credits of HIS 500, six credits from two field seminars, nine credits from three reading-research seminar sequences, six credits from two semesters of supervised teaching, and six credits from two elective courses such as HIS 582, 583, 584, or any graduate seminar. Students without teaching assistantships will need six additional credits of such electives.

Requirements for the Master of Arts in Teaching (M.A.T.) in Social Studies

A. 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.

B. Courses

1. 15 Credits in History
 HIS 500 Historiography (3 credits)
 12 credits from the following:
 HIS 521,22 Seminars-U.S. History (3 or 6 credits)
 HIS 501,02 Seminars-European History (3 or 6 credits)
 HIS 541,42 Seminars-Latin American History (3 or 6 credits)
 HIS 562 Topics Seminar-African and/or Asian History (3 or 6 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/HIS 577 Teaching Social Studies (fall only) (3 credits)
 CEE/HIS 578 Social Studies Strategies (spring only) (3 credits)
 CEE/HIS 580 Student Teaching Seminar
3. 6 credits in Supervised Student Teaching (CEE/HIS 579)

C. 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 must 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 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, Dissertation Field: An area of historical knowledge that includes the student's expected research interest, and that comprises a field sufficiently broad for the purpose of undergraduate teaching. Example: Modern European history with emphasis on 19th-century Germany.

Field 2, Comparative Field: An area of study comprising a second, distinct field based on selected historical problems or themes and the methods used in studying them. The topics chosen should cover more than one country or region. Possible comparative fields include social history with an emphasis on women or the working class, political history with an emphasis on movements or foreign policy, cultural history with an emphasis on institutions or popular culture, history of science and technology with an emphasis on the physical sciences or medicine.

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

A. Coursework

The first year of course work consists of the following:

1. HIS 500 Historiography
2. HIS 501-502 or 521-522 or 541-542: Introductory field seminars surveying the literature and controversies in each of the major fields (U.S., Europe, and Latin America).
3. HIS 510-511 or 530-531: One-year sequence reading-research seminars to introduce students to the literature and methods of the broad areas of European, U.S., and Latin American history. The first semester includes introductory

History

reading and discussion intended to lead the student to a profitable research topic. The second semester concentrates on production of a research paper.

4. HIS 682-686: Additional directed reading courses under faculty supervision.
5. Students holding teaching assistantships must register each semester for three credits of HIS 581 Supervised Teaching.

Students must complete 30 graduate credits from the courses listed above. For teaching assistants this would be three credits of HIS 500, six credits from two field seminars, nine credits from three reading-research seminar sequences, six credits from two semesters of supervised teaching, and six credits from two elective courses such as HIS 682, 683, 684, or any graduate seminar. Students without teaching assistantships will need six additional credits of such electives.

After the first year, the program should be planned in consultation with the student's Ph.D. preparation committee. In every case it must include four graduate seminars beyond the first-year courses, two of which must be research seminars. In addition, each student is required to take a formal reading course and a thesis prospectus workshop. These course requirements must be met before the qualifying (preliminary) examination is taken. 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 581 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-level seminars: reading (numbered above 500), which are principally discussion and written analysis of selected historical works; and research (numbered above 600), which provide the opportunity for original research and writing of a substantial paper based on the research. In addition to regular courses, students may take directed readings with faculty members to cover specialized fields.

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

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

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

HIS 510, 511 Reading and Research Seminar in European/Latin American History

A one-year sequence designed to develop research skills. First semester focuses on background reading, identifying a research

problem, and preparing a prospectus and bibliography. Second semester concentrates on researching and writing the project. This sequence is offered in broad topic areas such as intellectual history and stresses a comparative perspective. Required for M.A. in European or Latin American history.
Fall, 3 credits; spring, 6 credits

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

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 topics and interpretations. Required for M.A. in U.S. history.
3 credits

HIS 530, 531 Reading and Research Seminar In U.S. History

One-year sequence. See description of HIS 510, 511. Required for M.A. in U.S. history.
Fall, 3 credits; spring, 6 credits

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

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

HIS 562 Introduction to Modern African and/or Asian History

Field seminar in modern African and/or Asian history. Surveys major topics such as nationalism, anticolonial movements, and modernization.
3 credits

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

HIS 577 Teaching Social Studies

A study of social studies as taught in the secondary schools: the nature of the social studies, curricula models, scope and sequence of topics offered, new programs of social studies instruction, etc. Required for M.A.T. students.
3 credits

HIS 578 Social Studies Teaching Strategies

An examination of various models of teaching and their application to the teaching of secondary social studies. Required for M.A.T. students.
3 credits

HIS 579 Student Teaching in Social Studies

Prospective secondary school social studies teachers participate in a supervised internship in selected Long Island secondary schools. The teaching intern reports to his or her assigned school each full school day for the entire semester. Frequent consultation with the supervising teacher helps the student interpret and evaluate the teaching internship experience. Applications must be filed in the semester preceding that in which the student plans to do the internship. Required for M.A.T. students.
6 credits

HIS 580 Student Teaching Seminar

Seminar on problems and issues of teaching social studies at the secondary school level. Analysis of actual problems and issues encountered by the student in his or her internship experience. Required for M.A.T. students.
3 credits

HIS 581 Supervised Teaching

Teaching practicum that usually accompanies a student's assistantship.
3 credits

HIS 583-586 Directed Readings for M.A. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty. Required for M.A. students.
Variable and repetitive credit

READING COLLOQUIA FOR M.A. AND PH.D. STUDENTS

The following are specialized reading colloquia that vary with student demand and faculty interest.
3 credits each

HIS 503, 504 Reading Colloquia in Ancient and Medieval History

HIS 505-509, 515-517 Reading Colloquia in European History Since 1500

HIS 512 Reading Colloquium in the History of Science

HIS 523-529, 532-534 Reading Colloquia in U.S. History

HIS 535 Reading Colloquium in History and Public Policy

HIS 543, 544 Reading Colloquia in Latin American History

HIS 552-555 Reading Colloquia in English History

HIS 561 Reading Colloquium in East Asian History

HIS 590 Reading Colloquium in Cultural History

HIS 593 Reading Colloquium in Social Theory and History

HIS 595 Reading Colloquium in Women's History

RESEARCH 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 one research seminar is 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 600 Research Seminar in Political History

HIS 601 Research Seminar in Economic History

HIS 602 Research Seminar in Social History

HIS 603 Research Seminar in Intellectual and Cultural History

HIS 604-610, 615-617 Research Seminars in European History Since 1500

HIS 621-634 Topical Research Seminars in U.S. History

HIS 641-645 Topical Research Seminars in Latin American History

HIS 652-655 Topical Research Seminars in English History

HIS 661 Topical Research Seminar in Asian/African History

HIS 663 Topical Research Seminar in Women's History

HIS 682-686 Directed Readings for Ph.D. Candidates

Specialized tutorials based on contractual relationship between individual student and faculty member.
Variable and repetitive credit

HIS 695 Dissertation Prospectus Workshop for Ph.D. Candidates

Required of all Ph.D. candidates in order to prepare a dissertation prospectus. This seminar should be completed either before or in the same semester as the qualifying examination. Offered once each year.
3 credits

HIS 699 Research for Ph.D. Candidates

Dissertation research under direction of advisor.
Variable and repetitive credit

Linguistics

(LIN, DLT, ESL)

Chairperson: Ellen Broselow

Ward Melville Social and Behavioral Sciences Building S-213 (516) 632-7780

Graduate Program Director: Frank Anshen

Ward Melville Social and Behavioral Sciences Building S-227 (516) 632-7776

Graduate Secretary: Sandra Brennan

Ward Melville Social and Behavioral Sciences Building S-201 (516) 632-7774

Degrees awarded: M.A. in Linguistics; M.A. in Teaching English to Speakers of Other Languages; D.A. in Foreign 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), Doctor of Arts in Foreign Languages with a concentration in 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 D.A. degree is primarily an advanced degree for continuing a career in teaching at the secondary school, junior college, or undergraduate level.

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 have obtained a score of at least 600 on the Test of English as a Foreign Language (TOEFL). This requirement may be waived only in the case of exceptionally qualified students.

G. Acceptance by both the Department of Linguistics and the Graduate School.

Note: Students who do not meet the above requirements may be admitted provisionally. Their status will be reviewed after their first semester of graduate study.

Admission to the D.A. Program

For admission to the Doctor of Arts Program, the following, in addition to the minimum Graduate School requirements, are normally required:

A. A master's degree in linguistics or TESOL from a recognized institution.

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 have obtained a score of at least 600 on the Test of English as a Foreign Language (TOEFL). This requirement may be waived only in the case of exceptionally qualified students.

G. Acceptance by both the Department of Linguistics and the Graduate School.

Note: Students who do not meet the above requirements may be admitted provisionally. Their status will be reviewed after their first semester of graduate study.

Faculty

Anshen, Frank, Associate Professor and Graduate Program Director. Ph.D., 1968, New York University: Sociolinguistics; morphology.

Aronoff, Mark, Professor. Ph.D., 1974, Massachusetts Institute of Technology: Morphology; orthography.

Bailyn, John, Assistant Professor.⁶ Ph.D., 1994, Cornell University: Russian syntax; language acquisition.

Bethin, Christina Y., Professor.¹ Ph.D., 1978, University of Illinois: Slavic linguistics; phonology.

Brennan Susan, Assistant Professor.⁶ Ph.D., 1990, Stanford University: Psycholinguistics; reference and lexical choice; communication; human/computer interaction; computational linguistics; caricature and face recognition.

Broselow, Ellen, Professor and Chairperson. Ph.D., 1976, University of Massachusetts-Amherst: Phonology; phonetics; second language acquisition.

Finer, Daniel L., Associate Professor. Ph.D., 1984, University of Massachusetts-Amherst: Syntax; semantics; language acquisition.

He, Agnes W., Research Assistant Professor. Ph.D., 1993, University of California, Los Angeles: Discourse/conversation analysis; pragmatics; ESL/EFL teacher training; sociolinguistics.

Hoberman, Robert, Associate Professor.² Ph.D., 1983, University of Chicago: Semitic linguistics.

Huffman, Marie K., Assistant Professor. Ph.D., 1989, University of California, Los Angeles: Phonetics; phonology.

Kaufman, Dorit, Research Assistant Professor. Ph.D., 1991, State University of New York at Stony Brook: Language acquisition and attrition; language education.

Klein-Andreu, Flora, Associate Professor.³ Ph.D., 1972, Columbia University: Linguistic meaning; sociolinguistics; language change.

Larson, Richard K., Associate Professor. Ph.D., 1983, University of Wisconsin: Semantics; syntax.

Ledgerwood, Mikle D., Assistant Professor and Director of the Language Center.⁵ Ph.D., 1985, University of North Carolina: French literature; semiotics; education and technology.

Ludlow, Peter, Associate Professor.⁴ Ph.D., 1985, Columbia University: Semantics; philosophy of linguistics.

Repetti, Lori, Associate Professor.⁵ Ph.D., 1989, University of California, Los Angeles: Italian linguistics; Romance phonology; Italian dialectology.

Samuel, Arthur, Professor.⁶ Ph.D., 1979, University of California, San Diego: Perception; psycholinguistics.

Sridhar, Kamal K., Professor. Ph.D., 1977, University of Illinois: ESL; sociolinguistics; English in the international context; applied linguistics.

Sridhar, S. N., Professor. Ph.D., 1980, University of Illinois: Syntax; psycholinguistics; bilingualism; applied linguistics.

Vasvari, Louise O., Professor.² Ph.D., 1969, University of California, Berkeley: Romance philology; historical linguistics; contrastive analysis; translation theory.

Warren, David S., Professor.⁷ Ph.D., 1979, University of Michigan: Logic programming; database systems; interactive systems; artificial intelligence; natural language and logic.

Number of teaching, graduate, and research assistants, fall 1995: 15

¹ *Germanic and Slavic Languages and Literatures*

² *Comparative Literature*

³ *Hispanic Languages and Literature*

⁴ *Philosophy*

⁵ *French and Italian*

⁶ *Psychology*

⁷ *Computer Science*

⁸ *Joint appointment, German and Slavic Languages and Literature*

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

	<u>Credits</u>
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 532 Second Language Acquisition	
LIN 541 Bilingualism	
LIN 542 Sociolinguistics	
LIN 529 Methods and Materials of Tesol II	
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	<u>30</u>

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 D.A. in Foreign Languages with a Concentration in TESOL

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

A. Formal Course Requirements

	<u>Credits</u>
<i>Major Field Courses</i>	
1. LIN 521 Syntax I	3
2. LIN 522 Phonetics	3

Linguistics

3. LIN 523 Phonology I	3
4. LIN 541 Bilingualism or LIN 542 Sociolinguistics	3
5. LIN 535 Historical Linguistics or an appropriate course in the history of English, to be approved by the D.A. advisor. (Example: EGL 509)	3
6. 3 electives	9
Subtotal	24

Professional Courses

7. LIN 524 Methods of TESOL	3
8. LIN 532 Second Language Acquisition	3
9. LIN 571, 572 Practica	6
Total	36

Elective courses must be approved by the departmental advisor. A maximum of six transfer credits may be recognized for non-SUNY candidates and nine for SUNY candidates. The requirement of item 9, Practica, may be waived upon production of satisfactory teaching record.

B. Language Requirement

Demonstration of proficiency in speaking, understanding, reading, and writing a language other than the candidate's native tongue.

C. Comprehensive Examination

The comprehensive examination may be taken only after the student has completed 36 credits of coursework with an average grade of B or higher in all graduate courses taken at Stony Brook. The comprehensive examination will consist of two parts: (1) a written examination and (2) an oral examination. Students who pass the exam will advance to candidacy. Students are expected to complete the comprehensive exam before the end of the fifth semester of full-time study in the D.A. program.

D. Dissertation Proposal Defense

The candidate will form his or her doctoral committee, which will consist of at least two members of the faculty in the Department of Linguistics and one member from outside the department. The director of the Doctor of Arts Program will serve as an ex officio member of the committee. One of the committee members from the Department of Linguistics will be the dissertation director. The candidate will prepare a dissertation proposal in consultation with the dissertation director and must successfully defend it orally at a meeting of the doctoral committee.

E. Defense of Dissertation

The candidate must successfully defend his or her dissertation at a meeting of the doctoral committee.

Requirements for the Ph.D. in Linguistics

A. Students intending to pursue the Ph.D. will normally be admitted directly into the Ph.D. program. In their first three semesters, they will complete requirements 1 and 2.

1. Successful completion of 30 credits of coursework, including:

- 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.

2. *Successful performance on the comprehensive exam.* The exam must be taken at the end of the student's third semester in residence. The exam will be administered only once per year, and each student will take the exam just once. After completion of the exam, students will be evaluated by the faculty on the basis of both their performance on the exam and their performance in courses completed to date. This evaluation will have one of three outcomes:

- a. Students whose performance is judged unsatisfactory will be asked to leave the program.
- b. Students whose work is satisfactory without exhibiting the potential for completing a Ph.D. will be awarded a terminal M.A.
- c. Students whose work is of sufficiently high quality will be permitted to continue toward the Ph.D.; at this time the student may receive an M.A. in Linguistics.

B. Students who have been permitted to proceed to the Ph.D. must fulfill the following requirements:

1. 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.
2. 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, two of whom will be full-time faculty from within the department. Public presentation of at least one of these papers is required. Both papers should be completed by the end of the fifth semester. Upon completion of requirements 1 and 2, students will be considered to have advanced to candidacy.
3. 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.
4. Demonstrated knowledge of two foreign languages other than the student's mother tongue. This requirement may be satisfied by any of the following methods:
 - a. Submission of an analytic paper demonstrating knowledge of the structure of the language.
 - b. Satisfactory completion of a course in the structure of the language.
 - c. Satisfactory performance on a standardized exam designed to measure language proficiency.
 - d. 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

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.

Spring, 3 credits

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

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

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 corequisites: LIN 530, or LIN 521 and LIN 523

3 credits

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 corequisites: LIN 530, or LIN 521 and LIN 523

3 credits, repetitive

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

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, language and content-area instruction, curriculum design, and evaluation models.

Prerequisite: LIN 524 and permission of instructor

Spring, 3 credits

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

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 corequisites: LIN 530, or LIN 521 and LIN 523

3 credits

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 corequisites: LIN 530, or LIN 521 and LIN 523

3 credits

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

LIN 541 Bilingualism

Study of the social, linguistic, educational, and psychological aspects of bilingualism. Crosslisted with CEL 541.

Pre- or corequisites: LIN 530, or LIN 521 and LIN 523

3 credits

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

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

LIN 550 Selected Topics in Linguistics

Topics are announced each semester. The course may be repeated for credit if topic differs.

Fall and spring, 3 credits each semester

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

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

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

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

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

LIN 571 Practicum in TESOL I

Each student will have primary responsibility for teaching a section of English as a Second Language under the supervision of a member of the Linguistics Department.

Fall and spring, 3 credits each semester

Linguistics

LIN 572 Practicum in TESOL II

Each student will have primary responsibility for teaching a section of English as a Second Language under the supervision of a member of the Linguistics Department.

Fall and spring, 3 credits each semester

LIN 574 Student Teaching Seminar in English as a Second Language

Seminar on problems and issues of teaching English as a second language at the elementary, middle, and secondary school levels. Analysis of actual problems and issues encountered during the student teaching experience.

Prerequisites: LIN 524 and permission of instructor

Corequisite: LIN 581 and LIN 582
3 credits

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

Corequisite: LIN 582 and LIN 574
Fall or Spring, 3 credits

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

Corequisite: LIN 581 and LIN 574
Fall or Spring, 3 credits

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

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

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 to 6 credits

LIN 680 Doctoral Seminar

Doctoral candidates will present and discuss their own research work.

Prerequisite: Advanced standing
Fall and spring, 3 credits each semester

LIN 699 Doctoral Research in Linguistics

Independent research for the Ph.D. degree. Open only to candidates for the Ph.D. degree who have passed the comprehensive examination.

Fall and spring, 1-6 credits, repetitive

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

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

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 comprehensive examination.

Fall and spring, 1-9 credits, repetitive

W. Averell Harriman School for Management and Policy (MGT)

*Director: Thomas R. Sexton
Harriman Hall 306 (516) 632-7175*

*Graduate Program Director: Thomas Gjerde
Harriman Hall 314 (516) 632-7163*

*Director of the Center for Human Resource Management: Manuel London
Harriman Hall 306 (516) 632-7159*

*Staff Assistants: Sally Luzader and Lucy Quirk
Harriman Hall 109 (516) 632-7171*

Advanced Graduate Certificates awarded: Advanced Graduate Certificate in Health Care Management; Advanced Graduate Certificate in Information Systems Management; Advanced Graduate Certificate in Labor/Management Studies
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.

The programs also emphasize human resource management. Successful managers communicate, lead, coordinate, motivate, delegate, and participate. The programs refine these qualities via courses, group projects for clients, internships, and small group experiences interwoven throughout the curriculum.

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 entrepreneurship and marketing, finance and economics, health care management, human resource management, and information systems management. 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

W. Averell Harriman School for Management and Policy

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.

Technology Management Program

The Technology Management Program is an executive management option for people with a background in science, technology, or engineering who aspire to success in management. A specially tailored series of modules offered one evening a week and every other Saturday permits completion of the degree in two academic years on a part-time basis. The Technology Management Program, which is offered jointly with the Technology and Society Program, focuses on the special problems of managing rapidly changing technology as well as showing how to use technology for management purposes. In addition to developing the traditional core management skills, it exposes participants to the special challenges and opportunities of high technology. It is intended for organizations that are interested in building future leadership and individuals who want to move ahead in their positions. Special tuition and application procedures apply. For more information, call Gerrit Wolf at (516) 632-7744.

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 internship during the summer between the first and second years, and the school assists its students in securing internships. Working, part-time students may satisfy their internship requirement 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.

Center for Human Resource Management

The Harriman School's Center for Human Resource Management offers a professional development program for private- and public-sector managers, industrial relations specialists and union representatives, human resources/personnel managers, and employee training professionals. The program, leading to the New York State Advanced Certificate in Labor/Management Studies, requires a bachelor's degree from an accredited college. It is also available to students enrolled in Harriman's master of science program.

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 Certificate in Labor/Management Studies. The program must be completed in three years.

For 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 12 credits.

Certificate Program 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 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 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 towards career enhancement of new professionals, as well as towards 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.

W. Averell Harriman School for Management and Policy

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. They strongly believe that 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 and units 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 promote valuable interactions with industry, government, and nonprofit organizations and provides hands-on experience to students.

Facilities

To support utilization of computers throughout the curriculum, the Harriman School maintains a modern computing facility known as Harriman Electronic Learning Place (HELP). The HELP facility, containing IBM PCs and laser printers, is open only to Harriman graduate students, faculty, and staff. The

computers are connected by Novell Ethernet to the server, which links them to the faculty, the library, and worldwide communications. Each student has his or her own account.

The software available on each computer includes the latest versions of Lotus, WordPerfect, and Harvard Graphics—all designed to support coursework and internship project needs. There is also software available for accounting, finance, statistics, simulation, project management, expert systems, and modeling.

For special projects, students also have access to a scanner, color plotter, and color printer. Via the network, students can access the campus IBM and VAX systems as well as the on-line library catalog.

The HELP facility is supported by Harriman graduate student consultants who assist with whatever problems users may encounter. Harriman students also manage the Harriman Café, a convivial meeting place on the first floor.

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 provisional basis.

B. Aptitude for quantitative analysis, demonstrated through previous coursework, standardized tests, or practical experience. All applicants must successfully complete 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.

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:

Graduate Secretary
W. Averell Harriman School for
Management and Policy
University at Stony Brook
Stony Brook, New York 11794-3775

Faculty

Alloca, Carl J., C.P.A., Lecturer. Long Island University, C.W. Post: Public and private accounting, auditing, taxation, and internal systems development and review.

Altman, Stanley M., Associate Professor and Director of the Center for Health Policy and Management. Ph.D., 1967, Polytechnic Institute of Brooklyn: Health care management and policy; finance.

Carroll, T. Owen, Associate Professor. Ph.D., 1968, Cornell University: Nonlinear dynamics in finance; management information systems; pattern recognition with applications to finance.

Casey, Jeff T., Associate Professor. Ph.D., 1986, University of Wisconsin: Human resource management; managerial judgment and decision making.

Chatterjee, Subimal, Assistant Professor. Ph.D., 1994, University of Pittsburgh: Marketing; consumer behavior; marketing research; product management; behavioral decision theory and its applications to marketing.

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Feinberg, Eugene, Professor.⁵ Ph.D., 1979, Vilnius University, Russia: Manufacturing; telecommunications; operation research; transportation.

Gjerde, Thomas J., Graduate Program Director. Ph.D., 1996, Purdue University: Labor economics, macroeconomics, econometrics.

London, Manuel, Professor and Director of the Center for Human Resource Management. Ph.D., 1974, Ohio State University: Personnel promotion policies; management training; organizational behavior.

Paulson-Gjerde, Kathy A., Assistant Professor.⁷ Ph.D., 1993, Purdue University: Labor economics; industrial organization; total quality management; econometrics.

Preston, Anne E., Associate Professor.⁷ Ph.D., 1983, Harvard University: Labor economics; nonprofit organizations; applied econometrics; careers of scientists and engineers.

Sexton, Thomas R., Associate Professor, Director, and Codirector of Health Services Research and Management Unit.⁵ Ph.D., 1979, State University of New York at Stony Brook: Health care delivery systems; efficiency analysis; statistics.

Skorin-Kapov, Darko, Assistant Professor.⁵ Ph.D., 1989, University of British Columbia, Canada: Telecommunications; operations research; database design.

Skorin-Kapov, Jadranka, Associate Professor and Director of the Center for Information Systems Management.⁵ Ph.D., 1987, University of British Columbia, Canada: Management information systems; operations research; artificial intelligence.

Slotnick, Susan A., Assistant Professor. Ph.D., 1994, Carnegie Mellon University: Operations management; management information systems; applications of expert systems to manufacturing operations.

Sobel, Matthew J., Professor.⁵ Ph.D., 1967, Stanford University: Operations management; environmental management; operations research.

Weiner, Harry, Associate Professor. S.M., 1970, Massachusetts Institute of Technology: Public policy and management; human resources management; diversity in technical workforces.

Wolf, Gerrit, Professor.⁶ Ph.D., 1967, Cornell University: Entrepreneurship; organizational behavior; human resources management; international management.

Adjunct Faculty

Barnhart, Michael, Associate Professor.^{10,11,12,13} Ph.D., 1980, Harvard University: U.S. foreign policy; 20th-century U.S. history; modern Japan.

Koppelman, Lee E., Leading Professor.¹⁴ 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.

Leiken, Alan M., Associate Professor and Codirector of Health Care Management Certificate Program.¹⁵ Ph.D., 1978, State University of New York at Stony Brook: Health economics

McBarnette, Lorna S., Professor and Dean of the School of Health Technology and Management. Ph.D., 1993, State University of New York at Albany: Health policy and management.

Nathans, Robert, Professor and Director of the Institute for Pattern Recognition.¹⁶ Ph.D., 1954, University of Pennsylvania: Energy modeling and policy analysis.

Preston, Frederick R., Assistant Professor and Vice President for Student Affairs. Ed.D., 1971, University of Massachusetts-Amherst: Cross-cultural issues in higher education management.

Schneider, Mark S., Professor.¹⁴ Ph.D., 1974, University of North Carolina: Local government; public policy.

Scholz, John T., Professor.¹⁴ Ph.D., 1977, University of California, Berkeley: Bureaucracy; organizational decision making; regulation and enforcement.

Taksar, Michael, Professor.¹⁷ Ph.D., 1979, Cornell University: Stochastic models; diffusion theory.

Teske, Paul, Associate Professor.¹⁴ Ph.D., 1988, Princeton University: Political economy; urban politics; regulatory policy.

Number of teaching, graduate, and research assistants, fall 1995: 30

¹ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1974

² President, Communications Workers of America, AFL-CIO, CLC

³ Past President, United Transportation Union, Long Island Railroad

⁴ Joint appointment, Department of Political Science

⁵ Joint appointment, Department of Applied Mathematics and Statistics

⁶ Joint appointment, Department of Psychology

⁷ Courtesy appointment, Department of Economics

⁸ Research Fellow of the National Bureau of Economic Research

⁹ Recipient of the President's Award for Excellence in Teaching, 1985

¹⁰ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1985

¹¹ Recipient of the Teaching Merit Award, 1990

¹² Department of History

¹³ Department of Political Science

¹⁴ Department of Allied Health Resources

¹⁵ Department of Physics

¹⁶ Department of Applied Mathematics and Statistics

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 time 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 both the fall and spring semesters.

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 (3 credits)
- MGT 592 Organizational Behavior (3 credits)
- Elective
- Elective
- Elective

Spring—Second Year (15 credits)

- MGT 520 Ethics in Management (2 credits)
- MGT 580 Strategy (4 credits)
- Elective
- Elective
- Elective

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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 summer position in a business, government, or non-profit organization. Students must write a faculty-approved internship report in the semester following the internship.

Placement and Career Services

Placement and career services are conducted through two offices. The university-wide center has a placement officer who conducts placement activities for the College of Engineering and Applied Sciences which houses the Harriman School. In addition, there is a placement office within the Engineering College. Professional placement officers from both offices will help students explore their career objectives, identify career opportunities, and conduct successful job searches.

Courses

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

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

MGT 517 Management Information Systems

The analysis and design of information systems to aid in managerial decision making. Intra- and Inter-net computing.

Spring, 3 credits

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

MGT 533 Managerial Economics

The techniques and approaches of micro-economic 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

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

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

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

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

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

MGT 541 Group Project

Under faculty supervision groups of students work for clients on policy issues in a variety of areas such as development, energy, housing, and health. The course provides students with an opportunity to apply the analytic skills they have learned in the classroom to real problems. Other purposes are to give them practice in writing, speaking, and working cooperatively in small groups, all of which are important skills for the policy analyst.

Fall, 3 credits

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

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

ELECTIVES

MGT 501 Computers in Health Care Management

The use of computers in the management of health care delivery units. Hands-on experience using personal computers and spreadsheet and other software. Topics include budgeting, planning, and strategic management. Basic familiarity with personal computers and spreadsheet software is assumed.

Fall, 3 credits

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

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

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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

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

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

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.

Prerequisite: PAM 506/CES 516
Spring, 3 credits

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 smoke-stack 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

MGT 509 Rise of American Labor

Rebels, radicals, revolutionaries, and reformers have all focused upon the American worker as an instrument of social change in trying to shape the thought and action of working people to their particular philosophy. The programs and influence of such leaders as Eugene V. Debs, John Reed, Charlotte P. Gilman, Margaret Sanger, Martin Luther King, Big Bill Haywood, and Norman Thomas will be examined, as will such publications as *Masses*, *Mother Earth*, *Messenger*, and *New Masses*. The course concludes with an analysis of the effect of these efforts on today's American labor movement and social structure. Crosslisted with CES 522.

Spring, 3 credits

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.

Prerequisite: PAM 505/CES 515
Spring, 3 credits

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

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

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, 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.

Prerequisite: PAM 506/CES 516
Fall, 3 credits

MGT 516 Applied Analysis

Application of knowledge from microeconomics, model building, and statistics to solving complex managerial and policy problems using PCs, standard programs, and actual data.

Prerequisites: PAM 515, 533, and 543
Spring, 3 credits

MGT 518 Operations Research

Applications of operations research techniques. Among specific areas modeled are emergency services, sanitation, environmental protection, crime prevention, criminal justice, blood banking, energy supply and demand, manpower scheduling, and education. Techniques discussed include linear programming, queuing theory, simulation, and Markov processes.

Spring, 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 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

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

MGT 522 Managerial and Professional Computing

This course covers advanced topics in personal computing for managers and analysts. Topics include spreadsheets, databases, and higher-level programming.

Fall, 3 credits

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

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enrichment, and employee assistance programs, and learns how to devise model affirmative action and employee safety procedures. Crosslisted with CES 523.

Spring, 3 credits

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

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

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

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

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

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

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

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

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.

Spring, 3 credits

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 relation-

ships, and organizational structures. Quality improvement, employee involvement, and professional development are studied as examples of change strategies. Crosslisted with CEX 538.

3 credits

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

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

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

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

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

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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

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

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

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

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

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

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

MGT 561 Expert Systems for Management

Management view of expert systems, including basic principles, current topics, and hands-on development.

Fall, 3 credits

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 queuing theory.

Fall, 3 credits

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 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

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

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

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

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

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 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

MGT 579 Nonprofit Management

This course provides general knowledge of the operations and management of organizations and special familiarity with the characteristics and management problems of nonprofit organizations.

Fall, 3 credits

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

MGT 587 Manufacturing and Operations Management

This course focuses on issues related to manufacturing and service operations. Students with engineering or applied mathematics backgrounds are introduced to tools, techniques, and strategies used to make operations management decisions. Illustrative topics include product development, location and layout strategies, system simulation, inventory management, project management, and quality issues.

3 credits

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

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

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 credit

Marine Sciences Research Center (MAR, OCN)

Dean: J. Kirk Cochran

Endeavour Hall 145 (516) 632-8700

Graduate Program Director: Henry J. Bokuniewicz

Endeavour Hall 211 (516) 632-8674

Coordinator of Atmospheric Sciences Program: Sultan Hameed

Endeavour Hall 131 (516) 632-8681

Director of Waste Reduction and Management Program: R. Lawrence Swanson

Dutchess Hall 147 (516) 632-8704

Graduate Secretary: Laura Richardson

Endeavour Hall 105 (516) 632-8681

Degrees awarded: 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; fishery management; 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 imag-

inative 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. degree 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 sea-table space are available to MSRC faculty and students.

The center operates a 20-meter research vessel, the *R/V Onrust*, 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.

Marine Sciences Research Center

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. Methods of non-equilibrium thermodynamics have been used to study the energy balance in the present global climate. Time-series analysis and other statistical techniques are applied to investigate historical records of temperature and precipitation at various locations

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. Numerical models have been developed to study the relationships between the concentrations of trace gases in the troposphere and the stratosphere to their sources.

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. Models of the upper atmospheres of the planets are constructed in order to understand their neutral and ion densities, luminosity, thermal balance, and evolution.

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), which is 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.

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, fishery management, coastal zone management, or marine environmental sciences.

Ph.D. Program in Coastal Oceanography

The Ph.D. program is designed to prepare students to identify and attack coastal oceanographic 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 those interests are 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. Productive work in the coastal ocean requires both a profound knowledge of at least one basic science and a general understanding of the processes that characterize the coastal ocean.

Admission

Admission to the M.S. Program in Marine Environmental 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 (550) 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 capability in scholarship, motivation, diligence in the discharge of their duties, and 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 (550) 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

Aller, Josephine Y., Associate Professor. Ph.D., 1975, University of Southern California: Marine benthic ecology; invertebrate zoology; marine microbiology; biogeochemistry.

Aller, Robert C., Professor. Ph.D., 1977, Yale University: Marine geochemistry; marine animal-sediment relations.

Andreoli, Aldo, Adjunct Professor.¹ M.C.E., 1962 New York University: Water pollution control, water supply, subsurface denitrification.

