

# Electrical Engineering and Computer Science

## Course 6

Electrical engineers and computer scientists are everywhere – in industry, academia, public service, start-ups and professions such as law, medicine and finance. They cover areas as diverse as computer and communication networks, semiconductor and solid state devices, nanoelectronics, lasers and photonics, robotics, biomedical engineering, computational biology, design and manufacturing, artificial intelligence, control and optimization, computer algorithms, software engineering, computer architecture, vision and graphics, financial analysis, power and energy systems, and many more. Modern conveniences such as the Internet, the World Wide Web, cell phones, wireless communication devices, and cryptography all arose from innovations in electrical engineering and computer science, and current work in the field holds promise for continued innovations in entertainment, robotics, medical devices, communications, and other areas. Electrical engineering and computer science technologies and advances are crucial to making the world a better place.

### **Electrical Engineering and Computer Science at MIT**

The Department of Electrical Engineering and Computer Science at MIT has a history of leadership in research in almost every area of the field: examples include artificial intelligence, computer architecture, software systems, theoretical computer science, communications theory, electronics, control and systems theory, plasma fusion, power and energy, and bioelectrical engineering. Department faculty and graduates have been leaders in inventions, innovations and industrial developments in robotics, public key encryption systems, molecular electronics, photosynthetic solar cells, new battery technologies, nano-scale devices, femto-second lasers, HDTV, carbon nanotubes, quantum dots, nanobiotechnology, wireless networks, operating systems, and computer science methods in medicine. The inventor of the World Wide Web is a member of our faculty and the consortium that oversees the Web is located in MIT's computer science

building. The Department's primary goal is to continue to be a world leader in professional education and research in electrical engineering and computer science. The Department is the largest at MIT, comprising somewhat less than half the School of Engineering and approximately one-quarter of the undergraduate body of the Institute.

### **Undergraduate Program**

EECS offers bachelor's degrees in Electrical Science and Engineering (6-1), in Computer Science and Engineering (6-3), or in Electrical Engineering and Computer Science (6-2). Each of these programs introduces students to major concepts in electrical engineering and computer science in an integrated and hands-on fashion. As students progress to increasingly advanced subjects, they gain considerable flexibility in shaping their own educational experiences. Foundation subjects build depth and breadth in areas ranging from circuits and electronics to applied electromagnetics and from principles of software development to signals and systems. Header subjects and laboratory provide mastery within EECS's subdisciplines. Advanced undergraduate subjects and a capstone project enable students to target their degree program toward in-depth mastery of areas matching their specific interests.

Students who do well in their chosen areas of interest are eligible for admission to our Masters of Engineering program, which enables students to earn Course 6 bachelor's and master's degrees simultaneously over a period of five or five and a half years. More than half of the EECS undergraduate students complete the Masters of Engineering program.

An interdepartmental curriculum involving rigorous training in both molecular biology and computer science is offered jointly by EECS and the Department of Biology. This program leads to a Bachelor of Science degree in Computer Science and Molecular Biology (6-7), and prepares students for careers in emerging areas

at the interface of biology and engineering – including pharmaceuticals, bioinformatics, and computational molecular biology.

### **Research**

At MIT, students may conduct supervised research within the Undergraduate Research Opportunities Program (UROP). UROP positions allow students to earn either wages or credit while participating in faculty research. Electrical engineering and computer science students work in virtually every research area of the Department, as well as across the Institute. Several hundred EECS students participate each term as well as during the summer.

Starting in Fall 2012, EECS will offer an Advanced Undergraduate Research Program in which students work with both faculty and industry mentors to complete a year-long project, in preparation for graduate school, industry, or creating a startup. Students who complete the program will earn a certificate in advanced undergraduate research in their chosen field of interest.

Facilities on the MIT campus for students in electrical engineering and computer science include those of the Laboratory for Information and Decision Systems, Research Laboratory of Electronics, Computer Science and Artificial Intelligence Laboratory, Laboratory for Electromagnetic and Electronic Systems, Microsystems Technology Laboratories, Media Laboratory, and the Plasma Fusion Center.

### **Post-Baccalaureate Opportunities**

The Department also offers Master of Science and doctoral degrees. Electrical Engineering and Computer Science students may join the Institute of Electrical and Electronic Engineers (IEEE) and Association of Computing Machinery (ACM) student branches. Our students are also eligible for election to two very active honor societies: Eta Kappa Nu, and Tau Beta Pi.

The Department's graduates enter industry in such fields as software engineering, systems and control, communications systems, operations research, theoretical computer science, digital signal processing,

optics, medical electronics, and microelectronics. Others choose finance and investment banking, technical and strategic consulting, and many found their own companies. Graduates of the Department often go on to Ph.D.s here and elsewhere, and attend professional schools of business, law, and medicine.

### **Contact Information**

Many of the important products and services in our society are based upon the work of electrical engineers and computer scientists. If you are interested in learning more about our undergraduate programs, please visit <http://www.eecs.mit.edu/academics-admissions/undergraduate-programs>, or contact:

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The MIT Course Catalog contains further information on the Institute, including all graduate and undergraduate courses and programs. Please visit the MIT Course Catalog website for more details at <http://web.mit.edu/catalog/index.html>.

2012