

# 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	Title
<b>Requirements (48 units)</b>	
<i>Core Courses (32 units)</i> <sup>1</sup>	
4 mathematics courses ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
4 engineering analysis and computer proficiency courses ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
4 units of basic science chosen according to McCormick basic science guidelines ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> ) <sup>2</sup>	
3 design and communications courses ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
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 <sup>3</sup>
2 additional courses from two different areas: Computer architecture and numerical methods, Electrical science, Fluids and solids, Materials science and engineering, Thermodynamics ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
7 social sciences/humanities courses ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
5 unrestricted electives ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
<i>Major Program (16 units)</i>	
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
7 Electives:	
2 industrial engineering/operations research electives (p. 1)	
2 management science electives (p. 1)	
<b>3 General Technical Electives chosen from</b>	
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 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.

- See general requirements (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>) for details.
  - PHYSICS 135-2 General Physics and 1 unit of Chemistry (from approved list) recommended.
  - 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:	
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

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ECON 350-0	Monopoly Competition & Public Policy
ECON 355-0	Transportation Economics and Public Policy
ECON 360-2	Investments
ECON 362-0	International Finance
ECON 371-0	Economics of Energy
ECON 380-1	Game Theory
ECON 380-2	Game Theory
ECON 381-1	Econometrics
ECON 381-2	Econometrics
IMC 303-0	Integrated Marketing Communications Strategy
ISEN 220-0	Introduction to Energy Systems for the 21st Century
ISEN 230-0	Climate Change and Sustainability: Ethical Dimensions