Berger, Harold, Adjunct Professor.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.

Bokuniewicz, Henry J., Professor, Associate Dean for Educational Programs, and Graduate Program Director. Ph.D., 1976, Yale University: Nearshore transport processes; coastal sedimentation; marine geophysics.

Bowman, M.J., Professor. Ph.D., 1971, University of Saskatchewan, Canada: Coastal dynamics; oceanic fronts; productivity and physical processes.

Breslin, Vincent T., Assistant Professor. Ph.D., 1986, Florida Institute of Technology: Environmental chemistry; contaminant transport and leachability; waste treatment technologies.

Bricelj, V. Monica, Associate Professor. Ph.D., 1984, State University of New York at Stony Brook: Physiological ecology; bioenergetics; shellfish (molluscan) biology.

Brownawell, Bruce J., Associate Professor. Ph.D., 1986, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Biogeochemistry of organic pollutants in seawater and groundwater.

Cess, Robert D., Distinguished Professor and Distinguished Service Professor. Ph.D., 1959, University of Pittsburgh: Atmospheric sciences.

Carpenter, Edward J., Professor. 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.

Cerrato, Robert M., Associate Professor. Ph.D., 1980, Yale University: Benthic ecology; population and community dynamics; recolonization.

Chistoserdov, Andre Y., Assistant Professor. 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.

Cochran, J. Kirk, Professor and Director of the Marine Science Research Center. Ph.D., 1979, Yale University: Marine geochemistry; use of radionuclides as geochemical tracers; diagenesis of marine sediments.

Conley, Daniel C., Assistant Professor. Ph.D., 1983, University of California, San Diego (Scripps): Sediment transport; wave boundary layers; nearshore processes.

Conover, David O., Professor. Ph.D., 1981, University of Massachusetts: Ecology of fishes; fisheries biology.

Conversi, Alessandra, Research Assistant Professor. Ph.D., 1992, University of California, San Diego (Scripps): Decadal time series; water quality monitoring.

Cosper, Elizabeth M., Associate Research Professor. Ph.D., 1981, City University of New York: Phytoplankton physiology and ecology; resistance of microalgae to pollutants.

Cowen, Robert K., Associate Professor. Ph.D., 1985, University of California, San Diego (Scripps): Fishery oceanography; nearshore fish populations; fish ecology.

Crawford, W.R., Adjunct Professor. Ph.D., 1976, University of British Columbia, Canada: Continental shelf and slope dynamics microstructure; tidal dynamics.

Duerr, Eric O., Adjunct Assistant Professor. Ph.D., 1981, University of Miami: Aquaculture of marine phytoplankton, particularly cyanobacteria.

Elskus, Adria, Assistant Research Professor. Ph.D., 1992, Boston University: Environmental toxicity; reproductive ecology; pollutant metabolism; endogenous/ xenobiotic gene regulation.

Falkowski, Paul G., Adjunct Associate Professor.⁸ Ph.D., 1975, University of British Columbia, Canada: Marine phytoplankton ecology; phytoplankton physiology.

Feldman, Gene, Adjunct Assistant Professor.³ Ph.D., 1985, State University of New York at Stony Brook: Remote sensing of phytoplankton; satellite oceanography.

Fisher, Nicholas S., Professor. Ph.D., 1974, State University of New York at Stony Brook: Marine phytoplankton physiology and ecology; biochemistry of metals; marine pollution.

Flood, Roger D., Associate Professor. Ph.D., 1978, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Marine geology; sediment dynamics; continental margin sedimentation.

Fox, Jane, Professor. Ph.D., 1978, Harvard University: Planetary aeronomy.

Geller, Marvin A., Professor. Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric dynamics; climate and the upper atmosphere.

Gerard, Valrie A., Associate Professor. Ph.D., 1976, University of California, Santa Cruz: Seaweed ecology and physiology.

Hameed, Sultan, Professor and Coordinator of Atmospheric Sciences Program. Ph.D., 1968, University of Manchester, England: Atmospheric sciences.

Heidelberger, Edwin C., Adjunct Lecturer.⁵ M.S., 1969, New York University; meteorology, weather prediction.

Herman, Herbert, Professor.⁴ Ph.D., 1961, Northeastern University: Ocean engineering; undersea vehicles; marine materials.

Koppelman, Lee E., Professor, 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, Professor. Ph.D., 1975, University of California, San Diego (Scripps): Marine geochemistry of organic compounds; organic and inorganic nitrogen cycle biochemistry.

Lonsdale, Darcy J., Associate Professor. Ph.D., 1979, University of Maryland: Zooplankton ecology with special interest in physiology; life history studies.

Lopez, Glenn R., Professor. Ph.D., 1976, State University of New York at Stony Brook: Benthic ecology; animal-sediment interactions.

Mackin, James E., Associate Professor. Ph.D., 1983, University of Chicago: Diagenesis of sediments.

Mak, John E., Assistant Professor. Ph.D., 1992, University of California, San Diego (Scripps): Atmospheric chemistry and biosphere-atmosphere interactions; isotope geochemistry.

Manheim, Frank T., Adjunct Professor.⁶ Sc.D., 1974, University of Stockholm, Sweden: Marine geochemistry; ocean policy.

McElroy, Anne E., Associate Professor. Ph.D., 1985, Massachusetts Institute of Technology, Woods Hole Oceanographic Institution: Aquatic toxicity, fate and effects of organic contaminants.

McHugh, John L., Professor Emeritus. Ph.D., 1950, University of California, Los Angeles: Fishery management; fishery oceanography; whales and whaling.

Meyers, William J., Associate Professor.⁷ Ph.D., 1973, Rice University: Carbonates; sedimentology.

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Miller, Mark A., Adjunct Lecturer.⁸ Ph.D., 1994, Pennsylvania State University; Meteorology, surface-based remote sensing, marine boundary layer clouds.

Morgan, Steven, Assistant Professor. Ph.D., 1986, University of Maryland at College Park: Larval ecology and evolution of life histories.

Nittrouer, Charles, Professor. Ph.D., 1978, Washington University: Geological oceanography; continental margin sedimentation.

O'Connor, Joel, Adjunct Associate Professor.⁹ Ph.D., 1966, University of Rhode Island: Environmental assessment, policy, and quality indicators; marine ecology.

Peters, Hartmut, Assistant Professor. Ph.D., 1981, Kiel University, Germany: Turbulence; interval waves; large-scale flow; circulation of coastal and estuarine waters.

Pritchard, Donald W., Professor Emeritus. Ph.D., 1951, University of California, San Diego (Scripps): Estuarine and coastal dynamics; coastal zone management.

Reaven, Sheldon, Associate Professor. Ph.D., 1975, University of California, Berkeley: Energy and environmental problems; waste management; technology assessment; science and society.

Roethel, Frank J., Lecturer. Ph.D., 1982, State University of New York at Stony Brook: Environmental chemistry; behavior of coal waste in the environment; solution chemistry.

Sañudo-Wilhelmy, Sergio A., Assistant Professor. Ph.D., 1993, University of California, Santa Cruz: Chemical oceanography; coastal geochemistry; metal cycling in aquatic systems.

Schubel, J.R., Professor Emeritus.¹⁰ Ph.D., 1968, The Johns Hopkins University: Coastal sedimentation; suspended sediment transport; coastal zone management.

Scranton, Mary I., Professor. 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., Professor.¹¹ Ph.D., 1951, Yale University: Evolutionary strategy with reference to species diversity; timing of responses and self-image adaptive mechanisms of Hydra.

Sponaugle, Susan C., Lecturer. Ph.D., 1994, State University of New York: Fish ecology, tropical marine ecology, conservation.

Suszkowski, Dennis, Adjunct Associate Professor.¹² Ph.D., 1978, University of Delaware: Estuarine sedimentology; ocean and estuarine policy and management.

Swanson, R. Lawrence, Adjunct Professor and Director of Waste Management Program. Ph.D., 1971, Oregon State University: Physical oceanography of coastal waters and estuaries; ocean dumping; coastal zone management.

Taylor, Gordon T., Assistant Professor. Ph.D., 1983, University of Southern California; Marine microbial ecology, microbial mediation of biogeochemical processes, biofouling.

Thomson, Richard E., Adjunct Associate Professor. Ph.D., 1971, University of British Columbia, Canada: Coastal oceanography; continental shelf waves; slope currents.

Varanasi, Prasad, Professor. Ph.D., 1967, University of California, San Diego: Planetary spectroscopy; molecular physics.

Vaughn, James, Adjunct Associate Professor.¹³ Ph.D., 1972, University of New Hampshire: Transport fate and effects of viruses in the aquatic environment.

Waliser, Duane E., Assistant Professor. Ph.D., 1992, University of California, San Diego: Observational theoretical studies of ocean-atmosphere coupling in the tropics.

Wang, Dong-Ping, Professor. Ph.D., 1975, University of Miami: Coastal ocean dynamics.

Weyl, Peter K., Professor Emeritus. Ph.D., 1953, University of Chicago: Coastal zone planning; physical oceanography.

Wilson, Robert E., Associate Professor. Ph.D., 1973, The Johns Hopkins University: Estuarine and coastal ocean dynamics.

Woodhead, Peter M. J., Research Professor. B.S., 1953, Durham University, England: Behavior and physiology of fish; coral reef ecology; ocean energy-conversion systems.

Wurster, Charles F., Associate Professor Emeritus. Ph.D., 1957, Stanford University: Effects of chlorinated hydrocarbons on phytoplankton communities.

Yen, Jeannette, Associate Professor. Ph.D., 1982, University of Washington: Marine zooplankton ecology; predator-prey interactions; sensory perception and lipid metabolism of copepods.

Zhang, Minghua, Assistant Professor. Ph.D., 1987, Institute for Atmospheric Physics, Academia Sinica, Beijing: Atmospheric sciences; modeling of climate.

¹ Northville Industries

² Regional Director (Retired) Region 1, New York Department of Environmental Conservation

³ National Aeronautics and Space Administration, Goddard Space Flight Center

⁴ Joint appointment, Department of Materials Science and Engineering

⁵ NOAA National Weather Service (Retired)

⁶ U.S. Geological Survey

⁷ Joint appointment, Department of Earth and Space Sciences

⁸ Brookhaven National Laboratory

⁹ U.S. Environmental Protection Agency

¹⁰ New England Aquarium

¹¹ Joint appointment, Department of Ecology and Evolution

¹² Hudson River Foundation

¹³ The Conservation Foundation, World Wildlife Fund

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 all courses taken. Any student who receives two Cs that have not been offset by two As 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

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

A. Departmental examination.

B. Ph.D. degree dissertation proposal approved by three MSRC faculty.

C. Sea experience or appropriate field experience.

D. Seminar MAR 580 (two 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.

Corequisite: MAR 555 or permission of instructor

Fall, 4 credits

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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, 2 credits

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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

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, 3 credits

MAR 523 Marine Botany

Introduction to seaweeds and seagrasses. Reproductive biology and taxonomy are discussed in terms of ecology, physiology, and distribution of seaweeds in temperate and tropical waters. Several trips to rocky shore communities and a regional conference on algae are a required part of the course.

Prerequisite: General botany/ecology, enrollment in Marine Environmental Sciences program, or permission of instructor
Spring, 3 credits

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

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

MAR 526 Turbulence in Oceans and Coastal Waters

Basic properties and scales, similarity theory, spectra, boundary layers, stratified turbulence, double-diffusing convection measurements in ocean and atmosphere turbulence, internal waves and large-scale flows, parameterization of turbulent mixing.

Spring, alternate years, 3 credits

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, 2 credits

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

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
Spring, 3 credits

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

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

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

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

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

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

MAR 537 Primary Productivity in the Sea

Review of classic and current research on primary production by marine microalgae and macroalgae. Topics include photosynthesis and growth, nutrients, temporal and spatial variability, competition, and predation. Students carry out original research projects.

Fall, 3 credits

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
Spring, 3 credits

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

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
Spring, alternate years, 3 credits

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, 3 credits

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

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

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

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

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, 3 credits

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

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.

Prerequisite: Permission of instructor
Fall, 2 credits

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

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
Fall, alternate years, 3 credits

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

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, 3 credits

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

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

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

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MAR 562 Early Diagenesis of Marine Sediments

The course treats qualitative and quantitative aspects of the early diagenesis of sediments. Topics include diffusion and adsorption of dissolved species; organic matter decomposition and storage; and diagenesis of clay materials, sulfur compounds, and calcium carbonates. The effects of bioturbation on sediment diagenesis are also discussed. 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

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, 3 credits

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

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.

Spring, 3 credits

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

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

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

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
Spring, 2 credits

MAR 577 Special Topics—Coastal Zone Management

The course is designed for the discussion of topics of special interest on demand that are not covered in regularly scheduled courses. Examples of possible topics include micro-computer information systems, environmental law, coastal pollution, dredge spoil disposal, science and technology in public institutions, and coastal marine policy.

Prerequisite: Permission of instructor
1-4 credits

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

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

MAR 590 Research

Original investigation undertaken with the supervision of the advisor.

Prerequisite: Permission of instructor
Fall and spring, variable and repetitive credit

ATMOSPHERIC SCIENCES COURSES

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.

Fall, alternate years, 3 credits

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

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

MAR 595 Planetary Aeronomy

This course focuses on the chemical and thermal structures of planetary atmospheres, especially upper atmospheres. We discuss the ways that solar energy is absorbed and how it relates to the neutral and ionic composition, temperature, and airglow features of the atmosphere. We also look into the escape of species from the top of the atmosphere and atmospheric evolution. Crosslisted with ESC 547.

Prerequisite: Permission of instructor
Spring, alternate years, 3 credits

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.

Fall, 3 credits

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.

Fall, 3 credits

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

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

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

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

OCN 650 Dissertation Research

Original investigation undertaken with the supervision of research committee.

Fall and spring, variable and repetitive credit

OCN 655 Directed Study

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

Prerequisite: Permission of instructor
Fall, spring, and summer, 1-9 credits, variable and repetitive

OCN 670 Practicum in Teaching

Fall and spring, 1-3 credits, repetitive

OCN 677 Benthic Ecology

Ecological interactions of benthic organisms with their habitat. There are 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

Fall, alternate years, 2 credits

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, 1 credit, repetitive

Materials Science and Engineering (ESM)

Chairperson: Michael Dudley
Engineering Building 314 (516) 632-8484

Graduate Program Director: Miriam Raifalovich
Engineering Building 320 (516) 632-8483/8498

Department Office
Engineering Building 314 (516) 632-8484

Degrees awarded: M.S. in Materials Science Engineering; Ph.D. in Materials Science 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 course work 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.

One-Year Master's 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.

Facilities

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 eleven full-time faculty members, many of whom hold guest appointments at Brookhaven National Laboratory. The proximity of this excellent laboratory benefits the University's research programs through the availability of major facilities not normally found in university departments.

At Brookhaven, the facilities available to the department include a high-flux research reactor, 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. A newly commissioned neutron reflection spectrometer at Brookhaven's high-flux beam reactor, managed by the Polymer Group based in the department, provides researchers from industry, universities, and laboratories with atomic-scale structural and chemical information about the near-surface properties of liquids and solids. With a grant from the Exxon Education Foundation, materials science faculty are using the instrument to study the interactions of molecules at the air/liquid interface of polymers and membranes.

The Polymer Laboratory 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 copolymers, and wetting.

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 makeup of the newly discovered high-temperature superconductors. Novel methods of rapidly spraying such materials onto surfaces are being developed.

Several other programs within the department concentrate on applied areas of research. Thermal spray technology (melt-spray formation of protective coatings and free-standing forms) is carried out at the Thermal Spray Laboratory, which 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 pro-

grams with government and industry, including an NSF-sponsored Strategic Manufacturing Initiative program and a Department of Commerce-sponsored Advanced Technology Program. The laboratory actively collaborates with a wide range of industries to develop applications for thermal spray technology in materials engineering.

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 to match 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

Bari, Robert A., Adjunct Professor.¹ Ph.D., 1969, Brandeis University: Condensed matter physics; nuclear waste management; probabilistic risk assessment.

Berndt, Christopher C., Professor. Ph.D., 1980, Monash University, Australia: Protective coatings; mechanical properties; biomaterials; thermal spray.

Chu, Benjamin, Distinguished Professor.² 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.

Clayton, Clive R., Professor. Ph.D., 1976, Surrey University, England: Corrosion science; XPS; AES; RHEED; ion implantation; protective coatings.

Dudley, Michael, Professor and Chairperson. Ph.D., 1982, University of Warwick, England: Synchrotron topography; crystal defects; mechanical properties.

Francis, A.J., Adjunct Professor.¹ Ph.D., 1971, Cornell University: Microbiology; biosystems; process sciences.

Gambino, Richard, Adjunct Professor and 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.

Goland, Allen N., Adjunct Professor.¹ Ph.D., 1956, Northwestern University: Solid-state physics; defects; interaction of radiation with condensed matter.

Halada, Gary, Adjunct Assistant Professor. Ph.D., 1993, State University of New York at Stony Brook: Electron spectroscopy; electrochemistry; surface engineering; thin films; engineering design.

Herley, Patrick J., Professor.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, Professor. Ph.D., 1961, Northwestern University: Protective coatings; thermal spray; composites; marine materials.

Issacs, Hugh S., Adjunct Professor.¹ Ph.D., 1963, Imperial College, London: Corrosion; scanning techniques for surface defects; surface analysis.

Johnson, Peter D., Adjunct Professor.¹ Ph.D., 1978, University of Warwick, England: Spin polarized photoemission.

Jona, Franco P., Professor.² Ph.D., 1949, Swiss Polytechnic Institute (E.T.H.), Switzerland: Surface physics; LEED.

Kim, Mahn Won, Adjunct Professor. Ph.D., 1975, University of California, Santa Barbara: Light scattering; Languir-Blodgett films.

King, Alexander H., Professor. D.Phil., 1979, Oxford University, England: Electron microscopy; grain boundaries; crystal defects; thin films.

Materials Science and Engineering

Larson, David Jr., Research Professor and 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.

Marcus, Paul, Adjunct Professor. Ph.D., 1943, Massachusetts Institute of Technology: Atomic-scale surface structure; electron diffraction; magnetic properties of metals.

Papazian, John, Adjunct Professor. Ph.D., 1969, Columbia University: Physical metallurgy and forming of aluminum matrix composites.

Rafailovich, Miriam, Professor and Graduate Program Director. Ph.D., 1980, State University of New York at Stony Brook: Polymeric liquids; phase transitions; thin film wetting phenomena; atomic force microscopy; ion, X-ray, and neutron scattering.

Sampath, Sanjay, Adjunct Assistant Professor. Ph.D., 1989, State University of New York at Stony Brook: Thermal spraying; protective coatings; intermetallics; spray forming.

Schwarz, Steven, Adjunct Professor. Ph.D., 1980, Stanford University: Materials and device characterization by SIMS.

Seigle, Leslie, Professor Emeritus. Ph.D., 1951, Massachusetts Institute of Technology: Thermodynamics of solids; diffusions in solids; protective coatings.

Sokolov, Jonathan C., Associate Professor. Ph.D., 1983, State University of New York at Stony Brook: Surface and interface properties of polymers and blends; phase transitions; neutron and X-ray scattering; EXAFS; SIMS.

Suenaga, Masaki, Adjunct Professor.¹ Ph.D., 1969, University of California, Berkeley: Metallurgy of superconducting materials.

Warren, John B., Adjunct Assistant Professor.¹ Ph.D., 1978, University of Florida: Analytical electron microscopy; X-ray fluorescence; semiconductor defects.

Welch, David O., Adjunct Professor.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.

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:

I. M.S. Non-Thesis Option

A. Election

The election of this option must be made by the student upon admission to the program.

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 512 or higher-level diffraction course; ESM 513; ESM 511 or higher-level thermodynamics course; ESM 531; ESM 522 or higher-level imperfections course; PHY 511 or CHE 521; PHY 512 or CHE 522; ESM 523; PHY 555; PHY 556; PHY 682. At least one of these courses must be taken in each semester until the core program requirement is met.

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.

II. M.S. Thesis Option

A. Election

The election of this option must be made by the student upon admission to the program.

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 512 or higher-level diffraction course; ESM 513; ESM 511 or higher-level thermodynamics course; ESM 531; ESM 522 or higher-level imperfections course; PHY 511 or CHE 521; PHY 512 or CHE 522; ESM 523; PHY 555; PHY 556; PHY 682. At least one of these

courses must be taken in each semester until the core program requirement is met.

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 a minimum of five core courses selected from the following list: ESM 512 or higher-level diffraction course; ESM 513; ESM 511 or higher-level thermodynamics course; ESM 531; ESM 522 or higher-level imperfections course; PHY 511 or CHE 521; PHY 512 or CHE 522; ESM 523; PHY 555; PHY 556; PHY 682. At least one of these courses must be taken in each semester until the core program requirement is met.

3. The student must pass at least three credits of ESM 698 and six credits of ESM 699.

C. 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 faculty members of the Materials Science and Engineering Department, 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.

D. Advancement to Candidacy

After the student has successfully completed all requirements for the degree, other than the dissertation, he or she is eligible to be recommended for advancement to candidacy. This status is conferred by the dean of the Graduate School upon recommendation of the chairperson and the graduate program director.

E. Dissertation

The most important requirement of the Ph.D. degree is the completion of a dissertation, which must be an original scholarly investigation. The dissertation shall represent a significant contribution to the scientific literature and its quality shall be compatible with the publication standards of appropriate and reputable scholarly journals.

F. Defense

The candidate shall defend the dissertation before an examining committee consisting of four members, including the research advisor, two members of the Materials Science and Engineering Department, and one member from outside the department.

G. Residency

Two consecutive semesters of full-time study are required.

H. Time Limit

All requirements for the Ph.D. degree must be completed within seven years after completing 24 credit hours of graduate courses in the program.

Courses

ESM 501 Teaching Techniques

Introduction to basic pedagogical technique. Discussion of the various phases of teaching, including preparation, classroom technique, student evaluation. Problems and pitfalls and how to avoid them.
Fall, 1 credit

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

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; convergent-beam diffraction.
Spring, 3 credits

ESM 504 Biomaterials Science and Analysis

Course content is directed towards 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

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, oxidation, and phase transformations; thermodynamic analysis of phase equilibrium diagrams.
Fall, 3 credits

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

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

ESM 521 Kinetics and Transformations I

Atomistic rate processes in solids with emphasis on diffusion in crystals. Theory of diffusion and experimental techniques; 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

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

ESM 523 Solid-State Electronics

A study of the electronic processes in solids leading to the analysis and design of materials and devices. Crystal structures, binding, electrical and thermal conductivities, diffusion, galvomagnetic, thermomagnetic, and thermoelectric effects. Hall effect and magnetoresistance. Conductivity in thin films.

Fall, 3 credits

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

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

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

SM 534 Advanced Laboratory

Students perform five advanced materials laboratory experiments, choosing from the following topics: Hall effect in semiconductors, Mossbauh magnetism measurement,

Materials Science and Engineering

High T_c semiconductor characterization, absorption of particle radiation, wetting phases, contact angle measurements, polymer thin film morphology, and adhesion properties of polymer interfaces.

Fall, 3 credits

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

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

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

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

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 is discussed. Use of ultrasonics for nondestructive evaluation is considered.

Prerequisite: ESM 513

Spring, 3 credits

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

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

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

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

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

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

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

ESM 615 Seminar in Phase Transformations

The theory of phase transformations in solids is considered. Kinetics and mechanisms of nucleation and growth and martensitic transformations. Melting and solidification, precipitation from solid solution, polymorphic transformations, eutectic and eutectoid reactions, second-order transitions, recrystallization, and other transformations in solids.

Fall, 3 credits

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

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

ESM 698 Practicum in Teaching

3 credits, repetitive

ESM 699 Research

Variable and repetitive credit

Mathematics

(MAT)

Chairperson: *H. Blaine Lawson, Jr.*
Mathematics Building 5-116 (516) 632-8290

Graduate Program Director: *Marie-Louise Michelsohn*
Mathematics Building 5-112 (516) 632-8282

Graduate Secretary: *Joann Debis*
Mathematics Building 5-115 (516) 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 Teaching Option

The Secondary Teaching 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 calculus.
- C. Provisional New York State Certification for Teaching Mathematics, Grades 7-12.
- D. Evidence that the student is likely to succeed: this must include three letters of recommendation, preferably from present or former teachers or supervisors, and Graduate Record Examination (GRE) General Test scores.
- E. 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

- Anderson, Michael**, Professor. Ph.D., 1981, University of California, Berkeley: Differential geometry.
- Barcus, William**, Professor. D.Phil., 1955, University of Oxford, England: Algebraic topology.

Bifet, Emili, Associate Professor. Ph.D., 1988, University of Chicago: Algebraic geometry.

Bishop, Christopher, Associate Professor. Ph.D., 1987, University of Chicago: Complex analysis.

Douglas, Ronald G., Leading Professor. Ph.D., 1962, Louisiana State University: Operator theory; functional analysis; operator algebras and index theory.

Ebin, David, Professor. Ph.D., 1967, Massachusetts Institute of Technology: Global analysis; mathematics of continuum mechanics.

Epstein, Adam, Assistant Professor. Ph.D., 1993, CUNY Graduate School and University Center: Complex analytical dynamics; Riemann surfaces; Teichmüller spaces.

Fox, William, Associate Professor. Ph.D., 1955, University of Michigan: Complex analysis.

Frank, Lenore, Lecturer. M.S., 1972, Yeshiva University: Mathematics education.

Geller, Daryl, Professor. Ph.D., 1977, Princeton University: Analysis.

Glimm, James, Distinguished Leading Professor. Ph.D., 1959, Columbia University: Applied mathematics; numerical analysis.

Gromoll, Detlef, Leading Professor. Ph.D., 1964, University of Bonn, Germany: Differential geometry.

Hill, C. Denson, Professor. Ph.D., 1966, New York University: Partial differential equations; several complex variables.

Jones, Lowell, Professor. Ph.D., 1970, Yale University: Topology.

Knapp, Anthony, Professor. Ph.D., 1965, Princeton University: Lie groups; representation theory.

Kra, Irwin, Leading Professor. Ph.D., 1966, Columbia University: Complex analysis; Kleinian groups.

Mathematics

Kumpel, Paul, Professor.¹ Ph.D., 1964, Brown University: Algebraic topology.

Lawson, H. Blaine, Jr., Distinguished Professor and Chairperson. Ph.D., 1968, Stanford University: Differential geometry; topology; algebraic geometry.

LeBrun, Claude, Professor. D.Phil., 1980, University of Oxford, England: Complex analysis; mathematical physics; differential geometry; algebraic geometry.

Lister, William, Professor Emeritus. Ph.D., 1951, Yale University: Algebra.

Lyubich, Mikhail, Professor. Ph.D., 1983, Tashkent State University, U.S.S.R.: Dynamical systems.

Martens, Marco, Assistant Professor.⁴ Ph.D., 1990, Technical University of Delft, the Netherlands: Dynamical systems.

Maskit, Bernard, Leading Professor. Ph.D., 1964, New York University: Riemann surfaces; Kleinian groups and their deformation spaces.

McDuff, Dusa, Professor. Ph.D., 1971, University of Cambridge, England: Symplectic topology.

Michelsohn, Marie-Louise, Professor and Graduate Program Director. Ph.D., 1974, University of Chicago: Differential geometry.

Milnor, John W., Distinguished Professor.³ Ph.D., 1954, Princeton University: Dynamical systems.

Minsky, Yair, Assistant Professor. Ph.D., 1989, Princeton University: Low-dimensional geometry and topology.

Phillips, Anthony V., Professor. Ph.D., 1966, Princeton University: Differential topology.

Pincus, Joel, Professor. Ph.D., 1959, New York University: Operator theory and integral equations.

Plohr, Bradley James, Professor. Ph.D., 1980, Princeton University: Applied mathematics; partial differential equations.

Sah, Chih-Han, Professor. Ph.D., 1959, Princeton University: Algebra; elementary mathematics and applications.

Silvotti, Roberto, Assistant Professor.⁴ Ph.D., 1990, ETH, Switzerland: Mathematical physics; algebraic geometry.

Strasser, Elvira, Professor Emerita. Ph.D., 1956, New York University: Combinatorial group theory.

Sullivan, Dennis, Distinguished Professor.⁴ Ph.D., 1965, Princeton University: Dynamical systems; topology; geometry; partial differential equations.

Sutherland, Scott, Lecturer and Director of Computing.⁴ Ph.D., 1989, Boston University: Dynamical systems; root-finding algorithms; computing.

Szusz, Peter, Professor Emeritus. Ph.D., 1951, University of Budapest, Hungary: Analytic number theory.

Takhtajan, Leon, Professor. Ph.D., 1975, Leningrad Branch of the Steklov Mathematical Institute, Russia: Mathematical physics.

Teleman, Nicholas, Professor. Ph.D., 1977, Massachusetts Institute of Technology: Global analysis; noncommutative geometry.

Number of teaching, graduate, and research assistants, fall 1995: 56

¹ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990

² Recipient of the State University Chancellor's Award for Excellence in Teaching, 1993

³ Director of the Institute for Mathematical Sciences

⁴ 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, CEN 560 or CEN 561 Introduction to Computing, and a three-credit elective. 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 either CEN 560 or CEN 561.

For students in the Professional Option, the courses that satisfy the 30-credit requirement are worked out individually with each student but ordinarily include 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. 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.

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 at the time they are admitted.

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 in mathematics are required to participate in this program. It consists of supervised teaching or 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 school teachers of mathematics.

Fall, spring, or summer, 3 credits

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

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

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

MAT 515 Geometry for Teachers

A re-examination of elementary geometry using concepts from analysis and algebra.

Fall, spring, or summer, 3 credits

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

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

MAT 519 Seminar in Mathematics Teaching

Study of recent curricular and pedagogical developments in secondary school mathematics.

Fall, spring, or summer, 3 credits

CORE 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

MAT 531 Topology/Geometry II

Foundations of differentiable manifolds: differentiable maps, vector fields and flows, and differential forms and integration on manifolds. Stokes' theorem. Frobenius theorem. Lie derivatives. Immersions and submersions. Introduction to Lie groups and to the classical groups.

Spring, 3 credits

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

MAT 535 Algebra II

Groups: normal subgroups, Jordan-Hölder 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

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

MAT 539 Algebraic Topology

Homology and cohomology groups, homotopy groups and the Hurewicz theorem, the universal coefficient theorem, cup and cap products, Poincaré duality, and introduction to spectral sequences.

Spring, 3 credits

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

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

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

MAT 546 Differential Equations

Basic concepts in ordinary and partial differential equations. Existence, uniqueness, and stability theorems. Geometric theory of characteristics and the Frobenius theorem. Typical features of elliptic, hyperbolic, and parabolic equations.

Spring, 3 credits

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

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

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

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

MAT 580 Combinatorial Analysis

Permutations, combinations; generating functions, linear recursions; matching theory, Ramsey's theorem, block designs, orthogonal Latin squares, finite geometries, extremal problems, chromatic number, probabilistic methods.

Fall, 3 credits

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

Mathematics

MAT 589 First-Year Seminar II

Same concept as MAT 588, but covers different materials.

Spring, 3 credits

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

MAT 598 Teaching Practicum

Seminar and workshop for new teaching assistants.

Fall, 3 credits

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

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

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

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

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

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

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

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

MAT 648, 649 Topics in Mathematical Physics

Typical topics are mathematical methods of classical 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 4-dimensions; supergravity and mirror symmetry; strings.

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

MAT 650, 651 Topics in Combinatorics

Typical topics are drawn from combinatorics and graph theory, Ramsey theory, extremal problems, and methods of enumeration.

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

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

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 begin 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

MAT 666, 667 Advanced Topics in Algebraic Topology

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

MAT 670, 671 Advanced Topics in Complex Analysis

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

MAT 674, 675 Advanced Topics in Differential Equations

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

MAT 678, 679 Advanced Topics in Real Analysis

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

MAT 682, 683 Advanced Topics in Differential Geometry

Prerequisite: Permission of instructor

Fall and spring, 3 credits each semester, repetitive

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

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

MAT 697 Mathematics Colloquium

MAT 698 Independent Study

MAT 699 Dissertation Research

Mechanical Engineering (ESC)

Chairperson: Fu-Pen Chiang
Light Engineering Building 105 (516) 632-8311

Graduate Program Director: Toshio Nakamura
Light Engineering Building 141 (516) 632-8312

Graduate Secretary: Betty Kraebel
Light Engineering Building 103 (516) 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

Mechanical Design

Current research programs are in the areas of analysis and design of mechanical systems, such as high performance machinery and robotic manipulators, and mechanisms, including dynamics, motion, control, and vibration-related problems. The curriculum in the computer-aided design (CAD) area is a combination of teaching and learning experience through projects involving design optimization, computer graphics, and computer codes applications. Applied courses emphasize case studies, finite element methods, and computer graphics.

Solid Mechanics

Computational Mechanics

Various aspects of deformation in advanced materials and composite structures are studied with emphasis on their failure behavior. In particular, fracture mechanisms of embedded flaws in coatings and thin films, and interlaminar delamination in laminates are investigat-

ed with large-scale computational simulations. In addition, stability of complex shell structures is studied with an emphasis on establishing rigorous techniques for understanding the dominant deformation modes leading to buckling and collapse. Current research issues addressed are nonlinear buckling mode interactions in stiffened shells and inelastic material behavior in deformation localization mechanisms observed in shell collapse experiments.

