 Changes since Fall 2008 in red

Technology and Society (EST)

Chair: David L. Ferguson, Harriman Hall 347, (631) 632-8763
Graduate Program Director: Sheldon J. Reaven, Harriman Hall 343A, (631) 632-8768
Assistant to the Chair: Rita Reagan-Redko, Harriman Hall 335, (631) 632-1057
Graduate Program Coordinator: Carole Rose, Harriman Hall 347A, (631) 632-8765

Advanced Graduate Certificates awarded: Advanced Graduate Certificates in Educational Technology and in Global Operations Management. Degrees awarded: M.S. in Technological Systems Management (concentrations: Educational Technology, Energy and Environmental Systems, Global Operations Management); Ph.D. in Technology, Policy and Innovation

Technology shapes every facet of modern life. Familiarity with the characteristics, capabilities, and limitations of current and emerging technologies is indispensable to wise and effective decisions and practices in government, business, and personal life. At all levels and in all disciplines, careers in industry, government, and education ever more turn on the ability to see and seize the opportunities and address the problems that technology often presents. Technological developments are indeed re-defining these very careers and changing the workplace itself.

Managing modern technologies calls upon a synthesis of tools drawn from many areas: science and engineering, computers and information, economics and regulation, psychology and community values, design and assessment. The Master's Degree in Technological Systems Management provides professionals in all fields, and people planning such careers with state-of-the-art concepts, analytical tools, and practical skills for managing specific technological systems and improving their performance.

Students may pursue one of three areas of concentration: Educational Technology, Energy and Environmental Systems, or Global Operations Management. Students take a common core of six credits, a block of 15 credits specific to their concentration, and nine credits of electives. A master's project also must be completed by students in the Energy and Environmental Systems and Educational Technology concentrations.

A deep understanding of the technology and a broad knowledge of the social implications of technology are essential to identifying, understanding, and addressing a growing number of complex issues facing our society. The Ph.D. program in Technology, Policy, and Innovation (TPI) is at the forefront of current and emerging efforts in science and engineering education that aim to address these challenges. The Ph.D. degree in TPI is for students who wish to be engines of national leadership in gauging the prospects and charting the future course of technologies. Students in this program will carry out policy and design/planning research in three interacting socio-technological areas: energy and environmental systems; education (including educational technologies, and education in engineering and applied sciences); technology management, engineering entrepreneurship, and science and technology policy. TPI equips its doctoral graduates with skills that may be applied to careers in both the public and private sectors. The graduates will find strong needs for their skills — and job opportunities— in government agencies, think-tanks and research organizations, industries and consulting firms, and academia, both in the United States and overseas.

Advanced Graduate Certificate in Educational Technology

The Certificate prepares current and prospective teachers to use advanced technologies in learning and teaching, and helps business and industrial trainers and educators to develop and teach computer applications, multimedia technologies, and computer-based documentation. Students elect either the school track or the business/industry track.

Advanced Graduate Certificate in Global Operations Management

This Certificate program helps managers develop their abilities to use advanced technologies in their companies, understand their business processes, reduce waste and inefficiencies, and improve the bottom line of their companies.

Facilities

Graduate students enrolled in the Department of Technology and Society have access to several computing facilities. The University maintains a wide range of mainframe facilities and personal computing laboratories. However, the Department uses its two in-house, state-of-the-art computer laboratories as hands-on enhancements of the graduate student's experience. The first lab has 20 Pentium desktop computers that operate as stand-alone or within a basic network environment. The lab is integrated into the campus WAN, with full Internet access, and a wide array of educational, academic, and professional software. Video cameras, scanners, printers, laptops, and a projection system are available for student use within the lab.

The second computer laboratory is used for research and teaching related to computer-supported collaboration, e-learning technologies, and emerging educational technologies. The lab, available for faculty and students, consists of 20 laptop computers on a cart.

Both labs are designed for student work and as open laboratories to give students the broadest in-depth exposure to information technologies. The Department of Technology and Society is also a major contributor to three research centers at Stony Brook (the Advanced Energy Research and Technology Center (AERTC), the Center for Excellence in Wireless and Information Technology (CEWIT), and the Center for Interdisciplinary Environment Research) and collaborates with scientists at Brookhaven National Laboratory (BNL). Students working on research projects will have access to the facilities as appropriate for their project.

Admission

Admission to the M.S. and Ph.D. programs is handled separately by the departmental admissions committee. The requirements for admission to graduate study in this department include:

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 Energy and Environmental Systems concentration of the M.S., one year of calculus (MAT 131, 132, or equivalent) is required. For admission to the Global Operations Management concentration of the M.S., an introductory calculus course (MAT 123 or equivalent) is required;

B. A minimum undergraduate grade point average of 3.0;

C. Three letters of recommendation;

D. Graduate Record Examination (GRE) General Test scores;

E. Acceptance by the Department of Technology and Society and the Graduate School.

F. A Statement of Purpose describing the applicant's relevant past experience and immediate and long-term goals. Applicants for admission to the Ph.D. program should describe how the type of research that they expect to conduct while in the program relates to one of the department's research areas: energy and environmental systems; educational technologies, and education in engineering and applied sciences; technology management, engineering entrepreneurship, and science and technology policy.

In special cases, applicants who do not satisfy requirement A or B may be admitted on a conditional basis and may be subject to additional course requirements. Appropriate courses taken in non-matriculated status may be applied towards the M.S. degree in Technological Systems Management and the Ph.D. degree in Technology, Policy, and Innovation; however, no more than 12 credits taken in non-matriculated status can be applied to the credit requirements for the M.S. and Ph.D. degrees.

