



The Hottest Careers & Fastest Growing Occupations

RED HOT MAJORS, MINORS, & COMBINED DEGREE PROGRAMS

Applied Mathematics & Statistics:

Bachelor of Science (BS), Bachelor of Science/Master of Science (BS/MS), Bachelor of Science/Master of Business Administration (BS/MBA), Bachelor of Science/Master of Public Health (BS/MPH), Minor

Bioengineering: *Minor*

Biomaterials: *Minor*

Biomedical Engineering:

Bachelor of Engineering (BE), Bachelor of Engineering/Master of Science (BE/MS)

Chemical & Molecular Engineering:

Bachelor of Engineering (BE)

Civil Engineering:

Beginning Fall 2011 for Freshmen

Bachelor of Engineering (BE), Minor

Computer Engineering:

Bachelor of Engineering (BE), Bachelor of Engineering/Master of Science (BE/MS)

Computer Science: *Bachelor of Science (BS),*

Bachelor of Science/Master of Science (BS/MS), Bachelor of Science/Master of Business Administration (BS/MBA), Minor

Electrical Engineering:

Bachelor of Engineering (BE), Bachelor of Engineering/Master of Science (BE/MS), Minor

Electronic, Optical, & Magnetic Materials:

Minor

Engineering Science:

Bachelor of Engineering (BE), Bachelor of Engineering/Master of Science (BE/MS), Bachelor of Science/Master of Science (BS/MS), Minor

Environmental Engineering: *Minor*

Information Systems: *Bachelor of Science*

(BS), Bachelor of Science/Master of Business Administration (BS/MBA)

Manufacturing Engineering: *Minor*

Materials Science: *Minor*

Mechanical Engineering:

Bachelor of Engineering (BE), Bachelor of Engineering/Master of Science (BE/MS), Minor

Nanotechnology Studies: *Minor*

Physical Metallurgy: *Minor*

Science & Engineering: *Minor*

Technical Leadership: *Minor*

Technological Systems Management:

FUTURE-ORIENTED CAREER PATHS

Stony Brook University's College of Engineering and Applied Sciences (CEAS) offers many different exciting bachelor degree programs and accelerated combined degree programs that will give you a competitive edge in tomorrow's job market.

Experts cited by the College Board have predicted that **the top 10 occupations with the most job openings in 2016** requiring a bachelor's degree will include computer software engineers; computer systems analysts; network systems and data communications analysts; and network and computer systems administrators.

Experts also predict that **the top 50 fastest-growing occupations** will include network systems and data communications analysts, computer software engineers, computer systems analysts, database administrators, network and computer systems administrators, and environmental engineers.

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

- ★ **Jobs for biomedical engineers** will grow much faster than the average for all careers through 2016, with a 21 percent employment growth over the coming decade.
- ★ **Jobs for computer scientists and computer systems administrators** will grow much faster than the average for all professions through 2016. It is encouraging to note that there should be more job openings for computer scientists than people qualified to fill them.
- ★ **Job growth for network systems and data communications analysts** should be both extremely fast and large through 2016. In fact, government economists expect jobs for network systems and data communications analysts to grow faster than any other career they studied,

from 261,000 in 2006 to 401,600 in 2016, a projected increase of 53 percent.

- ★ **Jobs for computer and information systems managers** will grow faster than the average for all careers through 2016, with an anticipated increase of 27 percent from 309,200 jobs in 2006 to 392,500 in 2016. What's more, a shortage of technical workers should mean that there will be many more job openings than qualified job hunters.
- ★ **Jobs for actuaries** will grow much faster than the average for all occupations through 2016. If you can pass the actuarial exams, you'll face little competition.
- ★ **Employment of computer software engineers** will increase by 38 percent over the 2006 to 2016 period, which is much faster than the average for all occupations. In fact, this profession is one of the fastest-growing fields. This occupation will generate about 324,000 new jobs over this ten-year period, one of the largest employment increases of any occupation.
- ★ **Jobs for environmental engineers** will grow much faster than the average for all careers through 2016, growing from 54,300 jobs in 2006 to 68,200 in 2016, a 25 percent change. An environmental engineering job is one of the most promising and, perhaps, one of the more attractive for prospective engineers as we tackle the most important environmental problems.
- ★ **Jobs for database administrators** will grow at a much faster rate than other careers through 2016. In fact, this profession is one of the fastest-growing fields, anticipated to grow from 119,400 jobs to 153,500 jobs. There will probably be more jobs than qualified people to fill them.