Experimental Mechanics

The experimental concentration involves development of various optical techniques of strain analysis including moiré methods, laser and white-light speckle methods, holographic interferometry, photoelasticity, and classical interferometry. A major goal of the experimental program is to apply these methods to solid mechanics problems such as fracture, wave propagation, metal forming, flexor, and vibration. The experimental mechanics equipment includes various lasers, high-speed digitized cameras, a scanning electron microscope, and many other electro-optical devices in various research laboratories.

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 studies of turbine blade cooling, 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 machine and animation devices.

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

Mechanical Engineering

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 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

Chiang, Fu-Pen, Leading Professor and Chairperson. Ph.D., 1966, University of Florida: Experimental mechanics; solid mechanics; photoelasticity; moire and laser methods for stress analysis.

Ge, Q. Jeffrey, Assistant Professor. Ph.D., 1990, University of California, Irvine: Design automation; robotics; CAD/CAM; design for manufacture; mechanical systems analysis and simulation.

Harris, Stewart, Professor. Ph.D., 1965, Northwestern University: Brownian motion theory and its applications; epitaxial crystal growth.

Huang, Peisen S., Assistant Professor. Ph.D., 1993, University of Michigan; Ph.D., 1994, Tohoku University, Japan: Precision engineering; optical metrology; calibration and error compensation of machine tools; CMM and robots.

Irvine, Thomas F., Jr., Professor Emeritus. Ph.D., 1956, University of Minnesota: Measurement of thermophysical properties; rheological fluid mechanics; heat transfer.

Kao, Imin, Assistant Professor. Ph.D., 1991, Stanford University: Design and manufacturing; robotics; dextrous manipulation; stiffness control; mechatronics.

Kincaid, John, Professor. Ph.D., 1974, Rockefeller University: Statistical mechanics and thermodynamics.

Kushner, Alan, Professor. Ph.D., 1976, University of Maryland: Solid and computational mechanics.

Ladeinde, Foluso, Assistant Professor. Ph.D., 1988, Cornell University: Fluid mechanics; high-speed turbulent flows; heat transfer.

Nakamura, Toshio, Associate Professor and Graduate Program Director. Ph.D., 1986, Brown University: Solid mechanics; composite materials; computational fracture mechanics.

O'Brien, Edward E., Professor. Ph.D., 1960, Johns Hopkins University: Turbulent transport.

Prasad, Vishwanath, Professor. Ph.D., 1983, University of Delaware: Convective heat transfer; heat transfer in porous media; melting/solidification; crystal growth; thin film deposition; computational methods.

Rastegar, Jahangir, Associate Professor. Ph.D., 1976, Stanford University: Mechanical design.

Tasi, James, Professor. Ph.D., 1962, Columbia University: Solid mechanics; shock waves in crystal lattices.

Wang, Lin-Shu, Associate Professor. Ph.D., 1966, University of California, Berkeley: Energy conversion; thermodynamics; combustion heat engines.

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, Professor and 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, Professor, Department of Chemistry. Ph.D., 1961, New York University: Molecular theory of the fluid state; ionic fluid structural properties; transport in multiphase systems.

Adjunct Faculty

Greene, G. Alanson, Adjunct Associate Professor, Brookhaven National Laboratory. Ph.D., 1980, State University of New York at Stony Brook: Heat transfer; hydrodynamics.

Kutt, Lembit M., Adjunct Associate Professor. Ph.D., 1982, Columbia University: Nonlinear finite element analysis; composite material behavior.

Oman, Richard, Adjunct Professor. Sc.D., 1959, Massachusetts Institute of Technology: Technology transfer; fluid mechanics.

Pak, Eugene, Adjunct Assistant Professor. Ph.D., 1985, Stanford University: Theoretical and experimental research on fracture mechanics of piezoelectric ceramics.

Raghu, Surya, Adjunct Assistant Professor. Ph.D., 1987, Yale University: Experimental fluid mechanics of combustion.

Number of teaching, graduate, and research assistantships, fall 1996: 41

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. Master's program 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 thesis credits ESC 599, ESC 698, and ESC 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. 21 approved graduate course credits and an accepted thesis which is registered as nine credits of ESC 599 and 696 combined.
2. M.S. without thesis: 30 approved graduate credits. No credit for ESC 599 (Master's Thesis) is approved for fulfilling this requirement. No more than six credits of ESC 696 may be applied toward the course requirements.
3. AMS 508 or a similar approved applied mathematics course is a requirement. The graduate program director may waive this requirement if the student has taken an equivalent course elsewhere. A second applied mathematics course like AMS 509 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 ESC 599 and ESC 696, must be taken in the Department of Mechanical Engineering. All courses taken outside the department for application to the graduate degree requirements (excluding AMS 508 and 509) 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 are required. A minimum of nine credits, excluding, ESC 599, 696 and 699, must be taken in the department.
2. In addition to the above, an approved 3 credit applied mathematics course is required. 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 student's 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 (TF)
2. Solid Mechanics (SM)
3. Mechanical Design (MD)

D. Written Qualifying Examination

The written qualifying examination is offered once every year. Students who enter the graduate program with a 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 a 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 three parts. Part I covers applied mathematics. Parts II and III correspond to the student's area of concentration and a second area chosen from the following three areas of mechanical engineering:

1. Thermal Sciences and Fluid Mechanics
2. Solid Mechanics
3. Mechanical Design

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 by at least one month before the announced exam date.

E. 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 pre-

sent 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.

F. Advancement to Candidacy

A student will be advanced to candidacy for the Ph.D. degree when all formal coursework has been completed and all the requirements listed in items A through E have been satisfied. These requirements must be completed within one calendar year after passing the written qualifying examination.

G. 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.

Mechanical Engineering

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

ESC 501 Convective Heat Transfer and Heat Exchange

Examination of the heat transfer characteristics of external and internal flows (laminar and turbulent) with free and forced convection. Study of the operation and design of a variety of heat exchanger types including shell and tube, regenerator, finned plate, etc. *Prerequisite:* Graduate student standing in the department
Spring, 3 credits

ESC 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: Graduate student standing in the department.
Fall, 3 credits

ESC 503 Computation of Fluid Flow and Heat Transfer

Introduction of a general purpose computation method for numerical solution of problems in heat transfer, fluid flow, and related processes.

Prerequisites: ESC 511, ESC 512
Spring, alternate years, 3 credits

ESC 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, thermal network, computations for electronic systems.

Fall, alternate years, 3 credits

ESC 505 Modeling and Simulation for Materials Processing and Manufacturing

Importance of modeling and simulation; interface between computer models and actual processes; microscopic versus macroscopic models; continuum models; thermo-fluid models, chemical transport, magnetic and electrical effects, and stress field; simulation schemes: finite difference versus finite element methods; software development; post processing; graphical representation, video animation; case studies; melting/solidification bulk crystal growth; thin film deposition.

Spring, alternate years, 3 credits

ESC 511 Advanced Fluid Mechanics: 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.

Fall, 3 credits

ESC 512 Advanced Fluid Mechanics: Viscous Fluids

The role of viscosity in the dynamics of fluid flow. The Navier-Stokes equations, low Reynolds number behavior including lubrication theory, percolation through porous media, and flow due to moving bodies. High Reynolds number behavior including steady, unsteady, and detached boundary layers, jets, free shear layers, and wakes. Phenomenological theories of turbulent shear flows are introduced.

Fall, 3 credits

ESC 514 Advanced Fluid Mechanics: Introduction to Turbulence

Introductory concepts and statistical descriptions. Kinematics of random velocity fields. Equations of motion and their interpretation. Experimental techniques: isotropic turbulence and the closure problem. Transport processes in a turbulent medium. Turbulent jets, wakes, and boundary layers.

Prerequisite: ESC 512
Spring, alternate years, 3 credits

ESC 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.

Fall, 3 credits

ESC 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.

Spring, 3 credits

ESC 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.

Fall, alternate years, 3 credits

ESC 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

ESC 526 Mechanical Design of Electronic Packaging

Introduction to electronic packaging, various levels of packaging, factors influencing electronic system design, force systems in electronic equipment, displacement and stresses, dynamic characteristics, cooling techniques, thermal elastic effects, and strain relief concepts.

Fall, alternate years, 3 credits

ESC 532 Mechanical Vibration

Introduction to vibration analysis of structures and machines. Includes free and forced response of linear lumped parameter systems, model 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
3 credits

ESC 536 Mechanics of Solids

A unified introduction to the fundamental principles, equations, and notation used in finite deformation of solids, with emphasis on the physical aspects of the subject. Cartesian tensor representation of stress, principal values, finite strain, and deformation. Conservation of mass, momentum, and energy. Formulation of stress-strain relations in elasticity, and compatibility relations. The use of general orthogonal coordinate systems in the equations governing solids. Principles of virtual displacement and virtual work.

Fall, 3 credits

ESC 537 Experimental Fluid Mechanics I: 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.

Spring, alternate years, 3 credits

ESC 538 Experimental Fluid Mechanics II: Data Acquisition and Processing

Fundamentals and application of analog and digital data collection techniques. Fast-rate data acquisition systems and storage. Introduction to analysis of random variables with special applications to turbulent flows. Numerous examples of modern signal processing techniques as applied to various areas of fluid mechanics.

Spring, alternate years, 3 credits

ESC 539 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.

Fall, 3 credits

ESC 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: ESC 536

Spring, 3 credits

ESC 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 loadings; use of load bounding theorems and the calculation of collapse loads of structures; the theory of the slip-line field.

Corequisite: ESC 541

Fall, alternate years, 3 credits

ESC 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: ESC 536

Spring, alternate years, 3 credits

ESC 554 Vibrations and Wave Propagation in Solids

Lagrange's 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: ESC 536

Spring, alternate years, 3 credits

ESC 560 Advanced Control Systems

Analytical methods applied to the design of multivariable linear control systems. Introduction to linear system theory: linearization, solution of linear matrix differential equations, stability, controllability, observability, transformations to canonical forms. Formulation of control objectives. Deterministic state observer. Full-state feedback control based on pole assignment and linear quadratic optimization theory. Linear systems with stochastic inputs and measurement noise. The response of linear systems to random input; stochastic state estimator (Kalman filter); separation principle of stochastic control and estimation; system robustness.

Fall, alternate years, 3 credits

ESC 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

Fall, alternate years, 3 credits

ESC 568 Advanced Dynamics

Newtonian and Lagrangian mechanics of rigid bodies; kinematics, inertia tensor, principle of momentum, principle of virtual work, potential and kinetic energy, equations of motion, extraction of information from the equations of motion, and application to engineering problems.

Fall, alternate years, 3 credits

ESC 570 Introduction to Probabilistic Methods for Engineering

Introduction to probability; probability space and random variables; functions of random variables; sequences of random variables; stochastic processes; correlation and power spectrum of stationary processes; harmonic analysis of stochastic processes; Markov chains and Markov processes. Applications to engineering problems.

Spring, alternate years, 3 credits

ESC 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

ESC 572 Geometric Modeling for CAD/CAM

The deCasteljua 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: B.S. in engineering, computer sciences, or mathematics, or permission of instructor

Spring, 3 credits

ESC 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 non-conventional manufacturing processes.

Fall, 3 credits

ESC 581 Design for Manufacturability

Fundamentals of the design for manufacturability (DFM) methodologies. Structured design, concurrent engineering, design for assembly, quality function deployment (QFD), Taguchi's method, design of experiments, robust design.

Prerequisite: An undergraduate course in engineering design

Spring, 3 credits

Mechanical Engineering

ESC 582 Manufacturing Systems Design

Techniques and concepts involved in designing systems composed of and influenced by people, organizational factors, technology, and the use of modern information technology for intelligent systems. The focus will be on the design of high-productivity and high-performance manufacturing systems.

Fall, alternate years, 3 credits

ESC 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.

Spring, 3 credits

ESC 584 Statistical Quality Control

Design and analysis of procedures for forecasting and control of production processes. Topics include sampling plans, control procedures forecasting, and other related topics.

Spring, alternate years, 3 credits

ESC 590 Knowledge-Based Design and Manufacturing

An introduction to the important topics and areas under development in engineering design and manufacturing using artificial intelligence techniques. The development of expert systems with specific application to optimum design of mechanical and manufacturing systems will be emphasized.

Spring, alternate years, 3 credits

ESC 599 Research

Variable and repetitive credit

ESC 601 Nonlinear Mechanics

Phase plane analysis of binary systems. Autonomous and nonautonomous systems. Stability theory. Liapunov functions and functionals. Bifurcation theory and critical phenomena. Limit cycles and oscillations. Generalized Volterra and van der Pol equations. Perturbation theory and asymptotic process of Krylov and Bogoliubov. Problems in chemical kinetics and dynamic systems.

3 credits

ESC 630, 631, 632, 633, 634, 635, 636

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.

ESC 630 Special Topics in Fluid Mechanics

ESC 631 Special Topics in Heat Transfer

ESC 632 Special Topics in Statistical Mechanics

ESC 633 Special Topics in Thermodynamics

ESC 634 Advanced Topics in Kinematics and Dynamics of Machines

ESC 635 Advanced Topics in Nonlinear Dynamic Systems

ESC 636 Advanced Topics in Mechanical Vibration

ESC 637 Special Topics in Precision Engineering

3 credits, repetitive

ESC 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: ESC 536

Corequisite: ESC 541

Fall, alternate years, 3 credits

ESC 651 Advanced Finite Element Analysis

Finite element method for the analysis of continuous media. In-depth discussion of penalty method, integration technique, and differential equation solver. 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: ESC 536, ESC 539

Fall, alternate years, 3 credits

ESC 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 2-D 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.

Spring, 3 credits

ESC 696 Special Problems in Mechanical Engineering

Conducted jointly by graduate students and one or more members of the faculty.

1-6 credits, repetitive

ESC 698 Practicum in Teaching

0-3 credits, repetitive

ESC 699 Dissertation Research

Variable and repetitive credit

School of Medicine

Dean: Norman H. Edelman, M.D.

Health Sciences Center Level 4, Room 170 (516) 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 depart-

ments 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 11794-8432
(516) 444-2113

Molecular Biology and Biochemistry (BMO)

Chairperson, Department of Biochemistry and Cell Biology: William J. Lennarz
Life Sciences Building 450 (516) 632-8550

Graduate Program Director: James P. Quigley
Life Sciences Building 350 (516) 632-8533

Senior Staff Assistant: Janet Koenig
Life Sciences Building 350 (516) 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 Cellular and Molecular Pathology (elsewhere in this bulletin). A student may choose the Molecular Biology and Biochemistry Program upon applying or may indicate no preference. Once accepted, a student can change programs as his or her interests dictate. The object 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; it comprises all the members of the Department of Biochemistry and Cell Biology as well as members of the Department of Chemistry and the School of Medicine. The faculty is young and active, and there is extensive cooperative interaction between the 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, above, may be admitted, but such students must immediately remedy these deficiencies.

Faculty

Anderson, Janet, Assistant Professor.¹¹ Ph.D., 1989, State University of New York at Stony Brook: Steroid regulation of connexin43 in human uterine smooth muscle.

Bar-Sagi, Dafna, Associate Professor.¹⁵ Ph.D., 1984, State University of New York at Stony Brook: The role of *ras* oncogenes in cell proliferation.

Beach, David, Sr. Staff Scientist.¹⁵ Ph.D., 1977, University of Miami: Cell cycle control.

Berrios, Miguel, Assistant Professor.⁴ Ph.D., 1983, Rockefeller University: Architecture and function of nuclear pore complexes; fertilization and pronuclear formation.

Bingham, Paul M., Associate Professor.¹ Ph.D., 1979, Harvard University: Developmental control of gene expression and genetic control of development in the multicellular animals.

Bogenhagen, Daniel F., Professor.⁴ M.D., 1977, Stanford University: Synthesis of 5S RNA and mitochondrial nucleic acids in *Xenopus*.

Brown, Deborah, Assistant Professor.¹ Ph.D., 1987, Stanford University: Membrane protein trafficking in polarized epithelial cells.

Citovsky, Vitaly, Assistant Professor.¹ Ph.D., 1987, Hebrew University, Israel: Nuclear targeting and intercellular communication in plants.

Dean, Neta, Assistant Professor.¹ Ph.D., 1988, University of California, Los Angeles: Intracellular protein traffic.

Deutsch, Dale, Associate Professor.¹ Ph.D., 1972, Purdue University: Marijuana: biochemistry, cell biology, and biochemical toxicology.

Dingwall, Colin, Assistant Professor.⁴ Ph.D., 1985, University of Newcastle upon Tyne, England: Nuclear cytoplasmic transport, nuclear pore complex biogenesis.

Dunn, John, Microbiologist.¹³ Ph.D., 1970, Rutgers University: Structure and functional analysis of bacteriophage T7 RNA polymerase.

Edmunds, Leland N., Professor.¹² Ph.D., 1964, Princeton University: Cell division cycles and circadian oscillators in *Euglena*.

Engebrecht, JoAnne, Assistant Professor.² Ph.D., 1986, University of California, San Diego: Genetic analysis of meiosis.

- Enrietto, Paula**, Associate Professor.² Ph.D., 1980, University of Colorado: The oncogene *rel* in avian hematopoietic cells.
- Fisher, Paul A.**, Associate Professor.⁴ M.D., Ph.D., 1980, Stanford University: Karyoskeletal structure and function; DNA replication in eukaryotic cells.
- Fleit, Howard B.**, Associate Professor.⁵ Ph.D., 1980, New York University: Leukocyte Fc receptors; macrophage differentiation and physiology; plasma membrane receptors.
- Freundlich, Martin**, Professor.¹ Ph.D., 1961, University of Minnesota: *In vivo* and *in vitro* studies on regulation of gene expression in bacteria.
- Frohman, Michael A.**, Assistant Professor.⁴ M.D./Ph.D., 1986, University of Pennsylvania: Early mammalian development; gene regulation.
- Furie, Martha B.**, Associate Professor.⁵ Ph.D., 1980, Rockefeller University: Cell-cell interactions; interactions between leukocytes and endothelium.
- Galan, Jorge**, Associate Professor.² Ph.D., 1986, Cornell University: Molecular/genetic analysis of *Salmonella* invasion of epithelial cells.
- Gergen, J. Peter**, Associate Professor.¹ Ph.D., 1982, Brandeis University: Molecular biology and genetics of embryonic development in *Drosophila*; segmentation genes and the mechanism of body pattern formation.
- Greider, Carol W.**, Sr. Staff Scientist.¹⁵ Ph.D., 1987, University of California, Berkeley: Telomere regulation; cell senescence.
- Grollman, Arthur P.**, Professor.⁴ M.D., 1959, The Johns Hopkins Medical School: Molecular aspects of chemical carcinogenesis, mutagenesis, and DNA damage and repair.
- Habicht, Gail S.**, Professor.⁵ Ph.D., 1965, Stanford University: Immunobiology of aging; comparative immunology; lymphokines.
- Halegoua, Simon**, Associate Professor.³ Ph.D., 1978, State University of New York at Stony Brook: Role of second messenger pathways and proto-oncogenes in nerve growth factor-induced neuronal differentiation.
- Haltiwanger, Robert**, Assistant Professor.¹ Ph.D., 1986, Duke University: Structure, biosynthesis, and function of nuclear and cytoplasmic glycoproteins.
- Hayman, Michael J.**, Professor.² Ph.D., 1973, Institute for Medical Research, England: Viral and cellular oncogenes; differentiation of avian erythroid cells.
- Helfman, David M.**, Senior Staff Investigator.¹⁵ Ph.D., 1981, Emory University: Regulation of tissue-specific alternative RNA splicing and cellular function of cytoskeleton protein diversity.
- Hernandez, Nouria**, Sr. Staff Scientist.¹⁵ Ph.D., 1983, University of Heidelberg, Germany: Transcription of snRNA genes and HIV-1.
- Herr, Winship**, Assistant Director.¹⁵ Ph.D., 1982, Harvard University: Control of eukaryotic transcription.
- Holdenerr, Bernadette C.**, Assistant Professor.¹ Ph.D., 1990, University of Illinois: Genetic regulation of early mammalian development.
- Hollingsworth, Nancy**, Assistant Professor.¹ Ph.D., 1988, University of Washington, Seattle: Meiotic synapsis, recombination, and segregation in yeast.
- Jesty, Jolyon**, Professor.⁸ Ph.D., 1972, Oxford University, England: Biochemistry of control mechanisms in coagulation.
- Johnson, Roger A.**, Professor.⁶ Ph.D., 1968, University of Southern California, Los Angeles: Cell initiated regulation of transmembrane signal transduction.
- Kaplan, Allen P.**, Professor.⁸ M.D., 1965, State University of New York, Downstate Medical Center: Biochemical mechanisms of immunologic tissue injury.
- Katz, Eugene R.**, Professor.^{2,14} Ph.D., 1969, University of Cambridge, England: Biochemical genetics and development in cellular slime molds.
- Kernan, Maurice**, Assistant Professor.³ Ph.D., 1990, University of Wisconsin: Molecular basis for mechanical senses.
- Konopka, James**, Assistant Professor.² Ph.D., 1985, University of California, Los Angeles: Hormone signal transduction; yeast cell development.
- Krainer, Adrian R.**, Sr. Staff Scientist.¹⁵ Ph.D., 1986, Harvard University: mRNA splicing; gene expression.
- Krikorian, Abraham D.**, Professor.¹ Ph.D., 1965, Cornell University: Control of the morphogenetic potential of cultured plant cells; biochemical differentiation in cultured cells of angiosperms.
- Lazebnik, Yuri A.**, Staff Scientist.¹⁵ Ph.D., 1986, St. Petersburg State University, Russia: Molecular mechanisms of apoptosis.
- Lennarz, William J.**, Professor and Chairperson. Ph.D., 1959, University of Illinois: Biosynthesis and function of glycoproteins in development.
- Levine, Joel M.**, Associate Professor.³ Ph.D., 1980, Washington University: Cell-surface molecules of the developing nervous system; cellular basis of neuronal differentiation.
- London, Erwin**, Associate Professor.¹ Ph.D., 1979, Cornell University: Lipid-protein and protein-protein interactions in membranes; membrane protein folding and translocation.
- Lyman, Harvard**, Associate Professor.¹ Ph.D., 1960, Brandeis University: Control mechanisms in the biogenesis, development, and replication of chloroplasts.
- Ma, Hong**, Staff Investigator.¹⁵ Ph.D., 1988, Massachusetts Institute of Technology: Functional analysis of transcription factors in plant development and studies of G proteins in plant signal transduction, using *Arabidopsis thaliana* as an experimental system.
- Malbon, Craig C.**, Professor.⁴ Ph.D., 1976, Case Western Reserve University: Neurotransmitter receptors; G proteins.
- Mandel, Gail**, Professor.³ Ph.D., 1977, University of California, Los Angeles: Regulation of sodium channel genes.
- Marcu, Kenneth B.**, Professor.^{1,2,5} Ph.D., 1975, State University of New York at Stony Brook: Regulation and properties of the *c-myc* proto-oncogene and "myc-like" genes; recombination mechanisms of lymphoid antigen receptor genes; lymphoid cell transformation.
- McKinnon, David**, Assistant Professor.³ Ph.D., 1987, John Curtin School of Medical Research, Australia: Molecular physiology of sympathetic neurons and cardiac muscle.
- McLaughlin, Stuart G.**, Professor.⁶ Ph.D., 1968, University of British Columbia, Canada: Biophysics of membranes; the calcium-/phospholipid second-messenger system.
- Miller, W. Todd**, Assistant Professor.⁶ Ph.D., 1989, Rockefeller University: Phosphorylation; signal transduction; RNA; protein recognition.
- Morris, Andrew J.**, Assistant Professor.⁴ Ph.D., 1988, University of Birmingham, England: Signal transduction mechanisms involving lipids.
- Prives, Joav M.**, Associate Professor.⁴ Ph.D., 1969, McGill University, Canada: Regulation of surface membrane and synaptogenesis; control of acetylcholine receptor synthesis and topological distribution; role of peripheral cytoskeleton in the regulation of cell surface properties.
- Quigley, James P.**, Professor and Graduate Program Director.⁵ Ph.D., 1970, The Johns Hopkins University: Role of proteolytic enzymes and extracellular matrix in normal cell migration and tumor cell invasion and metastasis.
- Raleigh, Daniel**, Assistant Professor.⁹ Ph.D., 1988, Massachusetts Institute of Technology: Experimental studies of protein folding and of amyloid formation.
- Reich, Nancy C.**, Associate Professor.⁶ Ph.D., 1983, State University of New York at Stony Brook: Cellular and oncogenetic control of interferon-induced gene expression.
- Sampson, Nicole**, Assistant Professor.⁹ Ph.D., 1990, University of California, Berkeley: Enzyme mechanism and protein-protein interactions.
- Scarlata, Suzanne**, Assistant Professor.⁹ Ph.D., 1984, University of Illinois: Structure-/oligomerization of membrane proteins.

Molecular Biology and Biochemistry

Schechter, Nisson, Professor.¹⁷ Ph.D., 1971, Western Michigan University: Molecular basis of nerve development, growth, and regeneration.

Schmidt, Jakob, Professor.¹ Ph.D., 1970, University of California, Riverside; M.D., 1966, University of Munich, Germany: Structure, function, and regulation of nicotinic acetylcholine receptors in muscle and brain.

Setlow, Richard B., Adjunct Professor and Associate Director for Life Sciences.¹³ Ph.D., 1947, Yale University: DNA damage and repair; carcinogens and radiation.

Simon, Sanford R., Associate Professor.¹⁵ Ph.D., 1967, Rockefeller University: Regulation of extracellular matrix degradation by neutrophil proteases; role of lipoproteins in cholesterol transport; liposomes as drug and metabolite delivery systems.

Spector, David L., Senior Staff Investigator.¹⁵ Ph.D., 1980, Rutgers-The State University: Structural and functional organization of the cell nucleus; RNA transport.

Spector, Ilan, Associate Professor.⁶ Ph.D., 1967, University of Paris, France: Regulation of cell shape and mobility by cytoskeletal proteins and second messenger.

Stenlund, Arne, Sr. Staff Investigator.¹⁵ Ph.D., 1984, Uppsala University, Sweden: DNA replication of bovine papillomas.

Sternglanz, Rolf, Professor.¹ Ph.D., 1967, Harvard University: DNA topoisomerases; DNA replication, chromatin structure, and gene regulation in yeast.

Stillman, Bruce, Senior Scientist.¹⁵ Ph.D., 1979, Australian National University: Eukaryotic DNA replication and its regulation in mammalian cells and in yeast.

Strickland, Sidney, Professor.⁴ Ph.D., 1973, Michigan State University: Biochemistry of differentiation and development.

Studier, F. William, Adjunct Professor and Senior Biophysicist.¹ Ph.D., 1963, California Institute of Technology: Genetics and physiology of bacteriophage T7; control of gene expression; replication of T7 DNA.

Taichman, Lorne B., Professor.¹⁰ Ph.D., 1971, University of Wisconsin; M.D., 1965, University of Toronto, Canada: Differentiation of epidermal keratinocytes in skin and use of genetically altered keratinocyte grafts for epithelial gene therapy.

Theurkauf, William E., Assistant Professor.¹ Ph.D., 1988, Brandeis University: Role of the cytoskeleton in early development.

Thomsen, Gerald H., Assistant Professor.¹ Ph.D., 1988, Rockefeller University: Molecular embryology and cell signaling by growth factors.

Tonks, Nicholas K., Sr. Staff Scientist.¹⁵ Ph.D., 1985, University of Dundee, Scotland: Characterization of protein tyrosine phosphatases.

Trimmer, James S., Assistant Professor.¹ Ph.D., 1987, University of California, San Diego: Molecular neurobiology; regulation of the abundance, distribution, and function of voltage-sensitive ion channels in mammalian nerve and muscle.

Tseng, Linda, Professor.¹¹ Ph.D., 1968, University of North Dakota: Cellular endocrinology in uterus.

Van Nostrand, William E., Associate Professor.⁸ Ph.D., 1985, University of California, Irvine: Physiologic and pathophysiologic vascular functions of the Alzheimer's ideas amyloid beta-protein precursor.

Viola, Michael V., Professor.²⁸ M.D., 1964, McGill University, Canada: Molecular genetics of cancer susceptibility in humans.

Wigler, Michael H., Staff Scientist.²⁸ Ph.D., 1978, Columbia University: Growth control in eukaryotes, utilizing two model systems: the yeast *Saccharomyces cerevisiae* and cultured mammalian cells.

Williams, David L., Professor.⁴ Ph.D., 1972, University of Illinois: Hormonal control of gene expression; molecular biology of atherosclerosis.

Wimmer, Eckard, Professor.² Ph.D., 1962, University of Göttingen, Federal Republic of Germany: Structure and function of cellular and viral nucleic acids and proteins; the replication of poliovirus.

Zieve, Gary, Associate Professor.⁵ Ph.D., 1977, Massachusetts Institute of Technology: Structure and function of the snRNP particles; mechanisms of autoimmunity.

Number of teaching, graduate, and research assistantships, fall 1995: 70

¹ Department of Biochemistry and Cell Biology

² Department of Microbiology

³ Department of Neurobiology and Behavior

⁴ Department of Pharmacological Sciences

⁵ Department of Pathology

⁶ Department of Physiology and Biophysics

⁷ Department of Psychiatry

⁸ Department of Medicine

⁹ Department of Chemistry

¹⁰ Department of Oral Biology and Pathology

¹¹ Department of Obstetrics and Gynecology

¹² Department of Anatomical Sciences

¹³ Brookhaven National Laboratory

¹⁴ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1975

¹⁵ Cold Spring Harbor Laboratory

Degree Requirements

Requirements for the 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 pro-

gram 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

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

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

BMO 507/BNB 540 Molecular Approaches to the Nervous System

An advanced course for critical evaluation of biochemical, molecular biological, and cellular electrophysiological analysis of neuronal function and synaptic transmission. The format emphasizes discussion and evaluation of recent research findings by all participants.

Prerequisite: BMO 520, BNB 561, or permission of instructor
Spring, alternate years, 2 credits

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

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

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

BMO 520 Graduate Biochemistry I

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

Prerequisite: HBC 331
Fall, 3 credits

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

BMO 599 Research

Original investigation undertaken with the supervision of a faculty member.

Fall and spring, credit to be arranged

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

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

BMO 685-688 Advanced Seminars

Topics to be arranged. Visitors are welcome.

Fall and spring, 1 credit each semester

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

Molecular Microbiology (HBM)

Chairperson: Eckard Wimmer
Life Sciences Building 280 (516) 632-8787

Graduate Program Director: Patrick Hearing
Life Sciences Building 270 (516) 632-8813

Staff Assistant: Pam Apostle
Life Sciences Building 280 (516) 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. Research being conducted in the department encompasses prokaryotic systems, animal viruses, eukaryotic cells, and subcellular systems. The program is especially strong in the rapidly growing fields of the molecular biology of eukaryotic cells and animal viruses and of bacterial and yeast genetics. The recommended coursework is designed to cover cell biology, biochemistry, genetics, molecular biology, and developmental biology. As part of their course of study, students initially are given the opportunity to conduct short-term research projects in four different laboratories, followed by concentration on a major dissertation research project.

Facilities

The department occupies one and one-half floors of the Life Sciences Building. Approximately 29,500 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 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 H. Bentley Glass Biological Sciences Library is physically connected to the Life Sciences Building and contains an extensive collection of books and journals relating to all aspects of the biological sciences. This library currently maintains a collection of 66,000 books and 750 journal titles. The Health Sciences Library, located in the Health Sciences Center, contains collections of biological and medical books and journals presently totaling 213,692 volumes, including 4,300 journal titles. In addition, the Department of Molecular Microbiology maintains its own reading room with a collection of about 1,000 volumes of 13 major journals especially relevant to biological research.

Admission

Predocutorial trainees are admitted to the Graduate School of the University at Stony Brook by application to the particular graduate program. Admission to the Graduate Program in Molecular Microbiology requires, in addition to the minimum Graduate School requirements:

A. Superior undergraduate performance in science.

B. High scores on the Graduate Record Examination (GRE) General Test.

C. Three letters of enthusiastic recommendation.

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 \$15,080 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 notified by letter from the dean's office.

Faculty

Anderson, Carl W., Adjunct Associate Professor. Ph.D., 1970, Washington University: Protein synthesis; molecular biology of adenovirus; protein phosphorylation.

Bar-Sagi, D., Associate Professor. Ph.D., 1984, State University of New York at Stony Brook: Role of *ras* oncogenes in cell proliferation; signal transduction.

Bauer, William R., Professor. Ph.D., 1968, California Institute of Technology: Structure and function of closed circular DNA.

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

Carter, Carol A., Professor. Ph.D., 1972, Yale University: Translational controls and protein processing in HIV and retrovirus replication.

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

Dunn, John J., Adjunct Professor. Ph.D., 1970, Rutgers University: Transcription, processing, and translation of RNA.

Enrietto, Paula J., Associate Professor. Ph.D., 1980, University of Colorado: Interaction of the oncogene *rel* with hematopoietic cells.

