Electrical and Computer Engineering

Website (https://ece.northeastern.edu/)

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Electrical and computer engineering is a discipline that prepares graduates to solve problems across a diverse array of industries. Coursework is drawn from a curriculum that includes cutting-edge ECE technologies: embedded systems and Internet of Things, robotics and cyber-human systems, networking (mobile/wireless as well as the internet of the future), and Big Data analytics and machine learning. Northeastern University's historical strengths in ECE include communications and digital signal processing, power and control systems, power electronics, RF/microwave magnetic materials, device technologies, computer engineering, networking, and robotics. The Department of Electrical and Computer Engineering is deeply committed to training and educating the next generation of electrical and computer engineers through Northeastern's experiential learning model and comprehensive pedagogy. BS, MS, and PhD degrees are offered in both electrical and computer engineering.

Overview of Programs Offered

Please see the programs tab (p. 1) for a list of the department's academic programs.

Successful engineers need to organize and adapt information to solve problems. They also must work effectively in teams and communicate well. Therefore, the goal of the electrical engineering and computer engineering programs is to help students develop these skills and provide the appropriate technical background for a successful career.

The curricula are continuously assessed to ensure that graduates can achieve these goals and go on to succeed as professional electrical or computer engineers. The Bachelor of Science programs allow students sufficient flexibility within the standard eight academic semesters to earn a minor in nearly any department in the university. Typical minors might include physics, math, computer science, or business, but students might also organize their course of study to earn a minor in economics, English, or music.

The academic program is supported by extensive laboratory facilities for study and experimentation in computing, circuit analysis, electronics, digital systems, microwaves, control systems, semiconductor processing, very large-scale integration (VLSI) design, and digital signal processing. Students have access to state-of-the-art computing facilities, including numerous Linux and Windows-based workstations. Several introductory electrical and computer engineering courses meet in integrated lab-classrooms where students and professors, assisted by undergraduate and graduate teaching assistants, work together on both theoretical and practical aspects of a wide range of signal processing and computing systems.

Mission of the Department

The primary educational missions of the Department of Electrical and Computer Engineering are to educate undergraduate students so they have the opportunity to obtain successful careers in electrical and computer engineering and related disciplines and pursue advanced study, such as graduate study in engineering or related disciplines, and to educate graduate students so they can make meaningful contributions to the research and industrial communities.

Other Programmatic Features

More than 90% of department undergraduates take advantage of the cooperative education program. During the cooperative education phase of the program, the students' responsibilities grow as they gain theoretical and technical knowledge through applicable work experience. A second-year student might begin cooperative education experience in engineering from various entry points and progress by the senior year to a position with responsibilities similar to those of entry to midlevel engineers.

The department also offers significant research opportunities throughout all fields of electrical and computer engineering, including participating in research centers based in our department and college.

A senior-year design course caps the education by drawing on everything learned previously. Teams of students propose, design, and build a functioning electrical or computer engineering system—just as they might in actual practice.

Programs

Bachelor of Science in Computer Engineering (BSCmpE)

- Electrical and Computer Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-computer-engineering-bscmpe/)
- Computer Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/computer-engineering-bscompe/)

- Computer Engineering and Computer Science (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/computer-engineering-computer-science-bscompe/)
- Computer Engineering and Physics (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/computer-engineering-physics-bscompe/)

Bachelor of Science in Electrical Engineering (BSEE)

- Electrical and Computer Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-computer-engineering-bsee/)
- Electrical Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-engineering-bsee/)
- Electrical Engineering and Music with Concentration in Music Technology (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-engineering-music-concentration-music-technology-bsee/)
- Electrical Engineering and Physics (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-engineering-physics-bsee/)

Minors

- Biomedical Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/biomedical-engineering-minor/)
- Computational Data Analytics (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/computational-data-analytics-minor/)
- Computer Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/computer-engineering-minor/)
- Electrical Engineering (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/electrical-engineering-minor/)
- Robotics (https://catalog.northeastern.edu/undergraduate/engineering/electrical-computer/robotics-minor/)

Accelerated Programs

See Accelerated Bachelor/Graduate Degree Programs (https://catalog.northeastern.edu/undergraduate/engineering/accelerated-bachelor-graduate-degree-programs/#programstext)