This undergraduate program takes advantage of the physical similarities between mechanical engineering and physics, providing students with the opportunity to pursue studies that explore both topics. The program culminates with mechanical engineering capstone design.

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.

Universitywide Requirements
All undergraduate students are required to complete the Universitywide 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 satisfied by required engineering courses. Students are responsible for satisfying these requirements with general electives.

Engineering Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 2340</td>
<td>Introduction to Material Science</td>
<td>5</td>
</tr>
<tr>
<td>and ME 2341</td>
<td>and Lab for ME 2340</td>
<td></td>
</tr>
<tr>
<td>ME 2350</td>
<td>Statics</td>
<td>4</td>
</tr>
<tr>
<td>ME 2355</td>
<td>Mechanics of Materials and Lab for ME 2355</td>
<td>5</td>
</tr>
<tr>
<td>ME 2380</td>
<td>Thermodynamics and Recitation for ME 2380</td>
<td>4</td>
</tr>
<tr>
<td>ME 3455</td>
<td>Dynamics and Lab for ME 3455</td>
<td>5</td>
</tr>
<tr>
<td>ME 3475</td>
<td>Fluid Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>or ME 3480</td>
<td>International Applications of Fluid Mechanics</td>
<td></td>
</tr>
<tr>
<td>ME 4505</td>
<td>Measurement and Analysis with Thermal Science Application and Lab for ME 4505</td>
<td>5</td>
</tr>
<tr>
<td>ME 4508</td>
<td>Mechanical Engineering Computation and Design</td>
<td>4</td>
</tr>
<tr>
<td>ME 4550</td>
<td>Mechanical Engineering Design</td>
<td>4</td>
</tr>
<tr>
<td>ME 4555</td>
<td>System Analysis and Control</td>
<td>4</td>
</tr>
<tr>
<td>ME 4570</td>
<td>Thermal Systems Analysis and Design</td>
<td>4</td>
</tr>
</tbody>
</table>

MECHIE 4701 | Capstone Design 1 | 1 |
MECHIE 4702 | Capstone Design 2 | 5 |

Supplemental Credit
2 semester hours from the following course counts toward the engineering 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>

Mathematics/Science Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1151</td>
<td>General Chemistry for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>and CHEM 1153</td>
<td>and Recitation for CHEM 1151</td>
<td></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 2321</td>
<td>Calculus 3 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>PHYS 1161</td>
<td>Physics 1 and Lab for PHYS 1161</td>
<td>5</td>
</tr>
<tr>
<td>and PHYS 1163</td>
<td>and Recitation for PHYS 1163</td>
<td></td>
</tr>
<tr>
<td>PHYS 1165</td>
<td>Physics 2 and Lab for PHYS 1165</td>
<td>5</td>
</tr>
<tr>
<td>and PHYS 1167</td>
<td>and Recitation for PHYS 1165</td>
<td></td>
</tr>
<tr>
<td>PHYS 2303</td>
<td>Modern Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2371</td>
<td>Electronics and Lab for PHYS 2371</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 3600</td>
<td>Advanced Physics Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 3601</td>
<td>Classical Dynamics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 3602</td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 5318</td>
<td>Principles of Experimental Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

Advanced Physics Elective
Complete one 4-semester-hour course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 4606</td>
<td>Mathematical and Computational Methods for Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 4621</td>
<td>Biological Physics 1</td>
<td></td>
</tr>
<tr>
<td>PHYS 4623</td>
<td>Medical Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 4651</td>
<td>Medical Physics Seminar 1</td>
<td></td>
</tr>
<tr>
<td>PHYS 4652</td>
<td>Medical Physics Seminar 2</td>
<td></td>
</tr>
<tr>
<td>PHYS 5113</td>
<td>Particle Physics</td>
<td></td>
</tr>
<tr>
<td>PHYS 5116</td>
<td>Network Science 1</td>
<td></td>
</tr>
<tr>
<td>PHYS 5117</td>
<td>Advanced Astrophysics Topics</td>
<td></td>
</tr>
<tr>
<td>PHYS 5118</td>
<td>General Relativity and Cosmology</td>
<td></td>
</tr>
<tr>
<td>PHYS 5125</td>
<td>Advanced Quantum Mechanics</td>
<td></td>
</tr>
<tr>
<td>PHYS 5260</td>
<td>Introduction to Nanoscience and Nanotechnology</td>
<td></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>GE 1000</td>
<td>First-Year Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>
ENCP 2000  Introduction to Engineering Co-op Education  1
ENCP 3000  Professional Issues in Engineering  1

**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>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></td>
<td>Complete 8 semester hours of academic, nonremedial, nonrepetitive courses.</td>
<td>8</td>
</tr>
</tbody>
</table>

**Integrative Requirement**

This course is already required above and also fulfills the integrative requirement.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 5318</td>
<td>Principles of Experimental Physics</td>
<td></td>
</tr>
</tbody>
</table>

**Major GPA Requirement**

2.000 minimum GPA required in IE, ME, and MEIE courses

**Program Requirement**

139 total semester hours required

1 Students may substitute GE 1110 and GE 1111 for GE 1501 and 1502 in approved situations.

**Plan of Study**

**Four Years, One Co-op in Summer 2/Fall**

<table>
<thead>
<tr>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>CHEM 1151 (ND)</td>
</tr>
<tr>
<td>CHEM 1153</td>
</tr>
<tr>
<td>GE 1000</td>
</tr>
<tr>
<td>GE 1501</td>
</tr>
<tr>
<td>MATH 1341 (FQ)</td>
</tr>
<tr>
<td>PHYS 1161 (ND)</td>
</tr>
<tr>
<td>PHYS 1162 (AD)</td>
</tr>
</tbody>
</table>