For admission to the Advanced Graduate Certificate program, students must have a bachelor's degree and an undergraduate GPA of at least 3.0. Students with lower averages may be admitted in non-matriculated status, which may be changed upon earning six or more graduate credits applicable to the Certificate with a GPA of 3.0 or higher.

Credits for Certificate program courses may be applied to requirements for the M.S. degree in Technological Systems Management, subject to Graduate School rules and limitations; however, no more than 12 credits may be transferred.

Faculty

Distinguished Service Professors

Ferguson, David L.,[1] *Chair,* Ph.D., 1980, University of California, Berkeley: Quantitative methods; computer applications (especially intelligent tutoring systems and decision support systems); mathematics, science, and engineering education.

Paldy, Lester G., M.S., 1966, Hofstra University: Nuclear arms control; science policy.

Distinguished Teaching Professor

Liao, Thomas T.,[2] Ed.D., 1971, Columbia University: Computers in education; science and technology education.

Professors

Hogan, Joseph S., *Emeritus,* Ph.D., 1968, New York University: Planetary atmospheres; environmental satellites; climate change.

Piel, Emil J., *Emeritus,* Ed.D., 1960, Rutgers University: Decision making; technology-society issues; human-machine systems.

Teng, Tian-Lih, Ph.D., 1969, University of Pittsburgh: Electrical engineering; computer science; management of information systems; electronics commerce.

Visich, Marian Jr., *Emeritus,* Ph.D., 1956, Polytechnic Institute of Brooklyn: Aerospace engineering; technology-society issues.

Associate Professors

Kaplan, Edward, *Visiting Associate Professor,* Ph.D., 1973, University of Pennsylvania: Environmental systems engineering.

Morris, Samuel C., *Visiting Associate Professor,* Sc.D., 1973, University of Pittsburgh: Environmental science; risk analysis.

Reaven, Sheldon J., *Graduate Program Director,* Ph.D., 1975, University of California, Berkeley: Science and technology policy; energy and environment problems and issues; environmental and waste management, recycling and pollution prevention; risk analysis and life-cycle analysis; nuclear, chemical, and biological threats; technology assessment; homeland security and the war on terrorism.

Scarlatos, Lori L., Ph.D. 1993, Stony Brook University: Educational technology; tangible, physical, multi-modal, and collaborative human-computer interfaces; serious games; computer graphics; multimedia.

Assistant Professors

Abouelenean, Gamal, Ph.D, 1998, Suez Canal University; University P.E. (Alabama): Civil engineering; water resources engineering; hydraulics engineering; bridge hydraulics; bridge scour; numerical modeling; computer applications; GIS.

Sobel-Loieski, Karen, *Visiting Assistant Professor,* Ph.D., 2006, Stevens Institute of Technology: Societal impact of technology on human cognition, emotion and overall well-being; effects of networked technologies on education and business performance drivers such as leadership, innovation and student achievement.

Sun, Guodong, Ph.D., 2001, Carnegie Mellon University: Energy and environmental policy; technology assessment; technology innovation management.

Tonges, David J., Ph.D., 1998, Stony Brook University: Environmental management (salt marshes, mosquito control, alternative energy sources); contamination (groundwater, pesticides); monitoring (groundwater, surface water, estuaries); public policy and communication (risk assessment, environmental impact analyses, environmental justice).

Tucker, Jessica M., *Visiting Assistant Professor,* Ph.D., 2006, Carnegie Mellon University: Engineering ethics; bioethics; engineering education; chemical engineering; biomaterials.

Lecturers

Lewis, Herbert, Lecturer, Ph.D., 1996, Stony Brook University: Applied mathematics and statistics; operations research; management science; information systems; productivity and efficiency analysis.

Adjunct Lecturers

Gucciardo, Richard, M.B.A., 1986, New York Institute of Technology.

Kornfeld, Edward, B.B.A., 1965, Pace University.

Levanti, Gary, M.B.A., 1992, Binghamton University.

Laspina, Peter J., M.S., 1978, C.W. Post College; M.S., 1987, Stony Brook University: Technological systems management.

Lebel, Roy, B.S., 1979, Dowling College: Aeronautics; aeronautical management.

Leonhardt, Nina, M.S., 1978, Stony Brook University: Technological systems management.

Lynch, Margaret, M.B.A., 1983, New York University: Finance and marketing.

MacLeod, Charles, M.A., 2004, Stony Brook University: Liberal studies.

Moriarty, Kevin, M.B.A., Dowling College.

O'Connor Gerry, M.A.L.S., 1970, Stony Brook University: English.

Petralia, Thomas, M.S., 1992, Stony Brook University: Technological systems management.

Reagan-Redko, Rita, M.S.,1998, Stony Brook University: Technological systems management.

Rotchford, Louise M., M.S., 1990, Polytechnic University: Management.

Schmid, Glenn, M.S., 1981, Stony Brook University: Technological systems management.

Shak, Arnold, M.S., 1976, New York University: Computer science.

Shideler, Annette, Ed.D., 1989, Teachers College, Columbia University.

Siegel, Paul, M.S., 1997, Stony Brook University: Technological systems management.

Stenton, Kenneth, M.B.A., 1992, Wharton School of Business, University of Pennsylvania.

Taveras, Marypat, M.S., 2002, Stony Brook University: Technological systems management.

Tong, Alvin, Ph.D., 1968, University of Minnesota: Electrical engineering.