College of Engineering & Applied Sciences Programs for Undergraduates

APPLIED MATHEMATICS & STATISTICS

BS DEGREE, 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 the studies of computational biology, quantitative finance and operations research. The Applied Mathematics and Statistics major is a professional B.S. program that prepares graduates for quantitative careers in business with a toolkit of applicable mathematical techniques and problem-solving strategies.

About half of the Applied Mathematics 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. Mathematical strategies in investment have created exciting opportunities for applied mathematicians on Wall Street.

One of the most popular careers for Applied Math majors is in actuary. Many of the Applied Math courses cover material on the actuarial exams and there is an additional review course for the first actuarial exam. Altogether, 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 minor in Biomaterials is designed for students enrolled in programs leading to the Bachelor of Engineering (B.E.) degree 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 BE DEGREE, BE/MS

Department of Biomedical Engineering

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

In a rigorous, cross-disciplinary training and research environment, 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. The program in Biomedical Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET).

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

CHEMICAL & MOLECULAR ENGINEERING

BE DEGREE

Department of Materials Science & Engineering

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

The program in Chemical and Molecular Engineering is designed to meet 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 large-scale process engineering.

In a rigorous cross-disciplinary environment, 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. A broad spectrum of courses prepares students to assimilate and apply their knowledge creatively to solve complex problems involving not only scientific but also ethical and moral considerations, and utilize effective communication skills for working in an interdisciplinary team. Students have the option to specialize in several areas, such as Pharmacology, Materials Science, Polymer Science, Tissue Engineering and Business. Industrial and research-oriented internships are emphasized. The program in Chemical and Molecular Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET).

Employment opportunities for graduates of the program include high technology industries and institutions that are engaged in research and advanced manufacturing related to nanotechnology, pharmaceuticals, biotechnology, future fuels, waste management, and the synthesis of new materials. The program's mission is to serve the community by becoming a resource for regional economic development and to serve the nation by training students who can assume leadership in technological innovation, public service, and ethical standards. Its goal is to achieve international recognition as a center of excellence in molecularly based chemical engineering education and research.

CIVIL ENGINEERING **BE DEGREE, MINOR**

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 2011.

The program aligns with Stony Brook University's overall mission of providing multidisciplinary engineering education and economic development. 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. Students take a common core of Civil Engineering courses, and can specialize in the areas of Transportation, Environmental, or structural engineering. The program is also designed to give students a solid foundation in engineering and science. Students take courses in chemistry, physics, and math, in addition to a core set of engineering courses common to most engineering disciplines.

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.

During their senior year, undergraduate students work under supervision on two semester design projects. To satisfy the requirement of the degree of B.E. Civil Engineering, students must 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

COMPUTER ENGINEERING **BE DEGREE, BE/MS**

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

There is a growing demand for computer engineers as the application and use of electronic systems continues to rapidly increase. For example, computers in the form of microprocessors or microcontrollers are an integral compo-

nent in almost all modern electronic systems, including those in automobiles, appliances, medical instrumentation, manufacturing automation, consumer electronics, and avionics. Furthermore, 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. It is a response to the ever-increasing use of computers in every sphere of society, creating high demand for engineers with a balanced knowledge of both hardware and software.

The Computer Engineering major is accredited by the Accreditation Board for Engineering and Technology (ABET). The objective of the computer engineering program is to give students an excellent preparation 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 and an extensive study of digital hardware and software, along with a depth and breadth of knowledge in engineering science, engineering design, mathematics, and the natural sciences.

