**INDUSTRIAL ENGINEERING DEGREE**

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement) and the degree requirements of their home school.

### Course Requirements (48 units)

**Core Courses (32 units)**
- 4 mathematics courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 4 engineering analysis and computer proficiency courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 4 units of basic science chosen according to McCormick basic science guidelines (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 3 design and communications courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 5 basic engineering courses from at least four different areas:
  - EECS 211-0 Fundamentals of Computer Programming II
  - EECS 317-0 Data Management & Information Processing
  - CIV_ENV 205-0 Economics and Finance for Engineers
- 2 additional courses from two different areas: Computer architecture and numerical methods, Electrical science, Fluids and solids, Materials science and engineering, Thermodynamics (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 7 social sciences/humanities courses (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)
- 5 unrestricted electives (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext)

**Major Program (16 units)**
- 1 computer programming course:
  - EECS 111-0 Fundamentals of Computer Programming
- 6 IE Methods Core Courses
  - IEMS 202-0 Probability
  - IEMS 303-0 Statistics
  - IEMS 304-0 Statistical Learning for Data Analysis
  - IEMS 313-0 Foundations of Optimization
  - IEMS 315-0 Stochastic Models
  - IEMS 317-0 Discrete Event Systems Simulation
- 1 production and logistics course chosen from:
  - IEMS 381-0 Supply Chain Modeling and Analysis
  - IEMS 382-0 Production Planning and Scheduling
  - IEMS 383-0 Service Operations Management
  - IEMS 385-0 Introduction to Health Systems Management
- 1 Client Project Course
  - IEMS 394-0 Industrial Engineering Client Project Challenge

**Electives**
- 7 Electives:
  - 2 industrial engineering/operations research electives (p. 1)
  - 2 management science electives (p. 1)
- 3 General Technical Electives chosen from
  - Any 200-level or higher course in McCormick, excluding CRDV and PRDV courses
  - Any 200-level or higher course in Biology, Chemistry or Physics
  - Any 300-level or higher course in Math, Statistics, or MMSS

**Approved Non-engineering Technical Electives (p. 1)**

The following courses may not be used: CHEM 201-0, MATH 310-1, MATH 311-1, MATH 314-0, MATH 385-0, MATH 386-1, PHYSICS 311-1, PHYSICS 335-0, STAT 320-1, STAT 383-0

May include up to 2 units of IEMS 399-0

At most 2 courses in this group may be taken P/N; no other electives may be taken P/N.

1 See general requirements (https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext) for details.
2 PHYSICS 135-2 General Physics and 1 unit of Chemistry (from approved list) recommended.
3 May not be taken with or after KELLG_FE 310-0 Principles of Finance; see adviser for alternatives.

- Concentration (optional): at least 4 courses from an approved list
  - Students may pursue more than one concentration.
  - Concentrations may be created from courses that satisfy other requirements or concentrations.
  - A list of available concentration areas may be found on the department website.

### Major Program Electives

**Industrial Program Electives**

**Course**

**Title**

1 course chosen from:

- IEMS 307-0 Quality Improvement by Experimental Design
- IEMS 308-0 Data Science and Analytics
- IEMS 351-0 Optimization Methods in Data Science
- IEMS 365-0 Analytics for Social Good
- IEMS 373-0 Intro to Financial Engineering
- IEMS 381-0 Supply Chain Modeling and Analysis
- IEMS 382-0 Production Planning and Scheduling
- IEMS 383-0 Service Operations Management
- IEMS 385-0 Introduction to Health Systems Management
- IEMS 395-0 Special Topics in Industrial Engineering (selected topics)

### Management Science Electives

**Course**

**Title**

2 courses chosen from:

- IEMS 325-0 Engineering Entrepreneurship
- IEMS 341-0 Social Networks Analysis
- IEMS 342-0 Organizational Behavior
- IEMS 343-0 Project Management for Engineers
- IEMS 344-0 Leading Organizations and Teams
- IEMS 345-0 Negotiations and Conflict Resolution for Engineers
- IEMS 395-0 Special Topics in Industrial Engineering (selected topics)

### Approved Non-engineering Technical Electives

**Course**

**Title**

- ECON 309-0 Public Finance
- ECON 331-0 Economics of Risk and Uncertainty
- ECON 336-0 Analytic Methods for Public Policy Analysis
- ECON 339-0 Labor Economics
- ECON 349-0 Industrial Economics
<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ECON 350-0</td>
<td>Monopoly Competition &amp; Public Policy</td>
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<td>ECON 355-0</td>
<td>Transportation Economics and Public Policy</td>
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<tr>
<td>ECON 360-2</td>
<td>Investments</td>
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<tr>
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<tr>
<td>IMC 303-0</td>
<td>Integrated Marketing Communications Strategy</td>
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<tr>
<td>ISEN 220-0</td>
<td>Introduction to Energy Systems for the 21st Century</td>
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<tr>
<td>ISEN 230-0</td>
<td>Climate Change and Sustainability: Ethical Dimensions</td>
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