

# 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) <sup>1</sup>

Course	Title
<b>4 mathematics courses</b> ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
<b>4 units of basic science chosen according to McCormick basic science guidelines</b> ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
<b>4 engineering analysis and computer proficiency courses</b>	
GEN_ENG 205-1 & GEN_ENG 205-2 & GEN_ENG 205-3 or GEN_ENG 206-1 & GEN_ENG 206-2 & GEN_ENG 206-3	Engineering Analysis I and Engineering Analysis II and Engineering Analysis III Honor Engineering Analysis and Honors Engineering Analysis and Honors Engineering Analysis
ES_APPM 245-0	Elementary Applied Linear Algebra
<b>3 design and communications courses</b> ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
<b>7 social sciences/humanities courses</b> ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	
<b>5 unrestricted electives</b> ( <a href="https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext">https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext</a> )	

### Major Program (21 units)

Course	Title
<b>1 engineering economics course</b>	
CIV_ENV 205-0	Economics and Finance for Engineers <sup>2</sup>
<b>3 computer programming courses</b>	
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
<b>6 industrial engineering methods core courses</b>	
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
<b>1 production and logistics course chosen from the options below</b>	
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
<b>1 client project course</b>	
IEMS 394-0	Industrial Engineering Client Project Challenge
<b>5 IEMS elective courses</b>	
3 industrial engineering/operations research electives (p. 1)	
2 management science electives (p. 1)	
<b>4 general technical elective courses chosen from areas below</b>	

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.

<sup>1</sup> See general requirements (<https://catalogs.northwestern.edu/undergraduate/engineering-applied-science/#requirementstext>) for details.

<sup>2</sup> 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

Course	Title
BUS_INST 301-0	Accounting
BUS_INST 302-0	Marketing Management
BUS_INST 303-0	Leadership in Organizations
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
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
LOC 306-0	Studies in Organizational Change
LOC 311-0	Tools for Organizational Analysis