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.

Requirements (48 units)

Core Courses (27 units)

Course Title
4 mathematics 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)
4 engineering analysis and computer proficiency courses
- GEN_ENG 205-1: Engineering Analysis I
- & GEN_ENG 205-2: and Engineering Analysis II
- & GEN_ENG 205-3: and Engineering Analysis III
- or GEN_ENG 206-1: Honor Engineering Analysis
- & GEN_ENG 206-2: and Honors Engineering Analysis
- & GEN_ENG 206-3: and Honors Engineering Analysis

ES_APPM 245-0: Elementary Applied Linear Algebra

3 design and communications courses (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 (21 units)

Course Title
1 engineering economics course
- CIV_ENV 205-0: Economics and Finance for Engineers

3 computer programming courses
- COMP_SCI 111-0: Fundamentals of Computer Programming
- COMP_SCI 150-0: Fundamentals of Computer Programming 1.5
- COMP_SCI 217-0: Data Management & Information Processing

6 industrial engineering methods core courses
- IEMS 302-0: 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 the options below
- IEMS 381-0: Supply Chain Modeling and Analysis
- IEMS 382-0: Operations Engineering and Management
- IEMS 383-0: Service Engineering and Management
- IEMS 385-0: Introduction to Health Systems Management

1 client project course
- IEMS 394-0: Industrial Engineering Client Project Challenge

5 IEMS elective courses
- 3 industrial engineering/operations research electives (p. 1)
- 2 management science electives (p. 1)

4 general technical elective courses chosen from areas below

Any IEMS course not applied towards another degree requirement
Any 200-level or higher course in McCormick, excluding CRDV and PRDV courses
Any 200-level or higher course in Biology, Chemistry or Physics, except for exclusions listed below
Any 300-level or higher course in Math, Statistics, or MMSS, except for exclusions listed below
Other Approved Non-engineering Technical Electives (p. 2)
The following courses may not be used as General Technical Electives: CHEM 201-0, MATH 310-1, MATH 311-1, MATH 314-0, MATH 385-0, MATH 386-1, PHYSICS 311-1, PHYSICS 311-2, PHYSICS 335-0, STAT 301-1, STAT 301-2, STAT 301-3, STAT 303-1, STAT 303-2, STAT 303-3, STAT 320-1, STAT 383-0
May include up to 2 units of IEMS 399-0
At most 2 General Technical Electives 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 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 Engineering/Operations Research Electives

Course Title
3 courses chosen from the following list. Course used towards Production & Logistics requirement may not be used here.
- 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: Operations Engineering and Management
- IEMS 383-0: Service Engineering and Management
- IEMS 385-0: Introduction to Health Systems Management
- IEMS 395-0: Special Topics in Industrial Engineering (pre-approved topics only)

Management Science Electives

Course Title
2 courses chosen from:
- IEMS 325-0: Engineering Entrepreneurship
- IEMS 340-0: Qualitative Methods in Engineering Systems
- IEMS 341-0: Social Networks Analysis
- IEMS 342-0: Organizational Behavior
- IEMS 343-0: Project Management for Engineers
- IEMS 344-0: Whole-Brain Leadership
- IEMS 345-0: Negotiations and Conflict Resolution for Engineers
- IEMS 395-0: Special Topics in Industrial Engineering (pre-approved topics only)
## Other Approved Non-engineering Technical Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS_INST 301-0</td>
<td>Accounting</td>
</tr>
<tr>
<td>BUS_INST 302-0</td>
<td>Marketing Management</td>
</tr>
<tr>
<td>BUS_INST 303-0</td>
<td>Leadership in Organizations</td>
</tr>
<tr>
<td>ECON 309-0</td>
<td>Public Finance</td>
</tr>
<tr>
<td>ECON 331-0</td>
<td>Economics of Risk and Uncertainty</td>
</tr>
<tr>
<td>ECON 336-0</td>
<td>Analytic Methods for Public Policy Analysis</td>
</tr>
<tr>
<td>ECON 339-0</td>
<td>Labor Economics</td>
</tr>
<tr>
<td>ECON 349-0</td>
<td>Industrial Economics</td>
</tr>
<tr>
<td>ECON 350-0</td>
<td>Monopoly Competition &amp; Public Policy</td>
</tr>
<tr>
<td>ECON 355-0</td>
<td>Transportation Economics and Public Policy</td>
</tr>
<tr>
<td>ECON 360-2</td>
<td>Investments</td>
</tr>
<tr>
<td>ECON 362-0</td>
<td>International Finance</td>
</tr>
<tr>
<td>ECON 371-0</td>
<td>Economics of Energy</td>
</tr>
<tr>
<td>ECON 380-1</td>
<td>Game Theory</td>
</tr>
<tr>
<td>ECON 380-2</td>
<td>Game Theory</td>
</tr>
<tr>
<td>ECON 381-1</td>
<td>Econometrics</td>
</tr>
<tr>
<td>ECON 381-2</td>
<td>Econometrics</td>
</tr>
<tr>
<td>IMC 303-0</td>
<td>Integrated Marketing Communications Strategy</td>
</tr>
<tr>
<td>ISEN 220-0</td>
<td>Introduction to Energy Systems for the 21st Century</td>
</tr>
<tr>
<td>ISEN 230-0</td>
<td>Climate Change and Sustainability: Ethical Dimensions</td>
</tr>
<tr>
<td>LOC 306-0</td>
<td>Studies in Organizational Change</td>
</tr>
<tr>
<td>LOC 311-0</td>
<td>Tools for Organizational Analysis</td>
</tr>
</tbody>
</table>