The use of computer technology is exploding, driven by applications in wireless communications, multimedia, portable devices, and internet computing. At the core of these technological advances are computer engineers who research, design, and develop hardware and software. With a degree in computer engineering you might develop a full-featured multimedia phone, design the next-generation microprocessor, program computer-guided cameras to inspect nanomanufacturing facilities, or start your own software company.

The computer engineering major acquires a strong foundation in engineering principles and the physical sciences in addition to a powerful mix of theory and practice in hardware and software design. The core of the computer engineering curriculum comprises courses in computer organization and architecture, computer networks, computer-aided design, programming languages, optimization theory, and software design.

The BScmpE degree requires a sequence of core courses, technical electives, general electives, and electives in the arts and humanities and social sciences.

**Program Requirements**
Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

**University-Wide Requirements**
All undergraduate students are required to complete the University-Wide Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

**NUpath Requirements**
All undergraduate students are required to complete the NUpath Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

NUpath requirements Interpreting Culture (IC), Societies and Institutions (SI), and Differences and Diversity (DD) are not explicitly satisfied by required engineering courses. Students are responsible for satisfying these requirements and, if these are not fulfilled in engineering courses, should use general electives to do so.

### Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEE 2140</td>
<td>Computing Fundamentals for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>ECEE 2150</td>
<td>Circuits and Signals: Biomedical Applications</td>
<td>5</td>
</tr>
<tr>
<td>ECEE 2160</td>
<td>Embedded Design: Enabling Robotics</td>
<td>4</td>
</tr>
</tbody>
</table>

**Electrical Engineering Fundamentals**
If more than one electrical engineering fundamentals course is taken, it can count as a technical elective.

Complete one of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEE 2412</td>
<td>Fundamentals of Electronics and Lab for ECEE 2412</td>
</tr>
<tr>
<td>ECEE 2520</td>
<td>Fundamentals of Linear Systems</td>
</tr>
<tr>
<td>ECEE 2530</td>
<td>Fundamentals of Electromagnetics and Lab for ECEE 2530</td>
</tr>
</tbody>
</table>

**Computer Engineering Capstone Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEE 4791</td>
<td>Electrical and Computer Engineering Capstone 1</td>
</tr>
<tr>
<td>ECEE 4792</td>
<td>Electrical and Computer Engineering Capstone 2</td>
</tr>
</tbody>
</table>

**EECE Technical Electives**
Students can register for ECEE4991/ECEE4992/ECEE4993 more than once. For these courses combined, a maximum of 8 semester hours will be allowed to satisfy the requirement of technical electives. An additional 4 semester hours will be allowed as a general elective. At most, one of these courses (4 semester hours) can be taken in a semester.

Though students may register for ECEE 2750 more than once, only 4 semester hours will be allowed to satisfy the requirements of technical electives. An additional 4 semester hours will be allowed as a general elective.

Complete four of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECEE 2412 to ECEE 2530</td>
<td></td>
</tr>
<tr>
<td>EECE 4992</td>
<td>Directed Study</td>
</tr>
<tr>
<td>ECEE 4993</td>
<td>Independent Study</td>
</tr>
<tr>
<td>EECE 5115 to ECEE 5698</td>
<td></td>
</tr>
<tr>
<td>ENGR 5670</td>
<td>Sustainable Energy: Materials, Conversion, Storage, and Usage</td>
</tr>
</tbody>
</table>

Two CS/CY/IS courses from the following approved list may be taken toward the EECE technical elective requirement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 3200</td>
<td>Database Design</td>
</tr>
<tr>
<td>CS 3500</td>
<td>Object-Oriented Design</td>
</tr>
<tr>
<td>CS 3540 to CS 3800</td>
<td></td>
</tr>
<tr>
<td>CS 4100 to CS 4770</td>
<td></td>
</tr>
<tr>
<td>CS 4850</td>
<td>Building Game Engines</td>
</tr>
<tr>
<td>CY 2550</td>
<td>Foundations of Cybersecurity</td>
</tr>
<tr>
<td>IS 4200 to IS 4700</td>
<td></td>
</tr>
</tbody>
</table>

**Supplemental Credit**
2 semester hours from the following course count toward the engineering requirement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 1501</td>
<td>Cornerstone of Engineering 1</td>
</tr>
</tbody>
</table>

3 semester hours from the following course count toward the engineering requirement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 1502</td>
<td>Cornerstone of Engineering 2</td>
</tr>
</tbody>
</table>
Supporting Courses: Mathematics/Science Requirement

Complete all mathematics/science courses with a minimum of 30 semester hours.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Mathematics/Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 1151 and CHEM 1153</td>
<td>General Chemistry for Engineers and Recitation for CHEM 1151</td>
<td>4</td>
</tr>
<tr>
<td>CS 1800 and CS 1802</td>
<td>Discrete Structures and Seminar for CS 1800</td>
<td>5</td>
</tr>
<tr>
<td>MATH 1341</td>
<td>Calculus 1 for Science and Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1342</td>
<td>Calculus 2 for Science and Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MATH 2341</td>
<td>Differential Equations and Linear Algebra for Engineering</td>
<td>4</td>
</tr>
<tr>
<td>MATH 3081</td>
<td>Probability and Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 1151 and PHYS 1152 and PHYS 1153</td>
<td>Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 1155 and PHYS 1156 and PHYS 1157</td>
<td>Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155</td>
<td>5</td>
</tr>
</tbody>
</table>

