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)
- 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 ²
- 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>
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<tr>
<th>Course</th>
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<tr>
<td>BUS_INST 301-0</td>
<td>Accounting</td>
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<td>BUS_INST 302-0</td>
<td>Marketing Management</td>
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<tr>
<td>BUS_INST 303-0</td>
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<tr>
<td>ECON 309-0</td>
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<td>ECON 331-0</td>
<td>Economics of Risk and Uncertainty</td>
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<td>ECON 336-0</td>
<td>Analytic Methods for Public Policy Analysis</td>
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<td>ECON 339-0</td>
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<td>ECON 349-0</td>
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<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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<td>ECON 360-2</td>
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<td>ECON 371-0</td>
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<td>ECON 380-1</td>
<td>Game Theory</td>
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<td>ECON 380-2</td>
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<td>Econometrics</td>
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<tr>
<td>ECON 381-2</td>
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<tr>
<td>IMC 303-0</td>
<td>Integrated Marketing Communications Strategy</td>
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<td>ISEN 220-0</td>
<td>Introduction to Energy Systems for the 21st Century</td>
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<td>ISEN 230-0</td>
<td>Climate Change and Sustainability: Ethical Dimensions</td>
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<tr>
<td>LOC 306-0</td>
<td>Studies in Organizational Change</td>
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<tr>
<td>LOC 311-0</td>
<td>Tools for Organizational Analysis</td>
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