

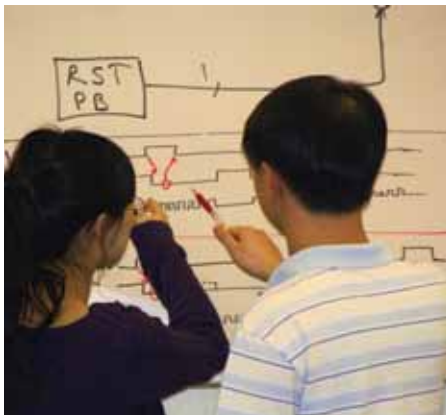
From its beginnings more than a half-century ago, Stony Brook University has been characterized by innovation, energy, and progress, transforming the lives of people who earn degrees, work, and make groundbreaking discoveries here.

Today Stony Brook is one of only 61 members of the prestigious, invitation-only Association of American Universities. Listed among the top 1 percent of the world's universities in the *Times Higher Education World University Rankings*, Stony Brook University is consistently named one of the best values among public universities by *Kiplinger's Personal Finance*.

Whether you aspire to be an applied mathematician, computer scientist, engineer, or technical project manager, Stony Brook University's College of Engineering and Applied Sciences can provide you with a solid foundation for your future.

CEAS is home to more than 1,700 undergraduate students, 1,000 graduate students, and a faculty of 170 engineers and applied scientists who are experts in their respective fields of research.

At Stony Brook, we encourage and prepare you to become a lifelong learner. We all acknowledge the dizzying pace of changing technology; surely, a great deal of the equipment and computers we work with today soon will be outdated. Yet the critical thinking skills and invaluable experience of teamwork and intellectual dialogue that will mark your four years at Stony Brook will remain with you forever. Our graduates not only weather the change, but lead the way through change.



MAJORS, MINORS, AND COMBINED-DEGREE PROGRAMS

Applied Mathematics & Statistics

BS, BS/MS, BS/MBA,
BS/MPH, Minor

Bioengineering Minor

Biomaterials Minor

Biomedical Engineering*

BE, BE/MS

Chemical & Molecular Engineering*

BE, BE/MBA

Civil Engineering

Beginning Fall 2012 for Freshmen
BE

Computer Engineering*

BE, BE/MS

Computer Science**

BS, BS/MS, BS/MBA, Minor

Electrical Engineering*

BE, BE/MS, BE/MBA, Minor

**Accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD, 21202-4012 - telephone: (410) 347-7700.

Electronic, Optical, & Magnetic Materials Minor

Engineering Science*

BE, BE/MS

Engineering & Technology Entrepreneurship Minor

Environmental Engineering Minor

Information Systems

BS, BS/MBA, Minor

Manufacturing Engineering Minor

Materials Science Minor

Mechanical Engineering*

BE, BE/MS, Minor

Nanotechnology Studies Minor

Physical Metallurgy Minor

Technological Systems Management

BS, BS/MBA Minor

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EXTRAORDINARY RESEARCH OPPORTUNITIES

Our faculty are top scientists and engineers who conduct cutting-edge research and write your textbooks. Through the senior design projects in the engineering programs, the software design project in computer science, or the interdisciplinary senior project in technological systems management, you will learn project design, planning, modeling, and execution. In addition, you can conduct original research through the Research Experiences for Undergraduates Program and the Undergraduate Research and Creative Activities Program. Additional research opportunities exist at nearby Brookhaven National Lab, which Stony Brook co-manages, and at our Center of Excellence in Wireless and Internet Technology.

VALUABLE INTERNSHIP EXPERIENCE

To help you explore career paths and get the experience employers want, the CEAS receives participating companies' internship requirements, reviews student records and verifies academic qualifications, and forwards applications to internship employers. Internships are available with local companies, as well as national or multinational companies such as, Citigroup, Microsoft, or Northrop Grumman.

WOMEN IN SCIENCE & ENGINEERING

WISE is a unique program designed to encourage talented freshman women interested in math, science, or engineering. WISE offers special enrichment courses, extracurricular activities and interaction with other like-minded women – both students and faculty. WISE is ideal if you are considering a career in the physical sciences, life sciences, computer science, information technology, math medicine, engineering or a similar field. With a limited number of students admitted each year, WISE can offer you scholarships, special classes, early research opportunities at Brookhaven National Lab, personalized academic advising, and small study groups to put you at the heart of a community where you can excel.