COMPUTER SCIENCE **BS DEGREE, 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, computer applications, algorithmic problem-solving, and the mathematical foundations of the discipline. Stony Brook's program ranks among the nation's top 20 and is accredited by the Accreditation Board for Engineering and Technology (ABET).

Students study programming, database systems, software engineering, artificial intelli-



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gence, 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. Graduates pursue careers in top technical and managerial positions in industry and research, and consulting in universities and industry. Students majoring in Computer Science also have sufficient freedom in the program to pursue other academic interests in the liberal arts, sciences, and engineering to complement their study of computer science, as well as the opportunity to pursue one of three different specializations:

The specialization in human-computer interaction emphasizes both the psychology aspects of effective human-computer interactions and the technical design and implementation of systems for those interactions.

The specialization in game programming prepares students for a career as either a professional game developer or researcher. Game graphics and multiplayer network programming techniques are stressed. The specialization also emphasizes original game development, game design methodology, and team projects and presentations.

The specialization in information assurance (IA) has been developed as part of the University's establishment of a Center for Cybersecurity and designation by the National Security Agency as a Center of Academic Excellence in Information Assurance Education. This is included in a multifaceted effort to expand and increase information assurance education and research. The specialization deals with the principles, design, development, and management of networks and software systems that provide high levels of assurance in the confidentiality, availability, and integrity of electronic information.

Many students prepare for their professional careers through internships at local companies. Computer science graduates are recruited heavily, and 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.

THE HONORS PROGRAM IN COMPUTER SCIENCE

The Honors Program in Computer Science, a highly selective academic program within the major in Computer Science, offers a specially designed curriculum to a limited number of exceptional students. The program is open to freshmen and to continuing students. To be admitted as a freshman, students must demonstrate overall academic excellence by achieving a combined SAT score of 1300, an unweighted high school average of at least 93, and high grade averages in mathematics and the natural sciences.

Honors course offerings include introductory course sequences in programming and in the foundations of computing, advanced courses on selected topics that reflect active research areas within the Department, and a two-semester senior honors project. Students will be able to take at least one honors course each semester throughout a four-year program of study. Honors program students must complete the regular requirements of the Computer Science major, but up to two-thirds of the required computer science courses can be covered by honors courses.

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. Students who successfully complete the honors program and who decide to enroll in the BS/MS program will be considered for a tuition waiver in the fifth year as well as for a graduate student assistantship.

ELECTRICAL ENGINEERING

BE DEGREE, BE/MS, 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. And the growth of this field shows no signs of slowing, with electrical engineers as much in demand as ever. With computers, networking and systems playing key roles in the operations of virtually all businesses today, electrical engineers can plan on being in high demand for years to come.

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. The Electrical Engineering major is accredited by the Accreditation Board for Engineering and Technology (ABET).

The objective of the Electrical Engineering program is to give students an excellent preparation for professional careers or graduate studies in the electrical engineering field. The program provides students with depth and breadth of knowledge in engineering science and engineering design as well as in 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, which is completed in the junior and senior years.



ELECTRONIC, OPTICAL, & MAGNETIC MATERIALS

MINOR

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

The Department of Materials Science and Engineering offers the minor in Electronic, Optical, and Magnetic Materials 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

BE DEGREE, BE/MS, BS/MS,

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

Engineering Science reflects the multidisciplinary nature of 21st century engineering. Students can take advantage of the newest technologies that will benefit society because they understand the materials and forces of nature, and possess the problem-solving skills to adapt to changing technologies. 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 Engineering Science degree program provide students with a foundation of scientific and mathematical skills for a broad choice of professional engineering pursuits. During the remaining two years, students choose one of the following seven specializations: biomedical engineering, mechanical and manufacturing engineering, electrical engineering, materials sci-

ence and engineering, civil and environmental engineering, nanoscale engineering, and engineering management.

