The Department of Electrical and Computer Engineering offers two distinct Bachelor of Science programs: Bachelor of Science in electrical engineering (BSEE) and Bachelor of Science in computer engineering (BSCompE). A combined major is available in electrical and computer engineering for students who complete the requirements of both majors. In addition, a minor in electrical engineering, a minor in computer engineering, and a minor in biomedical engineering are available to qualified students throughout the university, including majors within the department.

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 program educational objectives of the Bachelor of Science programs are that graduates should (1) obtain successful careers in electrical and computer engineering and related disciplines through substantial technical contributions, continued employment, professional recognition, advancement in responsibilities, a professional network, and personal satisfaction; and (2) pursue advanced study such as graduate study in engineering or related disciplines, if desired.

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 electrical engineering, computer engineering, 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-based workstations and Windows-based personal computers, all connected to the Internet. Many courses are taught in one of the four computer-based teaching classrooms, where students work online and practice the theory presented in lecture while still in the classroom.

More than 90 percent of department undergraduates take advantage of the cooperative education program. During the cooperative work phase of the program, the students’ levels of responsibility grow as they gain theoretical and technical knowledge through academic work. A sophomore might begin cooperative work experience as an engineering assistant and progress by the senior year to a position with responsibilities similar to those of entry-level engineers.

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.

**BSCompE in Computer Engineering and Physics**

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified.

**NU Core Requirements**

See page Error! Bookmark not defined. for requirement list.

**Major GPA Requirement**

2.000 minimum GPA required in EECE courses

**Mathematics/Science Requirement**

Complete 63 semester hours in mathematics and science as indicated below.

**Required Mathematics/Science**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1151</td>
<td>General Chemistry for Engineers</td>
<td>4 SH</td>
</tr>
<tr>
<td>CS 1800</td>
<td>Discrete Structures</td>
<td>4 SH</td>
</tr>
<tr>
<td>with CS 1801</td>
<td>Recitation for CS 1800</td>
<td>0 SH</td>
</tr>
<tr>
<td>MATH 1341</td>
<td>Calculus 1 for Science and Engineering</td>
<td>4 SH</td>
</tr>
<tr>
<td>MATH 1342</td>
<td>Calculus 2 for Science and Engineering</td>
<td>4 SH</td>
</tr>
<tr>
<td>MATH 2321</td>
<td>Calculus 3 for Science and Engineering</td>
<td>4 SH</td>
</tr>
<tr>
<td>MATH 2341</td>
<td>Differential Equations and Linear Algebra for Engineering</td>
<td>4 SH</td>
</tr>
<tr>
<td>MATH 3081</td>
<td>Probability and Statistics</td>
<td>4 SH</td>
</tr>
<tr>
<td>PHYS 1161</td>
<td>Physics 1</td>
<td>4 SH</td>
</tr>
<tr>
<td>with PHYS 1162</td>
<td>Lab for PHYS 1161</td>
<td>1 SH</td>
</tr>
<tr>
<td>or PHYS 1151</td>
<td>Physics for Engineering 1</td>
<td>3 SH</td>
</tr>
<tr>
<td>with PHYS 1152</td>
<td>Lab for PHYS 1151</td>
<td>1 SH</td>
</tr>
<tr>
<td>with PHYS 1153</td>
<td>Interactive Learning Seminar for PHYS 1151</td>
<td>1 SH</td>
</tr>
<tr>
<td>PHYS 1165</td>
<td>Physics 2</td>
<td>4 SH</td>
</tr>
<tr>
<td>with PHYS 1166</td>
<td>Lab for PHYS 1165</td>
<td>1 SH</td>
</tr>
<tr>
<td>or PHYS 1155</td>
<td>Physics for Engineering 2</td>
<td>3 SH</td>
</tr>
<tr>
<td>with PHYS 1156</td>
<td>Lab for PHYS 1155</td>
<td>1 SH</td>
</tr>
<tr>
<td>with PHYS 1157</td>
<td>Interactive Learning Seminar for PHYS 1155</td>
<td>1 SH</td>
</tr>
<tr>
<td>PHYS 2303</td>
<td>Modern Physics</td>
<td>4 SH</td>
</tr>
</tbody>
</table>
**Required Courses**

- **PHYS 2305** Thermodynamics and Statistical Mechanics 4 SH
- **PHYS 3600** Advanced Physics Laboratory 4 SH
- **PHYS 3602** Electricity and Magnetism 4 SH
- **PHYS 5115** Quantum Mechanics 4 SH

**Advanced Physics Elective**

Complete one of the following courses:

- **PHYS 4606** Mathematical and Computational Methods for Physics 4 SH
- **PHYS 4621** Biological Physics 1 4 SH
- **PHYS 4623** Medical Physics 4 SH
- **PHYS 4651** Medical Physics Seminar 1 4 SH
- **PHYS 4652** Medical Physics Seminar 2 4 SH
- **PHYS 5111** Astrophysics and Cosmology 4 SH
- **PHYS 5113** Introduction to Particle and Nuclear Physics 4 SH
- **PHYS 5114** Physics of Advanced Materials 4 SH
- **PHYS 5116** Complex Networks and Applications 4 SH
- **PHYS 5260** Introduction to Nanoscience and Nanotechnology 4 SH

**Supplemental Credit**

Partial credit from the following course counts toward the mathematics/science requirement:

- **GE 1111** Engineering Problem Solving and Computation 4 SH

**ENGINEERING**

Complete 48 semester hours in engineering as indicated below.