BE/MD AND BE/DMD PROGRAMS

The Engineering Scholars for Medicine Program and the Engineering Scholars for Dental Medicine are a highly selective BE/MD and BE/DMD programs for freshman applicants who wish to pursue interests in engineering and the medical or dental fields. Students accepted into these programs are guaranteed admission to Stony Brook University's School of Medicine and School of Dental Medicine, provided they satisfy certain conditions.

THE HONORS PROGRAM IN COMPUTER SCIENCE

The Honors Program in Computer Science is a highly selective academic program within the major in Computer Science. To be admitted as a freshman, students must demonstrate overall academic excellence.

Honors course offerings include introductory course sequences in programming and in the foundations of computing, advanced courses on selected topics, and a senior honors project.

Honors students with a grade point average of 3.50 at the end of the junior year will be automatically approved for admission to the five-year joint BS/MS program in Computer Science.

COMBINED DEGREE PROGRAMS

Stony Brook's College of Engineering and Applied Sciences offers a number of Combined Bachelor/Master degree programs, which allow students to use graduate credits taken as an undergraduate toward both the undergraduate and graduate degrees, thus reducing the normal time required to complete both Bachelor's and Master's degrees. When you enroll in one of our many combined degree programs, you'll fast-forward your future.



Applied Mathematics and Statistics

Major (BS), BS/MS, BS/MBA, BS/MPH, Minor
Department of Applied Mathematics & Statistics
<http://www.ams.stonybrook.edu>

Stony Brook's Department of Applied Mathematics and Statistics is unique among leading research universities in providing a single unified academic home for applied mathematics, statistics and operations research. The department offers a major focusing in core areas of mathematics, such as geometry and algebra, as well as computational biology, quantitative finance and operations research. The major prepares graduates for quantitative careers in business.

About half of the program's majors enter graduate or professional programs, primarily in statistics, operations research, computer science, and business management. Others go directly into professional careers as actuaries, programmer analysts, management trainees, and secondary school teachers. Employment opportunities exist in government, industry, and the financial sector.

One of the most popular careers is actuarial science. Many of the program's courses cover material on the actuarial exams, and there is an additional review course for the first actuarial exam. Students can pass up to five actuarial exams based on their coursework.

Bioengineering

Minor
Department of Biomedical Engineering
<http://www.bme.sunysb.edu/bme>

The Bioengineering minor with track specialization is designed for College of Arts and Sciences students who wish to obtain a more thorough understanding of how physical forces in the natural world influence biological systems. Coursework introduces these concepts and shows how an engineering approach can be useful in dealing with questions

in biology and medicine. The program serves as an excellent background for students who wish to prepare for graduate study in bioengineering or a related field, or for a career in which an understanding of engineering concepts would provide an advantage.

Biomaterials

Minor
Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

The Biomaterials minor is designed for students enrolled in Bachelor of Engineering (BE) degree programs who wish to obtain an understanding of how materials interact with the human body and how engineering materials can be designed to serve physiological functions. The minor includes a comprehensive selection of courses in materials science, biomechanics, and biology, as well as study of fluids and electricity as they relate to human physiology.

The program serves as an excellent background for engineering students who wish to prepare for graduate education in medicine, bioengineering, and the biosciences or a related field, or for a career in which an understanding of biological concepts is essential.

Biomedical Engineering

Major (BE), BE/MS
Department of Biomedical Engineering
<http://www.bme.sunysb.edu/bme>

The Biomedical Engineering major provides an engineering education, along with a strong background in the biological and physical sciences. It is designed to enhance the development of creativity and collaboration through study of a specialization within the field of biomedical engineering. Areas of specialization include: Biomechanics, Biomaterials, Bioelectricity/Bioimaging, and Molecular and Cellular Biomedical Engineering. Teamwork, communication

skills, and hands-on laboratory and research experience are emphasized.

The curriculum provides students with the underlying engineering principles required to understand how biological organisms are formed and how they respond to their environment. Core courses provide depth within the broad field of biomedical engineering.