Supplemental Credit
1 semester hour from the following course counts toward the mathematics/science requirement:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 1501</td>
<td>Cornerstone of Engineering 1</td>
<td>1</td>
</tr>
</tbody>
</table>

Professional Development

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Professional Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE 1000</td>
<td>Introduction to the Study of Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ENCP 2000</td>
<td>Introduction to Engineering Co-op Education</td>
<td>1</td>
</tr>
<tr>
<td>ENCP 3000</td>
<td>Professional Issues in Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

Additional Required Courses
1 semester hour from the following course counts toward the professional development requirement:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 1501</td>
<td>Cornerstone of Engineering 1</td>
<td>1</td>
</tr>
</tbody>
</table>

1 semester hour from the following course counts toward the professional development requirement:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 1502</td>
<td>Cornerstone of Engineering 2</td>
<td>1</td>
</tr>
</tbody>
</table>

Writing Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>A grade of C or higher is required:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGW 1111</td>
<td>First-Year Writing</td>
<td>4</td>
</tr>
<tr>
<td>ENGW 3302</td>
<td>Advanced Writing in the Technical Professions</td>
<td>4</td>
</tr>
<tr>
<td>or ENGW 3315</td>
<td>Interdisciplinary Advanced Writing in the Disciplines</td>
<td>4</td>
</tr>
</tbody>
</table>

Required General Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete 28 semester hours of academic, nonremedial, nonrepetitive courses.</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>
### Year 4

**Fall** | Hours | Spring | Hours |
--- | --- | --- | --- |
Co-op | 0 | EECE 4792 (EI, CE, WI) | 4 |
EECE technical elective | 4 |
EECE technical elective | 4 |
General elective | 4 |

Total Hours: 133

---

### Four Years, Two Co-ops in Spring/Summer 1

**Year 1**

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CHEM 1151 (ND) | 4 | GE 1502 (ER) | 4 |
CHEM 1153 | 0 | MATH 1342 (FQ) | 4 |
ENGW 1111 (WF) | 4 | PHYS 1151 (ND) | 3 |
GE 1000 | 1 | PHYS 1152 (AD) | 1 |
GE 1501 | 4 | PHYS 1153 | 1 |
MATH 1341 (FQ) | 4 | General elective | 4 |

| Fall | Hours | Summer 1 | Hours | Summer 2 | Hours |
--- | --- | --- | --- | --- | --- |
ENGW 1111 (WF) | 4 | PHYS 1151 (ND) | 3 |
GE 1000 | 1 | PHYS 1152 (AD) | 1 |
GE 1501 | 4 | PHYS 1153 | 1 |
MATH 1341 (FQ) | 4 | General elective | 4 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
EECE 2140 | 4 | Co-op | 0 |
EECE 2160 | 4 | General elective | 4 |
ENCP 2000 | 1 |
MATH 2341 | 4 |
PHYS 1155 (ND) | 3 |
PHYS 1156 (AD) | 1 |
PHYS 1157 | 1 |

| Fall | Hours | Summer 1 | Hours | Summer 2 | Hours |
--- | --- | --- | --- | --- | --- |
EECE 2140 | 4 | Co-op | 0 |
EECE 2160 | 4 | General elective | 4 |
ENCP 2000 | 1 |
MATH 2341 | 4 |
PHYS 1155 (ND) | 3 |
PHYS 1156 (AD) | 1 |
PHYS 1157 | 1 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CS 1800 (FQ) | 4 | Co-op | 0 |
CS 1802 | 1 |
EECE 2150 (AD) | 5 |
ENCP 3000 | 1 |
CE fundamentals | 4 |

| Fall | Hours | Summer 1 | Hours | Summer 2 | Hours |
--- | --- | --- | --- | --- | --- |
CS 1800 (FQ) | 4 | Co-op | 0 |
CS 1802 | 1 |
EECE 2150 (AD) | 5 | ENGW 3302 or 3315 (WD) | 4 |
ENCP 3000 | 1 |
CE fundamentals | 4 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
EECE 2140 | 4 | Co-op | 0 |
EECE 2160 | 4 | General elective | 4 |
ENCP 3000 | 1 |
MATH 2341 | 4 |
PHYS 1155 (ND) | 3 |
PHYS 1156 (AD) | 1 |
PHYS 1157 | 1 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CS 1800 (FQ) | 4 | Co-op | 0 |
CS 1802 | 1 |
EECE 2150 (AD) | 5 | ENGW 3302 or 3315 (WD) | 4 |
ENCP 3000 | 1 |
CE fundamentals | 4 |