Number of teaching, graduate, and research assistants, Fall 2007: 6

1) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1992; recipient of the President's Award for Excellence in Teaching, 1993; Recipient of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring of Under-represented Minority Students, 1997

2) Recipient of the State University Chancellor's Award for Excellence in Teaching, 1993; recipient of the President's Award for Excellence in Teaching, 1993

Degree Requirements

Requirements for the M.S. Program in Technological Systems Management

Students in the Masters program choose one of 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.

(See course titles and descriptions below.)

Core Courses (6 credits): EST 581, EST 582

Note: Entering students are presumed to have essential communications, computer, and mathematical skills. Otherwise, prerequisite study in these areas will be required.

Global Operations Management Concentration

Required Courses (15 credits):EMP 502, EMP 504, EMP 506, EMP 509, EMP 518

Suggested Electives (9 credits): EMP 503, EMP 507, EMP 511, EMP 517, EMP 521, EMP 522, EMP 523, EST 530, EST 599.

Educational Technology Concentration

Required Courses (15 credits): EST 568, EST 570, EST 571, EST 578, EST 590, Master's Project

Suggested Electives (9 credits): EST 573, EST 574, EST 575, EST 576, EST 579, EST 585, EST 589, EST 591, EST 599

Energy and Environmental Systems Concentration

Required Courses (15 credits): EST 592, EST 593, EST 594, EST 595, EST 590, Master's Project

Suggested Electives in TSM (9 credits): EST 502, EST 540, EST 541, EST 553, EST 576, EST 584, EST 586, EST 588, EST 591, EST 597, EST 599,

Electives from other departments: AMS 520, AMS 571, BEE 550, CEY 501, CEY 509, GEO 564, ESM 513, MAR 512, MBA 570, MEC 502, POL 531, POL 543, SOC 511.

Advanced Graduate Certificate in Educational Technology

(See course titles and descriptions below.)

A total of 18 credits (four core courses and two electives) are required.

Core Courses: EST 565, EST 567 (formerly EST 572), EST 570, EST 571

School Track

Choose one of three:

EST 563 (formerly EST 583), EST 573, EST 585

Choose one of three:

EST 591, CEI 511, CEN 580

Business Track

Choose one of three:

EST 509, EST 520, EST 530

Choose one of three:

EST 573, EST 591, EST 596

Advanced Graduate Certificate in Global Operations Management

Core Courses (all three must be taken):

EMP 502 --Management Accounting and Financial Decision Analysis

EMP 506 --Global Operations Management

EMP 509 –Enterprise Information and Knowledge Systems Management

Required Courses (two of five must be taken):

EMP 501 Behavioral and Organizational Aspects of Management

EMP 503 Legal and Regulatory Aspects of Management

EMP 504 Quantitative Methods in Management

EMP 511 Starting a Business Venture

EMP 517 Quality and Value Management

Elective Courses (select one additional from required courses above or one from the following below):

EMP 518 Program/Project Management

EMP 521 New Product Development and Design

EMP 522 Strategic Marketing: Planning and Process

EMP 523 International Business and Management

EST 520 Computer Applications and Problem Solving

EST 530 Internet Electronic Commerce

EST 581 Methods of Socio-Technological Decision Making

EST 582 Systems Approach to Human-Machine Systems

Requirement for the Ph.D. Program in Technology, Policy, and Innovation

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

A. Residence

The student must complete two consecutive semesters of full-time graduate study. Full-time study is 12 credits per semester until 24 graduate credits have been earned. Students who have earned 24 graduate credits at another school may be assigned advanced status and are required to take only nine credits per semester for full-time status.

B. Qualifying Examination

The qualifying examination must be taken by all students, regardless of whether they enter the program holding a master's degree or a bachelor's

degree only. Students are expected to take the qualifying examination in the fourth semester, preferably after having completed 34 credits in the program. The qualifying exam has three parts to it:

- a research project
- a take-home research report
- a proctored comprehensive exam

Note: the comprehensive exam may be waived if the GPA of the student in their core classes is above 3.5.

A student who fails one or more parts of the qualifying examination will be given one additional attempt on each failed part. If the student does not pass a failed part of the examination on the second attempt, he/she will be dismissed from the program.

Having passed the qualifying examination, the student is advanced to candidacy. This status, called G5, is conferred by the Dean of the Graduate School upon recommendation of the Department. Note that unlike the change from G3 to G4, the change from G4 to G5 is not automatic—the student must request to be advanced to candidacy by notifying the Technology and Society Graduate Program Coordinator. Students must advance to candidacy at least one year before defending their dissertations. The Graduate School requires G5 students to register for nine credits, which can be research or other graduate courses relevant to their dissertation. Courses outside of the major require the approval of the dissertation advisor and Graduate Program Director. Failure to complete the qualifying examination within the specified timeframe and obtain the G5 status is considered evidence of unsatisfactory progress.

C. Course Requirements

Our course requirement is designed to ensure TPI graduates have competency in two areas: (1) a specific technological area, and (2) policy research and analysis. Students are required to take 34 credits of course work beyond the B.S. degree level. These credits are comprised of the following:

- 10 credits of core courses to provide students with a common core of knowledge and techniques essential to research and practice in TPI. Core courses consist of Technology, Policy, and Innovation in Theory and Practice (4 credits); Data Analysis and Experimental Methods (3 credits); and Methods of Socio-Technological Decision Making (3 credits).
- 15 credits of courses in a specific technological area (engineering, science, mathematics, statistics) that are relevant to his or her individual research
- 9 credits in related social sciences (economics, political science, law, history, business management, psychology, sociology, education) to become proficient with social science methods of analysis

In addition, University policy requires that all doctoral students participate in an appropriately structured teaching practicum. This can be accomplished with a Practicum in Teaching course, in conjunction with T.A. responsibilities in the first year.