Biomedical engineers design and develop materials, processes, and devices to prevent, diagnose, and treat disease, to rehabilitate patients, and to generally improve health. Stony Brook's graduates prepare for professions in biomedical engineering, biotechnology, pharmaceuticals, medical technology, academia, and government. Potential employers include colleges and universities, hospitals, government, research institutes and laboratories, and private industry.

Chemical & Molecular Engineering

Major (BE), BE/MBA
Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

This program meets the expanding demand for chemical engineers in the nanotechnology, nutraceutical, pharmaceutical, environmental, and energy industries. It emphasizes engineering at the molecular level rather than traditional largescale process engineering.

The program provides students with knowledge in the basic physical sciences, mathematical techniques, and computational modeling tools that form the foundation of modern chemical and molecular engineering. Courses prepare students to solve complex problems involving scientific, ethical, and moral considerations, and to communicate effectively as members of interdisciplinary teams. Students can specialize in areas such as Pharmacology, Materials Science, Polymer Science, Tissue Engineering, and Business. Industrial and research-oriented internships are emphasized.

Employment opportunities for graduates of the program include high technology industries and institutions engaged in research and manufacturing related to nanotechnology, pharmaceuticals, biotechnology, future fuels, waste management, and the synthesis of new materials.

Civil Engineering

Major (BE)

Department of Mechanical Engineering

<http://me.eng.sunysb.edu>

Stony Brook University's new Civil Engineering program will begin by admitting freshmen into the undergraduate major in the fall of 2012.

The B.E. Civil Engineering degree will prepare students with a breadth and depth in the technical knowledge so that they can work immediately in most areas of the profession, including: geotechnical engineering; environmental engineering; hydraulics; structural engineering; construction management; and transportation/traffic engineering. The program will reside within the Department of Mechanical Engineering.

The undergraduate program offers a balanced approach to Civil Engineering education. Our Civil Engineering courses teach students the fundamentals of engineering design, as well as potential applications. Students are taught how to use computer software to expedite the design process, and they are also taught how to balance engineering designs with economic constraints.

Students take a common core of Civil Engineering courses, and choose from one of the following tracks to complement their depth requirement in Civil Engineering:

- Transportation Engineering Track
- Geotechnical Engineering Track
- Environmental Engineering Track
- Structural Engineering Track

The program is also designed to give students a solid foundation in engineer-

ing and science. Students take courses in chemistry, physics, and math, in addition to a core set of engineering courses common to most engineering disciplines. During their senior year, undergraduate students work under supervision on a two-semester design project.

Computer Engineering

Major (BE), BE/MS

Department of Electrical and

Computer Engineering

<http://www.ece.sunysb.edu>

Computers in the form of microprocessors or microcontrollers are an integral component in almost all modern electronic systems, including those in automobiles, appliances, medical instrumentation, manufacturing automation, consumer electronics, and avionics. Microcontroller-based systems will play a critical role as society transitions to a "green" economy.

Computer Engineering is based on mathematics, physics, circuit theory, electronics, digital systems, and computer science, and includes the study of embedded microprocessor system design, computer architecture, software engineering, operating systems, and software tools.

Students are prepared for professional careers or graduate studies in the electrical and computer engineering fields. The curriculum provides a solid education in the fundamentals of computer engineering, digital hardware and software, engineering science, engineering design, mathematics, and the natural sciences.

Computer Science

Major (BS), BS/MS, BS/MBA, Minor

Department of Computer Science

<http://www.cs.sunysb.edu>

Computer science is the study of computer systems, including the architecture of computers, development of computer software, information processing, com-

puter applications, algorithmic problem-solving, and the mathematical foundations of the discipline. Stony Brook's program ranks among the nation's top 20.

Students study programming, database systems, software engineering, artificial intelligence, computer architecture, scientific visualization, multimedia, and computer graphics. They are prepared to develop software systems for diverse applications in communications, business, medicine, telecommunications, internet technology, and financial services. Students majoring in Computer Science have the opportunity to pursue one of three different specializations: human-computer interaction, game programming, and information assurance.

Many students prepare for their professional careers through internships at local companies. Career opportunities include developing software systems for a diverse range of applications such as: user interfaces; networks; databases; forecasting; web technologies; and medical, communications, satellite, and embedded systems. Many are employed in the telecommunication and financial industries, and some are self-employed as heads of software consulting companies.