Galan, Jorge E., Associate Professor. Dr. Vet. Sc., 1982, National University of La Plata, Argentina; Ph.D., 1986, Cornell University: Molecular and genetic analysis of *Salmonella* invasion of epithelial cells; molecular pathogenesis.

Grodzicker, Terri, Adjunct Associate Professor.² Ph.D., 1969, Columbia University: Genetics of DNA tumor viruses; genetic analysis of viral regulatory functions; analysis of adenoviral vectors.

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

Hearing, Janet C., Assistant Professor.⁴ Ph.D., 1984, State University of New York at Stony Brook: Molecular analysis of the latent Epstein-Barr virus DNA replication.

Hearing, Patrick, Associate Professor and Graduate Program Director. Ph.D., 1980, Northwestern University: Viral molecular genetics; eukaryotic transcriptional regulation; adeno and hepatitis B replication; gene therapy.

Herr, Winship, Adjunct Associate Professor.² Ph.D., 1982, Harvard University: Transcriptional control mechanisms in mammalian cells.

Jacobson, Ann B., Research Associate Professor. Ph.D., 1962, University of Chicago: Analysis of structure in coliphage RNAs: correlation of structure and function.

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

Konopka, James B., Assistant Professor. Ph.D., 1985, University of California, Los Angeles: Cell growth and development in yeast; pheromone signal transduction.

Mackow, Erich R., Assistant Professor.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.

Matkovic, Christopher S., Adjunct Assistant Professor. M.D., 1974, Columbia University; Ph.D., 1972, Harvard University: Clinical infectious disease.

Setlow, Jane K., Adjunct Professor.¹ Ph.D., 1959, Yale University: Recombination and repair of microbial DNA.

Steinberg, Bettie M., Adjunct Associate Professor.³ Ph.D., 1976, State University of New York at Stony Brook: Papilloma viruses; cell-virus interactions; viral transformation.

Stillman, Bruce W., Adjunct Professor.² Ph.D., 1979, Australian National University: Mechanism of DNA replication, particularly adenovirus, SV40, and yeast.

Tegtmeyer, Peter, Professor. M.D., 1960, Saint Louis University: Carcinogenesis and transcriptional regulation of oncogenes and antioncogenes.

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

Number of teaching, graduate, and research assistants, fall 1995. 35

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 Molecular Biology and Biochemistry

⁶ Joint appointment, Department of Pharmacology

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 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 country 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 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

Spring

Graduate Genetics
Biology of Cancer (alternate years)
Cell Biology
Experimental Microbiology
(lab rotations)*
Microbiology Seminar

*Students rotate through four different laboratories over the course of their first year. At the end of that year, students generally 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

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.

Molecular Microbiology

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 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.

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.

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

HBM 504 Macromolecules

Introduction to the chemical and physical properties of biological macromolecules with emphasis on proteins and nucleic acids. Also included is the application of laboratory techniques to the analysis of macromolecules.

Prerequisite: Permission of instructor
Fall, 1 credit

HBM 509, 510 Experimental Microbiology

An introduction to modern microbiological research. Students rotate through two professors' laboratories, spending half a semester in each. 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

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

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

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
Fall modules, 1-4 credits per module

HBM 599 Graduate Research

Original investigations under faculty supervision.

Prerequisite: Permission of instructor
Fall and spring, 1-9 credits each semester

HBM 612 Animal Virology

Describes the molecular mechanisms used by animal viruses to replicate nucleic acids and control gene expression. Several viruses are covered in great experimental detail to illustrate the methodology used to investigate viruses. Classes consist of background material provided by the faculty and in-depth discussions, by students, of original publications.

Prerequisite: Permission of instructor
Fall, 2 credits

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, 3 credits

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

HBM 691 Readings in Microbiology Literature

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

Prerequisite: Permission of instructor
Fall, 1 credit

HBM 694 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, 1-8 credits

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

Music (MUS)

*Chairperson: David Lawton
Staller Center 3310 (516) 632-7330*

*Graduate Program Director: Peter Winkler
Staller Center 3307 (516) 632-7330*

*Graduate Secretary: Joan Vogelle
Staller Center 3304 (516) 632-7330*

Degrees awarded: M.A. in Music; M.M. in Music Performance; D.M.A. in Music; Ph.D. in Music

Degree Programs

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 violas, and some Renaissance wind instruments.

Admission

Admission to the M.A. Program

The following are required for admission to 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. At least three letters of recommendation from persons familiar with the applicant'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:

Music

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 invited, but are not 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

Amory, Misha, Performing Artist in Residence. M.M., 1992, the Juilliard School: Viola; chamber music.

Anderson, Ronald, Performing Artist in Residence. M.S., 1958, Juilliard School of Music; Ed.D., 1969, Columbia University: Trumpet; Renaissance and baroque brass performance practice; 20th-century brass repertory.

Auner, Joseph, Assistant Professor. 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.

Baron, Samuel, Professor. B.S., 1948, Juilliard School of Music; pupil of George Barrere and Arthur Lora: Flute; chamber music; baroque performance practice; 20th-century wind repertory.

Bonazzi, Elaine, Performing Artist in Residence. B.M., Eastman School of Music: Voice; vocal repertory.

Borrer, Ronald, Performing Artist in Residence. D.M.A., 1978, Yale University: Trombone; brass ensemble.

Burns, Miriam, Director of the University Orchestra. M.M., 1989, Mannes College of Music: Conducting.

Coolman, Todd, Director of the Jazz Ensemble. M.M., 1986, Manhattan School of Music: Jazz studies.

Cross, Richard, Performing Artist in Residence. A.B., Cornell University: Voice; opera workshop.

DesRoches, Raymond, Performing Artist in Residence. M.Mus., 1961, Manhattan School of Music: Percussion; percussion ensemble.

Eddy, Timothy, Professor and Member, Orion String Quartet. M.Mus., 1970, Manhattan School of Music; pupil of Bernard Greenhouse: Cello; cello repertory; chamber music.

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

Fuller, Sarah, Associate Professor.² Ph.D., 1969, University of California, Berkeley: Medieval and Renaissance music; history of music theory.

Goldstein, Perry, Assistant Professor and Coordinator of Musicianship. Ph.D., 1986, Columbia University: Theory.

Gosman, Lazar, Professor. Diploma, 1949, Moscow State Conservatory, Russia; pupil of David Oistrakh: Violin; orchestral conducting.

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

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

Kramer, Richard, Professor. Ph.D., 1974, Princeton University: 18th-century theory; Beethoven and Schubert; sketch studies.

Lawton, David, Professor and Chairperson. Ph.D., 1973, University of California, Berkeley: Orchestral and opera conducting; 19th-century studies.

Layton, Billy Jim, Professor Emeritus. Ph.D., 1960, Harvard University: Composition; analysis.

Lessard, John, Professor Emeritus. Diploma, 1940, Ecole Normale, France; Diploma, 1941, Longy School of Music: Composition; tonal counterpoint and fugue.

Levine, Julius, Professor and Associate Graduate Program Director. B.S., 1946, Juilliard School of Music: String bass; chamber music.

Leydon, Rebecca, Visiting Assistant Professor. M.A., 1991, Eastman School of Music Theory: 19th- and 20th-century music.

Lochhead, Judith, Associate Professor. Ph.D., 1982, State University of New York at Stony Brook: Theory and history of recent music; phenomenology and music; performance and analysis.

Meier, Gustav, Director of the Stony Brook Symphony Orchestra. Diploma (graduate), 1953, Zurich Conservatory of Music, Switzerland: Conducting.

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

Muraco, Thomas, Lecturer. M.Mus., 1972, Eastman School of Music: Vocal coach.

Neidich, Charles, Performing Artist in Residence. B.A., 1975, Yale University; pupil of Leon Russianoff: Clarinet; chamber music.

Purvis, William, Performing Artist in Residence. B.A., 1971, Haverford College; pupil of Forrest Standley and James Chambers: Horn; chamber music.

Robbins, Joyce, Professor Emerita. B.S., Juilliard School of Music; pupil of Ivan Galamian; M.A., Columbia University: Violin; violin repertory.

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

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

Sugarman, Jane, Assistant Professor.³ Ph.D., 1993, University of California, Los Angeles: Ethnomusicology; musics of South-eastern Europe and the Middle East; gender issues.

Taylor, Stephen, Performing Artist in Residence. Diploma, 1974, Juilliard School of Music: Oboe.

Weymouth, Daniel, Assistant Professor, 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.

Willard, Jerry, Performing Artist in Residence. Pupil of Sophocles Papas: Guitar; lute.

Winkler, Peter, Associate Professor and Graduate Program Director.¹ M.F.A., 1967, Princeton University: Composition; theory and history of popular music.

Number of teaching, graduate, and research assistants, fall 1996: 65

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.

Degree Requirements*

General Requirements for the M.A. Degree 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 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.

Music

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 pre-assigned compositions.

D. Research Paper

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

Specific Requirements for the M.A. Degree, Graduate Program in 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 Collegium Musicum 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, 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 a member 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. Students who propose to work in a second area of specialization should see section H below.

B. Public Lecture-Recital

See the description of MUS 696.

C. Essays

Two papers, one on an analytical topic and one on a historical topic, are required. These essays may be on performance-oriented subjects. Each must grow out of work in a separate graduate music course. 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.

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

Either a substantial portion of one of the recitals, described above in section A, or the lecture-recital, section B, must be devoted to 20th-century music.

E. Foreign Language

1. 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.
 - a. Instrumentalists and conductors: Instrumentalists and conductors entering the D.M.A. pro-

gram 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:

- (i) 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 (ii):
- (ii) 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.

b. 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.

2. Foreign 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 who choose this option must, in addition to satisfying the University requirement of ESL 198, take EGC 100 and achieve a grade of Satisfactory, and EGC 101 and achieve a grade of B or higher. Qualified students may be exempted from one or both of the latter two courses by a placement exam given by the Department of English. The requirement must be satisfied by the end of the first year of study.
3. 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, 30-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

Upon completion of the above requirements (A-I), the student may be advanced to candidacy. Advancement to candidacy is granted by the Graduate School upon recommendation from the departmental graduate program director.

L. Doctoral Degree Recital Examination

After being advanced to candidacy, 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.

M. 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 pertinent 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 to Ph.D. candidacy, 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

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

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

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

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

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

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

Music

MUS 507 Studies in Music History

Concentrated study of the works of a single composer, or of repertoires 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)

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)

MUS 509 Performance Studies

This course provides the opportunity for a student who is not in a performance degree program, but who can demonstrate graduate-level performance ability, to pursue performance studies without investing the time and credit required of M.M./D.M.A. students. The course is not open to M.M./D.M.A. students, except for conducting students who can demonstrate graduate-level ability in an instrument or voice.

Fall and spring, 2-3 credits

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

MUS 511 Compositional Techniques of the 20th Century

A study, by means of practical exercises in writing, of some of the important techniques of the present century in the organization or non-organization of pitch, rhythm, line, motive, and form.

Fall, 3 credits

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

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

MUS 516 Electronic Music Workshop

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

Prerequisite: MUS 515 or the equivalent
Spring, 3 credits

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

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

MUS 523 Advanced Composition

Individual projects for graduate students in composition.

Fall and spring, 2-6 credits each semester

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

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

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

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

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

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

MUS 545 Topics in Renaissance Music

Historical, analytical, and critical issues related to Renaissance music. Recent topics have included early 15th-century song repertoires, the boundaries of the Renaissance, and the works of Ockeghem.

3 credits

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

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

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

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

MUS 557 Topics in Theory

Studies in the writings of music theorists from the Middle Ages through the present day in the context of contemporary repertoires. Recent topics have included modal theory as a model for melodic construction; efforts to adapt modal theory to polyphonic practice; rhythm in theory and practice; theories of tonality from Rameau to Schenker; theoretical approaches to post-tonal and 12-tone music; and theories of timbre and texture.
Fall or Spring, 3 credits

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

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

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

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

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

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

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

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

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

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

MUS 573 Chamber Music

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

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

MUS 577 Master Class in Performance Pedagogy

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

MUS 579 Opera Workshop

Study and performance of scenes or complete operas from the standard and 20th-century repertoires. An interdisciplinary approach involving the departments of Music and Theatre Arts.
Fall and spring, 1-2 credits, variable

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

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

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

MUS 585 Early Music Performance Practice

Study and implementation of Renaissance and Baroque performance practices. Areas include brass ensemble music and lute and guitar repertoires.
Fall or spring, 2 credits

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

MUS 592 Seminar on the Teaching of Music

Discussion of fundamental problems in teaching music. Topics may include the explanation of musical processes; communication to non-professionals; and integration of aspects of performance, theory, history, and analysis with one another. Required of all students who teach one of the introductory undergraduate courses in musicianship, theory, or literature; to be taken during the first semester of teaching.
Fall, 1 credit

MUS 593 Practicum in Performance

Individual instruction and/or coaching for professional performing experience.
Fall and spring, 1 credit

Music

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

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

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

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

MUS 623 Directed Study in Composition

Intended for doctoral students in composition.

Fall and spring, 1-12 credits each semester, repetitive

MUS 661 Directed Study in Conducting

Intended for doctoral students in conducting.

Fall and spring, 1-12 credits each semester, repetitive

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

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

MUS 697 Directed Reading

Intended for preparation for the preliminary examinations and related requirements.

Fall and spring, 1-12 credits each semester, repetitive

MUS 698 Directed Dissertation Research

Intended for work in the area of the dissertation.

Fall and spring, 1-12 credits each semester, repetitive

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 (516) 632-8616

Graduate Program Director: James Gnad
Life Sciences Building 550 (516) 632-8616

Graduate Secretary: Linda Cerracchio
Life Sciences Building 550 (516) 632-8630

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 departmental faculty are located in a complex formed by the Life Sciences Building, Center for Behavioral Neuroscience, and the Health Sciences Center. 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. The 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 foreign students must score a minimum of 600 on the Test of English as a Foreign Language (TOEFL). The Department of Neurobiology and Behavior has the following additional requirements: one year of calculus and physics, inorganic chemistry, and organic chemistry, and demonstrated proficiency in biological sciences. Deficiencies in the departmental requirements do not preclude admission and special consideration will be made to promising applicants.

Faculty

Adams, Paul R., Professor. Ph.D., 1974, London University, England: Electrical and synaptic activity of nerve cells.

Brehm, Paul, Professor. Ph.D., 1975, University of California, Los Angeles: Cellular biophysics; development of muscle acetylcholine receptors.

Brink, Peter Professor.² Ph.D., 1976, University of Illinois: Electrotonic synapses.

Cabot, John B., Professor. Ph.D., 1976, University of Virginia: Neural control of the cardiovascular system.

Carlson, Albert D., Professor.³ Ph.D., 1960, University of Iowa: Physiology of invertebrate nervous systems; insect neuropharmacology; neural control of flash patterns by fireflies.

Collins, William F. III, Associate Professor. Ph.D., 1980, University of Pennsylvania: Neurophysiology; plasticity of neuronal connections and synaptic transmission in motor systems.

Davis, James, Professor.⁴ M.D., 1965, Cornell University: Recovery from brain injury; animal models of cerebral ischemia.

Evinger, Craig, Professor. Ph.D., 1978, University of Washington: Physiology of movement; neural control of eye movements.

Evinger, Marian J., Assistant Professor.⁵ Ph.D., 1978, University of Washington: Transcriptional regulation of neurobiological gene expression.

Fetcho, Joseph, Associate Professor. Ph.D., 1985, University of Michigan: Motor control; neural networks in spinal cord.

Frohman, Michael, Assistant Professor.⁶ Ph.D., M.D., 1985, University of Pennsylvania: Cell behavior during mammalian embryogenesis.

Gnad, James W., Assistant Professor and Graduate Program Director. Ph.D., 1985, University of Alabama at Birmingham: Cortical mechanisms involved in visual control of eye movement.

Halegoua, Simon, Professor. Ph.D., 1978, State University of New York at Stony Brook: Molecular and cell biology of neural development.

Neurobiology and Behavior

Hitzemann, Robert, Professor.⁷ Ph.D., 1975, University of California, San Francisco: Psychopharmacology; genetics; neuroimaging; alcohol.

Kernan, Maurice, Assistant Professor. Ph.D., 1988, University of Wisconsin: Finding the molecular basis of the mechanical senses, with mechanoreception-defective *Drosophila* mutants.

Kritzer, Mary, Assistant Professor. Ph.D., 1989, Yale University: Neocortex; cortical microcircuitry; association cortex.

La Gamma, Edmund F., Associate Professor.⁶ M.D., 1976, New York Medical College: Molecular mechanisms of transmitter gene expression; astrocytes as vehicles for gene therapy in the brain.

Levine, Joel, Associate Professor. Ph.D., 1980, Washington University: Role of cell surface molecules in the differentiation and development of the central nervous system.

Mandel, Gail, Professor. Ph.D., 1978, University of California, Los Angeles: Molecular neurobiology; structure of brain and muscle sodium channels.

Matthews, Gary G., Professor. Ph.D., 1975, University of Pennsylvania: Retinal physiology.

McKinnon, David, Assistant Professor. Ph.D., 1987, Australian National University: Molecular neurobiology: structure and expression of ion channel genes.

McLaughlin, Stuart, Professor.² Ph.D., 1968, University of British Columbia, Canada: Biophysics of excitable membranes and the calcium/phospholipid second messenger system.

McLaughlin, Susan, Assistant Professor. Ph.D., 1990, University of Florida, Gainesville: Molecular mechanisms of taste bud development and taste cell differentiation.

Mendell, Lorne, Professor and Chairperson. Ph.D., 1965, Massachusetts Institute of Technology: Spinal physiology; modifiability of spinal circuitry.

Morin, Lawrence, Associate Professor.⁷ Ph.D., 1974, Rutgers University: Neural control of circadian rhythms in mammals.

Rapp, Peter, Assistant Professor.¹ Ph.D., 1985, University of North Carolina: Neuropsychology and anatomy of aging and memory.

Schechter, Nisson, Professor.⁷ Ph.D., 1971, Western Michigan University: Molecular biology of nerve development in the fish visual pathway.

Schmidt, Jakob, Professor.⁸ Ph.D., M.D., 1970, University of Munich, Germany: Acetylcholine receptor gene regulation; membrane activity and gene control.

Sherman, Murray S., Professor. Ph.D., 1969, University of Pennsylvania: Structure and function of mammalian visual system.

Trimmer, James, Assistant Professor.⁸ Ph.D., 1987, University of California, San Diego: K⁺ channels: regulation and function in nerve muscle.

Walcott, Benjamin, Associate Professor. Ph.D., 1968, University of Oregon: Comparative neurobiology and cell biology; innervation of lacrimal glands.

Whitaker-Azmitia, Patricia, Associate Professor.⁷ Ph.D., 1979, University of Toronto: The role of serotonin in brain development.

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

Number of teaching, graduate, and research assistants, fall 1995: 30

¹ Primary appointment with Center for Behavioral Neuroscience

² Primary appointment with Department of Physiology and Biophysics

³ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1983

⁴ Primary appointment with Department of Neurology

⁵ Primary appointment with Department of Pediatrics

⁶ Primary appointment with Department of Pharmacology

⁷ Primary appointment with Department of Psychiatry

⁸ Primary appointment with Department of Biochemistry

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 in which 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 year.
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. Once a student has joined a research lab, they are expected to participate in this seminar each time it is offered during their graduate tenure.
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 five essay questions from a selection of several topics. The student must choose at least one question in each of three major disciplines (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 made 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 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

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

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

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

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

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

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

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

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

BNB 564 Neuroscience

Prerequisite: BNB 563

Spring, 4 credits

Neurobiology and Behavior

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. Coscheduled with BIO 374.
Spring, 3 credits

BNB 579 Developmental Neurobiology

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

Prerequisite: Permission of instructor
Spring, 3 credits

BNB 599 Research

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

Fall and spring, credit to be arranged

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

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

School of Nursing

Dean: Lenora J. McClean

Health Sciences Center Level 2, Room 236 (516) 444-3549

Advanced Graduate Certificates awarded: Advanced Graduate Certificate as a 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

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 Nursing; M.S. in Perinatal/Neonatal Health; M.S. in Perinatal/Women's Health ; M.S. in Psychiatric/Mental 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, 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 are admitted with advanced standing into the Child Health and Perinatal/Women's Health specializations.

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
(516) 444-3200

Oral Biology and Pathology (HDO)

Chairperson: Israel Kleinberg
Westchester Hall 196 (516) 632-8923

Graduate Program Director: Hershall W. Kaufman
Westchester Hall 115 (516) 632-8925

Graduate Secretary: Patricia Calia
Westchester Hall 109 (516) 632-8923

Degrees awarded: M.S. in Basic Health Sciences; 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 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 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; mechanism of development of periodontitis; mechanism and therapy of dentinal hypersensitivity; bone and salivary gland structure and metabolism; salivary gland function in normal and diseased states; secretory mechanisms; ultrastructure and metabolism of healthy and diseased periodontal tissues with an emphasis on remodeling and matrix metalloproteinases; chemistry and crystallography of the biological calcium phosphates; biology of epithelial growth and differentiation; epithelial gene therapy; biology of papillomavirus; mechanisms of epidermal and oral carcinogenesis; wound repair; sebocyte biology;

biology of skin and mucosal grafting. Further details may be obtained from the graduate program director.

Facilities

The Department of Oral Biology and Pathology currently occupies 18,000 square feet of research space. Facilities include scanning and transmission electron microscopes; X-ray diffraction; isotope counters and preparative and analytical ultracentrifuges; infrared, atomic absorption, ultraviolet/visible spectrophotometers; a mass spectrophotometer; an olfactometer; gas and high-pressure liquid chromatography systems; high-voltage, particle-free flow, and polyacrylamide gel electrophoresis systems; computer equipment of various types; fluorescence densitometer, spectrophotometer, and microscopes of various types; microdensitometer; automated colony counter; amino acid analyzer, peptide synthesizer, and peptide sequencer; autoanalyzer; 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

Archard, Howell O., Professor. D.D.S., 1955, Columbia University: Acquired and inherited morphologic changes affecting the oral mucosa and teeth; oral manifestations of metabolic and systemic diseases; clinical oral allergic disorders.

Auborn, Karen J., Adjunct Assistant Professor. Ph.D., 1983, Rutgers University and University of Medicine and Dentistry of New Jersey: Expression and replication of papilloma viruses in keratinocytes; effects of hormonal metabolism on the pathogenesis of papillomaviruses.

Fenjves, Elizabeth S., Research Associate Professor. Ph.D., 1985, State University of New York at Stony Brook: Molecular biology of gene expression and epithelial gene therapy.

Garlick, Jonathan A., Assistant Professor, D.D.S., 1985, Ph.D., 1993, State University of New York 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; epithelial gene therapy.

Golub, Lorne M., Professor. 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.

Gwinnett, John A., Professor. B.D.S., 1959, University of Birmingham, England; Ph.D., 1964, University of Bristol, England: Scanning electron and light optical microscopy of hard and soft dental tissue; dental biomaterials in the restoration of teeth; acid-etch resin technique in the bonding and debonding of orthodontic brackets; analysis of ancient teeth.

Kaufman, Hershall W., Professor and Graduate Program Director. 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, Professor and 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., Professor. Ph.D., 1959, Catholic University of America: Microbial etiology of dental caries and periodontal disease; immune mechanisms involved in dental pathogenesis; viral infection in oral microorganisms; significance of secretory IgA in caries prevention.

Pollock, Jerry J. Professor. Ph.D., 1969, Weizmann Institute of Science, Israel: Determination of the antimicrobial roles of lysozyme and the salivary histidine-rich polypeptides as natural host defense systems; salivary antifungal activity, oral candidiasis, and AIDS; the yeast connection in oral and systemic disease.

Ramamurthy, Nungavarm S., Research 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.

Ryan, Maria E., Assistant Professor, D.D.S., 1989, State University of New York at Stony Brook: Connective tissue biology; the role of growth factors in connective tissue metabolism; diagnostic technology as applies to preventative and therapeutic measures in dentistry.

Sciubba, James J., Professor. D.M.D., 1967, Fairleigh Dickinson University; Ph.D., 1974, University of Illinois: Cell deletion phenomena in salivary gland tumors; ultrastructure of cultured keratinocytes; electron microscopy of oral odontogenic tumors.

Simon, Marcia, Research Associate Professor. Ph.D., 1981, Brandeis University: Biology and biochemistry of epithelial cornification; epithelial graft therapy for thermal injury; metabolism of vitamin A; sebocyte biology; wound repair; connective tissue biology.

Sreebny, Leo M., Professor. D.D.S., 1945, M.S., 1950, Ph.D., 1954, University of Illinois: Studies of saliva in health and disease; relationship of salivary constituents to systemic diseases, especially Sjögren's syndrome and systematic lupus erythematosus.

Steinberg, Bettie, Adjunct Associate Professor. Ph.D., 1976, State University of New York at Stony Brook: Biology of papillomaviruses and their interaction with epithelial cells; viral oncogenesis.

Taichman, Lorne B., Professor. 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.

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 three 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

Oral Biology and Pathology

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 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 program. 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 694 Dissertation Research in Oral Biology and Pathology

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

Prerequisite: Permission of thesis advisor
Fall, spring, and summer, 1-12 credits

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

Pathology (HBP)

Chairperson: Frederick Miller

Health Sciences Center BHS T-9, Room 140 (516) 444-3000

Graduate Program Director: Nancy C. Reich

Health Sciences Center BHS T-9, Room 140 (516) 444-7503

Graduate Secretary: Adrienne Cascio

Health Sciences Center BHS T-9, Room 140 (516) 444-3000

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 need not choose a track of specialization until 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 from other clinical departments within the Health Sciences Center. 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 very 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 of 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.

Pathology

Faculty

Anderson, Janet, Assistant Professor.¹ Ph.D., 1989, State University of New York at Stony Brook: Molecular basis for the development of uterine smooth muscle tumors in humans.

Benach, Jorge, Professor.² Ph.D., 1972, Rutgers University: Infectious disease immunology.

Bock, Jay, Associate Professor. Ph.D., 1976, M.D., 1977, Albert Einstein College of Medicine: Clinical chemistry; nuclear magnetic resonance spectroscopy; metal ions in biochemistry.

Elias, Jules, Associate Professor. Ph.D., 1982, Union for Experimenting Colleges and Universities: Immunohematopathology.

Fleit, Howard B., Associate Professor. Ph.D., 1980, New York University: Leukocyte Fc receptors; signal transduction; mononuclear phagocyte development.

Furie, Martha B., Associate Professor. Ph.D., 1980, Rockefeller University: Roles of adhesion molecules and cytokines in inflammation.

Galanakis, Dennis, Associate Professor. M.D., 1962, University of Saskatchewan, Canada: Biochemistry, metabolism and physiology of fibrinogen in health and disease.

Ghebrehwet, Berhane, Associate Professor.³ D.V.M., D.Sc., 1974, University of Paris, France: Molecular immunology; biochemistry and function of complement.

Golightly, Marc G., Associate Professor. Ph.D., 1979, University of California, Los Angeles: Tumor immunobiology; natural killer cells.

Gorevic, Peter D., Professor.³ M.D., 1970, New York University: Amyloidosis; amyloid proteins.

Habicht, Gail S., Professor. Ph.D., 1965, Stanford University: Comparative immunology; pathogenesis of Lyme disease.

Kew, Richard R., Assistant Professor. Ph.D., 1985, State University of New York at Stony Brook: Leukocyte chemotaxis; inflammation; pulmonary immunopathology.

Lane, Bernard P., Professor. M.D., 1963, New York University: Ultrastructural pathology; differentiation; carcinogenesis.

Marcu, Kenneth B., Professor.⁴ Ph.D., 1975, State University of New York at Stony Brook: Organization and mechanisms of expression and evolution of eukaryotic multigene systems.

Miller, Frederick, Marvin Kushner Professor and Chairperson.⁵ M.D., 1961, New York University: Immunopathology; renal disease; protein and glycoprotein chemistry.

Moll, Ute M., Assistant Professor. M.D., 1970, Ulm (Germany): Tumor suppressor gene research; mechanism of P53 inactivation.

Peerschke, Ellinor I.B., Professor. Ph.D., 1980, New York University: Platelet physiology and pathology.

Quigley, James P., Professor. Ph.D., 1969, The Johns Hopkins University: Cell transformation; proteolytic enzymes; tumor cell invasion and metastasis.

Reich, Nancy, Associate Professor and Graduate Program Director. Ph.D., 1983, State University of New York at Stony Brook: Cytokine regulation of signal transduction and gene expression.

Simon, Sanford, Associate Professor.⁴ Ph.D., 1967, Rockefeller University: Regulation of extracellular matrix degradation by neutrophil proteases; role of lipoproteins in cholesterol transport; liposomes as drug and metabolite delivery systems.

Spitzer, Eric, Assistant Professor. M.D., Ph.D., 1985, The Johns Hopkins University: Molecular biology of microbial pathogens.

Spitzer, Silvia, Research Assistant Professor. Ph.D., 1983, University of Buenos Aires: Molecular biology of microbial pathogens and clotting diseases.

Steigbigel, Roy T., Professor.³ M.D., 1966, University of Rochester: Immunopathogenesis of HIV infection; macrophage function in human immunodeficiency virus (HIV) infection.

Testa, Jacqueline E., Research Assistant Professor. Ph.D., 1980, Wayne State University: Molecular basis of tumor cell metastasis.

Zieve, Gary, Associate Professor. Ph.D., 1977, Massachusetts Institute of Technology: Synthesis and assembly of snRNP particles; autoimmunity.

Number of teaching, graduate, and research assistants, fall 1996: 16

¹ Joint appointment, Department of Obstetrics, Gynecology, and Reproductive Medicine

² N.Y. State Department of Health

³ Joint appointment, Department of Medicine

⁴ Joint appointment, Department of Biochemistry

⁵ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1990

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

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 semesters, 3 credits

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, 4-6 credits with lab, 3 credits without lab

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

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

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

HBP 554 Advanced Immunology

Mechanisms of injury produced by immunological reactions in tissues, autoimmune diseases, and immunodeficiency diseases. Supervised laboratory experience in selected topics in immunochemistry or immunology can be arranged.

Prerequisite: HBP 531 or 533

Spring, 2 credits

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, 6 credits

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

HBP 562 Histochemistry

Theoretical basis of histochemical techniques (enzyme histochemistry, autoradiography, cytophotometry, immunohistochemistry) as applied to the analysis of chemical components of cells and tissues.

Prerequisites: HBP 533 and permission of instructor

Fall, 2 credits

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

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: Permission of instructor

Fall and spring, 1 credit per semester

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 per semester

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; open only to pathology graduate students

Fall and spring, 1 credit per semester

HBP 694 Thesis Research in Pathology

Original investigation under the supervision of a staff member.

Prerequisite: Permission of instructor

Fall and spring, variable and repetitive credit, 1-12 credits per semester

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

HBP 800 Summer Research

Summer, 0 credits

Pharmacological Sciences (HBH)

Chairperson: Arthur P. Grollman
Health Sciences Center T-8, Room 160 (516) 444-3080

Graduate Program Director: Daniel Bogenhagen
Health Sciences Center T-8, Room 193 (516) 444-3068

Graduate Program Administrator: Beverly Ponte
Health Sciences Center T-8, Room 196 (516) 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 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, 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 (PCs). These computers serve everyday laboratory operations such as E-mail, World Wide Web (WWW) 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, the H. Bentley Glass Biological 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 and one advanced test in biochemistry, biology, chemistry, computer science, physics, or mathematics, and TOEFL for foreign students.

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 (1996-97) is \$15,000 and includes health insurance coverage.

Faculty

Following are faculty members of the Department of Pharmacological Sciences. Seventeen additional faculty members with appointments in other programs are equally capable of serving as research advisors. A comprehensive list of faculty is available upon request from the Graduate Program Office.

Adams, Paul, Professor.³ Ph.D., 1974, London University, England: Cellular neurophysiology and biophysics; synaptic mechanisms.

Berrios, Miguel, Assistant Professor. Ph.D., 1983, Rockefeller University: Nuclear pore complex structure and function; nuclear envelope assembly and disassembly; fertilization and pronuclear formation.

Bogenhagen, Daniel, Professor and Graduate Program Director. M.D., 1977, Stanford University School of Medicine: Molecular biology of mitochondrial DNA.

de los Santos, Carlos, Research Assistant Professor. Ph.D., 1987, University of Buenos Aires, Argentina: NMR solution structure of nucleic acids and proteins.

Dingwall, Colin, Assistant Professor. Ph.D., 1985, University of Cambridge, England. Nuclear protein transport and the biochemistry of the nuclear pore complex.

Eisenberg, Moises, Associate Professor. Ph.D., 1972, California Institute of Technology: Computer-based modeling of biomolecular molecules and their interactions with drugs.

Engbrecht, JoAnne, Assistant Professor. Ph.D., 1986, University of California, San Diego: Mechanisms of meiotic chromosome segregation.

Fisher, Paul A., Associate Professor. M.D., Ph.D., 1980, Stanford University: Structure and function of the cell nucleus; enzymology of eukaryotic DNA synthesis.