E. Thesis Proposal and Preliminary Examination

Students who pass all three parts of the qualifying examination are expected to develop a thesis proposal within one semester for full-time students, and two semesters for part-time students. This thesis proposal must then be presented and defended in an oral preliminary examination. Failure to fulfill this requirement within 18 months of passing the qualifying examination, and without a formal extension, may be considered evidence of unsatisfactory progress toward the Ph.D. degree.

The major requirements of the thesis proposal are as follows: (1) the student must be thoroughly familiar with the background and current status of the intended research area; (2) the student must have clear and well-defined plans for pursuing the research objectives; and (3) the student must offer evidence of progress in achieving these objectives.

The student will present the thesis proposal to the thesis committee in a seminar presentation. It is limited to members of the committee, invited Technology and Society faculty, and invited graduate students. The committee for the student's preliminary examination, dissertation and defense will include at least one faculty member who does not have a primary or joint appointment in DTS. Students will be strongly encouraged to have at least one faculty member from another university on their committee. As part of the preliminary examination, faculty members are free to question the student on any topics they feel are in any way relevant to the student's objectives and career preparation. Most questions, however, will be directed toward verifying the student's grasp of the intended specialty in depth. The student will be expected to show complete familiarity with the current and past literature of this area.

The findings of the committee will be communicated to the student as soon as possible and to the Graduate School within one week of the presentation of the proposal. A student who does not pass the preliminary examination on the first attempt will be given a second chance. If the preliminary is failed on the second attempt, the student will be dismissed from the program.

F. Dissertation

An important requirement of the Ph.D. program is the completion of a dissertation which must be an original scholarly investigation. The dissertation shall represent a significant contribution to the scientific literature, and its quality shall be compatible with the publication standards of appropriate reputable scholarly journals.

G. Approval and Defense of Dissertation

The dissertation must be orally defended before a dissertation examination committee, and the candidate must obtain approval of the dissertation from this committee. The oral defense of the dissertation is open to all interested faculty members and graduate students. The final draft of the dissertation must be submitted to the committee no later than three weeks prior to the date of the defense.

H. Satisfactory Progress and Time Limit

Students are expected to finish all the requirements, including thesis research and defense, in four to five full-time-equivalent years. A student who does not meet the target dates for the Qualifying Examination, Thesis Proposal, and Preliminary Examination, or who does not make satisfactory progress toward completing thesis research, may lose financial support. The candidate must satisfy all requirements for the Ph.D. degree within seven years after completing 24 credit hours of graduate courses in the

Department of Technology and Society at Stony Brook. In rare instances, the Dean of the Graduate School will entertain a petition to extend this time limit, provided it bears the endorsement of the Department's Graduate Program Director. A petition for extension must be submitted before the time limit has been exceeded. The Dean or the Department may require evidence that the student is still properly prepared for the completion of work.

I. Part-Time Students

Students admitted into the Ph.D. program for part-time study are bound by all the rules set out henceforth. In particular, part-time students should adhere to the schedule for the Qualifying Examination, Thesis Proposal, and Preliminary Examination unless a different schedule has been approved in writing by the Graduate Program Director.

J. Switching Between the M.S. and Ph.D. Programs

A Ph.D. student who has passed the Qualifying Examination can complete the requirements for an M.S. degree by satisfying the proficiency requirements and completing 30 credits of coursework. Passing the Qualifying Examination is considered to have satisfied the proficiency requirements. (Another way to satisfy these requirements is, of course, to take the required courses and do the masters project.)

Courses

EMP 501 Behavioral and Organizational Aspects of Management

This course provides an understanding of the management process by analyzing organizational behavior. Topics include behavior in two-person situations, factors influencing attitudes and changes in organizational behavior, group influence on behavior, formal and informal organizational structures, conflict and conflict resolutions, and the dynamics of planned change.
Fall, 3 credits, ABCF grading

EMP 502 Management Accounting and Financial Decision Analysis

Fundamentals of financial and managerial accounting with emphasis on concepts, ratio, and break-even analysis, financial structure, cost analysis, replacement of assets, and cash flow management.
Fall, 3 credits, ABCF grading

EMP 503 Legal and Regulatory Aspects of Management

A survey of business and regulatory law. Topics include contracts, sales, warranties, and business partnerships and corporations. An overview is provided of high technology topics such as computer law, product liability, patent, trademark, copyright, and environmental law and their impact on business.
Summer, 3 credits, ABCF grading

EMP 504 Quantitative Methods in Management

This course is a rapid introduction to the application of modern mathematical concepts and techniques in management science. Algebraic operations, mathematical functions and their graphical representation, and model formulation are reviewed. Topics covered include the following: mathematics of interest, annuity, and mortgage; algebraic and graphic methods of linear programming; PERT, CPM, and other network models; and inventory theory. Simple management-oriented examples are used to introduce mathematical formulations and extensions to more general problems. The computer laboratory is used to give students experience with PC software packages that solve problems in all course topics. Interpretation of computer outputs is also stressed.
Prerequisite: MAT 123 or equivalent
Fall, 3 credits, ABCF grading