Reflecting the breadth and variety of topics falling within the domain of engineering science, the Department also offers seven minors that afford undergraduate students the opportunity to enhance their engineering or science studies with knowledge in a specific area. In addition to the minor in Materials Science, the Department offers minors in Biomaterials; Electronic, Optical, and Magnetic Materials; Manufacturing Engineering; Environmental Engineering; Physical Metallurgy; and Nanotechnology Studies.

The program is accredited by the Accreditation Board for Engineering and Technology (ABET) and has a mission aimed toward providing an engineering education that thoroughly 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. The program is designed to provide core competency and skills in communication, design, and research while preparing students to participate in a rapidly evolving high-technology environment.

ENVIRONMENTAL ENGINEERING

MINOR

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

With the current emphasis on environmental issues, environmentally-friendly careers are on the rise. Environmental engineering is the application of science and engineering principles to improving the environment (air, water, and/or land resources), to providing healthful water, air and land for human habitation and for other organisms, and to investigate 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.

The coursework of the 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. The minor also provides coursework on materials and technology development for sustainable development and manufacturing.

INFORMATION SYSTEMS

BS DEGREE, 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, finance, insurance, manufacturing, medical imaging, air traffic control, satellite communications, and national defense. Building these systems requires advanced skills in meeting exacting performance standards.

Information systems skills are crucial in a variety of industries, such as advertising, retail, finance, insurance, manufacturing, biotechnology, pharmaceutical, medical imaging, video games, air traffic control, satellite communications, and national defense.

Information systems majors are the users' advocates. Career opportunities include top level design and supervision of a large variety of software systems, including on-line internet transactions, security, database management, network design, company internet portals, simulation tools and video games.

Engineering and familiarity with application areas in computer science are key factors in the program. The emphasis, however, is on advanced databases and data communication, rather than computer hardware and computer science theory. Students also complete business-related courses, acquiring the knowledge essential for information systems



College of Engineering & Applied Sciences Programs for Undergraduates

applications in business operations.

The program is technically oriented, emphasizing the design and implementation aspects of large-scale information systems as well as the more traditional 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: specialization in Business and Economics; specialization in Psychology; or specialization in Technological Systems Management.

MANUFACTURING ENGINEERING MINOR

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

The Department of Materials Science and Engineering offers the minor in Manufacturing Engineering, suitable for Engineering Science students or for non-Engineering Science students who seek to obtain a more thorough understanding of the engineering sciences. The rapidly changing nature of technology in the manufacturing industries creates a need for graduates with a background in such areas as modern materials processing, design, thermodynamics, statistics, and analysis. The courses in the minor in Manufacturing Engineering provide the student with a broad introduction to the engineering science principles and applications associated with manufacturing engineering and provide important skills for careers in manufacturing, process and systems engineering, and quality engineering.

MATERIALS SCIENCE

MINOR

Department of Materials Science and 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. Without a clear understanding of the relationship between material structure, properties, and processing, achieving the performance necessary to meet the needs of current and future high technology applications would be impossible. For this reason, industrial and research laboratories value graduates with an understanding of materials science and engineering issues in addition to their other engineering or physical science knowledge. 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

BE DEGREE, 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 that are at the heart of both traditional and leading edge technologies. It is a broad profession concerned with activities such as energy conversion, power generation, design, and manufacturing.

Mechanical engineers work in a variety of areas, including energy, design, transportation, power generation, manufacturing, aerospace, computer and household product industries.

The theoretical and technical bases of knowledge include the pure sciences, mathematics, and the engineering sciences, especially the mechanics of solids and fluids, thermodynamics, and kinemat-

ics. Students should have an aptitude and interest in the physical sciences and the language of mathematics, and the ability to apply these to societal needs.

