This intercollege combined major serves students who would like to explore their interest in physics while earning the benefit of a Bachelor of Science degree in chemical engineering. Upon completion, the successful student will understand the fundamental physics behind many chemical-based processes, resulting in the ability to design and practice in the field of engineering that deals with the movement of mass, heat transfer, and reactions involved in the processing of various materials.

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 satisfied by required engineering courses. Students are responsible for satisfying these requirements with general electives.

### Engineering

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<thead>
<tr>
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<td>Conservation Principles in Chemical Engineering</td>
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<td>CHME 2310</td>
<td>Transport Processes 1</td>
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<td>CHME 2320</td>
<td>Chemical Engineering Thermodynamics 1</td>
<td>4</td>
</tr>
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<td>CHME 3312</td>
<td>Transport Processes 2 and Separations</td>
<td>4</td>
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<tr>
<td>CHME 3315</td>
<td>Chemical Engineering Experimental Design 1</td>
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<td>and CHME 3316</td>
<td>and Recitation for CHME 3315</td>
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<td>and Recitation for CHME 4315</td>
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<td>Chemical Engineering Kinetics</td>
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<td>Advanced Physics Laboratory</td>
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<td>Capstone Design 2: Chemical Process Design</td>
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<td>and CHME 4705</td>
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Supplemental Credit

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

- GE 1501 Cornerstone of Engineering 1

### Mathematics/Science Requirement
Complete all Mathematics/Science courses with a minimum of 30 semester hours.

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<thead>
<tr>
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<tbody>
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<td>and CHEM 1153</td>
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<td>MATH 1342</td>
<td>Calculus 2 for Science and Engineering</td>
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<td>MATH 2321</td>
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<td>Differential Equations and Linear Algebra for Engineering</td>
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<td>PHYS 3602</td>
<td>Electricity and Magnetism 1</td>
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<td>PHYS 5318</td>
<td>Principles of Experimental Physics</td>
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Supplemental Credit

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

- GE 1501 Cornerstone of Engineering 1

### Advanced Science Requirement

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<td>Organic Chemistry 1 and Lab for CHEM 2311</td>
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<tr>
<td>PHYS 2303</td>
<td>Modern Physics</td>
<td>4</td>
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<tr>
<td>PHYS 4115</td>
<td>Quantum Mechanics</td>
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Complete one of the following:

- CHEM 2313 and CHEM 2314 | Organic Chemistry 2 and Lab for CHEM 2313 | 5     |
- CHEM 2317 and CHEM 2318 | Organic Chemistry 2 for Chemistry Majors and Lab for CHEM 2317 | 5     |
## Professional Development

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<td>ENCP 2000</td>
<td>Introduction to Engineering Co-op Education</td>
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<td>ENCP 3000</td>
<td>Professional Issues in Engineering</td>
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### Additional Required Courses

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

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<tr>
<td>GE 1501</td>
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</table>

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

<table>
<thead>
<tr>
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<td>GE 1502</td>
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## Writing Requirements

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<tr>
<td>ENGW 3302</td>
<td>Advanced Writing in the Technical Professions</td>
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<tr>
<td>or ENGW 3315</td>
<td>Interdisciplinary Advanced Writing in the Disciplines</td>
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A grade of C or higher is required:

- ENGW 3302 or 3315 (WD)

## Required General Electives

Complete 8 SH of academic, nonremedial, nonrepetitive courses.

## Major GPA Requirement

2.000 minimum required in CHME courses

## Program Requirement

135 total semester hours required

1 Students can 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

**Year 1**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<th>Hours</th>
<th>Summer 2</th>
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<tr>
<td>CHEM 1151 (AD, WI)</td>
<td>4</td>
<td>CHEM 2308</td>
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<td>MATH 1342 (FIQ)</td>
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<tr>
<td>GE 1000 (AD)</td>
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<td>PHYS 1151 (AD)</td>
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<td>PHYS 1157 (AD)</td>
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<td>PHYS 1152 (AD)</td>
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### Year 2

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<th>Hours</th>
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### Year 3

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<th>Hours</th>
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<td>PHYS 3600 (ND, AD, WI)</td>
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<td>CHEM 3315 (AD)</td>
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<td>CHEM 4316</td>
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<td>CHEM 4701</td>
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### Year 4

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<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
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<tbody>
<tr>
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<td>CHEM 4705</td>
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<td>PHYS 4115 (AD, FIQ)</td>
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### Total Hours: 135

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

**Year 1**

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<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
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<tbody>
<tr>
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<td>MATH 2321 (FIQ)</td>
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### Year 2

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<th>Hours</th>
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### Year 3

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<th>Hours</th>
<th>Summer 2</th>
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<tbody>
<tr>
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<td>CHEM 4315 (AD, WI)</td>
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<td>CHEM 3315 (AD)</td>
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### Year 4

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### Total Hours: 135
### Year 2

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### Year 5

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**Total Hours: 135**

**Notes:**

Physics courses are offered on the following schedule:

- PHYS 2303 offered every fall, spring and summer 2.
- PHYS 2371/2372 offered every fall.
- 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 Academic Advisor to discuss scheduling options for Year 4 of odd years.
- PHYS 3602 offered every fall and spring.
- PHYS 3603 offered fall (even years) and summer 1 (odd years).
- PHYS 4115 offered every fall and spring.
- PHYS 4305 offered every spring and summer 2 (even years).
- PHYS 4621 offered spring (odd years) and fall (even years).
- PHYS 4623 offered summer 1 and fall (even years).
- PHYS 4651 offered spring and fall (odd years).
- PHYS 4652 offered every spring.
- PHYS 5318 offered every spring.