EMP 506 Global Operations

A managerial approach to the concepts, issues, and techniques used to convert an organization's resources into products and services. Topics include strategic decisions for planning products, processes, and technologies, operating decisions for planning production to meet demand, and controlling decisions for planning and controlling operations through teamwork and Total Quality Management (TQM). Operational problems in producing goods and services are reviewed.
Prerequisite: MGT 515
Spring, 3 credits, ABCF grading

EMP 507 Research and Special Topics in Global Industrial Management

An individual study course for students investigating special topics relating to global industrial management.
Prerequisite: Permission of instructor
Fall and spring, 1-3 credits, ABCF grading

EMP 509 Enterprise Information and Knowledge Systems Management

This course covers the different types of enterprise systems, how they are used to manage an organization's processes, re-engineering the business with enterprise systems, and the relationship among technology, organization, and management. Knowledge-based and Web-based features in modern enterprise systems will be emphasized. Database management, security, control, ethical, and social issues of enterprise systems will be discussed.
Spring, 3 credits, ABCF grading

EMP 511 Starting a Business Venture

This course covers the necessities of beginning a business from turning a concept into a new venture and developing a business plan for a venture. Topics include how to identify and evaluate the product and its market potential; management and organization issues; production and channels of distribution; and how to present a plan to the financial community. Specific case studies and guest speakers are utilized.
Summer, 3 credits, ABCF grading

EMP 517 Quality and Value Management

Modern management's approach to quality has changed radically in the last 20 years; this course explains why and how. It covers methods used by both manufacturing and service organizations to achieve high quality: how each organizational function is involved in quality; how improving quality can reduce costs; importance of communication; importance of involving all employees; need to measure quality; and introduction to statistical quality control and how it is used.
Summer, 3 credits, ABCF grading

EMP 518 Program/Project Management

We will examine how teams can be organized, directed, and monitored so that relatively complex projects can be carried out efficiently. Topics include: planning, organizing, and controlling resources; monitoring progress toward objectives; identifying and managing risks; resolving conflicts; communicating effectively; setting priorities; and writing proposals. The systems approach will be emphasized.
Fall, 3 credits, ABCF grading

EMP 521 New Product Development and Design

This course covers how to manage enterprise innovation, corporate innovation cultures, ideation and creative thinking, product design and development processes and phases, issues in product design, collaboration between R&D, and operations/marketing. Also, this class will focus on how to use forecasting to ensure the successful launch of a product. Case studies will be discussed.
3 credits, ABCF grading

EMP 522 Strategic Marketing: Planning and Process

This course will examine the vital role that strategic marketing and planning plays in all businesses, as well as non-profit and government organizations. Marketing's role in our economy, society, and the appropriate marketing target and mix of media will also be presented. The various careers that exist in marketing and the structure of marketing plans and departments are studied. The class will create a marketing plan based on real products and present it.
3 credits, ABCF grading

EMP 523 International Business and Management

This course covers the world's marketplace, international environment, managing international business, and managing international business operations. Additional topics include cultural issues in a global marketplace, the impact of law and legal differences in the world marketplace compared to the U.S., and addressing competitive issues related to items such as a need for local contact.
3 credits, ABCF grading

EST 520 Computer Applications and Problem Solving
A problem-solving course for professionals who use applications software to address administrative and managerial problems. Students develop skills in planning, forecasting, and MIS requirements. The major applications software packages used are Excel and Access. Students learn to create advanced-level spreadsheets and data files, and use them to find optimal solutions to problems in all professions.
Summer, 3 credits, ABCF grading

EST 530 Internet Electronic Commerce
Topics addressed in this course include: technology infrastructure, business models and concepts, technological skills needed to build an E-Commerce Web site, marketing, communications, security and encryption, payment systems in E-Commerce/M-commerce. Financial transactions, advertising models, content ownership, and the prospects for E-Commerce are also covered.
Summer, 3 credits, ABCF grading

EST 540 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. Crosslisted as HPH 672 or MAR 514.
Prerequisite: Permission of instructor
Spring, 3 credits, ABCF grading

EST 541 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 as MAR 521 or HPH 673.
Prerequisite: Permission of instructor
Summer, 3 credits, ABCF grading

EST 550 Introduction to Homeland Security
The course is a combination of lectures and laboratory experience to introduce students to critical issues and assess needs for homeland security. The course includes invited lectures by experts on special topics such as fundamentals of nuclear, chemical, and biological weapons and the associated threat to the transportation of goods and the public. The students will learn about cyber security, devices to safeguard materials from terrorist threats, safety of nuclear power plants and water supply, forensics, and emergency preparedness. The students will submit a term paper on a selected topic in lieu of the final exam. Cross listed with ESM 550 and HPH 643.
Prerequisites: Undergraduate level biology, chemistry, and physics
Fall and spring, 3 credits, ABCF grading

EST 553 Nuclear Security
The course will familiarize students with the fundamentals of nuclear physics, radiation, mining, weapons, and fuel cycle, other than producing electricity, as it pertains to nuclear power plants. Topics include nuclear detection, devices to safeguard nuclear materials from terrorist threats, needed physical protection for safe handling and its relevance to Homeland Security. The course combines lectures with hands-on experience at the newly installed nuclear detection facility located at the nearby U.S. Department of Energy's Brookhaven National Laboratory. Crosslisted as EST 553 and HPH 654.
Prerequisite: Undergraduate equivalent physics and chemistry.
Fall, spring, 4 credits, ABCF grading

