The Department of Mechanical and Industrial Engineering offers two accredited programs leading to a Bachelor of Science in industrial engineering and a Bachelor of Science in mechanical engineering. Five-year Bachelor of Science/Master of Science PlusOne programs in the above two disciplines are also available. In addition, the department offers the following minors: (a) minor in industrial engineering, (b) minor in mechanical engineering, and (c) minor in biomechanical engineering.

Our mission is to educate persons for professional and technical excellence; to perform research to advance the science and practice of engineering; to engage in service activities that advance the department, the university, and the profession; and to instill in ourselves and our students habits and attitudes that promote ethical behavior, professional responsibility, and careers that advance the well-being of society.

The program educational objectives for the mechanical engineering and industrial engineering programs are as follows. Graduates from our undergraduate programs will demonstrate technical excellence in their chosen fields, anticipate and respond to societal changes and develop careers with depth and flexibility, while retaining a professional and intellectual thrust throughout. Specifically, (1) graduates will contribute to the advancement of the mechanical or industrial engineering field, while satisfying the expectations of their employers and displaying leadership in the larger community; and (2) graduates will engage in activities that promote professional development and personal growth.

**Industrial Engineering**

Industrial engineering involves the design and analysis of systems that include people, equipment, and materials and their interactions and performance in the workplace. An industrial engineer collects this information and evaluates alternatives to make decisions that best advance the goals of the enterprise.

The program in industrial engineering offers students a base of traditional engineering courses, such as work design, human-machine systems, probability, statistics, and engineering economy, while emphasizing such contemporary areas as simulation modeling, engineering database systems, quality assurance, logistics and supply chain management, operations research, and facilities planning. Students integrate the knowledge acquired in these courses in a two-semester capstone design project.

Industrial engineers work in manufacturing firms, hospitals, banks, public utilities, transportation, government agencies, insurance companies, and construction firms. Among the projects they undertake are design and implementation of a computer-integrated manufacturing system, facilities planning for a variety of industries, design of a robotics system in a manufacturing environment, long-range corporate planning, development and implementation of a quality-control system, simulation analyses to improve processes and make operational decisions, design of workstations to enhance worker safety and productivity, and development of computer systems for information control.

More than 90 percent of department undergraduate students take advantage of the cooperative education program. Cooperative education assignments generally increase in level of responsibility as students gain theoretical and technical knowledge through their academic work. A sophomore might begin as a computer analyst evaluating the performance of a manufacturing system and progress to designing manufacturing engineering workstations by the senior year.

**BSIE—Bachelor of Science in Industrial Engineering**

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 IE and MEIE courses

**MATHEMATICS/SCIENCE REQUIREMENT**

Complete 39 semester hours in mathematics and science as indicated below.

**Required Mathematics/Science**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>SH</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1151</td>
<td>General Chemistry for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 1211</td>
<td>General Chemistry 1</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 1214</td>
<td>General Chemistry 2</td>
<td>4</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 1151</td>
<td>Physics for Engineering 1</td>
<td>3</td>
</tr>
</tbody>
</table>
Supplemental Credit
Partial credit from the following courses counts toward the mathematics/science requirement:

- IE 3412 Engineering Probability and Statistics 4 SH
- IE 4512 Engineering Economy 4 SH
- IE 4515 Operations Research 4 SH
- IE 4520 Stochastic Modeling 4 SH
- GE 1111 Engineering Problem Solving and Computation 4 SH

**ENGINEERING**
Complete 57 semester hours in engineering as indicated below.

### Required Engineering
- IE 2310 Introduction to Industrial Engineering 4 SH
- IE 3425 Engineering Database Systems 4 SH
- IE 4510 Simulation Modeling and Analysis 4 SH
- IE 4516 Quality Assurance 4 SH
- IE 4522 Human Machine Systems 4 SH
- IE 4523 Lab for IE 4522 1 SH
- IE 4525 Logistics and Supply Chain Management 4 SH
- IE 4530 Manufacturing Systems and Techniques 4 SH
- IE 4531 Lab for IE 4530 1 SH
- MEIE 4701 Capstone Design 1 1 SH
- MEIE 4702 Capstone Design 2 5 SH

### Engineering Electives
Complete 8 semester hours of technical electives in the following subject areas: CHME, CIVE, EECE, EMGT, IE, ME, and MEIE.

### Supplemental Credit
Partial credit from the following courses counts toward the engineering requirement:

- IE 3412 Engineering Probability and Statistics 4 SH
- IE 4512 Engineering Economy 4 SH
- IE 4515 Operations Research 4 SH
- IE 4520 Stochastic Modeling 4 SH
- GE 1110 Engineering Design 4 SH
- GE 1111 Engineering Problem Solving and Computation 4 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
- IE 3412 Engineering Probability and Statistics 4 SH
- IE 4512 Engineering Economy 4 SH
- IE 4515 Operations Research 4 SH
- IE 4520 Stochastic Modeling 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..

### REQUIRED GENERAL ELECTIVES
Complete five academic, nonremedial, nonrepetitive courses, each equivalent to 4 semester hours.

### 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
137 total semester hours required
Minimum 2.000 GPA required