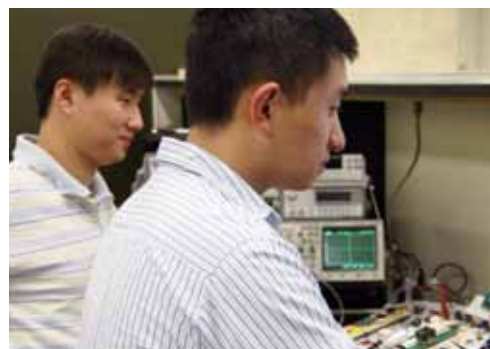
The program in Mechanical Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET) and the educational objectives recognize that students have a variety of career objectives and a choice of industrial environments in which to pursue them. Jobs in the field of mechanical engineering are in excess in today's job market.

Emerging technologies in biotechnology, materials science and nanotechnology will create new job opportunities for mechanical engineers. Also, although total employment in manufacturing industries is expected to decline, employment of mechanical engineers in manufacturing is expected to actually increase because the demand for improved machinery and machine tools will grow, and industrial machinery and processes have become increasingly complex.

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 mechanical engineering curriculum provides students with a core education in mathematics and the physical sciences along with a broad sequence of 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 as well as 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

College of Engineering and Applied Sciences

The minor in Nanotechnology Studies (NTS) is an interdisciplinary, research-intensive program intended for students in majors from the College of Engineering and Applied Sciences or the College of Arts and Sciences who wish to learn about the emerging field of nanotechnology. The coursework in the minor 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. The inclusion of a minimum of two semesters of research in the students’ own major areas, as well as choice of technical electives, allow for integration into current interests and disciplines, and provide knowledge and skills valuable to students planning to seek employment or graduate studies in fields related to the engineering, business, policy or the broader impact of nanotechnology.

PHYSICAL METALLURGY

MINOR

Department of Materials Science and Engineering

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

The Department of Materials Science and Engineering offers the minor in Physical Metallurgy, suitable for students who seek to obtain 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 govern-

ment applications.

The courses in the minor provide the student with a broad introduction to the engineering science principles and applications associated with physical metallurgy.

SCIENCE & ENGINEERING

MINOR

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

Because scientists and engineers increasingly work together in industry, government, and higher education, Stony Brook offers an interdisciplinary minor in Science and Engineering. The interdisciplinary minor in Science and Engineering is designed to give students an appreciation of the many fields in science and engineering and of the relationships of these fields to each other and to society.

Through the minor, students receive broad exposure to several science and engineering disciplines represented at Stony Brook. This minor will also provide students with opportunities to study issues that scientists and engineers face today and to learn about future trends and research that will change the face of science and engineering in the 21st century. Technical writing and oral presentation skills are an integral part of the upper-level courses in this minor.

TECHNICAL LEADERSHIP

MINOR

The minor in Technical Leadership is offered through the Living Learning Center in Science and Engineering. The minor in Technical Leadership is designed to give students a mix of skills that are desirable for a successful technically-related career, but are not part of every major. Through the minor, students receive a broad exposure to communication, business and computer skills as well as an understanding of larger societal issues. These are skills that alumni, employers and graduate schools say lead to truly successful careers in science, engineering, and related areas.

TECHNOLOGICAL SYSTEMS MANAGEMENT

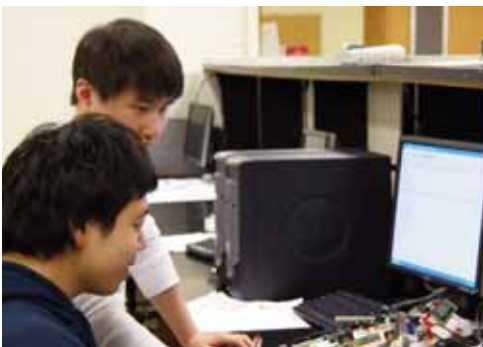
BS DEGREE, BS/MBA, MINOR

Department of Technology and Society
<http://www.stonybrook.edu/est>

The major in Technological Systems Management leads to a Bachelor of Science degree. The 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—in short, all professions and business ventures that are dependent on technological applications and implementation and in which project management is key to success. Students are also prepared for advanced study in areas such as business, law, education, policy analysis, and industrial or environmental management.