EST 554 Chemical and Biological Weapons: Safeguards and Security
This course deals with the fundamentals of chemistry and biochemistry related to chemical weapons (CW) and biological weapons (BW) that could be used by terrorists. Topics include CW and BW history, production, control, detection, identification, and emergency response measures to deal with intended or unintended release and escape, and security measures to protect and control stockpiles. Cross listed as EST 554 and HPH 655.
Prerequisite: Undergraduate equivalent chemistry, biochemistry, and microbiology
Fall, spring, 4 credits, ABCF grading

EST 560 Risk Assessment, Regulation, and Homeland Security
The course focus is on risk assessment associated with nuclear, chemical, and biological weapons as it relates to Homeland Security. Topics include air dispersion, uncertainty analysis, exposure measurements, epidemiology, toxicology, regulatory issues, risk management, risk communication, risk perception, and risk preparedness. The course will also cover laws and regulation, discouraging terrorism, and disaster preparedness, various acts passed by the U.S. Congress to regulate water, air, and controlled substances. Cross listed as EST 560 and HPH 656.
Prerequisite: Undergraduate or equivalent physics, math, and chemistry
Fall and spring, 4 credits, ABCF grading

EST 562 Decision Support Systems
In this course, both model-driven and data-driven decision support systems will be considered. Students will identify an appropriate engineering or management application. By collecting relevant data, building suitable mathematical models, designing an accessible user interface, and connecting these components via computer code, students will develop a deliverable DSS. Through a series of presentations, they will demonstrate how their DSS addresses the stated engineering or management problem. In doing so, students will gain insight into the interrelationships among information systems, statistics and management science.
Prerequisite: EMP 504 or permission of instructor.
Spring, 3 credits, ABCF grading

EST 563 Computer Literacy for Educators
This course is an introduction to computer and software basics and was formerly listed as EST 583. Students will develop an understanding of the underlying concepts and principles behind computers. Students will gain sufficient knowledge to successfully navigate the digital world. Emphasis will focus on computer literacy areas used in education and other professional environments. Students will leave this course with the ability to grasp the risks and benefits surrounding new and current computer technologies. The following areas will be addressed; electronic communication, application-based projects, information management, assessment, and the societal impacts of computer-based technologies. Students having completed EST 565 in a prior semester cannot receive credit for EST 563. EST 563 and EST 565 may be taken in the same semester.
Fall, 3 credits, ABCF grading

EST 565 Instructional Technologies
This course examines issues in teaching and learning, especially the use of computers and emerging technologies to investigate unique types of learning that are made possible, or may be more efficient, with this technology. Exposure to generic software applications, and an overview of commercial software titles and applications are provided. Students have the opportunity to work collaboratively with others in this field, and will develop a working application that could be used in an educational environment.
Prerequisite: EST 563 or permission of instructor
Fall, spring, and summer, 3 credits, ABCF grading

EST 567 The Internet and Networking for E-Learning
Students will learn the basic design concepts behind the Internet, as well as wired and wireless communication networks. Students learn effective use of the Internet and networks for active learning. Discussion topics include: the role of the Internet as a 21st-century global communication tool, ethical and societal issues as they relate to educational standards, and how to judge the benefits and risks associated with these networks. This course was formerly listed as EST 572. Not for credit if you have already taken EST 572.
Prerequisite: Computer experience
Fall, spring, and summer, 3 credits, ABCF grading

EST 568 Network Communication—Wired and Wireless
This course examines the range of technologies used in teaching, learning, and communication. Instructional technologies both stand-alone and networked are surveyed with a focus on how they can be used effectively to enhance learning. Students will learn fundamental hardware and software principles underlying the development of the Internet and other networked communications tools. Emphasis will be placed on assessment of these technologies in terms of societal impacts and learning outcomes. This course combines topics from EST 565 and EST 567.
Fall, spring, summer, 3 credits, ABCF grading

EST 570 Design of Courseware
Principles of designing courseware modules for K-12 schools, universities, and industry. Educational technologies used in courseware. Theories of learning and educational policy making. Courseware design specification. Each student will develop a courseware design specification that can be implemented for his/her master's project.
Fall, every year, 3 credits, ABCF grading

EST 571 Research Methodologies for Educational Technologies
This course evaluates the educational uses of computer technology. Course goals include understanding research methodology and literature, conducting a research study of educational technology, developing professional leadership skills, and exploring micro-worlds and constructivism. The course includes class discussions to assess the quality of research articles on educational technology.
Prerequisite: EST 565 Fall and spring, 3 credits, ABCF grading

EST 573 Design of Multimedia Courseware
This course was designed for school teachers, corporate trainers, and multimedia specialists who are interested in the use of multimedia design techniques as a teaching tool. The class is half lecture and half hands-on training in multimedia production tools. Students have a term project for which they have to create a courseware program.
Prerequisite: EST 565 or permission of instructor
Co-requisite: EST 570 or permission of instructor
Spring, 3 credits, ABCF grading

EST 574 Distance Education
Web-based distance learning applications are quickly growing within higher education institutions, K-12 schools, and corporate envrionments. This course is designed for higher education faculty, K-12 administrators and teachers, educational computing coordinators, and corporate training personnel who would like to investigate ways to enhance their educational systems through the development and implementation of E-learning applications. The focus of this course is on the design and implementation of effective modes of E-learning.
Fall, summer, every year, 3 credits, ABCF grading

EST 575 Developing Grants and Managing Projects
This course will develop the skills necessary to take a program proposal from idea through reality with an emphasis on new technological resources available to help with this process. Topics include: techniques for successful fundraising, grant writing, program design, staffing, publicity and outreach, and reporting and evaluation. It is designed for current educators and administrators, as well as students about to enter the education, social service, and health fields.
3 credits, ABCF grading