Frohman, Michael A., Assistant Professor. M.D., Ph.D., 1985, University of Pennsylvania: Mammalian development.

Grollman, Arthur P., Professor and Chairperson.¹ M.D., 1959, The Johns Hopkins University: Chemical carcinogenesis and mutagenesis.

Hernandez, Nouria, Research Assistant Professor.⁵ Ph.D., 1983, University of Heidelberg, Germany: Mechanisms of transcription in the human snRNA genes and the HIV-1 virus.

Iden, Charles R., Associate Professor, Ph.D., 1971, The Johns Hopkins University: Biomedical mass spectrometry; structure studies of oligodeoxynucleotides and peptides, using FAB/MS.

Johnson, Francis, Professor.² 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., Leading Professor and Vice President 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.

Marcus, Philip, Assistant Professor of Clinical Pharmacology. M.D., 1973, State University of New York, Downstate Medical Center: Internal medicine-pulmonary disease.

Morris, Andrew J., Assistant Professor. Ph.D., 1988, University of Birmingham, England: Roles of phospholipids in cellular signaling.

Prives, Joav M., Associate Professor. Ph.D., 1968, McGill University, Canada: Regulation of surface receptors in muscle cells.

Reich, Edward, Distinguished Professor. M.D., 1956, The Johns Hopkins University; Ph.D., 1962, Rockefeller University: Auto-crine regulation; parasite biochemistry; design of new therapeutic systems.

Shibutani, Shinya, Research Assistant Professor. Ph.D., 1983, Toyama Medical and Pharmaceutical University, Japan: Chemical carcinogenesis and mutagenesis.

Strickland, Sidney, Professor. Ph.D., 1972, University of Michigan: Protease function in mammalian memory and neuronal degeneration; genetics of early development.

Sussman, Joel L., Research Professor.⁶ Ph.D., 1972, Massachusetts Institute of Technology: 3-D structural studies of proteins and nucleic acid.

Takeshita, Masaru, Research Associate Professor. Ph.D., 1960, Tokyo Kyoiku University, Japan: DNA damage and repair; chemical carcinogenesis.

VanDerKloot, William G., Professor.⁴ Ph.D., 1952, Harvard University: Physiology and pharmacology of synapses.

Watkins, David C., Adjunct Assistant Professor. D.Phil., 1984, Sussex University, England: Discrimination of transmembrane signaling elements; guanine nucleotide regulatory proteins.

Williams, David L., Professor. Ph.D., 1972, University of Illinois: Hormonal control of gene expression; molecular biology of atherosclerosis.

Number of teaching, graduate, and research assistants, fall 1995: 26

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

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. 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 course work, 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 their graduate career (HBH 601).

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

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

Pharmacological Sciences

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 560 Regulatory Biology

A literature-based course focusing on major research areas in molecular and biochemical pharmacology. Examines important drugs, hormones, and neurotransmitters to illustrate how effector molecules interact with and modify the biochemistry of living systems. Topics include the hormonal regulation of gene expression, interactions of drugs and regulatory proteins with nucleic acids and enzymes of nucleic acid metabolism, the central role of adenylate cyclase in cellular regulation, biochemical and molecular actions of mutagens and teratogens, and regulation of cellular function by peptides and proteins. Emphasis on the specificity of drug-receptor interactions and the transduction of this interaction to the biochemical response in the target cell.

Prerequisite: Graduate biochemistry
Spring semester, even years, 3 credits

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 staff.

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 686 Minicourse: Advanced Seminars in Pharmacological Sciences

A series of five to six lectures by members of the Stony Brook faculty in conjunction with distinguished outside speakers on topics of current importance in pharmacology and related areas of biochemistry, molecular biology, and cell biology.

Fall, spring, 1-2 credits

HBH 694 Thesis Research in Pharmacology

Original investigation undertaken as part of the Ph.D. program under supervision of the thesis adviser and committee.

Prerequisite: Permission of thesis adviser
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 (516) 632-7590

Graduate Program Director: Don Ihde
Harriman Hall 216 (516) 632-7580

Graduate Secretary: Martha J. Smith
Harriman Hall 207 (516) 632-7580

Degree awarded: M.A. in Philosophy; Ph.D. in Philosophy

Degree Programs

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.

Ph.D. Program

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 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

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 that special work be undertaken.

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

Allison, David B., Associate Professor. Ph.D., 1974, Pennsylvania State University: Contemporary European philosophy.

Baynes, Kenneth, Associate Professor. Ph.D., 1987, Boston University: Social and political philosophy; moral theory; modern and contemporary German philosophy.

Casey, Edward S., Professor and Chairperson. Ph.D., 1967, Northwestern University: Aesthetics; phenomenology; philosophy of psychology.

Crease, Robert, Assistant Professor. Ph.D., 1987, Columbia University: Philosophy of science; aesthetics.

Dilworth, David, Professor. Ph.D., 1963, Fordham University; Ph.D., 1970, Columbia University: East Asian languages and cultures.

Edwards, Jeffrey, Assistant Professor. Ph.D., 1987, Universität Marburg, Germany: History of philosophy; Kant; modern philosophy.

Gelber, Sidney, Distinguished Service Professor Emeritus. Ph.D., 1954, Columbia University: Political philosophy.

Grim, Patrick, Associate Professor. B. Phil., 1975, University of St. Andrews, Scotland; Ph.D., 1976, Boston University: Ethics; logic; contemporary analytic philosophy.

Howard, Dick, Professor. Ph.D., 1970, University of Texas: Political and social philosophy; Marxism.

Ihde, Don, Leading Professor and Graduate Program Director. Ph.D., 1964, Boston University: Phenomenology; philosophy of technology; hermeneutics.

Kittay, Eva, Professor. Ph.D., 1978, City University of New York: Philosophy of language; philosophy and literature; feminism.

Kuspit, Donald B., Professor. D.Phil., 1960, University of Frankfurt, Germany; Ph.D., 1971, University of Michigan: Art criticism; 20th-century art; northern Renaissance art.

Philosophy

Ludlow, Peter, Associate Professor. Ph.D., 1985, Columbia University: Philosophy of language; cognitive science; linguistics.

Manchester, Peter, Associate Professor.² Ph.D., 1972, Graduate Theological Union: Greek philosophy; Heidegger.

Mar, Gary, Associate Professor.⁷ Ph.D., 1985, University of California, Los Angeles: Logic; philosophy of mathematics; contemporary analytical philosophy; philosophy of religion.

Miller, Clyde Lee, Associate Professor.⁶ Ph.D., 1974, Yale University: History of philosophy.

Nolan, Rita D., Professor. Ph.D., 1965, University of Pennsylvania: Philosophy of language; theory of knowledge; philosophy of psychology.

Rawlinson, Mary C., Associate Professor. Ph.D., 1978, Northwestern University: 19th-century philosophy; Hegel; aesthetics and literary theory; philosophical psychology; philosophy of medicine.

Silverman, Hugh J., Professor.⁴ Ph.D., 1973, Stanford University: Continental philosophy; history of ideas; literary theory.

Simon, Michael A., Professor. Ph.D., 1967, Harvard University: Social philosophy; philosophy of biological and social science; philosophy of mind; philosophy of law.

Spector, Marshall, Professor. Ph.D., 1963, The Johns Hopkins University: Philosophy of science; philosophy of technology; environmental issues.

Sternfeld, Robert, Professor Emeritus. Ph.D., 1948, University of Chicago: Logical theory; epistemology.

Tejera, Victorino, Professor Emeritus. Ph.D., 1956, Columbia University: Aesthetics; classical philosophy.

Watson, Walter, Professor Emeritus. Ph.D., 1958, University of Chicago: History of philosophy.

Welton, Donn, Associate Professor. Ph.D., 1973, Southern Illinois University: Phenomenology and epistemology; philosophical psychology.

Williams, Peter, Associate Professor.^{3,5} Ph.D., 1973, Harvard University: Philosophy of law; ethics.

Number of teaching, graduate, and research assistants, fall 1995: 28

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

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 among 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 all 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
- *PHI 601 Medieval and/or Renaissance Philosophy
- *PHI 602 Modern Philosophy
- *PHI 603 19th-Century Philosophy
- PHI 604 Special Topics in the History of Philosophy
(Variable and repetitive credit)

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
- PHI 611 Philosophy and Literature
- PHI 612 Philosophy and Psychology
- PHI 613 Philosophy and Politics
- PHI 614 Philosophy and Linguistics
- PHI 615 Philosophy and Feminism
- PHI 616 Philosophy and Technology
- PHI 617 Philosophy and Environmental Studies
- PHI 618 Philosophy and the Sciences
- PHI 619 Special Topics in Interface Studies
(Variable and repetitive credit)

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
- *PHI 631 Seminar in Analytic Philosophy
- *PHI 632 Seminar in Comparative Philosophy

Additional Seminars in Contemporary Philosophy

- PHI 633 American Pragmatism and Naturalism
- PHI 634 Eastern Philosophy
- PHI 635 Philosophy of Science and Logic
- PHI 636 Metaphysics
- PHI 637 Epistemology
- PHI 638 Philosophical Psychology
- PHI 639 Social and Political Philosophy
- PHI 640 Ethics
- PHI 641 Aesthetics
- PHI 642 Philosophy of Religion
- PHI 643 Semiotics
- PHI 644 Special Topics in Contemporary Philosophy

IV. Independent and Directed Studies

- PHI 620 Advanced Problems in Philosophy
Variable and repetitive credit
- PHI 621 Independent Study
Variable and repetitive credit
- PHI 622 Supervised Teaching
3 credits
- PHI 690 Dissertation
Variable and repetitive credit

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.

Physics

(PHY)

Chairperson: Peter Paul
Physics Building P-110 (516) 632-8100

Graduate Program Director: William I. Weisberger
Physics Building P-110 (516) 632-8100

Assistant Graduate Program Director: Pat Peiliker
Physics Building P-106 (516) 632-8080

Degrees awarded: M.A. in Physics; M.S. in Physics; Ph.D. in Physics

The Department of Physics, 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 Physics Department has a large base of research facilities installed in the Physics Building 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. A number of institutes dedicated to specific fields of research are associated with the department and are housed in the Physics Building. The Institute for Theoretical Physics, under director C.N. Yang, is dedicated to 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 AGS accelerator at Brookhaven National Laboratory (and RHIC when it becomes available) for research on relativistic heavy-ion physics. The High-Energy Group uses the large D0 detector at the Fermilab collider for experiments in the TeV region. 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 is a strong effort in solid-state physics research, both theoretical and experimental. We have an in-house 17 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 entire faculty participates in teaching a rich curriculum of courses, with many courses on special topics of current interest. Course 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 Department, which has been highly ranked in national surveys for the quality of its graduate program and 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.

Doctoral Programs with Concentrations in Astrophysics, Biophysics, and Chemical Physics

The Department of Physics participates in three Ph.D. curricula in cooperation with other programs. The basic degree requirements for a physics 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 astrophysics, 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:

Astrophysics: Department of Astronomy

Biophysics: Department of Pharmaceutical Sciences and Department of Physiology and Biophysics

Chemical Physics: Department of Chemistry

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 and Europe. Currently, most of the effort is devoted to research with the D0 detector operating at the Fermilab collider, which provides the highest energies now available. Our 20 faculty members, research staff, and students are involved in the analysis of the large amount of data, and study the properties of the top quark, discovered last year, search for as yet undiscovered new particles, perform precision measurement of the Standard Model parameters, study QCD with very high Pt jets, and study the physics of the bottom quark. In addition, work towards a major upgrade of the D0 detector by early 1999 is underway. A part of the group is involved with the newly commissioned SuperKamiokande detector. This detector, located deep underground in Japan, aims to measure neutrinos from the sun, neutrinos produced in the upper atmosphere, and neutrinos from super-nova bursts, and is also sensitive to a host of possible proton decay signals. The Super-Kamiokande experiment is uniquely suited to decide a number of outstanding problems in particle physics: on the question of neutrino mass and the stability of the proton. The group is collaborating in the CMS experiment approved for the Large Hadron Collider at CERN, Geneva, the next generation high energy accelerator. Our proximity to Brookhaven National Laboratory with its staff and facilities continues to provide fruitful opportunities for research.

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 transi-

tions. 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. 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 a continuing development of major novel experimental devices.

Optical Sciences at Stony Brook

The optical sciences include some of the most dynamic areas of physics. Their impact in contemporary life spans from communication and medicine to the development of the most sophisticated tools for the study of atomic matter. At least six groups in the Physics 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. All the experimental groups use pulsed or continuous lasers of various wavelengths to prepare, control and probe atoms. Optical control of atomic motion is emerging from laser cooling. The realization of deBroglie wave optics in experiments with helium and rubidium provides a testing ground for exciting new ideas. Rydberg atoms are extremely 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 the simplest atom in nature, highly excited hydrogen, driven by microwave electric fields large enough to cause ionization have

made this system a paradigm for studies on quantum chaos. Coherent control of photo-initiated reactions in helium Rydberg states permit a particular outcome, but the presence of noise has given surprises. Quantum Optics experiments focus on the non-classical properties of light. Cavity quantum electrodynamics allow quantitative studies of open quantum systems. Capturing short lived radioactive atoms with laser traps permits study of their atomic structure well enough to probe weak interactions. Theoretical studies of transverse effects in nonlinear optics and various aspects of topological phase and gauge potentials complement ongoing experimental explorations.

Condensed Matter and Device Physics

An active and expanding program in solid-state and low-temperature physics is being carried out by several groups in the Department of Physics. Areas of study include semiconductors, low-temperature and high-temperature superconductors, 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 electron-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 diffraction, absorption and spectrometry, superconductor quantum interferometry, scanning electron microscopy, optical 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 mod-

Physics

ern 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. In addition, a high-power rotating-anode X-ray generator is available in the department. Work in progress includes the study of phase transitions in lower-dimensional systems using X-ray scattering, the development of X-ray microscopy and holography, and the study of multiply excited atomic and molecular species.

Atmospheric Physics

Atmospheric science uses the techniques of physics, chemistry, mathematics, and engineering to understand the atmospheres of the Earth and the other planets. The Institute for Terrestrial and Planetary Atmospheres uses satellite data and data from general circulation models to better understand the evolution of the Earth's stratospheric ozone and its future changes, and the processes that affect lower atmospheric composition. Stony Brook scientists have made the first identification of chlorine species responsible for the depletion of ozone in the Antarctic ozone hole using remote-sensing apparatus built in the Physics Department. They are receiving real-time satellite data on the Earth's radiation balance on stratospheric energetics, dynamics, and chemical composition from a NASA satellite. Physics offers the ideal training to conduct research in these fascinating and important research areas.

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 and 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 Physics Department, 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 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 mini-computers and remote supercomputer facilities. In statistical mechanics there is very active research into one- and two-dimensional systems where exact mathematical calculations can be made. These include studies of phase transitions, solitons, and spin diffusion. The effort spans the range from quantum field theory to computer studies.

Accelerator and Beam Physics

Research in accelerator physics is being carried out at Stony Brook and in 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, the electron storage rings of the National Synchrotron Light Source, and more. 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.

Admission

For admission to graduate study in physics 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 physics and mathematics.

C. Submission of results of the Graduate Record Examination (GRE) General Test.

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

In special cases, a student not meeting requirement A (or, in unusual cases, requirement B) may be admitted on a provisional basis. 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

Professors

Allen, Philip B., Professor. Ph.D., 1969, University of California, Berkeley: Theoretical solid-state physics.

Averin, Dmitrii V., Associate Professor. Ph.D., 1987, Moscow State University, Russia: Theoretical solid-state physics.

Baarmand, Marc, Assistant Professor. Ph.D., 1987, University of Wisconsin: Experimental high energy physics.

Brown, Gerald E., Distinguished Professor.¹ Ph.D., 1950, Yale University: Theoretical physics; the many-body problem.

deZafra, Robert L., Professor. Ph.D., 1958, University of Maryland: Atmospheric sciences; remote sensing, stratospheric dynamics, and trace constituent measurements; millimeter-wave spectroscopy.

Engelmann, Roderich, Professor. Ph.D., 1966, University of Heidelberg, Federal Republic of Germany: Experimental high-energy physics.

Fossan, David B., Professor. Ph.D., 1961, University of Wisconsin: Experimental nuclear physics.

Goldhaber, Alfred S., Professor.¹ Ph.D., 1964, Princeton University: Theoretical physics; nuclear theory; particle physics.

Goldman, Vladimir J., Associate Professor. Ph.D., 1985, University of Maryland: Experimental condensed matter physics.

Graf, Erlend H., Associate Professor. Ph.D., 1967, Cornell University: Experimental low-temperature physics.

Grannis, Paul D., Professor. Ph.D., 1965, University of California, Berkeley: Experimental high-energy physics.

Gurvitch, Michael, Professor. Ph.D., 1978, State University of New York at Stony Brook: Experimental solid-state physics.

Han, Siyuan, Research Associate Professor. Ph.D., 1986, Iowa State University: Experimental solid-state and X-ray physics.

Hemmick, Thomas, Associate Professor. Ph.D., 1989, University of Rochester: Experimental nuclear physics; relativistic heavy ions.

Jackson, Andrew D., Professor. Ph.D., 1967, Princeton University: Nuclear theory.

Jacobsen, Chris, Associate Professor. Ph.D., 1988, State University of New York at Stony Brook: X-ray microscopy and holography.

Jain, Jainendra, Associate Professor. Ph.D., 1985, State University of New York at Stony Brook: Theoretical solid-state physics.

Jung, Chang Kee, Associate Professor. Ph.D., 1986, Indiana University: Experimental high-energy physics.

Kahn, Peter B., Professor. Ph.D., 1960, Northwestern University: Theoretical physics; nonlinear dynamics.

Kirz, Janos, Distinguished Professor. Ph.D., 1963, University of California, Berkeley: Experimental high-energy physics; energy physics; X-ray optics.

Koch, Peter M., Professor. Ph.D., 1974, Yale University: Experimental atomic physics; quantum chaos; nonlinear dynamics.

Korepin, Vladimir. Professor.¹ Ph.D., 1977, Leningrad University, Russia: Theoretical physics.

Kuo, Thomas T.S., Professor. Ph.D., 1964, University of Pittsburgh: Nuclear theory.

Lee, Linwood L., Professor. Ph.D., 1955, Yale University: Experimental nuclear physics.

Likharev, Kostya, Professor. Ph.D., 1979, Moscow State University, Russia: Solid-state physics.

Lukens, James, Professor. Ph.D., 1968, University of California, San Diego: Experimental solid-state physics.

Marburger, John H., Professor and former President of the University at Stony Brook. Ph.D., 1966, Stanford University: Laser theory.

Marx, Michael D., Professor. Ph.D., 1974, Massachusetts Institute of Technology: Experimental high-energy physics and relativistic heavy ion physics.

McCarthy, Robert L., Professor. Ph.D., 1971, University of California, Berkeley: Experimental high-energy physics.

McCoy, Barry M., Professor.¹ Ph.D., 1967, Harvard University: Theoretical physics; statistical mechanics.

McGrath, Robert L., Professor. Ph.D., 1965, University of Iowa: Experimental nuclear physics.

Mendez, Emilio, Professor and Director of the Institute for Interface Phenomena. Ph.D., 1979, Massachusetts Institute of Technology: Experimental solid-state physics.

Metcalf, Harold J., Professor. Ph.D., 1967, Brown University: Atomic physics; laser cooling and trapping; atom optics; precision stark spectroscopy; lasers and optics

Milhaly, Laszlo, Professor. Ph.D., 1977, Eotvos Lorand University, Budapest, Hungary: Experimental solid-state physics.

Mould, Richard A., Associate Professor. Ph.D., 1957, Yale University: Theoretical physics; general relativity; quantum theory of measurements.

Nathans, Robert, Professor. Ph.D., 1954, University of Pennsylvania: Experimental solid-state physics.

Nieh, Hwa-Tung, Professor.¹ Ph.D., 1966, Harvard University: Theoretical physics; elementary particles.

Orozco, Luis, Associate Professor. Ph.D., 1987, University of Texas at Austin: Quantum optics; atomic physics.

Paul, Peter, Distinguished Service Professor and Chairperson. Ph.D., 1959, University of Freiburg, Federal Republic of Germany: Experimental nuclear physics.

Prakash, Madappa, Research Assistant Professor. Ph.D., 1979, University of Bombay, India: Theoretical nuclear physics.

Rijssenbeek, Michael, Professor. Ph.D., 1979, University of Amsterdam, Netherlands: Experimental high-energy physics.

Rocek, Martin, Professor.¹ Ph.D., 1979, Harvard University: Theoretical physics: supersymmetry and supergravity.

Shrock, Robert, Professor.¹ Ph.D., 1975, Princeton University: Theoretical physics; gauge theories; statistical mechanics.

Shuryak, Edward, Professor. Ph.D., 1974, Institute of Nuclear Physics, Novosibirsk, Russia: Theoretical nuclear physics.

Siegel, Warren, Professor.¹ Ph.D., 1977, University of California, Berkeley: Theoretical physics; strings.

Smith, John, Professor.¹ Ph.D., 1963, University of Edinburgh, Scotland: Theoretical physics; elementary particle physics.

Sproue, Gene D., Professor. Ph.D., 1968, Stanford University: Experimental nuclear physics.

Stephens, Peter W., Professor. Ph.D., 1978, Massachusetts Institute of Technology: Experimental solid-state physics.

Sterman, George, Professor.¹ Ph.D., 1974, University of Maryland: Theoretical physics.

Strassenburg, Arnold A., Professor. Ph.D., 1955, California Institute of Technology: Experimental high-energy physics.

Van Nieuwenhuizen, Peter, Professor.¹ Ph.D., 1971, University of Utrecht, Netherlands: Theoretical physics; quantum field theory.

Physics

Verbaarschot, Jac, Associate Professor. Ph.D., 1982, University of Utrecht, Netherlands: Theoretical nuclear physics.

Weisberger, William I., Professor and Graduate Program Director.¹ Ph.D., 1964, Massachusetts Institute of Technology: Theoretical physics; quantum field theory; particle physics.

Yang, Chen Ning, Einstein Professor and Director of the Institute for Theoretical Physics. Ph.D., 1948, University of Chicago: Theoretical physics; field theory; statistical mechanics; particle physics.

Yanigasaqa, Chiaki, Research Assistant Professor, Ph.D., 1981, Tokyo University: High energy physics.

Zahed, Ismail, Associate Professor. Ph.D., 1983, Massachusetts Institute of Technology: Theoretical nuclear physics.

Professors Emeriti

Balazs, Nandor L., Professor Emeritus. Ph.D., 1951, University of Amsterdam, Netherlands: Theoretical physics: statistical mechanics; general relativity.

Courant, Ernest D., Professor Emeritus.¹ Ph.D., 1943, University of Rochester: Theoretical physics; high-energy accelerator design.

Dresden, Max, Professor Emeritus. Ph.D., 1946, University of Michigan: Theoretical physics; field theory; statistical mechanics; particle physics.

Finocchiaro, Guido, Professor Emeritus. Ph.D., 1957, University of Catania, Italy: Experimental high-energy physics.

Fox, David, Professor Emeritus. Ph.D., 1952, University of California, Berkeley: Theoretical solid-state physics.

Good, Myron L., Professor Emeritus. Ph.D., 1951, Duke University: Experimental high-energy physics.

Muether, Herbert R., Professor Emeritus. Ph.D., 1951, Princeton University: Experimental nuclear physics.

Silsbee, Henry B., Professor Emeritus. Ph.D., 1951, Harvard University: Experimental physics; molecular and atomic beams; magnetic resonance.

Swartz, Clifford E., Professor Emeritus. Ph.D., 1951, University of Rochester: Experimental high-energy physics; school curriculum revision.

Adjunct Professors

Ben-Zvi, Ilan, Adjunct Professor. Ph.D., 1967, Weizmann Institute, Israel: Accelerator and beam physics.

Fernow, Richard C., Adjunct Professor. Ph.D., 1973, Syracuse University: Experimental high-energy physics.

Geller, Marvin, Adjunct Professor and Director of the Institute for Atmospheric Studies. Ph.D., 1969, Massachusetts Institute of Technology: Atmospheric physics.

Lee-Franzini, Juliet, Adjunct Professor. Ph.D., 1960, Columbia University: Experimental high-energy physics.

Palmer, Robert, Adjunct Professor. Ph.D., 1960, Imperial College, England: Accelerator physics.

Number of teaching, graduate, and research assistants, fall 1995: 165

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. Passing the master's examination.

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 very frequent 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.
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: (a) a written comprehensive examination and (b) an oral examination on a broad range of topics relevant to the student's intended area of thesis research. The written examination, given at the beginning of each semester, must be passed no later than the beginning of the fifth semester of graduate study. The oral examination must be passed before the beginning of the fifth semester.

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, variational principles, Hamilton-Jacobi theory, mechanics of fields, special relativity.
3 credits

PHY 503, 504 Methods of Mathematical Physics I, II

A selection of mathematical techniques useful for physicists. Topics are selected from the following: asymptotic analysis, perturbation theory applied to linear and nonlinear systems, boundary layer techniques, chaotic systems, differential equations, special functions, boundary value problems, integral transforms, integral equations. This course should be taken only by entering graduate students who have a deficiency in this area.
3 credits each semester

PHY 505, 506 Classical Electrodynamics

Electrostatics and magnetostatics with emphasis on the solution of boundary value problems through the use of eigenfunction expansions and Green's functions; dielectrics, magnetic materials, Maxwell's equations, electromagnetic waves, wave guides, diffraction, plasma physics, special relativity, relativistic particle kinematics and dynamics, energy loss and scattering of charged particles in matter, radiation, multipole fields, spin resonance, and superconductivity.
3 credits each semester

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 drive perturbation solutions for differential equations and maps. This is followed by a discussion of global aspects which have the potential to lead to chaotic orbits. More advanced concepts associated with particular aspects of chaos, intermittency mechanisms, Melnikov theory and bifurcation from periodic orbits are treated in less detail.
3 credits each semester

PHY 511, 512 Quantum Mechanics I, II

Topics include basic quantum physics and mathematical apparatus; angular momentum; symmetries; semiclassical theory of radiation; Dirac theory; and numerous concrete applications to atoms, nuclei, etc.
3 credits each semester

PHY 515, 516 Methods of Experimental Research

A course designed to expose all graduate students to the disciplines and techniques of experimental research. A number of historically important experiments are studied and performed with the aid of modern instrumentation. As they progress, students are encouraged to pursue independent projects in which there are no rigidly fixed formats or procedures. Primary emphasis is on the development of experimental skills and on

professionally acceptable analysis and presentation of results, both in written and oral form. Projects are typically chosen from such fields as atomic and nuclear spectroscopy, particle physics, solid-state and low-temperature physics, optics, and electromagnetism. Two three-hour laboratory sessions per week.
3 credits each semester

PHY 525 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

PHY 540 Statistical Mechanics

Brief review of thermodynamics. Thermal equilibrium ensembles for classical and quantum systems. Applications to systems for which the Hamiltonian is separable. Approximate treatment of nonseparable Hamiltonians.
3 credits

PHY 541 Advanced Statistical Mechanics

Topics are selected from cluster expansions, elementary theory of quantum fluids, phase transitions, transfer matrix, Ising and ferroelectric models, and introduction to fluctuation and nonequilibrium phenomena.
3 credits

PHY 551 Nuclear Physics I

Basic properties of nuclei and quarks; the structure of the nucleon; independent particle models; collective models; equation of state of nuclear matter; nuclei matter; quark matter phase transition; relevant experimental techniques.
3 credits

PHY 552 Nuclear Physics II

Nuclear reactions from 1eV to relativistic energies, statistical models of the nucleus, thermodynamics of nuclear matter, and chaos in nuclear physics.
3 credits

PHY 555, 556 Solid-State Physics I, II

The first part of the course is primarily devoted to single-particle properties of solids. Topics covered include symmetries of solids, energy band theory, transport properties, and phonons. It also includes an elementary discussion of cooperative phenomena, such as magnetism and superconductivity. The second semester addresses the collective properties of strongly interacting condensed matter systems.
3 credits each semester

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 electroweak theory and models for strong interactions. Interactions at high energies.

Physics

Interactions between particles and matter and their application in particle detectors. A case study of modern particle detectors.
3 credits

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 simple sources such as a two-level atom interacting with a single mode of the electromagnetic field.
3 credits each semester for each course

PHY 580 Special Research Projects

Research under the direction of a faculty member. Not open to Ph.D. candidates.
Each semester, variable and repetitive credit

PHY 581 Astrophysics

An introduction to some areas of astrophysics. Topics are selected from stellar structure and evolution, stellar atmospheres, interstellar matter, planetary atmospheres, galactic dynamics, high-energy astrophysics and cosmology, laboratory astronomical techniques.
3 credits

PHY 582 Optics Rotation

Optical science students experience three to five 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

PHY 585 Special Study

Reading course in selected topics.
Each semester, variable and repetitive credit

PHY 595 Master's Degree Thesis Research

Independent research for master's degree students. Open only to those approved by individual faculty for thesis work.
Each semester, 1-12 credits, variable and repetitive

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. Both courses are required for all first-year graduate students.
1 credit each semester

PHY 600 Practicum in Teaching

2 credits, repetitive

PHY 610, 611 Quantum Field Theory I, II

Field quantization: interacting fields, S-matrix theory, Feynman diagrams, charge and mass renormalization, dispersion relations, general field theory.
3 credits each semester

PHY 612 Theoretical Particle Physics

Applications of quantum field theory to interactions between elementary particles. Topics are chosen from perturbative quantum chromodynamics, the standard electro-weak model, lattice field theory, grand unified models, supersymmetry, and current research problems.
3 credits

PHY 620 Relativity

General theory of relativity, cosmology.
3 credits

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 670 Seminar in Theoretical Physics

PHY 672 Seminar in Elementary Particle Physics

PHY 674 Seminar in Nuclear Physics

PHY 676 Seminar in Solid-State Physics

PHY 678 Seminar in Quantum Electronics

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

PHY 681 Special Topics in Statistical Mechanics

PHY 682 Special Topics in Solid-State Physics

PHY 683 Special Topics in Radiation Physics

PHY 684 Special Topics in Nuclear Physics

PHY 685 Special Topics in Mathematical Physics

PHY 686 Special Topics in Elementary Particles

PHY 688 Special Topics in Astrophysics

PHY 690 Special Topics in Quantum Electronics

PHY 698 Colloquium

1 credit

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

Physiology and Biophysics (HBY)

*Acting Chairperson: William G. Van der Kloot
Basic Science Tower T-6, Room 140 (516) 444-2287*

*Graduate Program Director: Leon Moore
Basic Science Tower T-6, Room 140 (516) 444-2287*

*Graduate Program Staff Assistant: Melanie Bonnette
Basic Science Tower T-6, Room 140 (516) 444-2287*

Degree awarded: Ph.D. in Physiology and Biophysics

The Department of Physiology and Biophysics, in the Health Sciences Center, offers a program of study leading to the degree of Doctor of Philosophy. The department's principal areas of teaching and research specialization are 1) hormonal regulation of cell function and metabolism, with special emphasis on intercellular and intracellular signaling mechanisms; 2) biophysical studies of membranes; and 3) cellular physiology and electrophysiology. Studies are conducted at the molecular, subcellular, cellular, organ, and intact animal levels.

Faculty members collaborate in both teaching and research with scientists in the Biology, Biochemistry, Chemistry, Physics, Pharmacology, and Neurobiology departments, and students are encouraged to do likewise. In addition to advanced courses in cellular signal transduction, and physiology and pharmacology of excitable membranes, the program involves tutorials, seminars, and independent research. During their first two years students generally rotate through three laboratories to gain research experience. After successful completion of the preliminary examinations, students choose their own independent area of research under the supervision of the faculty. The requirements are flexible and can be adapted to the individual's preference and needs. Close tutorial contact between the individual student and the faculty is regarded as the most important feature of the educational program. Additional information about department requirements and programs can be obtained by writing to the graduate program director.

Facilities

The Department of Physiology and Biophysics is well equipped with major research instrumentation for physiological, metabolic, and biochemical studies: scintillation counters for radioisotope work, ultracentrifuges, an amino acid analyzer, a gas phase protein sequencer, a DNA synthesizer, DNA sequencer, instrumentation for measuring ORD and CD, plus a wide variety of chromatographic, electrophoretic, spectrophotometric, and electronic equipment. Specialized equipment used in studies of membrane physiology and biophysics, e.g., membrane potentials and patch-clamp studies on ion channels, is in use in laboratories of several of the faculty. The department has a fully equipped cell and molecular biology core facility that allows students to engage in studies involving RNA-DNA recombinant technology. Located in the department are a well-equipped molecular modeling and graphics facility and a computer center, networked with the University's computer center. Also available in Health Sciences Center core facilities are a peptide synthesizer, mass spectrophotometer, and a laboratory for chemical synthesis of low molecular weight compounds. NMR instrumentation is also available through collaboration with other departments. Department faculty members have many collaborative arrangements with other basic science and clinical departments, as well as with investigators at Cold Spring Harbor and Brookhaven National Laboratories.

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.

Physiology and Biophysics

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

Abumrad, Nada A., Associate Professor. Ph.D., 1978, State University of New York Health Science Center at Syracuse: Mechanism of membrane transport of fatty acids.