Electrical Engineering

Major (BE), BE/MS, BE/MBA, Minor

Department of Electrical and

Computer Engineering

<http://www.ece.sunysb.edu>

With the explosion of growth in the high-tech industry, the definition of what it means to be an "electrical engineer" has expanded. Electrical engineering is central to the fast-growing industries of communications, computers, lasers, electro-optics, robotics, and consumer electronics. Current growth areas include telecommunications, signal processing, optoelectronics, microelectronics, pattern recognition, machine vision, artificial intelligence, and robotics.



Students apply fundamental scientific and mathematical principles to learn about the design of communication systems, signal processing, control systems, semiconductor electronics, circuits, microprocessors, and instrumentation. The program provides a sequence of laboratory and design courses and the opportunity to engage in research and industrial projects with faculty.

Students are prepared students for professional careers or graduate studies in the electrical engineering field. The program provides students with knowledge in engineering science, engineering design, mathematics, and the natural sciences. Development of non-technical skills such as communication and teamwork is also emphasized. Electrical Engineering students may follow the general track, or choose a specialization in microelectronics or telecommunications.

Electronic, Optical, & Magnetic Materials

Minor

Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

The minor in Electronic, Optical, and Magnetic Materials is for students who seek to obtain a more thorough understanding of the engineering sciences. Emerging technologies in wireless communication, data

storage and transmission, sensors, medical diagnostics, and semiconductor manufacturing require graduates with an understanding of electronics design, electromagnetic theory, and electronic and magnetic materials. The courses in the minor provide the student with a broad introduction to the engineering science principles and applications associated with electronic, optical, and magnetic materials.

Engineering Science

Major (BE), BE/MS

Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

Engineering Science reflects the multidisciplinary nature of 21st century engineering. The sequence of design and technical courses prepares students for careers in a variety of engineering-based industries, including communications, computing, biomaterials, and aerospace.

The first two years of the program provide students with a foundation of scientific and mathematical skills. During the next two years, students choose one of seven specializations: biomedical engineering, mechanical and manufacturing engineering, electrical engineering, materials science and engineering, civil and environmental engineering, nanoscale engineering, and engineering management.

The program provides an engineering education that covers fundamental aspects of engineering design, physical and chemical sciences, mathematics, and materials science and engineering, while also providing flexibility so that students can create a track tailored to their particular academic and career interests in a traditional or emerging discipline.

Engineering and Technology Entrepreneurship

Minor

Department of Electrical and Computer Engineering
<http://www.ece.sunysb.edu>

The purpose of the Engineering and Technology Entrepreneurship minor is to expose engineering students to entrepreneurial skills; and to expose non-engineering students to various technology entrepreneurship skills.

Environmental Engineering

Minor

Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

Environmental engineering is the application of science and engineering principles to improving the environment (air, water, and/or land resources), providing health-

ful water, air and land for human habitation and for other organisms, and investigating the possibilities for remediation of polluted sites. Environmental engineering also involves design and application of technology, including development of new materials, in support of the principles of sustainability and green manufacturing.

This minor emphasizes the chemical mechanisms at work behind environmental processes that govern production and transport of pollutants, bioavailability and toxicity, changing ecological and geochemical factors, and design of remediation and pollution prevention methodologies. It also provides coursework on materials and technology development for sustainable development and manufacturing.

Information Systems

Major (BS), BS/MBA, Minor
Department of Computer Science
<http://www.cs.sunysb.edu>

The Information Systems major prepares its graduates to design and build computerized data processing and decision support systems. Information Systems students learn how to build the systems that manage the information required in industries including advertising, retail, finance, insurance, manufacturing, biotechnology, pharmaceutical, medical imaging, air traf-

fic control, satellite communications, and national defense. Career opportunities include top level design and supervision of a large variety of software systems, including online internet transactions, security, database management, network design, company internet portals, simulation tools and video games.

The program emphasizes the design and implementation aspects of large-scale information systems as well as managerial and organizational issues, and it balances development of system engineering skills with learning to deliver reliable systems on time and within budget. Throughout the program, students are exposed to diverse application areas ranging from traditional business, finance, and accounting through telecommunications, networks, multimedia, and database management, to computer aided design and industrial production management systems. Students may design their own specialization, or complete one of the following specializations: Business and Economics; Psychology; or Technological Systems Management.