EST 576 Geographic Information Systems in Education and Research
Students use Geographical Information Systems (GIS) software to create, manipulate, and interpret layers of interactive maps and databases. Students collect and modify geographical materials from the Internet, satellite and aerial imagery, and field data. They design and test scientific inquiry-driven educational modules and/or visualizations for research and analysis on global and local geography, for use in economics, earth sciences, politics and civic action, history and sociology, global studies, and environmental planning and assessment.
Prerequisite: EST 565 or EST 595 or permission of instructor
Spring, 3 credits, ABCF grading

EST 577 Environmental Information Systems (EIS)
Due to the complex nature of environmental and spatial data, these systems require state-of-the-art computer technology to achieve environmental decisions. The purpose of this course is to provide the connection between environmental science and information technology. This course will address the technical and conceptual bases of data capture, data storage, data analysis and decision support, and meta-data management. Environmental Information Systems are concerned with the management of data about the rock, the soil, the water, the air, and the species around us. By the end of this course, the student will be able to design and implement information systems to support decision-making in environmental management, energy and protection.
Spring, 3 credits, ABCF grading

EST 578 Human-Computer Interaction Design for Construction
Principles of human-computer interaction applied to the design of educational courseware. Usability engineering, with a focus on the audience and learning objectives. Interface design principles. Human-computer dialogs. Multimedia as a communication tool, using images, audio, and video. Multimodal input devices and strategies. Students will use a multimedia authoring tool to create a prototye of an educational application or learning tool.
3 credits, ABCF grading

EST 579 Educational Games
Simulations and computer games as a learning tool. Traditional game and simulation genres, and their appropriate uses in education. Gameplay design. Game development process, from storyboarding to delivery. Assessing games as learning tools. Students will use a multimedia authoring tool to prototype an educational game or simulation of their own design.
Prerequisite: EST 578
Summer, 3 credits, ABCF grading

EST 581 Methods of Socio-Technological Decision Making
Focus is on the application of decision-making techniques to analyze problems involving technology, particularly its social impacts. Areas of study include decision making under uncertainty, decision making in a passive vs. active environment, sequential decisions, estimating payoffs, forecasting, and technology assessment. These systems-analysis techniques are used to formulate and solve a variety of socio-technological problems, especially those that arise in educational, industrial, and environmental professions.
Prerequisite: Graduate standing in Department or permission of instructor
Fall, 3 credits, ABCF grading

EST 582 Systems Approach to Human-Machine Systems
Systems concepts (feedback, stability, chaos, ergonomics) and analytical tools applied to dynamic systems in which technologies and/or natural environments interact with human users, regulators, or designers. Examples: ecological systems, nuclear power plant operations, space shuttle missions, computer/Web educational technologies, regional planning. Students prepare a systems design study of an industrial, educational, or environmental device, technology, or management system.
Prerequisite: EST 581 or permission of instructor, graduate standing in the Department
Spring, 3 credits, ABCF grading

EST 584 Air Pollution and Air Quality Management
The effects of air pollution on the environment and public health are explored. Primary pollutants, such as particulates, oxides of sulfur, nitrogen and carbon, hydrocarbons, lead and CFCs are considered, as are secondary pollutants, such as sulfuric acid, PAN, and surface ozone. The effect of atmospheric conditions on the dilution and dispersion of pollutants and the impact of pollution on the global atmosphere are explained. Air pollution disasters and the impacts and ramifications of the Clean Air Act of 1970, its 1990 amendments, and recent international accords are discussed. Case studies of air pollution reduction, management, and regulation in local industry are included. Other contemporary topics include the loss of stratospheric ozone and global warming due to human activities. Crosslisted as EST 584 or HPH 683.
Prerequisites: College chemistry or permission of instructor
Spring, 3 credits, ABCF grading

EST 585 Technology in Learning Systems
This course is designed to provide educators with an overview of uses of technology to improve instruction. Standard and innovative, nonconventional modes of learning are considered. Specific areas of study include a systems-based analysis of the design and function of learning environments, individual applications related to the student's area of professional practice, and assessment of educational uses of technology today and tomorrow. Students are exposed to various educational technologies and they make a formal presentation applying a technology to an educational system.
Prerequisite: EST 582, systems background, or permission of instructor
3 credits, ABCF grading

EST 586 Environmental and Waste Management in Business and Industry
Environmental and waste management practices in industrial and other institutional settings. Technologies of hazardous waste prevention, treatment, storage, transportation, and disposal are considered. Topics include:

Information systems and software tools for environmental audits, regulatory monitoring and compliance, cost estimation, recycling programs, air, land, and water emissions controls and permits. Employee health, safety, education, and quality management are examined. Field trips to several Long Island institutions. Crosslisted as EST 586 or HPH 684.
3 credits, ABCF grading

EST 587 Today's Technology: Impact on Education and Economics
This course involves the student in studies of the science, technology, and economics of four selected areas: electronics, transportation, energy, and health sciences. Classroom time is supplemented by visits to appropriate facilities in each area; individuals and groups also plan for the use of the information in their specific areas of responsibility. For example, teachers are responsible for developing teaching strategies for use of the information in their classes and for student career advice and preparation. Those from commerce and industry learn of the powerful influence of technological development on regional economics. This knowledge is helpful in carrying out strategic planning and forecasting within the student's organization.
3 credits, ABCF grading