Abumrad, Naji N., Professor.¹¹ M.D., 1971, American University of Beirut, Lebanon: Hormonal control of protein metabolism.

Baldo, George J., Research Assistant Professor. Ph.D., 1982, State University of New York at Stony Brook: Lens intercommunication; gap junctions.

Benjamin, William B., Professor. M.D., 1959, Columbia University: Endocrinology; mechanism of insulin action.

Berelowitz, Michael, Professor.² M.B., Ch.B., 1968, Cape Town University, South Africa: Growth hormones.

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

Cabot, John B., Associate Professor.¹ Ph.D., 1976, University of Virginia: Central nervous system control of cardiovascular function.

Cameron, Roger H., Research Assistant Professor. Ph.D., 1990, State University of New York at Stony Brook: Electron microscopy; pharmacology of plasma cells secretion.

Clausen, Chris, Associate Professor. Ph.D., 1979, University of California, Los Angeles: Electrical properties of transporting epithelia.

Cohen, Ira S., Professor. M.D., Ph.D., 1974, New York University: Electrophysiology of the heart; synaptic physiology.

Dilger, James P., Associate Professor.⁵ Ph.D., 1980, State University of New York at Stony Brook: Neuromuscular junction; ion channels in nerve membranes.

Edelman, Norman H., Professor.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.

El-Maghrabi, Raafat, Research Associate Professor. Ph.D., 1978, Wake Forest University: Enzyme regulation; hormonal control of metabolism.

Fajer, Jack, Professor.⁷ Ph.D., 1962, Brandeis University: Electron transfer in photosynthetic and enzymatic reactions.

Fan, Shih-Fang, Research Professor. Ph.D., 1955, Chinese Academy of Sciences, Shanghai: Gap junction channels.

Goligorsky, Michael S., Associate Professor.² M.D., 1970, Ph.D., 1973, Kiev Medical Institute, Russia: Signal transduction.

Hod, Yaacov, Research Associate.¹² Ph.D., 1977, Israel Institute of Technology: Hormonal regulation of gene transcription.

Hurewitz, Adam, Assistant Professor.² M.D., 1973, New York Medical College: Respiratory physiology.

Johnson, Roger A., Professor. Ph.D., 1968, University of Southern California: Mechanism of hormone action; inter- and intracellular regulation of membrane-bound hormone-sensitive enzymes.

Kaskel, Frederick, Associate Professor.⁴ Ph.D., 1972, M.D., 1975, University of Cincinnati: Renal physiology.

Lang, Charles, Professor.³ Ph.D., 1981, Hahnemann: Mechanisms of insulin resistance in sepsis.

Marshak, Daniel R., Assistant Professor.⁶ Ph.D., 1983, Rockefeller University: Neurite extension factor from mammalian brain.

Mathias, Richard T., Professor. Ph.D., 1975, University of California, Los Angeles: Electrophysiology of cardiac muscle; volume regulation in the lens.

McLeod, Kenneth, Assistant Professor.⁹ Ph.D., 1986, Massachusetts Institute of Technology: Effects of electrical fields on bone tissue.

McLaughlin, Stuart, Professor. Ph.D., 1968, University of British Columbia, Canada: Biophysics of membranes.

Mendell, Lorne, Professor.¹ Ph.D., 1965, Massachusetts Institute of Technology: Physiology and modifiability of synapses in the spinal cord.

Miller, W. Todd, Assistant Professor. Ph.D., 1988, Rockefeller University: Protein structure and function; molecular mechanisms of signal transduction.

Moore, Leon C., Professor and Graduate Program Director. Ph.D., 1976, University of Southern California: Renal physiology.

Porcelli, Robert, Associate Professor.¹⁰ Ph.D., 1972, New York University: Control of pulmonary circulation with emphasis on the role of biogenic amines.

Rebecchi, Mario J., Research Assistant Professor.⁵ Ph.D., 1984, New York University School of Medicine: Signal transduction in mammalian cells.

Sachs, John, Professor.² M.D., 1960, Columbia University: Sodium potassium pump in the red cell.

Said, Sami, Professor. M.D., 1951, University of Cairo, Egypt: Vasoactive intestinal peptides (VIP); acute lung injury.

Scarlata, Suzanne, Assistant Professor. Ph.D., 1984, University of Illinois: Effects of pressure on membrane-component interactions.

Smaldone, Gerald C., Assistant Professor.² M.D., Ph.D., 1975, New York University: Respiratory physiology.

Spector, Ilan, Associate Professor. Ph.D., 1967, University of Paris, France: Electrophysiology of nerve and muscle cell lines; ion channels; neurotoxins.

Stein, Leonard A., Assistant Professor.² M.D., 1974, Ph.D., 1983, University of Pennsylvania: Muscle physiology and biochemistry.

Sutherland, John C., Senior Biophysicist.⁷ Ph.D., 1967, Georgia Institute of Technology: Biological effects of ultraviolet radiation on DNA; spectroscopy; synchrotron radiation.

Tewarson, Reginald P., Professor.⁹ Ph.D., 1961, Boston University: Numerical analysis; mathematical models in physiology.

Van der Kloot, William G., Professor and Acting Chairperson. Ph.D., 1952, Harvard University: Cellular neurophysiology.

Varadaraj, Kulandaiappan, Research Assistant Professor. Ph.D., 1991, Madri Kamaraj University: Lens membrane proteins and gap junctions.

Wang, Hsien Yu, Research Assistant Professor. Ph.D., 1989, State University of New York at Stony Brook: Signal transduction and development.

Whittaker, Jonathan, Assistant Professor.² M.D., 1973, University College Hospital Medical School, London, England: Insulin receptors.

Number of teaching, graduate, and research assistants, fall 1995: 24

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 Orthopaedics

¹⁰ Joint appointment, Veterans Administration Hospital

¹¹ Joint appointment, North Shore University Hospital

¹² Joint appointment, Department of Urology

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 520, HBY 570, HBY 591, HBY 690, HBY 694, HBY 695, and three 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*

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

HBY 530 Cellular Physiology and Biophysics

Cellular structure and function. Topics include electrophysiology, 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, 3 credits

HBY 531 Organ Systems

An introduction to organ systems physiology with ultrastructural correlates is the major focus. Ultrastructural correlates are demonstrated in the form of histological preparations in a laboratory setting. This is a graduate level course designed to serve as an introduction to the physiology and ultrastructure of the following systems: cardiovascular, respiratory, integument, renal, gastrointestinal, endocrine, and male and female reproductive systems.

Prerequisites: Admission to medical or dental school and permission of instructor
Spring, 8 credits

HBY 551 Biomembranes

A survey of biological membranes. Major topics considered include the structure and assembly of biomembranes, the mobility of the membrane components, molecular neurobiology, membrane transport, the chemosmotic hypothesis, and receptors on biological membranes.

Prerequisite: An undergraduate course in physical chemistry
Spring, even years, 3 credits

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, odd years, 3 credits

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

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

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

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, 1-2 credits each semester, repetitive

HBY 694 Thesis Research in Physiology and Biophysics

Original thesis research undertaken with the supervision of a member of the staff.

Prerequisite: Permission of thesis advisor
Fall and spring, 1-12 credits each semester, repetitive

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, 1-4 credits each semester, repetitive

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

Political Science

(POL)

Chairperson: Mark Schneider

Ward Melville Social and Behavioral Sciences Building S-711 (516) 632-7660

Graduate Program Director: Paul Teske

Ward Melville Social and Behavioral Sciences Building N-749 (516) 632-7634

Graduate Coordinator: Annette Borenstein

Ward Melville Social and Behavioral Sciences Building S-703 (516) 632-7650

Degrees awarded: M.A. in Political Science; 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:
 - a) Political Psychology/Behavior
 - b) Political Economy and Public Policy
 - c) 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 responsibility and blame management, 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, international trade, 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.

Our 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, protectionism in international trade, 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 emphasis on elections. 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, 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. 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 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

Casey, Jeff T., Associate Professor. Ph.D., 1986, University of Wisconsin: Behavioral decision theory; organizational behavior; political psychology.

Cover, Albert D., Associate Professor. Ph.D., 1976, Yale University: American politics: congressional elections.

Feldman, Stanley, Professor. Ph.D., 1978, University of Minnesota: American politics, emphasizing political psychology and socialization; public opinion; voting behavior and participation; methodology.

Huddy, Leonie, Associate Professor. Ph.D., 1987, University of California, Los Angeles: Political attitudes; groups and politics; sociopolitical gerontology; women and politics.

Kaji, Joel, Assistant Professor. Ph.D., 1993, University of Michigan: Legislative behavior; the American presidency; political economy; formal theory and statistics and data analysis.

Koppelman, Lee E., Leading Professor. 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.

Lodge, Milton G., Professor. Ph.D., 1967, University of Michigan: Political psychology; political cognition.

McGraw, Kathleen M., Professor. Ph.D., 1985, Northwestern University: Political psychology; law and psychology.

Myers, Frank, Professor. Ph.D., 1965, Columbia University: Comparative politics; political theory.

Norpoth, Helmut, Professor. Ph.D., 1974, University of Michigan: Electoral behavior; public opinion.

Scarrow, Howard A., Professor. Ph.D., 1954, Duke University: Political parties; New York State politics and elections; British politics and elections.

Schneider, Mark, Professor and Chairperson. Ph.D., 1974, University of North Carolina, Chapel Hill: Urban public policy; urban service delivery; administration and public policy.

Scholz, John T., Professor. Ph.D., 1977, University of California, Berkeley: Administration and public policy: implementation, regulation, enforcement, and compliance.

Segal, Jeffrey A., Professor. Ph.D., 1983, Michigan State University: Judicial process and behavior; research methods; American politics.

Taber, Charles, Associate Professor. Ph.D., 1989, University of Illinois: International relations; political psychology; foreign policy; conflict modeling; computational modeling (AI).

Teske, Paul, Associate Professor and Graduate Program Director. Ph.D. 1988, Princeton University: Political economy; urban politics; regulatory policy.

Timpone, Richard, Assistant Professor. Ph.D., 1994, State University of New York at Stony Brook: American politics emphasizing electoral behavior, institutions and representation, methodology.

Number of teaching, graduate, and research assistants, fall 1995: 22

Degree Requirements

Requirements for the Ph.D.

Degree in Political Science

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:

Political Science

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. Political psychology students take POL 610, a graduate-level course in experimental design. They are also required to take an additional advanced methods course, chosen in conjunction with their advisor.
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. These seminars 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 in the middle of the spring 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: (a) recommend continuation of graduate study toward the Ph.D., (b) recommend that the student be allowed to continue toward a terminal M.A. but not to continue in the Ph.D. program, or (c) 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.

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.

Courses

The required courses for first-year students are given every year, while 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

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

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

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

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

POL 605 Foundations: American Politics

A review of the basic political science literature on American politics, with emphasis on American political institutions.

3 credits

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

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 cointegration and vector autoregression are also addressed.

3 credits

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

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

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

POL 677 Advanced Topics: Methods II

A continuation of POL 676.

3 credits

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

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

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

POL 615 Legislative Process

A seminar on the legislative process, focusing on current research on the United States Congress.

3 credits

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

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

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

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

POL 674 Advanced Topics: American Politics II

A continuation of POL 673.

3 credits

ELECTIVES: PUBLIC POLICY

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

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

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.

Political Science

The historical, economic, and political foundations of intergovernmental policy delivery systems are examined. Crosslisted with CER 534.

3 credits

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

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

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

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

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

POL 623 Urban Politics

This course concentrates on urban and sub-urban 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

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

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

POL 671 Advanced Topics: Public Policy Analysis II

A continuation of POL 670.

3 credits

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

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

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

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

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

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

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

POL 679 Advanced Topics: Political Psychology/Behavior II

A continuation of POL 678.

3 credits, repetitive

ELECTIVES: GENERAL

POL 536 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. Crosslisted with CER 536.

3 credits

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

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

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

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

POL 598 Thesis Registration

1 credit, repetitive, grading S, U

POL 667 Political Elites

A critical review of established and new theoretical approaches and methodological orientations to the study of political elites.
3 credits

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

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

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, grading S, U

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

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, grading S, U

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, grading S, U

POL 693 Practicum in Teaching

1-3 credits

POL 699 Doctoral Dissertation Research

Prerequisite: Permission of graduate program director
1-9 credits, repetitive, grading S, U

School of Professional Development and Continuing Studies

Dean: Paul J. Edelson

Ward Melville Social and Behavioral Sciences Building N-203 (516) 632-7052

Assistant Dean and Teacher Certification Officer: Marvin J. Glockner

Ward Melville Social and Behavioral Sciences Building N-223 (516) 632-7055

Director of Academic Services and Student Advisement: Sandra Romansky

Ward Melville Social and Behavioral Sciences Building N-201 (516) 632-7050

Academic Advisor: Nancy Cangelosi

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Director of Curriculum Development, Extension, and Lifelong Learning Programs: Patricia Baker

Ward Melville Social and Behavioral Sciences Building N-215 (516) 632-9159

Director of Professional, Management, and Human Resource Development Programs: Jane O'Brien

Ward Melville Social and Behavioral Sciences Building N-247 (516) 632-7071

Advanced Graduate Certificates awarded: Advanced Graduate Certificate in Coaching; Advanced Graduate Certificate in Educational Computing; Advanced Graduate Certificate in Environmental/Occupational Health and Safety; Advanced Graduate Certificate in Long Island Regional Studies; Advanced Graduate Certificate in School Administration and Supervision; Advanced Graduate Certificate in School District Administration; Advanced Graduate Certificate in Software Engineering; Advanced Graduate Certificate 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 (Chemistry, Earth Science or Physics); M.A.T. in Social Studies 7-12; Master of Professional Studies

The School of Professional Development and Continuing Studies 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. This year, SPD celebrates its 29th 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 such areas as coaching, educational computing, Long Island regional studies, occupational health and safety, school administration and supervision, school district administration, 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 632-7050 to request the current *SPD Bulletin*.

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 (516) 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 (516) 632-7050.

Foreign Student Admission

In addition to the admission procedures listed above, students who are not citizens or permanent residents of the United States must meet the following requirements:

A. English Proficiency

Foreign students must demonstrate proficiency in reading, writing, and speaking English, as well as comprehension of the spoken language, if their first or native language is not English or if they have pursued higher education in a non-English-speaking country. They can do this by presenting a score of at least 550 on the Test of English as a Foreign

Language (TOEFL). This test is given at centers throughout the world several times each year. The testing schedule and registration information can be obtained by writing to TOEFL, CN 5161, Princeton, NJ 08540, USA.

B. *Financial Verification*

Foreign students must provide the University with verification that the necessary funds are available to finance their education and living expenses at Stony Brook. University Financial Affidavit Form SUSB 1202 must be completed and submitted for this purpose along with the application for admission and the application fee.

C. *Visa Clearance*

Government regulations require that every foreign student attend the institution that issues his or her visa clearance. The student must take a full course of study of at least 12 credits each semester and consult with a foreign student advisor about any anticipated changes in student status that affect his or her visa clearance.

D. *Mandatory Health Insurance*

Foreign students should consult Foreign Student Services, located in the Graduate School (516) 632-7040, for information regarding mandatory student health insurance.

Academic Advising

The School of Professional Development and Continuing Studies' 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 (516) 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 register in SPD's graduate certificate programs should schedule an appointment with a SPD advisor by calling (516) 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. A maximum of 12 graduate credits earned at Stony Brook as a non-matriculated student (GSP) can be applied toward the requirements for a School of Professional Development and Continuing Studies degree.
- B. A maximum of six credits of CED 599 Independent Study can be applied to a School of Professional Development and Continuing Studies degree (where appropriate).
- C. Stony Brook graduate courses that the student took more than five years before being admitted or readmitted to an SPD degree program will be individually reviewed by the appropriate program or faculty to determine if they may be applied to current SPD degree requirements. The grades in such courses must be B- or higher. A course that is both more than five years of age 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 degree requirements.
- D. A maximum of six 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 meeting degree requirements. Transfer is not automatic. A student must request the transfer, and the request must be reviewed and approved by SPD's transfer credit advisor. (For complete information, see the section below on transferring graduate credit from other institutions.)

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 gradu-

ate 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 a 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 a School of Professional Development and Continuing Studies 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 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

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text(s) and outside readings, a complete schedule of class meetings (including dates, times, and locations), 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 almost 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. Depending on your date of admission, the program consists of 30-33 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 school administration and supervision.

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 grade point average (G.P.A.) of 2.75 or higher is required to matriculate in these programs. Students with an undergraduate cumulative G.P.A. of less than 2.75 will be matriculated conditionally until they complete at least six graduate credits at Stony Brook and achieve a cumulative G.P.A. of at least 3.0.

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. Three concentrations are available within this program: labor/management studies, public affairs, and waste management studies. 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.

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 grade point average (G.P.A.) of 2.75 or higher is required to matriculate in these programs. Students with an undergraduate cumulative G.P.A. of less than 2.75 will be matriculated conditionally until they complete at least six graduate credits at Stony Brook and achieve a cumulative G.P.A. of at least 3.0.

Master of Arts in Teaching (M.A.T.)

Each 36-credit Master of Arts in Teaching program includes a set of professional 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, 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.

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. 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 GREs during the first semester of registration in the M.A.T. program.

M.A.T. in English

Offered through SPD in collaboration with the Center for Excellence and Innovation in Education 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 (516) 632-7303.

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. 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 and Continuing Studies:

- 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

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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 Center for Excellence and Innovation in Education, the Department of French and Italian, and the Department of Germanic and Slavic Languages and Literatures, the Master of Arts in Teaching Foreign Languages programs are individually designed to lead to New York State certification for teaching either 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 36 graduate credits of coursework.

For additional information about this graduate program, please address inquiries to Paul Ferrotti, Director, M.A.T. in Foreign Language Programs, University at Stony Brook, Stony Brook, New York 11794-3359, or telephone (516) 632-7440, 632-7696, or 632-7055.

Admission

Applicants for admission to any of the M.A.T.s in Foreign Language are expected to have good preparation in the program language (preferably a major or minor) with a minimum grade point average of 2.75 in their overall bachelor's degree program and at least a 3.00 in their 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 and Continuing Studies

- 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 Languages 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: Chemistry, Earth Science, or Physics

Offered by the Departments of Chemistry, Geology, and Physics and the Center for Science, Mathematics, and Technology Education in collaboration with the School of Professional Development and Continuing Studies, these Master of Arts in Teaching programs are individually designed to lead to New York State certification for teaching either Chemistry, Earth Science, or Physics in the secondary schools (grades 7-12). Each program consists of a total of 36 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 Continuing Education:

- 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 Chemistry M.A.T. Program advisement, call Dr. Frank Fowler at (516) 632-7938.

For Earth Science M.A.T. Program advisement, call Dr. Robert Dodd at (516) 632-8204.

For Physics M.A.T. Program advisement, call Dr. Clifford Swartz at (516) 632-8175.

For applications and/or additional information about this graduate program, please contact the Center for Science, Mathematics and Technology Education at (516) 632-7075, the appropriate director noted above, or the assistant dean of SPD at (516) 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 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 Center for Excellence and Innovation in Education 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 in history or another social science major (excluding psychology, education, and linguistics) with 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 class-

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room teaching experience. To be considered for admission, all students must submit or have sent to the School of Professional Development and Continuing Studies:

- 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. Eli Seifman, Director, M.A.T. in Social Studies Program, University at Stony Brook, Stony Brook, New York 11794-4333, or telephone (516) 632-7690, 632-7696, or 632-7055. For curriculum information see pp. 167 of this bulletin.

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.

Graduate Certificate Programs

Concentrations in either Long Island regional studies, waste management, environmental/occupational health and safety, coaching, school administration, school district administration, software engineering, or educational computing are available in the School of Professional Development and Continuing Studies as certificate programs. In addition, the labor/management studies cluster of courses offered in the School of Professional Development and Continuing Studies by the Harriman School for Management and Policy is available as a graduate certificate program.

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.

Admission

- A. Prospective candidates may obtain an application for a graduate certificate program by writing to, calling, or visiting the School of Professional Development and Continuing Studies. 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 grade point average of 2.75 is required. Students with less than a 2.75 average may be admitted on the condition that they achieve at least a 3.00 grade point average in their first six credits of coursework in the program.

Certificate Requirements

- A. A student preparing for a School of Professional Development and Continuing Studies 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 grade point average. Students may request advising appointments with SPD advisors to discuss certificate program requirements by calling (516) 632-7050.
- B. Candidates must formally request issuance of these certificates through the School of Professional Development and Continuing Studies at Stony Brook upon satisfac-

tory completion of all program requirements. This may be done by completing and submitting a graduation application available in the SPD office.

Coaching Graduate Certificate Program

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 the Division of Physical Education and Athletics at (516) 632-7215.

Environmental/Occupational Health and Safety Graduate Certificate Program

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 Occupational Health and Safety Graduate Certificate Program, please contact SPD at (516) 632-7055.

Long Island Regional Studies Graduate Certificate Program

The School of Professional Development and Continuing Studies, in collaboration with Stony Brook's Center for Regional Policy Studies and Department of Political Science, offers a multidisciplinary 18-credit Long Island regional studies graduate certificate program that combines courses in urban politics, housing, cultural geography, planning, and environmental issues.

For full information on this program, call (516) 632-7055 to request the latest *SPD Bulletin*.

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Waste Management Graduate Certificate Program

The School of Professional Development and Continuing Studies, in collaboration with Stony Brook's Waste Management Institute at 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, call the Waste Management Institute Office at (516) 632-8704.

Educational Computing Graduate Certificate Program

The School of Professional Development and Continuing Studies in collaboration with the Technology and Society Program, 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 a school based or business/industry based situation.

The School 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 appli-

cations 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, call Thomas Liao, Director of the Educational Computing Program, Technology and Society Program at (516) 632-8767 or 632-7050.

Software Engineering Graduate Certificate Program

The School of Professional Development and Continuing Studies, in collaboration with the Department of Computer Science, 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 and those who need a basic grounding in the writing of software packages which 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, call David Smith, Graduate Program Director, Computer Science Department at (516) 632-8443 or 632-7050.

Advanced Graduate Certificate School Administration and Supervision (SAS)

This Advanced Graduate Certificate is offered through the School of Professional Development in collaboration with the Center for Excellence and Innovation in Education.

Prior to admission in the Advanced Graduate Certificate program in School Administration and Supervision (SAS), students are required to possess a masters degree. 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

CEQ 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 which 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 Administration Supervision 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.

Admission Requirements

Applicants for admission to the School Administration and Supervision 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.

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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 masters 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, SUNY at Stony Brook, Stony Brook, NY 11794-4310, or telephone (516) 632-7055.

Advanced Graduate Certificate in School District Administration (SDA)

This Advanced Graduate Certificate is offered through the School of Professional Development in collaboration with the Center for Excellence and Innovation in Education.

Prior to admission in the Advanced Graduate Certificate program in School District Administration (SDA), students are required to have a masters degree. 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

CEQ 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 which 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, 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.

Admission Requirements

Applicants for admission to the School District Administration 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 masters 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, SUNY at Stony Brook, Stony Brook, NY 11794-4310, or telephone (516) 632-7055.

Psychology (PSY)

Chairperson: Jasper Brener
Psychology B 154 (516) 632-7805

Graduate Program Director: Jasper Brener
Psychology B 152 (516) 632-7814

Graduate Secretary: Debbie Campani
Psychology B 150 (516) 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 150 doctoral students in the department. More than 525 Ph.D. degrees have been awarded since the program began more than 30 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 three program areas: Clinical Psychology, Social/Health Psychology, and Experimental/Cognitive/Biopsychology. Students must be admitted to one of these three 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 practica 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 difficul-

ties. 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.

Psychology

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 materials for fall admission is February 1. 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

Anderson, Brenda J., Assistant Professor. 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.

Aron, Arthur, Assistant Professor. Ph.D., 1970, University of Toronto, Canada: Motivation and cognition in close relationships; methodology.

Birns, Beverly, Professor.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.

Boice, Robert, Professor.⁸ Ph.D., 1966, Michigan State University: Faculty development; identification of basic teaching skills; assessment and treatment of writing blocks.

Brener, Jasper, Professor, Graduate Program Director, and Chairperson. Ph.D., 1964, University of London, England: Cardiovascular psychophysiology; behavioral energetics; autonomic learning.

Brennan, Susan, Assistant Professor. Ph.D., 1990, Stanford University: Psycholinguistics; reference and lexical choice; communication; human/computer interaction; computational linguistics; caricature and face recognition.

Carr, Edward G., Professor. Ph.D., 1973, University of California, San Diego: Analysis and treatment of child behavior problems; developmental disabilities; communication disorders.

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

D'Zurilla, Thomas, Associate Professor. Ph.D., 1964, University of Illinois: Social problem solving; problem-solving therapy; preventive problem-solving training.

Eisenstein, Edward, Adjunct 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.

Emmerich, David S., Professor. 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.

Fischel, Janet, Associate Professor.⁷ Ph.D., 1978, State University of New York at Stony Brook: Behavioral and developmental pediatrics; developmental language disorders and emergent literacy skills; psychological management of disorders of elimination.

Franklin, Nancy, Associate Professor. Ph.D., 1989, Stanford University: Human memory; spatial cognition; mental models of physical systems; reality monitoring.

Friedman, Richard, Professor.⁵ Ph.D., 1975, State University of New York at Stony Brook: Psychophysiological disorders; behavioral medicine.

Friend, Ronald, Professor. 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, Associate Professor. Ph.D., 1984, Stanford University: Psycholinguistics; text understanding and representation; non-conventional language; cognitive experiences of narrative worlds.

Goldfried, Marvin, Professor. Ph.D., 1961, State University of New York at Buffalo: Psychotherapy process research; cognitive behavior therapy; delineation of common therapeutic principles across theoretical orientations.

Katkin, Edward S., Professor. 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., Professor. Ph.D., 1983, State University of New York at Buffalo: Psychopathology; mood and personality disorders; assessment, classification, course, familial transmission, and treatment of depression.

Levine, Marvin, Professor 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., Professor and Director of Clinical Training and the Psychological Center. Ph.D., 1966, Stanford University: Affective liability.

Lobel, Marci, Assistant Professor. Ph.D., 1989, University of California, Los Angeles: Stress, coping, and physical health; psychosocial factors in pregnancy and birth outcomes; social comparison processes.

Loney, Jan, Professor.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.

McGraw, Kathleen, Associate Professor.⁸ Ph.D., 1985, Northwestern University: Political cognition; accountability; normative determinants of judgment and behavior.

Morin, Lawrence P., Associate Professor.⁵ Ph.D., 1974, Rutgers University, Institute of Animal Behavior: Biological rhythms; environment and reproduction; endocrine system and behavior.

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

O'Leary, K. Daniel, Distinguished Professor. Ph.D., 1967, University of Illinois: Etiology and treatment of marital discord and spouse abuse; the effects of marital discord on childhood problems.

O'Leary, Susan G., Professor. Ph.D., 1972, State University of New York 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.

Rachlin, Howard, Professor. 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.

Rajaram, Suparna, Assistant Professor. Ph.D., 1991, Rice University: Human memory and amnesia; implicit and explicit memory distinctions; repetition priming; experimental investigation of remembering and knowing the past.

Robinson, John, Assistant Professor. Ph.D., 1991, University of New Hampshire: Rodent models of learning and memory disorders; behavioral actions of neuropeptides and anandamides.

Samuel, Arthur, Professor. Ph.D., 1979, University of California, San Diego: Perception, psycholinguistics, and attention; perception of speech and music as domains of study in cognitive psychology.

Sprafkin, Joyce, Associate Professor.⁵ Ph.D., 1975, State University of New York at Stony Brook: Child psychopathology; ADHD; Tic disorders; effects of television on child behavior.

Squires, Nancy K., Associate Professor. 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.

Sternglanz, Sarah, Adjunct Assistant Professor.¹ Ph.D., 1973, Stanford University: Human ethology; sex roles; social learning theory; female academic and career success.

Stone, Arthur, Professor.⁵ Ph.D., 1978, State University of New York at Stony Brook: Stress, coping, and illness; immune system functioning and health.

Strassberg, Zvi, Assistant Professor. 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.

Valins, Stuart, Professor. Ph.D., 1964, Columbia University: Stress; social interaction.

Vivian, Dina, Research Assistant Professor. Ph.D., 1986, State University of New York 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.

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

Waters, Harriet Salatas, Associate Professor. 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.

Weidner, Gerdi, Associate Professor. 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., Professor. Ph.D., 1970, University of Illinois: Language disorders; emergent literacy; early interventions to enhance child development and reduce the effects of poverty.

Wolf, Gerrit, Professor. Ph.D., 1967, Cornell University: Public policy and management; social policy; decision and organizational behavior.

Wortman, Camille, Professor. 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; other's reactions to those who experience life crisis.

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

Number of teaching, graduate, and research assistants, fall 1995: 95

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

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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.

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 *Corequisite:* PSY 508 *Fall, 3 credits*

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 *Corequisite:* PSY 508 *Spring, 3 credits*

PSY 503 Experimental Design

Examination of properties of common experimental designs in psychology together with the study of appropriate statistical analyses. Topics include factorial, hierarchical, latin square, and incomplete designs. Statistical procedures include analysis of variance, linear contrasts, analysis of covariance, and selected post-hoc procedures. This is an advanced course in design and statistics. *Prerequisite:* PSY 502 *Fall or spring, 3 credits*

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*

PSY 505 Multivariate Methods Including Structural Equation Modeling

Brief coverage of specialized techniques used in data analysis in psychology, such as multi-way 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, alternate years, 3 credits*

PSY 507 Distribution- and Scale-Free Statistics

Statistical inference when the exact form of population distribution is not specified, or when interval scale measures are not available. In addition to tests based on ranks and concordance, the course considers alternate measures of association and monotone relations (isotonic regression), feasible randomization and bootstrap tests for metric data, and the Mantel approach. *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. *Corequisite:* PSY 501 or 502 *Fall and spring, 0-1 credits, repetitive*

PSY 509 Practicum in Computer Applications

Workshops and practical experience in computer applications. Provides computer access for courses that do not have their own accounts and for student projects to satisfy other degree requirements. *Prerequisite:* Psychology doctoral student not advanced to candidacy; for Section 2 (statistical application), PSY 502 as a pre- or corequisite. *Section 1: fall and spring, no credit, repetitive* *Section 2: fall or spring, 1 credit*

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, 3 credits*

PSY 511 Learning

A consideration of the basic principles of learning. Analysis of the leading theories of learning as well as areas of controversy and dispute. *Fall, 3 credits*

PSY 512 Cognition and Memory

An introduction to research and theory related to human learning and information processing. A review of major historical contributions as well as critical review of contemporary developments. *Spring, 3 credits*

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*

PSY 514 Sensation and Perception

An introduction to the phenomena of sensation and perception and the methods by which they may be studied. Different theoretical frameworks are also considered. *Fall, 3 credits*

PSY 517 Judgment, Decision, and Choice

Survey of recent research in psychological decision theory, judgment and choice covering human and animal research, and economic theory of human behavior. *Fall and spring, 3 credits*

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*

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*

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*

PSY 524 Cognitive Development

The information in this course integrates and expands some of the research and new methods available in the study of the complex human processes such as language, memory, and growth of logical thinking. *Fall or spring, alternate years, 3 credits*

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

Corequisite: PSY 601

Fall, 3 credits

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

Corequisite: PSY 601

Spring, 3 credits

PSY 535 Advanced Research Methods

Advanced research methods employed in clinical, personality, social, and behavioral research.

Prerequisites: PSY 501, 502, and clinical doctoral student

Annually, 3 credits

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

Corequisite: PSY 602

Spring, 3 credits

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

Corequisite: PSY 602

Fall, 3 credits

PSY 540, 541 Proseminar in Developmental Psychology

Survey of the facts and theories of human and animal development.

Fall and spring, 3 credits each semester

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 cognitions. Readings include papers from classic emotions theorists such as Canon and Ekman, as well as more recent thinkers such as Zajonc. Special topics covered include emotions and psychotherapy, emotional expression in a social context, and the impact of emotions on health.

Fall, 3 credits

PSY 545 Psychopathology

Theory and research on abnormal behavior such as neuroses, schizophrenia, addiction, sexual dysfunction, and childhood problems. Coverage of models of deviance, assessment, diagnosis, and treatment approaches. Broad approach to topics with stress on behavioral theories and presentation of biological and psychodynamic points of view.

Fall, 3 credits

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

PSY 547 Laboratory Research in Social Psychology

Review of basic aspects of laboratory experimentation in social psychology, including conceptualizing the independent variable, creating experimental manipulations, devising dependent measures, experimental design and the control of bias, and ethical issues and debriefing.

Fall, 3 credits

PSY 548 Field Research Methods

Introductory, graduate-level survey of field research methods. Topics include evaluation research, meta-analysis, quasi-experimental design and analysis, randomized social experiments, survey design, and validity framework for assessing and designing research studies.

Fall, 3 credits

PSY 549 Prejudice, Stereotyping, and Discrimination

Survey of social psychological theories and research concerning domination, exclusion, and stigmatization processes in intergroup relations; focus especially on race, gender, and cultural difference.