Manufacturing Engineering

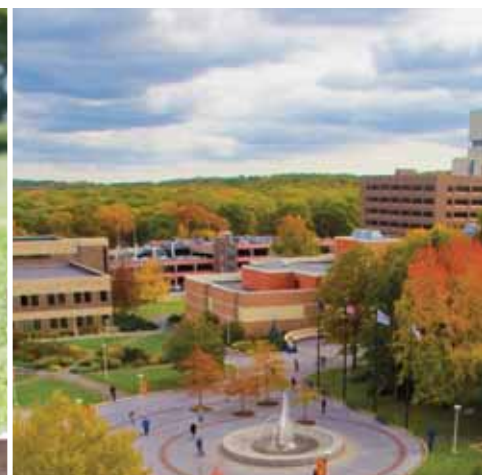
Minor
Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

The minor in Manufacturing Engineering is suitable for students who seek to obtain a more thorough understanding of the engineering sciences. The rapidly changing nature of technology in manufacturing creates a need for graduates with a background in such areas as modern materials processing, design, thermodynamics, statistics, and analysis.

Materials Science

Minor
Department of Materials Science & Engineering
<http://www.matscieng.sunysb.edu>

The development of new materials and research into the engineering applications of materials are critical to a wide variety of industries including aerospace, automotive, energy, electronics, environmental, medical instrumentation, advanced computing, and defense-related companies. The sequence of courses included in the minor in Materials Science provides a firm background for students seeking employment in materials-related industries or those who will pursue graduate study in related fields.



Mechanical Engineering

Major (BE), BE/MS, Minor

Department of Mechanical Engineering

<http://me.eng.sunysb.edu>

Mechanical engineering is one of the core disciplines of engineering and it encompasses a large number of subdisciplines in both traditional and leading edge technologies. It is concerned with activities such as energy conversion, power generation, design, and manufacturing. Mechanical engineers work in areas such as energy, design, transportation, power generation, manufacturing, aerospace, computer, and household product industries.

Emerging technologies in biotechnology, materials science and nanotechnology will create new job opportunities for mechanical engineers. While the majority of our graduates are immediately employed in industry, a significant percentage pursues graduate study. Most of the students entering graduate schools continue with mechanical engineering studies. However, some go to law, business, and medical schools.

The curriculum provides students with a core education in mathematics and the physical sciences, along with courses covering thermal processes and fluid mechanics, mechanical design, solid mechanics, and the dynamic behavior and control of mechanical systems. Students also take courses that introduce them to the use of advanced computational methods for engineering design and analysis, and data processing and analysis. A series of laboratory courses introduces them to sensors and electronics, modern instrumentation and experimental techniques used in engineering for tasks ranging from product design, evaluation, and testing to research.

The Mechanical Engineering Department also provides students with the opportunity to build and test

an interactive robot, a fully functioning off-road "Baja" vehicle, or a solar powered racing boat. Stony Brook's student teams (Robotics, Solar Boat, and SBU Motorsports) have placed high in national and international competitions.

Nanotechnology Studies

Minor

Department of Materials Science & Engineering

<http://www.matscieng.sunysb.edu>

The minor in Nanotechnology Studies (NTS) is an interdisciplinary, research-intensive program for students in the College of Engineering and Applied Sciences or the College of Arts and Sciences. The coursework provides a broad background in the science, design, manufacture, and societal, health, and environmental impacts of nanomaterials and nanoscale structures and their applications in engineering and health related areas. A minimum of two semesters of research in the students' own major areas, as well as choice of technical electives, provide knowledge and skills for students planning to seek employment or graduate studies in fields related to engineering, business, policy, or the broader impact of nanotechnology.

Physical Metallurgy

Minor

Department of Materials Science and Engineering

<http://www.matscieng.sunysb.edu>

This minor is for students seeking a more thorough understanding of the engineering sciences. Physical metallurgy is the study of the structure of metals and its influence on material properties and performance. It is an essential component of many areas of mechanical, manufacturing, civil, and materials engineering in the aerospace, automobile, transportation, energy, environmental, biomedical, and electronics

industries as well as in engineering research and design for military and government applications.