EST 588 Technical Communication for Management and Engineering
The ability to communicate technical ideas clearly and effectively is critical to success in management and engineering. Hours and money are wasted when confused, distorted writing and speaking obscure the information they are intended to convey. This course will provide managers, engineers, and other technical professionals with practical methods for making their memos, reports, and correspondence clear, comprehensible, and persuasive. Students learn strategies for communicating with both nonspecialist and technical audiences, stating their purpose clearly, organizing points most effectively, and expressing ideas concisely and precisely. Special attention is given to technical presentations and to communicating in meetings.
3 credits, ABCF grading

EST 589 Technology-Enhanced Decision Making
This course examines the use of technological devices, especially computers, as aids in decision making. A treatment is given of the cognitive science and artificial intelligence methods used in the structure and operation of some systems that support human decision-making. Medical diagnosis systems, business and industrial planning systems, and computer-aided dispatch systems are discussed. In addition, the application of high technology in air traffic control systems is examined.
Prerequisite: EST 581
Co-requisite: EST 582 or permission of instructor
3 credits, ABCF grading

EST 590 Seminar for MS, TSM Students
A forum for the discussion of research methods, project ideas, and proposal preparation. A final product of this seminar is an approved master's project proposal. Each student also leads a discussion of an important technology-society problem, such as censorship of the Internet, scientific decision making, or environmental regulations. Each student works with a faculty advisor on background research and preparation of the master's project proposal.
Fall, 3 credits, ABCF grading

EST 591 Independent Study in Technology and Society
The primary objective of independent study is to provide a student with opportunities to interact with faculty members who can be of assistance in his or her master's project. Students should consult individually with faculty members on workload and credit(s).
Prerequisite: EST 590 or permission of instructor
1-3 credits, ABCF grading
May be repeated for credit

EST 592 Sustainable Energy: Technologies, Systems, Markets, and Policies
The ample supply and appropriate use of energy is critical to the well being of human society. Energy plays an enormous role in environmental degradation, national insecurity, international conflict, and in solutions to these problems. This course aims to introduce the major energy issues to students in engineering, business, and public policy areas. It discusses energy choices to meet regional and global energy needs. Major renewable and conventional energy sources, energy supply technologies, and end-use efficiency options will be assessed in the context of political, social, economic, and environmental goals.
Prerequisite: Undergraduate major in science or engineering strongly preferred
3 credits, ABCF grading

EST 593 Risk Assessment and Hazard Management
A case-study approach to the assessment of risk and the management of natural and technological hazards, with emphasis on those that can harm the environment. The course focuses on technological hazards involving energy, transportation, agriculture, natural resources, chemical technology, nuclear technology, and biotechnology, and on natural hazards such as climactic changes, droughts, floods, and earthquakes. The first part of the course consists of readings on risk assessment and hazard management and discussions of published case studies. During the second part of the course, students conduct their own case studies and use them as the basis for oral and written reports. Crosslisted as EST 593 or HPH 686.
3 credits, ABCF grading

EST 594 Diagnosis of Environmental Disputes
Diagnosis of disagreements about environmental and waste problems. Tools for evaluating disputes about (1) scientific theories and environmental models, (2) definitions and analytical methodologies for estimating risk, "real" cost, net energy use, and life-cycle environmental impact, (3) regulatory and legal policy, (4) siting of controversial environmental facilities, and (5) fairness and other ethical issues. These diagnostic tools are brought to bear upon case studies of pollution prevention, recycling, nuclear waste disposal, and climate change. Cross-listed as EST 594 or CEY 594 or HPH 687.
3 credits, ABCF grading

EST 595 Principles of Environmental Systems Analysis
This course is intended for students interested in learning systems engineering principles relevant to solving environmental and waste management problems. Concepts include compartmental models, state variables, optimization, and numerical and analytical solutions to differential equations. Crosslisted as EST 595 or HPH 688.
Prerequisites: MAT 132 and one year of quantitative science such as physics, chemistry, or geology; or permission of instructor
Fall, 3 credits, ABCF grading

EST 596 Simulation Models for Environmental and Waste Management
This course is intended for students interested in developing computer models for technology assessment and for environmental and waste management. Concepts developed in EST 595 Environmental Systems Engineering and Analysis are applied to real-world problems. Techniques in model development are presented in the context of applications in surface and groundwater management, acid rain, and health risks from environmental contamination. Crosslisted as EST 596 or HPH 689.
Prerequisite: EST 595 or permission of instructor
Spring, 3 credits, ABCF grading

EST 597 Waste Management: Systems and Principles
Students will learn about the technologies and policy options in waste management, emphasizing recycling, incineration, landfilling, and source reduction options for municipal solid waste on Long Island. Problems concerning paper, glass, plastic, organic materials, and other waste stream components will be explored. Environmental impacts and economics of landfills, materials recovery facilities, and waste-to-energy systems are examined. The institutional and regulatory climate, current and planned practices in the region, and hazardous waste will be discussed. Cross-listed as CEY 597 or HPH 663 or EST 597.
3 credits, ABCF grading

EST 598 Teaching Practicum
Designed to give graduate students teaching experience. Note: These credits cannot be counted as part of the 30 credits required for the degree.
3 credits, S/U grading

EST 599 Special Projects and Topics
A technology assessment laboratory for emerging problems and focused research. May be run as a hands-on, group research study of an important educational, environmental or waste problem (perhaps to provide an assessment to a regulatory agency or administrative system).
Fall, spring, 3 credits, ABCF grading

EST 800 Summer Research
0 credit, ABCF grading
May be repeated for credit