**Required Courses**

- **EECE 2150** Circuits and Signals: Biomedical Applications 4 SH
  - with **EECE 2151** Lab for EECE 2150 1 SH
- **EECE 2160** Embedded Design Enabling Robotics 3 SH
  - with **EECE 2161** Lab for EECE 2160 1 SH

**Computer Engineering Fundamentals**

- **EECE 2322** Fundamentals of Digital Design and Computer Organization 4 SH
  - with **EECE 2323** Lab for EECE 2322 1 SH
- **EECE 2540** Fundamentals of Networks 4 SH
- **EECE 2560** Fundamentals of Engineering Algorithms 4 SH

**Electrical Engineering Fundamentals**

Complete one of the following courses. If more than one electrical engineering fundamentals course is taken, it can count as a technical elective:

- **EECE 2412** Fundamentals of Electronics 4 SH
  - with **EECE 2413** Lab for EECE 2412 1 SH
- **EECE 2520** Fundamentals of Linear Systems 4 SH
- **EECE 2530** Fundamentals of Electromagnetics 4 SH
  - with **EECE 2531** Lab for EECE 2530 1 SH

**Capstone Courses**

- **EECE 4790** Electrical and Computer Engineering Capstone 1 4 SH

**Capstone Courses**

- **EECE 4799** Electrical and Computer Engineering Capstone 2 4 SH

**Computer Engineering Technical Electives**

Complete two of the following courses. Only one course may be in CS:

- **EECE 4993** Independent Study 4 SH
- **EECE 2412** Fundamentals of Electromagnetics 4 SH
  - with **EECE 2413** Lab for EECE 2412 1 SH
- **EECE 2520** Fundamentals of Linear Systems 4 SH
- **EECE 2530** Fundamentals of Electromagnetics 4 SH
  - with **EECE 2531** Lab for EECE 2530 1 SH
- **EECE 2750** Enabling Engineering 4 SH
  - **EECE 3392 to EECE 4626**
  - **EECE 4630 to EECE 4698**
  - **EECE 5576 to EECE 5698**
  - **ENGR 4608** Nanotechnology in Engineering 4 SH
  - **ENGR 5670** Sustainable Energy: Materials, Conversion, Storage, and Usage 4 SH
  - **CS 3200** Database Design 4 SH
  - **CS 3500** Object-Oriented Design 4 SH
  - **CS 3540** Game Programming 4 SH
  - **CS 3700 to CS 3800**
  - **CS 4100 to CS 4650**
  - **CS 5010 to CS 5610**
  - **CS 5650 to CS 5850**

**Supplemental Credit**

Partial credit from the following courses counts toward the engineering requirement:

- **GE 1110** Engineering Design 4 SH
- **GE 1111** Engineering Problem Solving and Computation 4 SH

**PROFESSIONAL DEVELOPMENT**

**Required Professional Development**

- **GE 1000** Introduction to the Study of Engineering 1 SH
- **EECE 2000** Introduction to Engineering Co-op Education 1 SH
- **EECE 3000** Professional Issues in Engineering 1 SH

**Additional Required Courses**

Partial credit for the following courses counts toward requirements above:

- **GE 1110** Engineering Design 4 SH
- **GE 1111** Engineering Problem Solving and Computation 4 SH

**INTEGRATIVE REQUIREMENT**

The following course, which counts toward the engineering requirement above, is an integrative course:

- **EECE 4790** Electrical and Computer Engineering Capstone 1 4 SH

**ADDITIONAL NU CORE COURSES**

**Writing**

A grade of C or higher is required:
ENGW 1111  First-Year Writing  4 SH
ENGW 3302  Advanced Writing in the Technical Professions  4 SH
or ENGW 3315  Interdisciplinary Advanced Writing in the Disciplines  4 SH

*Arts/Humanities Level 1*
Complete one course from the NU Core arts/humanities level 1 domain, as described on page  Error! Bookmark not defined.

*Social Science Level 1*
Complete one course from the NU Core social science level 1 domain, as described on page  Error! Bookmark not defined.

**COURSE WORK THAT DOES NOT COUNT TOWARD THE ENGINEERING DEGREE**
Students in engineering are allowed to count a maximum of two pass/fail courses toward their degree program. Only general electives outside the College of Engineering may be taken on a pass/fail grading basis. A maximum of one pass/fail course is allowed per semester.

**GENERAL ELECTIVES**
Additional courses taken beyond college and major course requirements to satisfy graduation credit requirements.

**COOPERATIVE EDUCATION**

**RESIDENCY REQUIREMENT**
Students must earn a minimum of 64 Northeastern University semester hours in order to receive a bachelor’s degree.

**UNIVERSITY-WIDE REQUIREMENTS**
131 total semester hours required
Minimum 2.000 GPA required