The Department’s focus is on technological advances that shape every facet of modern life. Students develop understanding of the characteristics, capabilities, and limitations of current and emerging technologies. Successful practices in government, industry, education, and personal life depend on such understanding. The Department applies engineering concepts that underlie technological change and that form the bridge from engineering to other disciplines. In this multidisciplinary approach, the Department provides one of the vehicles by which Stony Brook interacts with other universities and colleges, pre-college institutions, professional schools, government, and industry. Effective management of modern technologies requires use of tools from many domains: science and engineering, information technologies, economics, legal and regulatory practice, psychology and sociology, design and assessment.



College of Engineering & Applied Sciences Programs for Undergraduates

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 an exciting future.

Top National Rankings

CEAS is home to more than 1,400 undergraduate students, 900 graduate students, and a faculty of 170 engineers and applied scientists. Our alumni currently numbers more than 23,000.

Recent data shows that we rank 5th nationwide in the number of computer science bachelor degrees awarded, 14th in the number of electrical and computer engineering bachelor degrees awarded, 12th in the percentage of doctoral degrees, and 10th in the percentage of masters degrees awarded to women. In a recent survey, Stony Brook's undergraduate computer science program ranked 15th in the nation and 2nd in New York State.

Extraordinary Research Opportunities

Our faculty are top scientists and engineers who conduct cutting-edge research and write your textbooks. Undergraduate research projects take place in the very same labs used by leaders and innovators in your field of study. 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'll be able to perform your own original research and even get your own funding through the Research Experiences for Undergraduates Program and the Undergraduate Research and Creative Activities Program.

Valuable Internship Experience

To help you explore career paths and get the experience employers want, you'll be invited to do an internship with one of the many prestigious high technology corporations headquartered on Long Island, including Computer Associates, Data Device Corporation, The Omnicon Group, and Motorola. Or, perhaps you'll choose an internship with a national or multinational company such as BAE Systems, Citigroup, Estee Lauder, General Dynamics, Microsoft, or Northrop Grumman.

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.

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 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 the special classes, early research opportunities, personalized academic advising and small study groups to put you at the heart of a community where you can excel.

Engineering Scholars for Medicine

The Engineering Scholars for Medicine Program is a highly selective BE/MD program for freshman applicants who wish to pursue interests in both the engineering and medical fields.

A background in engineering has proven highly desirable for admission to medical school; engineers develop strong problem solving skills and tend to attack problems from several angles. This ingenuity is particularly important in developing new methods of treatment, technology, and medicine. Students accepted into this program are guaranteed admission to Stony Brook University's School of Medicine, provided they satisfy certain conditions for continuation.

THE GREENING OF AMERICAN JOBS

A recent study commissioned by the U.S. Conference of Mayors says that about 750,000 people work today in what can be considered green jobs, from scientists and engineers researching alternative fuels to designers of wind turbines and more energy-efficient products.

But that's less than one half of 1 percent of total employment. By 2038, another 4.2 million green jobs are expected to be added, accounting for 10 percent of new job growth over the next 30 years. The growth in "green" jobs will include many technology-related careers.

For example, the solar thermal industry employs more than 600,000 people today and the more than 3,400 solar energy sector companies are expected to create 440,000 jobs & \$325 billion in private investment by 2016. Another 85,000 people are employed in the wind industry today -- up from 50,000 a year ago. Despite economic uncertainty, the 3 major clean energy sectors increased their growth in revenues by 53% between 2007 and 2008.

The study asserts that by 2038 alternative energy will account for 40 percent of electricity production, with half of that coming from wind and solar. The report predicts 1.4 million green jobs related to engineering, research, consulting, and legal work will be generated by the shift to alternative energy and energy efficiencies.

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