Total Hours: 133

---

### Five Years, Three Co-ops in Summer 2/Fall

**Year 1**

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CHEM 1151 (ND) | 4 | GE 1502 (ER) | 4 |
CHEM 1153 | 0 | MATH 1342 (FQ) | 4 |
ENGW 1111 (WF) | 4 | PHYS 1151 (ND) | 3 |
GE 1000 | 1 | PHYS 1152 (AD) | 1 |
GE 1501 | 4 | PHYS 1153 | 1 |
MATH 1341 (FQ) | 4 | General elective | 4 |

| Fall | Hours | Summer 1 | Hours | Summer 2 | Hours |
--- | --- | --- | --- | --- | --- |
ENGW 1111 (WF) | 4 | PHYS 1151 (ND) | 3 |
GE 1000 | 1 | PHYS 1152 (AD) | 1 |
GE 1501 | 4 | PHYS 1153 | 1 |
MATH 1341 (FQ) | 4 | General elective | 4 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
EECE 2140 | 4 | Co-op | 0 |
EECE 2160 | 4 | General elective | 4 |
ENCP 2000 | 1 |
MATH 2341 | 4 |
PHYS 1155 (ND) | 3 |
PHYS 1156 (AD) | 1 |
PHYS 1157 | 1 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
EECE 2140 | 4 | Co-op | 0 |
EECE 2160 | 4 | General elective | 4 |
ENCP 2000 | 1 |
MATH 2341 | 4 |
PHYS 1155 (ND) | 3 |
PHYS 1156 (AD) | 1 |
PHYS 1157 | 1 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CS 1800 (FQ) | 4 | Co-op | 0 |
CS 1802 | 1 |
EECE 2150 (AD) | 5 | ENGW 3302 or 3315 (WD) | 4 |
ENCP 3000 | 1 |
CE fundamentals | 4 |

| Fall | Hours | Spring | Hours |
--- | --- | --- | --- |
CS 1800 (FQ) | 4 | Co-op | 0 |
CS 1802 | 1 |
EECE 2150 (AD) | 5 | ENGW 3302 or 3315 (WD) | 4 |
ENCP 3000 | 1 |
CE fundamentals | 4 |

Total Hours: 133
### Computer Engineering, BSCmpE

#### General elective

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Fall Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td>0</td>
<td>ENCP 3000</td>
<td>1</td>
<td>Co-op</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH 3081 (AD)</td>
<td>ECE 4791 (EI, WI, CE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ECE technical elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH 3081 (AD)</td>
<td>ECE technical elective</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Year 4**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td>0</td>
<td>ECE 4792 (EI, WI, CE)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ECE technical elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours: 133**

### Five Years, Three Co-ops in Spring/Summer 1

#### Year 1

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1151 (ND)</td>
<td>4</td>
<td>GE 1502 (ER)</td>
<td>4</td>
<td>Vacation</td>
</tr>
<tr>
<td>CHEM 1153</td>
<td>0</td>
<td>MATH 1342 (FQ)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENGW 1111 (WF)</td>
<td>4</td>
<td>PHYS 1151 (ND)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE 1000</td>
<td>1</td>
<td>PHYS 1152 (AD)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GE 1501</td>
<td>4</td>
<td>PHYS 1153</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MATH 1341 (FQ)</td>
<td>4</td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Year 2**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 2140</td>
<td>4</td>
<td>Co-op</td>
<td>Co-op</td>
<td>Vacation</td>
</tr>
<tr>
<td>ECE 2160</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ENCP 2000</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 2341</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 1155 (ND)</td>
<td>3</td>
<td></td>
<td></td>
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</tbody>
</table>

**Year 3**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 1800 (FQ)</td>
<td>4</td>
<td>Co-op</td>
<td>Co-op</td>
<td>ENGW 3302 or 3315 (WD)</td>
</tr>
<tr>
<td>CS 1802</td>
<td>1</td>
<td></td>
<td></td>
<td>General elective</td>
</tr>
<tr>
<td>ECE 2150 (AD)</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE fundamentals</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General elective</td>
<td>4</td>
<td></td>
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</tbody>
</table>

**Year 4**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENCP 3000</td>
<td>1</td>
<td>Co-op</td>
<td>Co-op</td>
<td>ECE 4791 (EI, WI, CE)</td>
</tr>
<tr>
<td>CE fundamentals</td>
<td>4</td>
<td></td>
<td></td>
<td>ECE technical elective</td>
</tr>
<tr>
<td>CE fundamentals</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE fundamentals</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General elective</td>
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<td></td>
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</table>

**Year 5**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring Hours</th>
<th>Summer 1 Hours</th>
<th>Summer 2 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 4792 (EI, WI, CE)</td>
<td>4</td>
<td>ECE technical elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 3081 (AD)</td>
<td>4</td>
<td>ECE technical elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ECE technical elective</td>
<td>4</td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>General elective</td>
<td>4</td>
<td>General elective</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours: 133**

### NOTES

- Computing Fundamentals for Engineers (ECE 2140) can be taken in year 1 spring instead of a general elective by students who are interested in the course in preparation for co-ops involving programming and computing hardware.
- The capstone design courses are taken as follows: (ECE 4791—summer 1 and ECE 4792—spring) OR (ECE 4791—summer 2 and ECE 4792—fall).