Year 2

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours Summer 1</th>
<th>Hours Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2321 (FQ)</td>
<td>4 ENCP 2000</td>
<td>1 ME 3475 or 3480</td>
<td>4 Vacation</td>
<td></td>
</tr>
<tr>
<td>ME 2340 (WI)</td>
<td>4 MATH 2341</td>
<td>4 PHYS 3600 (ND, AD, WI)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ME 2341</td>
<td>1 ME 2356</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 2350</td>
<td>4 ME 2356</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 2303 (ND)</td>
<td>4 ME 2380</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 2381</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 3601 (ND)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Year 3

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours Summer 1</th>
<th>Hours Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGW 3302 or 3315 (WD)</td>
<td>4 ME 3455</td>
<td>4 ME 4550</td>
<td>4 Co-op</td>
<td>0</td>
</tr>
<tr>
<td>ME 4505 (AD)</td>
<td>4 ME 3456</td>
<td>1 MEIE 4701 (EI, CE, WI)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ME 4506</td>
<td>1 ME 4508</td>
<td>4 General elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYS 2371 (ND)</td>
<td>3 ME 4570</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 2372 (EI)</td>
<td>1 PHYS 3602 (ND)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General elective</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Year 4

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td>0 ENCP 3000</td>
<td>1</td>
</tr>
<tr>
<td>ME 4555</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MEIE 4702 (EI, CE, WI)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PHYS 5318 (ND, AD, WI, CE)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Advanced physics elective</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Total Hours: 139

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

<table>
<thead>
<tr>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>CHEM 1151 (ND)</td>
</tr>
<tr>
<td>CHEM 1153</td>
</tr>
<tr>
<td>GE 1000</td>
</tr>
<tr>
<td>GE 1501</td>
</tr>
<tr>
<td>Year 2</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>MATH 1341 (FQ)</td>
</tr>
<tr>
<td>PHYS 1161 (ND)</td>
</tr>
<tr>
<td>PHYS 1162 (AD)</td>
</tr>
<tr>
<td>MATH 2321 (FQ)</td>
</tr>
<tr>
<td>MATH 2341 (FQ)</td>
</tr>
<tr>
<td>ME 2350</td>
</tr>
<tr>
<td>PHYS 2371 (ND)</td>
</tr>
<tr>
<td>PHYS 2372 (E)</td>
</tr>
<tr>
<td>MODE 2380</td>
</tr>
<tr>
<td>ME 2381</td>
</tr>
<tr>
<td>PHYS 2303 (ND)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td>0</td>
<td></td>
<td>ENGW 3302 or 3315 (W)</td>
<td>4</td>
<td>ME 3475 or 3480</td>
<td>4</td>
<td>Co-op</td>
<td>0</td>
</tr>
<tr>
<td>ME 3455</td>
<td></td>
<td>4</td>
<td>PHYS 3600 (ND, AD, W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 3456</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 4508</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 3602 (ND)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0</td>
<td>17</td>
<td>8</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td>0</td>
<td></td>
<td>ENCP 3000</td>
<td>1</td>
<td>ME 4550</td>
<td>4</td>
<td>Co-op</td>
<td>0</td>
</tr>
<tr>
<td>ME 4505 (AD)</td>
<td></td>
<td>4</td>
<td>MEIE 4701 (E, W, C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 4506</td>
<td>1</td>
<td></td>
<td>General elective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 4555</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME 4570</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHYS 3601 (ND)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0</td>
<td>18</td>
<td>9</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Year 5   | Fall         | Hours | | | | | | |
|---------|--------------|-------| | | | | | |
| Co-op | 0 | | MEIE 4702 (E, W, C) | 5 | | | | |
| PHYS 5318 (ND, AD, CE, W) | 4 | | | | | | |
| Advanced physics elective | 4 | | | | | | |

<table>
<thead>
<tr>
<th>General elective</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>17</td>
</tr>
</tbody>
</table>

Total Hours: 139

Notes:

Physics courses are offered on the following schedule:

- Modern Physics (PHYS 2303) offered every fall, spring, and summer 2.
- Electronics (PHYS 2371) and Lab for PHYS 2371 (PHYS 2372) offered every fall.
- Advanced Physics Laboratory (PHYS 3600) offered every summer 1 and summer 2.
- Classical Dynamics (PHYS 3601) is offered fall and spring semesters of even years only. Please meet with your COS academic advisor to discuss scheduling options for year 4 of odd years.
- Electricity and Magnetism 1 (PHYS 3602) offered every fall and spring.
- Electricity and Magnetism 2 (PHYS 3603) offered fall (even years) and summer 1 (odd years).
- Quantum Mechanics (PHYS 4115) offered every fall and spring.
- Thermodynamics and Statistical Mechanics (PHYS 4305) offered every spring and summer 2 (even years).
- Biological Physics 1 (PHYS 4621) offered spring (odd years) and fall (even years).
- Medical Physics (PHYS 4623) offered summer 1 and fall (even years).
- Medical Physics Seminar 1 (PHYS 4651) offered spring and fall (odd years).
- Medical Physics Seminar 2 (PHYS 4652) offered every spring.
- Principles of Experimental Physics (PHYS 5318) offered every spring.