Fall, 3 credits

PSY 550, 551 Topics in Social Psychology

Content varies as a function of staff and student interests. Recent topics include environmental psychology, society and health, aggression, politics of social psychology, research methods, attitude change, and social inequality.

Fall and spring, variable and repetitive credit

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.

Spring, 3 credits

PSY 553 Social/Community Practicum

This practicum provides supervised experiences in a variety of community settings, including mental health centers, residential counseling, social action and self-help organizations, alternative institutions, and program evaluations.

Fall, spring, summer, 1-3 credits

PSY 554 Health Psychology

This course is concerned with behavioral and psychosocial factors in health and illness. Students become familiar with an interdisciplinary perspective and are exposed to research studies and databases.

Fall, 3 credits

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.

Spring, alternate years, 3 credits

PSY 556 Social Psychology Research Seminar

Required research seminar for all social psychology students who have not yet completed their specialty examination. Weekly research presentations and specialty oral examinations are given in this seminar. Social psychology students only.

Fall and spring, 3 credits, repetitive

PSY 557 Personality

Advanced survey of contemporary behavioral, dispositional, phenomenological, and psychoanalytic theory and research in personality. A course for Ph.D. students.

Fall, alternate years, 3 credits

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.

Spring, 3 credits

PSY 559 Gender and Health

Gender differences in physical and mental health are explored. A multidisciplinary approach is employed (e.g., psychology, sociology, medicine, epidemiology).

Spring, 3 credits

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.

Spring, 3 credits

Psychology

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

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.

Fall, 3 credits

PSY 565 Behavioral Organization of Motor Activity

The principles by which motor activity is organized to generate adaptive performance. Cognitive, behavioral, psychophysiological, and neurophysiological processes are examined in relation to the following motor processes: learning, memory and retention, preparation and programming, energy requirements, and efficiency. Where relevant, the effects of nervous system pathology and injury are discussed.

Fall, 3 credits

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

PSY 568 Human Electrophysiology

Techniques for recording the electrophysiological activity of the human brain are presented. Sensory and cognitive event-related potentials are discussed, as well as the application of these techniques to clinical questions. Individual reports on selected topics based on library research are required.

Fall, 3 credits

PSY 569 Human Electrophysiology Lab

Experience in a variety of human electrophysiological techniques, with emphasis on recording evoked potentials in auditory, visual, and somatosensory modalities. Individuals are responsible for conducting experiments on selected topics and submitting reports.

Spring, 3 credits

PSY 571, 572 Comparative Behavior

Comparative methods for the observation and measurement of animal behavior. Both naturalistic and laboratory methods are discussed. This course is taught in conjunction with PSY 573, 574.

Fall and spring, 3 credits each semester

PSY 573, 574 Comparative Behavior Lab

Detection response techniques, conditioning techniques, and habituation methods in the study of adaptive behavior are practiced using a wide variety of vertebrate and invertebrate species.

Fall and spring, 3 credits each semester

PSY 575 Psychobiology of Primates

An advanced general course in the behavior of Old World monkeys and apes. Emphasis is placed on social organization, communication, development, and learning, especially under naturalistic conditions; but beyond this, topics are selected to reflect the most current advances in the area.

Prerequisite: Permission of instructor

Fall or spring, 3 credits

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

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

PSY 595 Functional Analysis of Child Behavior

A functional analysis of behavior excesses and behavior deficits in children, with particular emphasis on the interface between developmental and behavioral psychology.

Fall or spring, alternate years, 3 credits

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

PSY 597 Stress and Coping

An examination of current dilemmas, challenges, and questions in stress and coping research. Emphasis is on recent empirical research and theoretical development in social and health psychology. Rather than focusing on specific stressful contexts such as chronic illness or bereavement, we concentrate on issues relevant to stress and coping across a broad range of circumstances. Students are not expected to have prior familiarity with the topic areas. We begin by reviewing the definitions and major theoretical approaches.

Fall, 3 credits

PSY 600 Teaching Methods and Practicum

A working seminar for students teaching or assisting in some particular course(s), particularly PSY 103, 211, or 303, with emphasis on delineation of course objectives, the preparation and presentation of special materials or topics, and the evaluation of teaching methods.

Prerequisites: Appointment as teaching assistant or graduate instructor and permission of instructor

Fall and spring, 1-3 credits, repetitive

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 and spring, no credit

PSY 602 Assessment Practicum

Exposure to the application of clinical assessment procedures.

Corequisite: PSY 534

Fall, 1 credit

PSY 603 Ethics and Professional Issues

Ethics and professional issues. Required of all first-year clinical students.

Spring, 1 credit

PSY 604 Intervention Practicum

Exposure to the application of clinical intervention procedures.

Prerequisite: PSY 537 or PSY 538

Fall, 1 credit

PSY 605 Advanced Clinical Practicum

Exposure to the application of advanced intervention procedures.

Fall and spring, 1 credit

PSY 606 Supervised Practice

Supervised experience for advanced clinical students.

Fall and spring, 0-1 credit

PSY 608 Clinical Psychology Internship

Qualified clinical students carry out supervised clinical responsibilities in settings approved by the faculty.

Fall and spring, 1 credit

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

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

PSY 638 Psychophysiological Methods

Covers organization of the human nervous system and its interaction with physiological response systems. Studies methods of recording and analyzing psychophysiological response measures. Examines the application of psychophysiological response measures and patterns to the study of individual attitudes and behavior. Crosslisted with POL 630.

Spring, 3 credits

PSY 696 Readings

Prerequisites: Permission of instructor
Variable and repetitive credit

PSY 698 Research

Prerequisites: Permission of instructor
Variable and repetitive credit

PSY 699 Doctoral Research

Prerequisites: Advancement to candidacy
Variable and repetitive credit

School of Social Welfare

Dean: Frances L. Brisbane

Health Sciences Center Level 2, Room 093 (516) 444-2139

Degree awarded: M.S.W. in Social Work; Ph.D. in Social Welfare

The School of Social Welfare offers an accredited two-year graduate program leading to the Master of Social Work degree, and a one-year advanced standing program (open only to students who are graduates of a CSWE accredited baccalaureate program) which prepare students for entry into advanced social work practice.

The M.S.W. program prepares students with the theoretical and practical expertise needed to function with maximum competence at various administrative or policy levels in social welfare fields or 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 throughout the University.

Field instruction experiences are available in a broad range of human service programs which meet needs of children, adolescents, adults, and the elderly, and which emphasize at-risk populations. Field instruction practicum sites are located throughout Nassau and Suffolk counties and some of the boroughs of New York City.

After a year of generalist professional foundation courses, two areas of concentration are offered: Direct Practice; and Planning, Administration, and Research. These concentrations are structured to provide students with theoretical and practical expertise. In addition, students may choose a specialization in alcoholism and substance abuse, health, or student community-development.

In addition to the regular full-time two-year program, the school has two alternative pathways that extend the time necessary to achieve the degree. Students who are employed in the field of social welfare may, under certain conditions, use their employment site to fulfill fieldwork requirements. In addition to daytime courses, some courses are offered in the late afternoons, evenings and on weekends. A major attempt is made to build ethnic, income, and sexual diversity into the student body.

A separate bulletin is available describing the Ph.D. program and the M.S.W. program, the curriculum, and requirements for admission. To receive a copy of this bulletin, applications, and further information, please contact:

Office of Admissions and Student Services

School of Social Welfare
Health Sciences Center
University at Stony Brook
Stony Brook, NY 11794-8230
(516) 444-3141

Sociology (SOC)

Chairperson: Andrea Tyree

Ward Melville Social and Behavioral Sciences Building S-409 (516) 632-7720

Graduate Program Director: Ivan D. Chase

Ward Melville Social and Behavioral Sciences Building S-435 (516) 632-7753

Graduate Secretary: Wanda Vega

Ward Melville Social and Behavioral Sciences Building S-401 (516) 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 but does not maintain a separate M.A. program and does not encourage applicants who seek to pursue an M.A. in sociology as a terminal degree.

The sociology program grants the doctorate to three to six students per year. Most of these go on to university or college teaching positions or postdoctoral programs at other universities. A few enter government service or business.

Facilities

The Sociology Department has the only experimental fish laboratory 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. Program 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

Arjomand, Said, Professor. Ph.D., 1980, University of Chicago: Comparative; historical; political; religion.

Barthel, Diane, Professor. Ph.D., 1977, Harvard University: Culture; community; historical; gender.

Burg, Mary Ann, Adjunct Assistant Professor. Ph.D., 1986, University of Florida: Medical sociology; research methods; community medicine.

Chase, Ivan, Associate Professor and Graduate Program Director. Ph.D., 1972, Harvard University: Social organization; social structure; behavioral processes in small groups; resource allocation; division of labor; cross-species comparisons.

Cole, Stephen, Professor. Ph.D., 1967, Columbia University: Science; gender; theory.

Collver, O. Andrew, Associate Professor. Ph.D., 1964, University of California, Berkeley: Human ecology; urban community; demography.

Coser, Lewis A., Distinguished Professor Emeritus. Ph.D., 1954, Columbia University: Theory; conflict and violence; intellectual life; knowledge.

Feldman, Kenneth, Professor. Ph.D., 1965, University of Michigan: Social psychology; higher education; socialization.

Gagnon, John H., Professor. Ph.D., 1969, University of Chicago: AIDS research; simulations; sexual conduct; social control; cognitive.

Goode, Erich, Professor. Ph.D., 1966, Columbia University: Deviance; criminology; collective behavior.

Goodman, Norman, Distinguished Teaching Professor and Distinguished Service Professor. Ph.D., 1963, New York University: Social psychology; family; socialization; emotions.

Hunt, Morton, Adjunct Professor. B.A., 1941, Temple University: Social science writing; human sexuality; criminology; marriage and family life.

Isvan, Nilufer, Assistant Professor. Ph.D., 1994, University of Michigan: Rural sociology; gender; comparative; social change.

Kimmel, Michael, Professor. Ph.D., 1981, University of California, Berkeley: Comparative and historical development; social movements; gender and sexuality.

Lazerson, Mark H., Assistant Professor. Ph.D., 1985, University of Wisconsin-Madison: Economic; industrial; law; organizations.

Romo, Frank, Associate Professor. Ph.D., 1986, Yale University: Statistics; methodology; social organizations; economic.

Roxborough, Ian, Professor. Ph.D., 1977, University of Wisconsin-Madison: Latin America; historical; revolutions; economic.

Rule, James B., Professor. Ph.D., 1969, Harvard University: Theory; political; technology.

Schwartz, Joseph, Research Associate Professor. Ph.D., 1978, Harvard University: Quantitative methods; social stratification; sociology of work and occupations; social networks.

Sociology

Schwartz, Michael, Professor.⁷ Ph.D., 1971, Harvard University: Methodology; historical; political economy; business structure; social movements.

Tanur, Judith, Distinguished Teaching Professor.⁸ Ph.D., 1972, State University of New York at Stony Brook: Statistics; methodology; survey research; social psychology.

Tyree, Andrea, Professor and Chairperson. Ph.D., 1968, University of Chicago: Demography; social stratification; ethnicity; marital violence.

Zussman, Robert, Associate Professor. Ph.D., 1982, Columbia University: Work; medical; political.

Number of teaching, graduate, and research assistants, fall 1995: 38

¹ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1989. Recipient of the President's Award for Excellence in Teaching, 1989

² Recipient of the President's Award for Excellence in Teaching, 1992

³ Recipient of the President's Award for Excellence in Teaching, 1994

⁴ Joint appointment, Department of Psychology

⁵ Recipient of State University Chancellor's Award for Excellence in Teaching, 1976

⁶ Joint appointment, Departments of Psychiatry and Behavioral Sciences

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, 1990. Recipient of the President's Award for Excellence in Teaching, 1990

Degree Requirements

Requirements for the Ph.D.

Degree in Sociology

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

A. Residence

Minimum residence is one year of full-time study. Students may be admitted to the Ph.D. program on a part-time basis, but these arrangements usually require that the students appear on campus during certain periods of the normal working day. Full-time study entails 12 or more graduate credit hours per semester for those students entering without prior graduate study or fewer than 24 graduate credit hours, and nine or more graduate credit hours per semester for those students entering with more than 24 graduate credit hours or with advanced standing provided by prior graduate work. Since a graduate traineeship is considered part of the academic program, credit hours will be given for teaching or research assistant-

ships 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 four designated courses, two in sociological theory and two in research methods, all taken in the first year of graduate study. Of an additional ten required courses, one must provide additional methodological training and can be chosen by the student from a variety of suitable offerings specified by the department. Three of the remaining nine 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 and research methods (SOC 501 and 502)—and two elective courses. 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 must be submitted to a funding agency (but not necessarily accepted) before it can be approved as a paper.

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, 502 Research Design and Statistics

A review of the main statistical techniques used in sociological research. Discussion of and practical experience in the design of sociological research. These two courses must be taken in the same academic year.
3 credits each semester

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

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

SOC 508 Experimental Methods

The design, conduct, and analysis of laboratory and field experiments.
3 credits

SOC 509 Field Work

Practicum in field interviews and observations; problems of rapport, reliability, and validity.
3 credits

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

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

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

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

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

SOC 523 Sociology of Education

Relationships between education and other institutions. Internal dynamics of the school and the classroom.
3 credits

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

SOC 532 Complex Organizations

Division of labor, communication, and decision making in large and formally administered organizations, such as industrial concerns, governmental agencies, political parties, trade unions, schools, hospitals, and prisons.
3 credits

SOC 541 Conflict and Violence

Conflict and violence as related to social change. Examination of community controversies, social movements, uprisings, and war.
3 credits

Sociology

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

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

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

SOC 549 Social Change

The image of technological, generational, and cultural forces on social organization from historical and comparative perspectives.
3 credits

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

SOC 561 Sociology of Intellectual Life

A comparative and historical analysis of the social conditions leading to the development of intellectual professionals.
3 credits

SOC 562 Sociology of the Arts

The relations between social structure, social change, and the development of major art forms.
3 credits

SOC 563 Sociology of Science

The relations between science and society; social influences on the choice of problems and methods; the social organization of scientific research.
3 credits

SOC 564 Communications

The social organization of the communications industry; the effects of mass communication.
3 credits

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

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

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

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: Microsociology; Advanced Topics in Marxist Theory; Sociology of Emotions; Historical Methods; Ethnic Relations; Biosociology; Comparative Stratification; Max Weber; Science of Sociology and Everyday Life; Methods of Behavioral Observation; Social Structure; Sociology of the Family; Cognitive Sociology; Sociology of Work; Economic Sociology; Sociology of Gender; Sociology of Culture; Development of Capitalism; Film as a Sociological Research Tool; The Three Faces of Social Psychology; A Structural Approach to Organizational Behavior; Professionals and Professionalism; Sociology of Modernity; Research Support in Sociology; Sociology of Sexual Behavior; Global Sociology; Gender and the Law; Poverty and Homelessness.
1-3 credits each semester

SOC 598 Research

Execution of a research project under the supervision of one or more faculty members.
Variable and repetitive credit

SOC 603 Advanced Topics in Quantitative Analysis

Mathematical and statistical methods in the analysis of quantitative data.
Prerequisites: SOC 501 and 502 and 503
3 credits

SOC 604 Advanced Topics in Qualitative Analysis

The use of personal documents, official records, field observations, and interviews.
3 credits

SOC 606 Sociological Theory Construction

Modes of conceptualization and theory construction. Problems in developing a theory.
Prerequisite: Permission of instructor
3 credits

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

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 SOC 693 in following semester.
Fall, 3 credits

SOC 693 Practicum for Graduate Teaching Interns

Supervised teaching of a section of Sociology 103 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

SOC 698 Dissertation Research

Variable and repetitive credit

Technology and Society (EST)

Director: Thomas T. Liao
Engineering Building E-210 (516) 632-8770

Graduate Program Director: Sheldon J. Reaven
Engineering Building E-210 (516) 632-8770

Graduate Secretary: June Parpan
Engineering Building E-210 (516) 632-8765

Degree awarded: M.S. in Technological Systems Management

M.S. Program in Technological Systems Management

Individuals increasingly depend upon modern technology, which helps mold every facet of life. Governmental as well as 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.

Facilities

Graduate students enrolled in the Program in 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 grad-

uate 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 14 Macintosh PowerPCs, networked as above, that is dedicated to modeling and simulation as well as a multimedia development platform. Both labs are designed for both 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.

Faculty

Blessner, William B., Adjunct Professor. M.E.E., 1957, Polytechnic Institute of New York; Sc.D., 1974, Indiana University: Biomedical engineering; science/engineering; science fiction.

Bravman, Richard, Adjunct Lecturer, B.S., 1978, State University of New York at Stony Brook; Automatic identification; mobile and wireless systems.

Brooks, Jacqueline G., Assistant Professor. M.S., 1979, State University of New York at Stony Brook; Ed.D., 1987, Columbia University: Science education; biotechnology teaching laboratories.

Cope, Randolph H., Lecturer. M.E.E., 1958, Polytechnic Institute of Brooklyn: Engineering management; electronic systems.

Darnel, David H., Adjunct Lecturer. M.S., 1987, State University of New York at Stony Brook: Biomedical engineering; medical information systems.

Davis, Jack M., Adjunct Lecturer. M.S., 1951, University of North Carolina: Engineering, project, and international management; software development.

Ferguson, David L., Professor. Ph.D., 1980, University of California, Berkeley: Quantitative methods; computer applications (especially intelligent tutoring systems and decision support systems); mathematics, science, and engineering education.

Giglia, John A., Adjunct Lecturer and Director of Computer Laboratories. M.S., 1986, State University of New York at Stony Brook: Computer applications; computer networking and Internet applications.

Gilmore, Arthur W., Adjunct Lecturer. M.S., 1957, University of Colorado: Aerospace engineering; engineering economics.

Technology and Society

Hogan, Joseph S., Associate Professor. 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.

Laspina, Peter J., Adjunct Lecturer. M.S., 1978, C.W. Post College; M.S., 1987, State University of New York at Stony Brook: Computers in education.

Leonhardt, Nina, Adjunct Lecturer. M.S., 1978, State University of New York at Stony Brook: Computer literacy.

Liao, Thomas T., Professor and Director.² Ed.D., 1971, Columbia University: Computers in education; technology assessment.

Morris, Samuel C., Visiting Associate Professor. Sc.D., University of Pittsburgh: Environmental science; risk analysis.

Paldy, Lester G., Distinguished Service Professor. M.S., 1966, Hofstra University: Nuclear arms control; science policy.

Piel, Emil J., Professor Emeritus. Ed.D., 1960, Rutgers University: Decision making; technology-society issues; human-machine systems.

Reaven, Sheldon J., Associate Professor and Graduate Program Director. Ph.D., 1975, University of California, Berkeley: Science and technology policy; energy and environment problems and issues; waste management.

Sangesland, David W., Lecturer. B.S., 1962, State University of New York at Binghamton; C.P.A., 1986 (New York State): Accounting; financial management.

Schmid, Glenn, Adjunct Lecturer. M.S., 1981, State University of New York at Stony Brook: Quantitative aspects of management.

Shapiro, Stephen D., Visiting Professor. Ph.D., 1967, Columbia University: Picture processing and pattern recognition.

Truxal, John G., Distinguished Teaching Professor Emeritus. Sc.D., 1950, Massachusetts Institute of Technology: Control systems; technology-society issues.

Visich, Marian, Jr., Professor. Ph.D., 1956, Polytechnic Institute of Brooklyn: Aerospace engineering; technology-society issues.

Number of teaching, graduate, and research assistants, fall 1996: 10

¹ Recipient of the State University Chancellor's Award for Excellence in Teaching, 1992; recipient of the President's Award for Excellence in Teaching, 1993.

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 chart on this page 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.

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

EMP 502 Management Accounting and Financial Decision Analysis

Fundamentals of managerial accounting with emphasis on cost accounting terms, concepts, ratio and break-even analysis, financial structure, cost analysis, replacement of assets, portfolio theory. Crosslisted with MGT 535.

Fall, 3 credits

EMP 503 Legal and Regulatory Aspects of Management

This course provides 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.

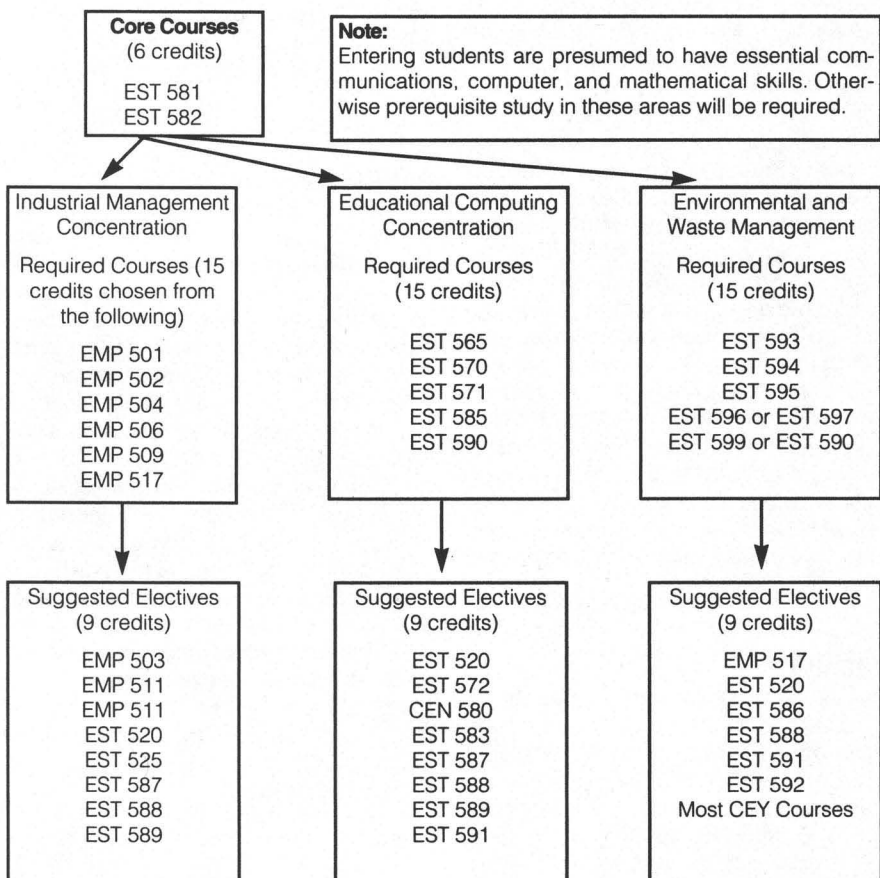
3 credits

EMP 504 Quantitative Methods in Management

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

M.S. Program in Technological Systems Management

(See course titles and descriptions below)



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

EMP 506 Production and Operations Management

This course deals with the design, planning, and organization of resources to develop and manufacture new products or to bring new services on line. The factors affecting product and process design, project planning, facility location and layout, operations scheduling, job analysis, inventory control, material requirements planning, and quality control are identified and related through analytical and modeling techniques.

Prerequisite: EMP 504 or permission of instructor
Spring, 3 credits

EMP 507 Research and Special Topics in Industrial Management

An individual study course for students investigating special topics relating to industrial management.

Prerequisite: Permission of instructor
Fall and spring, 1-3 credits

EMP 509 Management Information Systems

The flow of data in industrial and governmental organizations. How information is stored, analyzed, and disseminated for various management tasks. The physical and logical organization of computer data processing systems. Principles of file processing, database management, and information systems design.

Spring, 3 credits

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

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

EMP 517 Quality Management

Quality is now being recognized as a strategic imperative for competitive businesses. 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. It includes the following topics: how each organizational function is involved in quality; how improving quality can reduce costs; the importance of communication; the importance of involving all employees; the need to measure quality; and an introduction to statistical quality control and how it is used.

Spring, 3 credits

EST 520 Computer Applications and Problem Solving

A problem-solving course for managers that uses applications software to address such managerial problems as planning, forecasting, and MIS requirements. The major applications software packages used are Lotus 1-2-3 and DBASE III+. Students learn to create spreadsheets and data files, making use of the features in the software that optimize solutions to business problems.

3 credits

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

EST 565 Personal Computers in Learning Environments

This course examines issues in teaching and learning with a focus on the use of personal computers to investigate unique types of learning that are made possible, or that may be made more efficient, with this technology. Some exposure to generic computer applications in DOS, Windows, and Macintosh environments, as well as an overview of commercial software titles and applications, is provided. Students have the opportunity to work collaboratively with other persons in this field, and at the end of the course are able to develop a working application that could be used in a classroom.

Prerequisite: EST 583 or permission of instructor

Fall, 3 credits

EST 570 Design of Computer Courseware

The purpose of this course is to develop in the student the capability to develop computer 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 course-

ware development from his or her discipline and concentrates on module development under the individual guidance of the instructor. Students implement the programs in microcomputers in the Laboratory for Personal Computers in Education.

Prerequisite: EST 565 or permission of instructor

Spring, 3 credits

EST 571 Computer-Based Educational Technologies

This course emphasizes the design and evaluation of computer-based educational technology systems. The uses of personal computers, intelligent video disks, CD ROMs, games, and other devices in education are examined. Students learn state-of-the-art technology, contemporary uses, strategies for matching these technologies to the needs and characteristics of learners, ways of introducing these systems into learning environments, and the evaluation of their effectiveness.

Prerequisite: EST 565 or permission of instructor

Spring, 3 credits

EST 572 Educational Uses of the Information Highway

This practical, hands-on course is designed for teachers interested in exploring the Information Highway. The Information Highway is a rich resource for educators. This course prepares teachers to "mine" these resources creating learning opportunities for their students. Introduction and hands-on experience with the following on-line services are provided: Internet, America On-Line, Prodigy, Comuserve, Dow Jones News retrieval and Kids Net. Crosslisted with CEJ 591.

Prerequisite: Participants must have computer experience.

Fall and spring, 3 credits

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

EST 582 Systems Approach to Human-Machine Systems

Applications of systems concepts (input-output, feedback, stability, information analysis) to the analysis of dynamic systems involving technology and society. Areas of study include automatic compensation of systems through use of feedback; stability and instability of urban systems, transportation, epidemics, and economics; and machines and systems for human use, including communication and prosthetics.

Spring, 3 credits

Technology and Society

EST 583 Computer Literacy

Students develop a basic understanding of digital computers—how they work and their applications. Emphasis is placed on applications and the social implications of the use of computers in education, business, artificial intelligence and robotics, medicine, and government. Actual experience with the computer includes introduction to programming, algorithmic problem formulation, and running existing programs.
3 credits

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

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

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

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

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

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

Corequisite: EST 582 or permission of instructor
3 credits

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 MX controversy. Each student works with a faculty advisor on background research and preparation of the master's project proposal.

Fall, 3 credits

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

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.

3 credits

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

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, cost, energy use, environmental impact, etc., (c) regulatory and legal considerations, (d) siting and ranking "NIMBY" facilities (in light of interests of "stakeholders"), and (e) fairness and other ethical issues. These diagnostic tools are illustrated by, and brought to bear upon, a variety of case studies. Crosslisted with CEY 594.

Prerequisite: Permission of instructor

Pre- or corequisite: 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

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 the instructor
Spring, 3 credits

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

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)

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

CEI 511 Modern Communications: Technology Systems

The study of basic principles and concepts that underlie the design and usage of modern communications technology systems is the emphasis of this course. All effective communications systems (such as radio, TV, and radar) must be designed to match the capabilities of the human user. An example of good ergonomic design is how a hi-fi system is designed to match the hearing characteristics of humans. The background principles that relate to communications systems include the electromagnetic spectrum and analog and digital signals. The study of communications technology systems also deals with the human and societal impacts.

3 credits

CEN 580 Socio-Technological Problems

A series of case studies of current socio-technological problems encompassing such areas as health service delivery, water supply, population, emergency medical care, auto safety, noise pollution, and 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

CEN 582 The Science in Science Fiction

The course examines various science fiction short stories and novels to evaluate the validity of the science content based upon the time of writing. Works before and after 1960 are compared to assess how well science fiction predicts future technologies. Video and film versions are compared to written stories to see how (and if) the story and scientific emphasis are changed.

3 credits

Theatre Arts

(THR, DRM)

Chairperson: John Lutterbie
Staller Center for the Arts 3046 (516) 632-7300

Graduate Studies Director: John Cameron
Staller Center for the Arts 3037 (516) 632-7301

Graduate Secretary: Scott Sheidlower
Staller Center for the Arts 3046 (516) 632-7275

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; Indian drama, performance, and dance; 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, 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 University library is immediately 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 of 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 also accessible to students.

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 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. 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

Arthur, Loyce, Assistant Professor. M.F.A., 1985, New York University: Costume design; ethnic folk theatre.

Cameron, John, Associate Professor and Graduate Program Director. Ph.D., 1986, Kent State University: Acting; choreography; musical theatre; directing.

Dai, Dunsì, Assistant Professor. M.F.A., 1992, University of Illinois: Scene design.

Kim, Theresa, Assistant Professor. Ph.D., 1988, New York University: Asian history; acting; Eastern styles.

Levy, Jonathan, Distinguished Teaching Professor.³ Ph.D., 1966, Columbia University: Playwriting; theatre for children; dramatic criticism; Italian Renaissance drama.

Lutterbie, John, Associate Professor and Chairperson. Ph.D., 1983, University of Washington: Theatre history; performance theory and criticism; dramaturgy; directing.

Neumiller, Thomas G., Professor. M.F.A., 1965, Yale University School of Drama: Directing; acting; mime.

Prusslin, Norman L., Adjunct Instructor and WUSB Director. B.A., 1973, State University of New York at Stony Brook: Broadcast management.

Richmond, Farley, Professor. Ph.D., 1966, Michigan State University: Asian theatre; theatre history; directing.

Saltz, David, Assistant Professor. Ph.D., 1993, Stanford University: Interactive media; criticism; dramatic literature.

Sullivan, Amy, Associate Professor. M.F.A., 1980, University of North Carolina at Greensboro: Dance with emphasis on performance and choreography.

Faculty members from participating departments include:

Allentuch, Harriet R., Professor.⁴ Ph.D., 1962, Columbia University: 17th-century French prose and classical theatre; Corneille.

Rosen, Carol, Associate Professor.⁵ Ph.D., 1975, Columbia University: Dramatic theory and criticism; dramaturgy; comparative modern drama.

Zimmermann, Eléonore M., Professor.² Ph.D., 1956, Yale University: 17th-century French theatre; Racine; French romantic and early 20th-century theatre; 19th-century literature, especially lyricism.

Number of teaching, graduate, and research assistants, fall 1996: 5

¹ *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1981*

² *Department of French*

³ *Recipient of the State University Chancellor's Award for Excellence in Teaching, 1991*

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

⁵ *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 511 Western Theatre History and Non-Western Theatre History

Theatre Arts

THR 520 and 521 Western Dramatic Literature and Non-Western Dramatic Literature.

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

The following courses are required:

THR 500 Introduction to Graduate Studies

THR 507 Introduction to Dramaturgy

THR 510 and 511 Western Theatre History and Non-Western Theatre History

THR 520 and 521 Western Dramatic Literature and Non-Western Dramatic Literature

In addition, students select from among 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 residence.

C. Projects

Successful completion of the following projects is required:

THR 680 Dramaturgy Workshop (6 credits)

THR 691 M.F.A. Project (3 credits)

THR 690 Professional Internship (6 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 exercise 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 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 playwrighting, 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 field 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. May be repeated.
Prerequisites: Permission of instructor
Fall and spring, 1-3 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. 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 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 Playwriting Workshop

Students write and discuss original plays, evaluate their work, study techniques of composition and formal organization, and develop strategies for audience communication. Advanced students may study techniques for revision and the development of material for performance. Some plays may be read or 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 either 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

(WNS)

Director: Adrienne Munich
Old Chemistry 105 (516) 632-7378

Associate Director: Sarah Hall Sternglanz
Old Chemistry 105 (516) 632-7365

Secretary: Marie Traylor
Old Chemistry 105 (516) 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 in a wide range of disciplines whose work deals with gender issues. Since Women's Studies has affiliates in nearly every department in the social sciences and humanities, the certificate program offers graduate students the opportunity for an unusually rich interdisciplinary experience.

The program is particularly strong in feminist theory, with faculty affiliates from the departments of Philosophy, English, Art, History, Comparative Studies, and Hispanic Languages and Literature offering courses in this area. Other areas of concentration include European and Latin American women's history, women in British, American, and Caribbean literature, women in the Third World, 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 research colloquium in women's studies on research methods, pedagogy, epistemology, and curriculum. 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, 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. For a more detailed description of the requirements and course offerings for the graduate certificate, students should contact the Women's Studies Office.

Admission

The Graduate Certificate Program in Women's Studies is open to any student enrolled in a graduate degree-granting program that is normally considered full time. Since applicants to the program will have already been admitted to the University, admission in most cases will only involve filling out a brief form. The forms and additional information are available through the Women's Studies Office. One to two 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.

Affiliated Faculty

Allentuch, Harriet (French and Italian), Professor. Ph.D., 1962, Columbia University: 17th-century French literature.

Anshen, Frank (Linguistics), Associate Professor. Ph.D., 1968, New York University: Sociolinguistics; morphology.

