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 (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:

- IEMS 304-0 Statistical Learning for Data Analysis
- CIV_ENV 205-0 Economics and Finance for Engineers
- COMP_SCI 217-0 Data Management & Information Processing

2 additional basic engineering courses chosen according to McCormick guidelines (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)

2 computer programming courses:

- COMP_SCI 111-0 Fundamentals of Computer Programming
- COMP_SCI 150-0 Fundamentals of Computer Programming 1.5

5 IE Methods Core courses:

- IEMS 202-0 Probability
- IEMS 303-0 Statistics
- 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 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

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

Other Approved Non-engineering Technical Electives

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 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 Requires IEMS 202-0 Probability and IEMS 303-0 Statistics as prerequisites.

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 Engineering/Operations Research Electives

2 courses 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 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

2 courses chosen from:

- IEMS 325-0 Engineering Entrepreneurship
- IEMS 340-0 Field Project Methods
- 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

2 courses chosen from:

- BUS_INST 302-0 Marketing Management
- ECON 309-0 Public Finance
- ECON 331-0 Economics of Risk and Uncertainty
- ECON 336-0 Analytic Methods for Public Policy Analysis
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>