Technological Systems Management

Major (BS), BS/MBA, Minor

Department of Technology and Society

<http://www.stonybrook.edu/est>

This program integrates a foundation in the natural sciences, engineering, applied sciences, or environmental studies with applications in technology systems, assessment, and management. The Department also offers a minor in Technological Systems Management.

The major prepares students for careers in government, industry, or education in positions such as manager of computer network systems, manager of information systems, quality control specialist, systems or environmental analyst, technical sales representative, or technology trainer/educator. Students are also prepared for advanced study in areas such as business, law, education, policy analysis, and industrial or environmental management.

Students develop understanding of the characteristics, capabilities, and limitations of current and emerging technologies. The Department applies engineering concepts that underlie technological change and that form the bridge from engineering to other disciplines.

Future-Oriented Career Paths

Specific predictions by the U.S. Department of Labor's Bureau of Labor Statistics:

Jobs for civil engineers are expected to increase much faster than the average for all occupations through 2018 (by 24% between 2008 and 2018). More civil engineers will be needed to design and build things as the population grows. For example, they will need to fix and replace buildings and roads as they continue to become old, unsafe, and worn out. States with the highest employment level in this occupation include California, Texas Florida, New York, and Pennsylvania.

Jobs for actuaries are expected to increase 21 percent through 2018. Actuaries will be needed to develop, price, and evaluate a variety of insurance products and calculate the costs of new risks. The growing popularity of annuities, a financial product offered primarily by life insurance companies, will also spur demand.

Jobs for statisticians are projected to grow 13 percent through 2018. Technological advances are expected to spur demand for statisticians. Ever-faster computer processing allows statisticians to sort through large amounts of data that would not have been analyzed in the past. As pharmaceutical companies develop new treatments and medical technologies, biostatisticians will be needed to do research and clinical trials.

Biomedical engineers are expected to have employment growth of 72 percent through 2018. The aging of the population and a growing focus on health issues will drive demand for better medical devices and equipment designed by biomedical engineers.

Computer hardware engineers are expected to have employment growth of 4 percent through 2018. Much of this growth is expected to take place in the computer systems design and related services industry.

Electrical engineers are expected to have employment growth of 2 percent through 2018. Although strong demand for electrical devices should spur job growth, international competition will limit employment growth. Electrical engineers working in firms providing engineering expertise and design services to manufacturers should have better job prospects.

Mechanical engineers are expected to have employment growth of 6 percent through 2018. Mechanical engineers are involved in the production of a wide range of products, and continued efforts to improve those products will create continued demand for their services. In addition, some new jobs will be created through the effects of emerging technologies in biotechnology, materials science, and nanotechnology.

Jobs for computer software engineers are expected to increase by 32 percent through 2018. This occupation will see a large number of new jobs, with more than 295,000 created between 2008 and 2018. Demand for computer software engineers will increase as computer networking continues to grow.

Network and computer systems administrators are expected to have employment growth of 23 percent through 2018. The increasing adoption of mobile technologies means that more establishments will use the Internet to conduct business online. This growth translates into a need for systems administrators who can help organizations use technology to communicate with

employees, clients, and consumers. Growth will also be driven by the increasing need for information security.

Database administrators are expected to have employment growth of 20 percent through 2018. Demand is expected to increase as organizations need to store, organize, and analyze increasing amounts of data. In addition, a growing number of these workers will be needed to protect databases from attack.

Network systems and data communications analysts are expected to have employment growth of 53 percent through 2018. This occupational category includes network architects and engineers, as well as Web administrators and developers.

Computer scientists should enjoy excellent job prospects, with expected employment growth of 24 percent through 2018. Very rapid growth in computer systems design and related services industry, as well as the software publishing industry, will drive demand. In addition, the growing emphasis on information security will lead to new jobs.

Computer systems analysts are expected to have employment growth of 20 percent through 2018. The demand for computer networking, Internet, and intranet functions will drive demand for computer systems analysts who are knowledgeable about systems development and integration.

Environmental engineers are expected to have employment growth of 31 percent through 2018. More environmental engineers will be needed to help companies comply with environmental regulations and to develop methods of cleaning up environmental hazards.



www.stonybrook.edu/admissions



Priority Application Deadline:
January 15

E-mail: enroll@stonybrook.edu
Phone: (631) 632-6868