Arens, William (Anthropology), Professor. Ph.D., 1970, University of Virginia: Africa; social anthropology.

Birns, Beverly (Social Sciences Interdisciplinary and Psychology), Professor Emerita. Ph.D., 1963, Columbia University: Child development; psychology of women.

Bogart, Michelle (Art), Associate Professor. Ph.D., 1979, University of Chicago: 19th- and 20th-century American and European art and culture.

Bottigheimer, Ruth B. (Comparative Studies), Adjunct Associate Professor. D.A., 1981, State University of New York 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.

Cash, Floris Barnett (Africana Studies and History), Assistant Professor. Ph.D., 1986, State University of New York at Stony Brook: U.S. social and political history; African-American women.

Chamon-Deutsch, Lou (Hispanic Languages and Literature), Professor. Ph.D., 1978, University of Chicago: 18th- and 19th-century Spanish literature; feminist theory.

Cooper, Helen (English), Associate Professor. Ph.D., 1982, Rutgers University: Victorian, Latin American, and, Caribbean literature; creative writing; women's studies.

Cowan, Ruth Schwartz (History), Professor. Ph.D., 1969, The Johns Hopkins University: History of biology and technology; women in modern society.

Gibson, Ann (Art), Associate Professor. Ph.D., 1984, University of Delaware: 20th-century art theory; feminism and multiculturalism.

Goodman, Norman (Sociology), Distinguished Teaching Professor. Ph.D., 1963, New York University: Social psychology; family; socialization.

Hawkins, Robert, Jr. (Health Technology and Management), Professor Emeritus. Ph.D., 1986, New York University: Sexual jealousy; sexual orientation issues; sexuality.

Henigman, Laura (English), Assistant Professor. Ph.D., 1991, Columbia University: Colonial American literature.

Huddy, Leonie (Political Science), Assistant Professor. Ph.D., 1987, University of California, Los Angeles: Political psychology; public opinion; women in politics.

Hutner, Heidi, (English), Assistant Professor. Ph.D., 1993, University of Washington: 17th- and 18th-century British literature; women writers; colonial discourse; feminist theory.

Ihde, Don (Philosophy), Professor. Ph.D., 1964, Boston University: Phenomenology; philosophy of technology; hermeneutics.

Isvan, Nilufer A. (Sociology), Assistant Professor. Ph.D., 1994, University of Michigan: Feminist theory; gender relations; family; development; political economy; quantitative methods.

Kaplan, E. Ann (English and Humanities Institute), Professor. Ph.D., 1970, Rutgers University: 19th- and 20th-century British and American literature; women's studies; film.

Kaplan, Temma (Women's Studies and History), Professor. Ph.D., 1969, Harvard University: Comparative history; 20th-century social movements of women.

Kessner, Carole (Comparative Studies), Assistant Professor, part time. Ph.D., 1975, State University of New York at Stony Brook: 17th-century English literature; Bible; modern Jewish literature and culture.

Kimmel, Michael (Sociology), Associate Professor. Ph.D., 1981, University of California, Berkeley: Comparative and historical development; social movements; gender and sexuality.

Kittay, Eva Feder (Philosophy), Professor. Ph.D., 1978, City University of New York: Philosophy of language; philosophy and feminism; modern philosophy.

Kuchner, Joan (Social Sciences Interdisciplinary), Lecturer. Ph.D., 1981, University of Chicago: Child development; motherhood; cross-cultural parenting.

Larson, Brooke (History), Associate Professor. Ph.D., 1978, Columbia University: Andean history; colonial and modern Latin America; women in Latin America.

Lemay, Helen (History), Associate Professor. Ph.D., 1972, Columbia University: Medieval and Renaissance intellectual history; women in premodern Europe.

Livingston, Ira (English), Assistant Professor. Ph.D., 1990, Stanford University: Romanticism; postmodernism; constructions of the body.

Lobel, Marci (Psychology), Assistant Professor. Ph.D., 1989, University of California, Los Angeles: Stress and coping; women's health.

Lochhead, Judith (Music), Associate Professor. Ph.D., 1982, State University of New York at Stony Brook: 20th-century music theory and history.

Man-cheong, Iona (History), Assistant Professor. Ph.D., 1991, Yale University: Modern China and Japan; modern Chinese and Japanese women.

Munich, Adrienne (English), Associate Professor and Director. Ph.D., 1976, City University of New York: Victorian studies; feminist theory; women's studies.

Nolan, Rita D. (Philosophy), Professor. Ph.D., 1965, University of Pennsylvania: Philosophy of language; theory of knowledge; philosophy of psychology.

Paldy, Lester G. (Technology and Society), Distinguished Service Professor. M.S., 1966, Hofstra University: Nuclear arms control; science policy.

Rashkow, Ilona (Comparative Studies), Associate Professor. Ph.D., 1988, University of Maryland: Renaissance literature; feminist literary criticism; the Bible as literature.

Rawlinson, Mary C. (Philosophy), Associate Professor. Ph.D., 1978, Northwestern University: the body; feminist bioethics; Hegel; Irigaray.

Rosen, Carol (Theatre Arts), Associate Professor. Ph.D., 1975, Columbia University: Theory; criticism; modern drama.

Rosenthal, Joel (History), Professor. Ph.D., 1963, University of Chicago: Medieval Europe; England; social history.

Sternglanz, Sarah Hall (Women's Studies and Psychology), Lecturer and Associate Graduate Program Director. Ph.D., 1973, Stanford University: Psychology of women; sex role development; human ethology.

Sugarman, Jane (Music), Assistant Professor. Ph.D., 1992, University of California, Los Angeles: Ethnomusicology; Albanian, Yugoslavian, and Bulgarian folk music; music of Arabia, Turkey, and Iran; gender issues.

Taylor, William R. (History), Professor Emeritus. Ph.D., 1956, Harvard University: 19th- and 20th-century U.S. cultural and intellectual history.

Tomes, Nancy (History), Associate Professor. Ph.D., 1978, University of Pennsylvania: U.S. social, medical, and women's history.

Vernon, Kathleen (Hispanic Languages and Literature), Associate Professor. Ph.D., 1980, University of Chicago: Spanish and Latin American cinema; Hispanic literature; modern Spanish literature

Weidner, Gerdi (Psychology), Associate Professor. Ph.D., 1981, Kansas State University: Health psychology; personality.

Weinstein, Barbara (History), Associate Professor. Ph.D., 1980, Yale University: Brazil; modern Latin America; industrialization and labor.

Wilson, Kathleen (History), Associate Professor. Ph.D., 1985, Yale University: Modern British history; 18th- and 19th-century social and cultural history.

Wishnia, Judith (Social Sciences Interdisciplinary and History) Associate Professor. Ph.D., 1978, State University of New York at Stony Brook: Women's history; labor history; European history; anti-war history.

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

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 that is normally considered full time. 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 (WNS 601 Feminist Theory, or WNS 602 Social Perspectives on Feminist Theory).

B. An interdisciplinary research colloquium (WNS 699 Research Colloquium in Women's Studies). The research paper for this course will be evaluated by the instructor, who will normally be the director of Women's Studies, and a faculty member affiliated with Women's Studies who works in the student's area of interest.

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.

Women's Studies

Courses

WNS 510, 511, 512 Gender and Culture

A variable topics course on the many ways in which culture and gender interact. Both methodological and content issues will be studied. Possible topics include women in multiethnic America, women in the labor movement, women and social policy.

Prerequisite: Permission of the instructor
Fall or spring, 3 credits

WNS 559 Gender and Health

Gender differences in physical and mental health will be explored. A multidisciplinary approach will be employed (e.g., psychology, sociology, medicine, epidemiology). Crosslisted with PSY 559.

Spring, 3 credits

WNS 595 Reading Colloquium in Women's History

Crosslisted with HIS 595.
3 credits

WNS 599 Directed Readings in Women's Studies

Students may opt to read on 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 may be counted toward the certificate.

Prerequisite: Permission of the instructor
Fall or spring, 1-3 credits

WNS 601 Feminist Theory

This course covers foundational works of feminist theory in the humanities. Readings focus on important works that deal either with the theory and practice of feminism or with feminist methods of scholarship.

Prerequisite: Admission to a normally full-time graduate program at Stony Brook
Fall or spring, 3 credits

WNS 602 Social Perspectives on Feminist Theory

This course will introduce students to the main currents of feminist thought and will locate them in their social, political, and intellectual environment. It will explore theories and texts and the linkages between developing feminism and such fields as Marxist economics, sociology, psychoanalysis, and philosophy.

Prerequisite: Admission to a normally full-time graduate program at Stony Brook
Fall or spring, 3 credits

WNS 610, 611, 612 Advanced Topics in Women's Studies

A variable topic seminar course in women's studies for the advanced student. Topics might include feminist peace politics, women in Third World cinema, or feminist theology. Course may be repeated as topic varies.

Fall or spring, 3 credits

WNS 690 Advanced Readings in Women's Studies

Advanced students may arrange readings 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

WNS 699 Research Colloquium in Women's Studies

Students enrolled in this culminating course consider questions of feminist pedagogy, methods, epistemology, and curriculum. This course examines the place of Women's Studies in the University, its claims and goals concerning research and teaching. Students design a foundational interdisciplinary course in Women's Studies, visit undergraduate Women's Studies courses, and become acquainted with available resources in the field. Students must complete the colloquium before finishing the program.

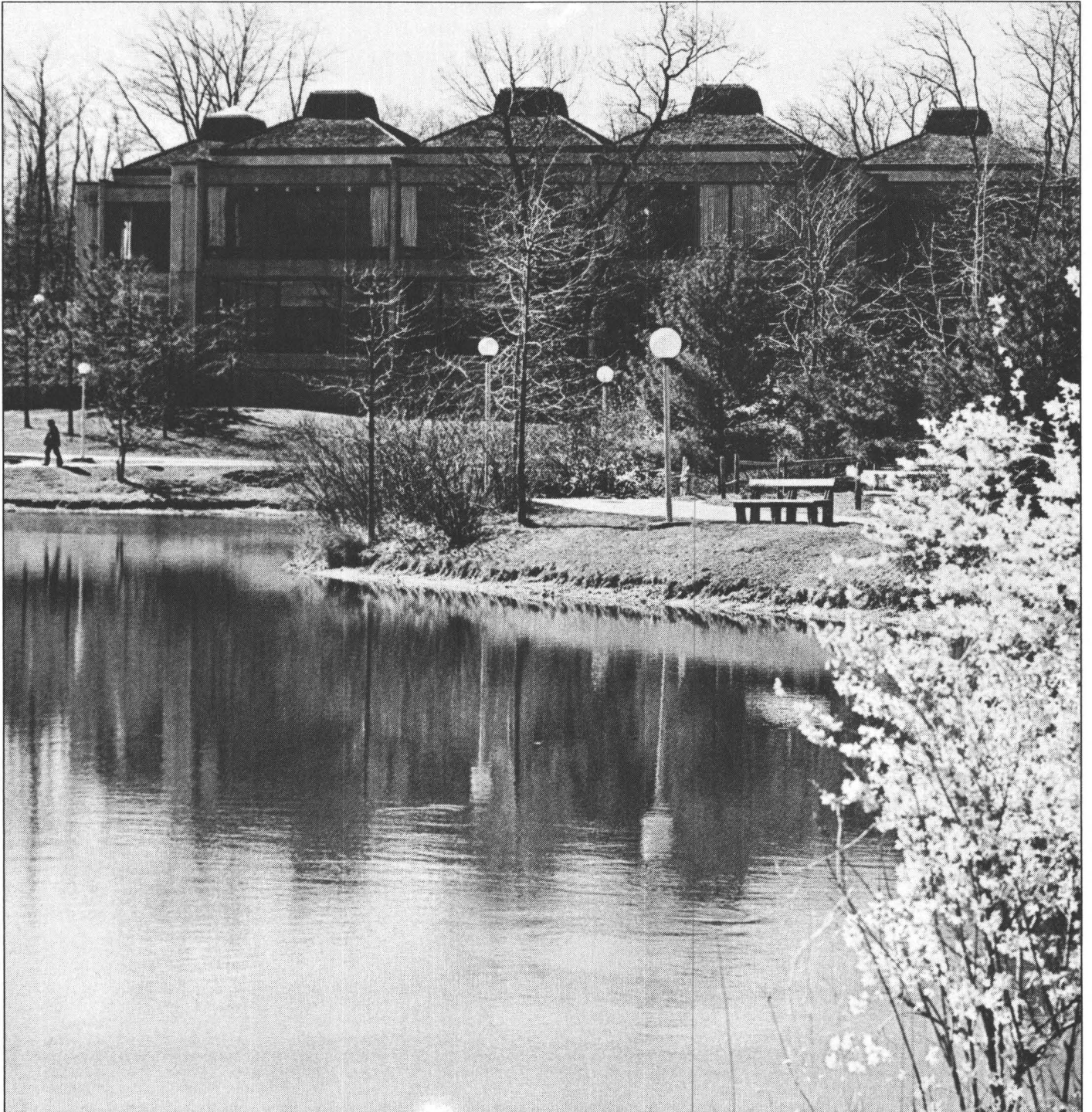
Prerequisite: A graduate feminist theory course

Corequisite: Completion of the requirements for the Graduate Certificate in Women's Studies

Spring, 3 credits



Directories, Maps, Index



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***

*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.

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

Board of Trustees

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STATE UNIVERSITY OF NEW YORK 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 ten-member council. Nine are appointed by the Governor; the tenth, a student member with all the rights and responsibilities of the other members, is elected by the student body. All positions are listed correct as of July 1, 1996.

Mr. Robert H. Flynn
Mr. John C. Gallagher
Mr. James L. Larocca
Mr. Richard Don Monti
Mr. Richard Nasti
Dr. Jeffrey A. Sachs
Ms. Eliana Villar

*Three vacancies exist at the time of publication.

*These operate as "contract colleges" on the campuses of independent universities.

**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.

Officers of Administration

All positions are correct as of July 1, 1996.

Dr. Shirley Strum Kenny
President

Dr. Rollin Richmond
Provost & Executive Vice President for Academic Affairs

Ms. Ceil Cleveland
Vice President for University Affairs
Executive Director, Stony Brook Foundation

Dr. Norman H. Edelman
Vice President University Medical Center
Dean, School of Medicine

Dr. Gail Habicht
Interim Vice President for Research

Dr. Frederick R. Preston
Vice President for Student Affairs

Dr. Paul Armstrong
Dean, College of Arts & Sciences

Dr. Lorna S. McBarnette
Dean, School of Health Technology & Management

Mr. Joseph Branin
Dean & Director of Libraries

Dr. Frances Brisbane
Dean, School of Social Welfare

Dr. Kirk Cochran
Dean and Director, Marine Sciences Research Center

Dr. Paul J. Edelson
Dean, School of Professional Development & Continuing
Studies

Dr. Richard Laskowski
Dean, Division of Physical Education & Athletics

Dr. Lawrence B. Martin
Dean, Graduate School

Dr. Lenora J. McClean
Dean, School of Nursing

Dr. Ernest McNealey
Associate Provost and Dean, Undergraduate Academic
Affairs

Dr. Burton Pollack
Dean, School of Dental Medicine

Dr. Yacov Shamash
Dean, College of Engineering & Applied Sciences

Ms. Carmen Vasquez
Dean of Students

Ms. Karol Gray
Assistant Vice President for Finance/Management

Mr. Alan Inkles
Interim Director, Staller Center for the Arts

Ms. Theresa LaRocca-Meyer
Associate Provost for Enrollment & Retention Management

Mr. Gary Matthews
Special Assistant to President for Diversity & Opportunity
Interim Assistant Vice President for Campus Services

Dr. Robert McGrath
Deputy Provost

Mr. George Meyer
Assistant Vice President for Presidential Initiatives

Dr. Lynn King Morris
International Student Advisor

Dr. Thomas Sexton
Director, W. Averell Harriman Program for Management &
Policy

Ms. Ana Maria Torres
Assistant Provost Student Services
Director of Financial Aid

The Graduate School

Dr. Lawrence B. Martin
Dean

Elizabeth Barnum
Assistant Dean (International Scholar Services)

D. Ann Carvalho
Assistant Dean (Admissions and records)

Pedro Gonzalez
Assistant Dean (Recruitment, orientation, Turner fellowships,
minority student affairs)

Lynn King Morris
Assistant Dean (International Student Services)

John P. Schmidt
Assistant Dean (Budget and finance, tuition scholarships,
fellowships, and awards)

Eugenia Reiersen
Office Manager and Secretary to the Dean (Degree certifi-
cation)

Rose Brown
Staff Assistant (International Student Services)

Debbie Kloppenburg
Secretary

Sheila Levine
Secretary (Dissertation/thesis processing)

Norene Klein
Senior DEMO

Jenny Hardina
Receptionist

Cara Shapiro
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 (516-473-0286) and from New London to Orient Point (516-323-2415); call for schedules and information.

By Train

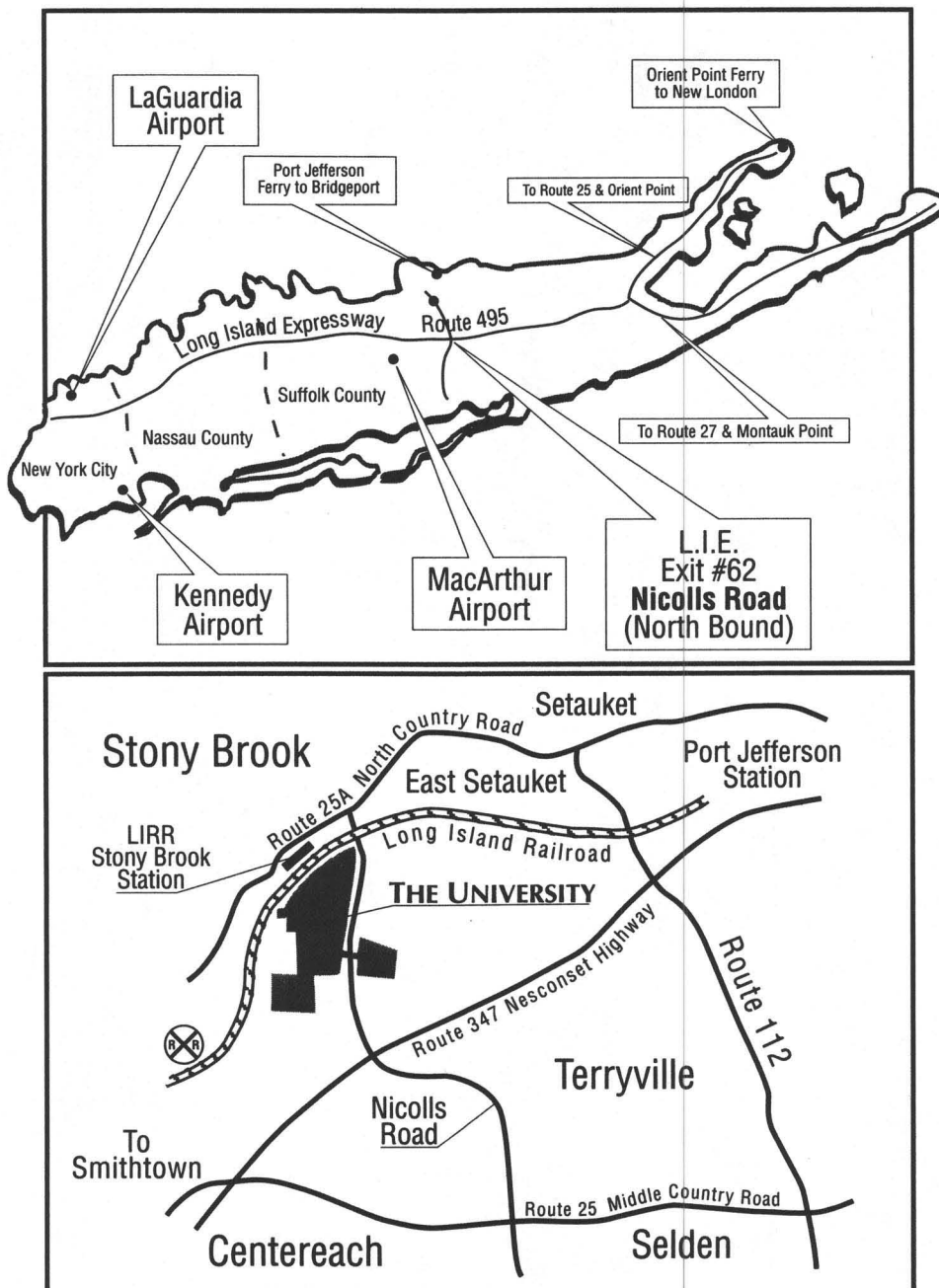
Take the Long Island Rail Road's Port Jefferson line to Stony Brook. Cross tracks for campus bus.

By Bus

Call Suffolk County Transit (516-369-5700) for schedules, rates, and routes for buses to campus from many local towns.

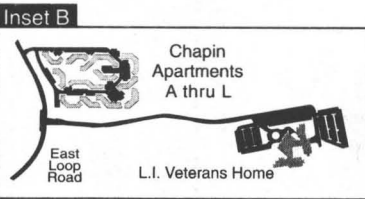
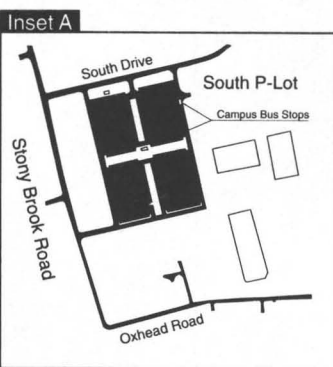
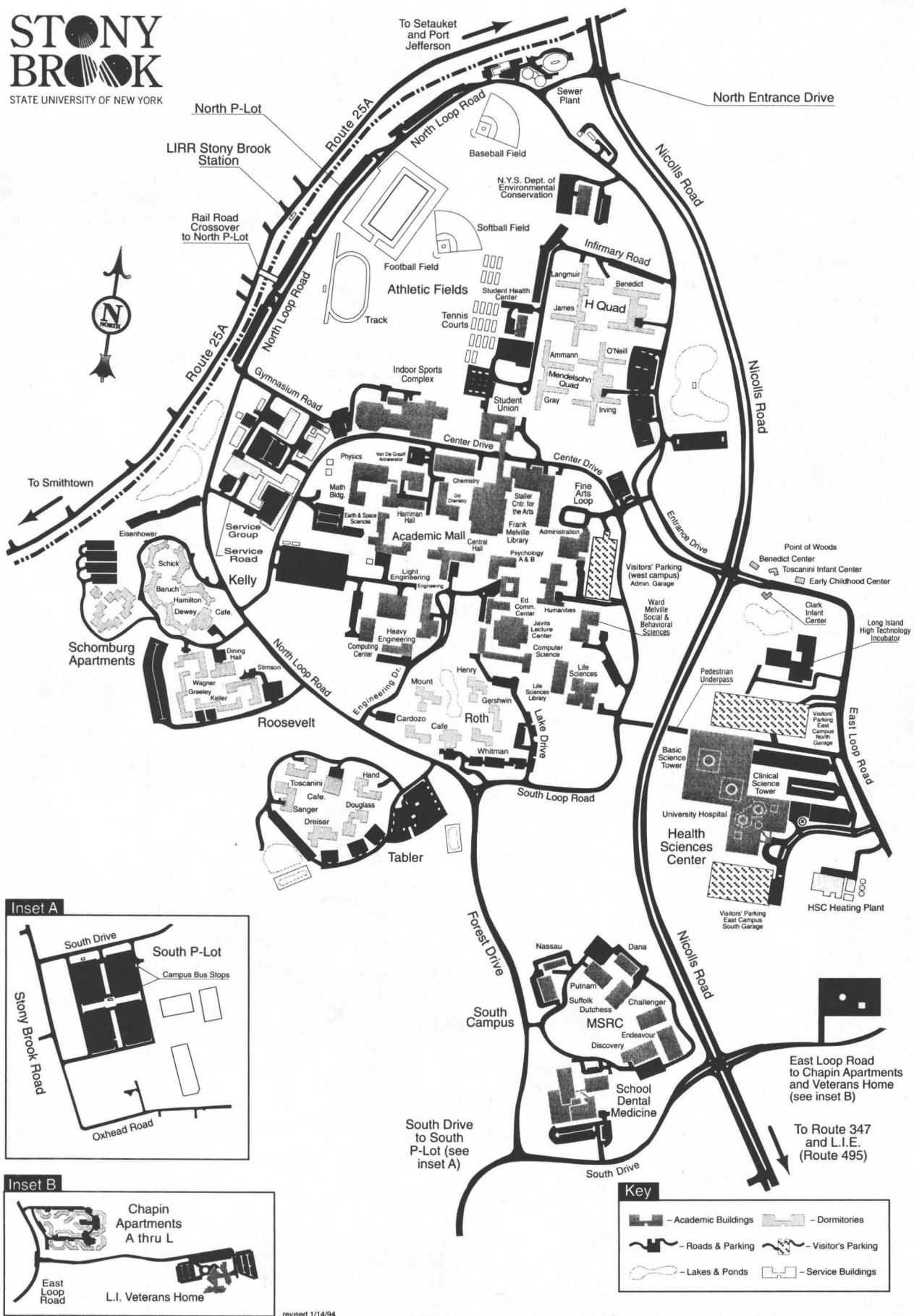
By Air

Land at Kennedy or LaGuardia Airport, 50 miles west of campus, or at Long Island MacArthur Airport (516-467-6161), ten miles south of campus. All airports offer limousine and taxi service to campus.



STONY BROOK

STATE UNIVERSITY OF NEW YORK



Key

	- Academic Buildings		- Dormitories
	- Roads & Parking		- Visitor's Parking
	- Lakes & Ponds		- Service Buildings

revised 1/14/94

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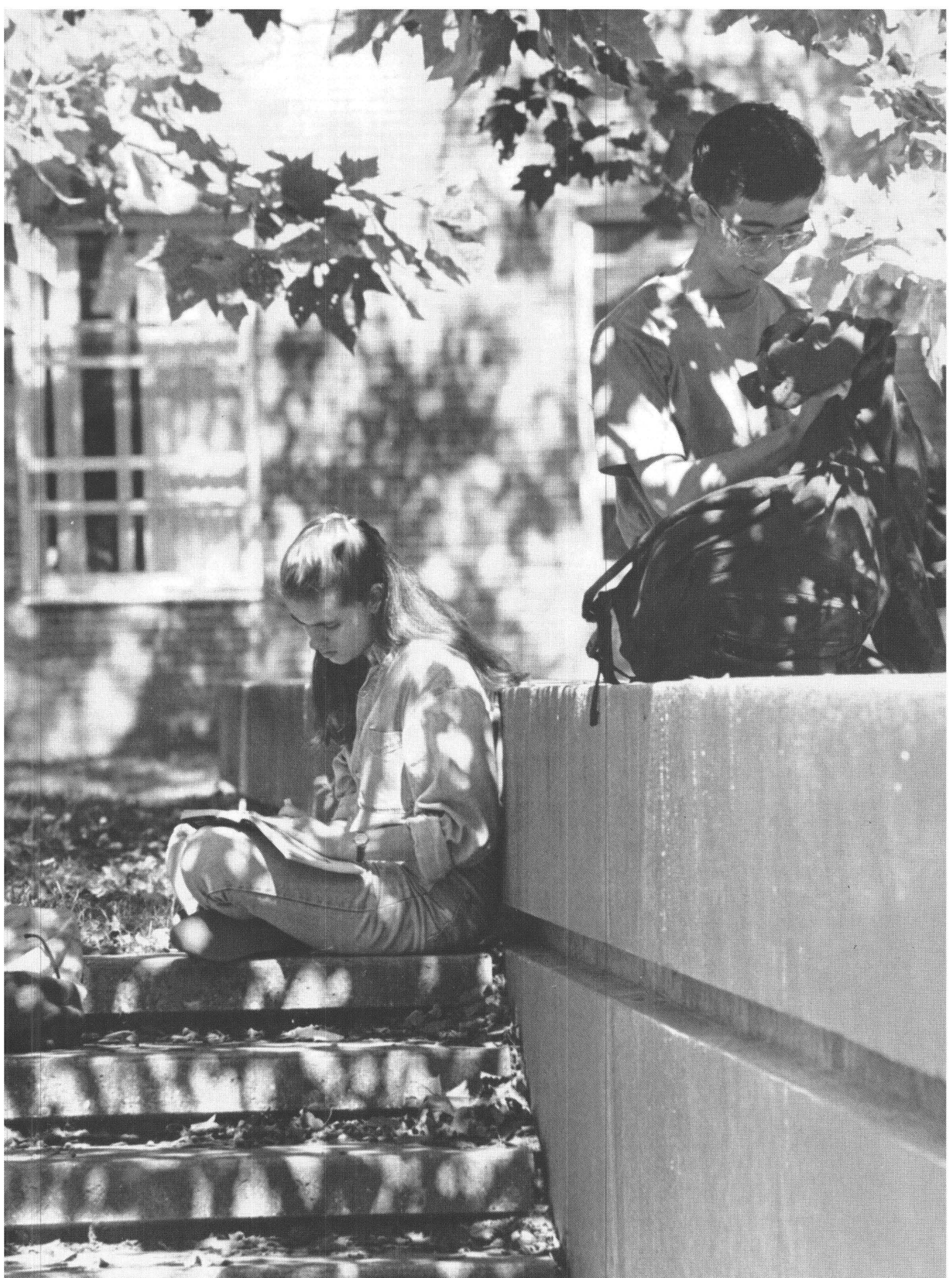
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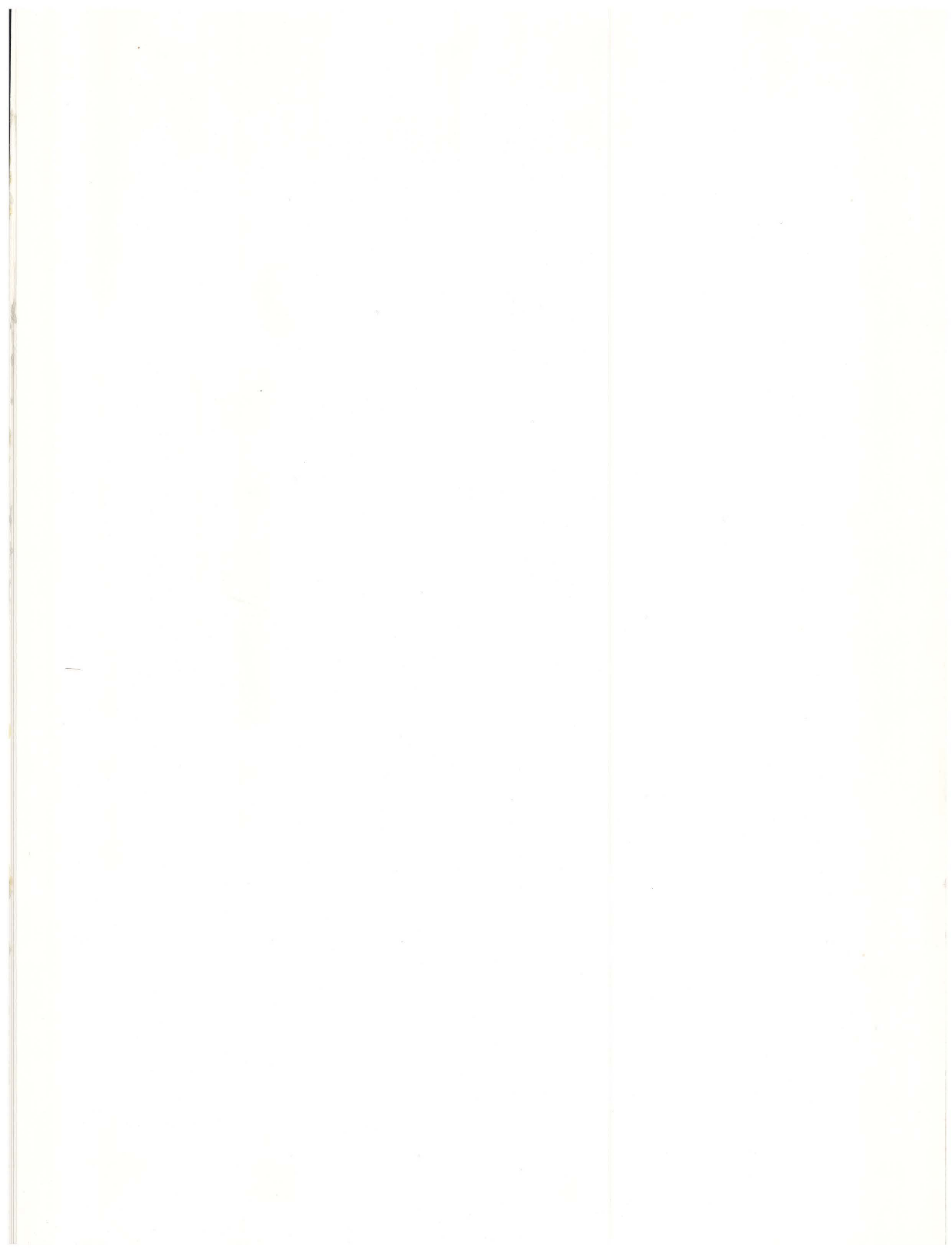
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