BS in Industrial Engineering
Degree Requirements, AY 2020-2021

Major Program
IE Methods Core

Done	Course	Course Name	Notes
Mathematics Requirement (4 credits)			
☐	Math 220-1	Single-variable Differential Calculus	
☐	Math 220-2	Single-variable Integral Calculus	
☐	Math 228-1	Multivariable Diff. Calc. for Eng.	
☐	Math 228-2	Multivariable Int. Calc. for Eng.	
Engineering Analysis and Computer Proficiency (4 credits)			
☐	Gen Eng 205-1	EA 1	
☐	Gen Eng 205-2	EA 2	
☐	Gen Eng 205-3	EA 3	
☐	Gen Eng 205-4	EA 4	
Basic Sciences (4 credits)			
☐			See reverse for details on acceptable courses
☐			
☐			
☐			
Design and Communications (3 credits)			
☐	DSGN 106-1/Engl 106-1	DTC 1	
☐	DSGN 106-2/Engl 106-2	DTC 2	
☐	Communications Course	Chosen from COMM_ST 102, PERF_ST 103 or PERF_ST 203	
Basic Engineering (5 credits)			
☐	COMP_SCI 211	Fund. Of Computer Programming II	Comp. Programming
☐	COMP_SCI 217	Data Mgmt & Info Processing	Comp. Programming
☐	CIV ENV 205	Eng. Econ	Systems Eng.
2 additional courses from two different areas			
☐	Basic Engineering Choice		See reverse for details on acceptable courses
☐	Basic Engineering Choice		
Theme Courses (7 credits)			
☐	Theme		See reverse for details on requirements
☐	Theme		
☐	Theme		
☐	Theme		
☐	Theme		
☐	Theme		
☐	Theme		

Done	Course	Course Name	Notes
IEMS Major Program: Methods Core + PL + Project (9 credits)			
☐	COMP_SCI 111	Fundamentals of Computer Programming I	Prerequisite for COMP_SCI 211
☐	IEMS 202	Probability	IE/OR Methods Core
☐	IEMS 303	Statistics	
☐	IEMS 304	Statistical Learning for Data Analysis	
☐	IEMS 313	Foundations of Optimization	
☐	IEMS 315	Stohastic Models	
☐	IEMS 317	Discrete-Event Systems Simulation	
☐	Prodn & Logistics	Choose from IEMS 381, 382, 383, or 385	
☐	IEMS 394	IE Client Project Challenge	Junior spring or Senior fall
IEMS Major Program: IE/OR Electives (2 credits)			
☐	IE/OR Elective		May not count course used for Prodn & Logistics above
☐	IE/OR Elective		
		See reverse for details on acceptable courses	
IEMS Major Program: Management Science Electives (2 credits)			
☐	Elective-MS		See reverse for details on acceptable courses
☐	Elective-MS		
IEMS Major Program: General Technical Electives (3 credits)			
☐	Elective-GTE		See reverse for details on acceptable courses
☐	Elective-GTE		
☐	Elective-GTE		
Unrestricted Electives (5 credits)			
☐			
☐			
☐			
☐			
☐			

Full details can be found in the Undergraduate Catalog for 2020-2021 (catalogs.northwestern.edu)

Basic Science Courses

Four units, including courses from at least two areas
At most 2 units from Earth Sciences and Astronomy; no more than 3 units from any other area
Lab courses may count only in combination with their corresponding lecture courses

Physics

PHYSICS 135-2 & 136-2	General Physics & Laboratory
PHYSICS 135-3 & 136-3	General Physics & Laboratory
PHYSICS 239	Foundations of Modern Physics

Chemistry

CHEM 131 or 151 or 171	(General/Accelerated/Advanced) Chemistry 1
CHEM 141 or 161 or 181	(Gen/Acc/Adv) General Chemistry Laboratory 1
CHEM 132 or 152 or 172	(General/Accelerated/Advanced) Chemistry 2
CHEM 142 or 162 or 182	(Gen/Acc/Adv) Chemistry Laboratory 2
CHEM 210-1	Organic Chemistry
CHEM 210-2	Organic Chemistry

Biological Sciences

BIOL_SCI 215	Genetics and Molecular Biology
BIOL_SCI 217	Physiology
BIOL_SCI 219	Cell Biology
BIOL_SCI 220	Genetics and Molecular Processes Laboratory
BIOL_SCI 221	Cellular Process Laboratory
BIOL_SCI 222	Investigative Laboratory
CHEM_ENG 275	Molecular & Cell Biology for Engineers
CIV_ENV 202	Biological & Ecological Principles

Earth Sciences and Astronomy

ASTRON 220	Introduction to Astrophysics
CIV_ENV 203	Earth in the Anthropocene
EARTH 201	Earth Systems Revealed
EARTH 202	Earth's Interior
EARTH 203	Earth System History

Basic Engineering Courses

Five basic engineering courses must come from four distinct areas.
COMP_SCI 211 & COMP_SCI 217, required, are in the Computer Programming area.
Civ_Env 205, required, is in the Systems Engineering area
Two additional courses must be chosen from two of the areas below.

Computer Architecture & Numerical Methods

COMP_ENG 203	Intro to Computer Eng.
COMP_ENG 205	Fundamentals of Computer Software
ES_APPM 346	Modeling & Computation

Electrical Science

ELEC_ENG 202	Intro to Electrical Eng.
ELEC_ENG 270	Applications of Electronic Devices
ELEC_ENG 221	Fundamentals of Circuits
ELEC_ENG 222	Fundamentals of Signals & Systems
ELEC_ENG 223	Fundamentals of Solid State Engineering
ELEC_ENG 224	Fundamentals of Elegromagnetics & Photonics
MECH_ENG 233	Electronics Design

Fluids & Solids

CHEM_ENG 321	Fluid Mechanics
CIV_ENV 216	Mechanics of Materials I
MECH_ENG 241	Fluid Mechanics I
BMD_ENG 270	Fluid Mechanics
BMD_ENG 271	Intro to Biomechanics

Materials Science and Engineering

MAT_SCI 201	Introduction to Materials
MAT_SCI 301	Materials Science Principles

Thermodynamics

BMD_ENG 250	Thermodynamics
CHEM_ENG 211	Thermodynamics
MAT_SCI 314	Thermodynamics of Materials
MAT_SCI 315	Phase Equilibria and Diffusion
MECH_ENG 222	Thermo & Statistical Mechanics I
MECH_ENG 322	Thermo & Statistical Mechanics II

IE/OR Elective Options

IEMS 307	Quality Improvement by Exper. Des.
IEMS 308	Data Science and Analytics
IEMS 351	Optimization Methods for Data Science
IEMS 365	Analytics for Social Good
IEMS 373	Intro. to Financial Engineering
IEMS 381	Supply Chain Modeling
IEMS 382	Production Plan & Sched
IEMS 383	Service Opns. Mgmt.
IEMS 385	Health Systems Eng.

Management Science Elective Options

IEMS 325	Engineering Entrepreneurship
IEMS 341	Social Network Analysis
IEMS 342	Organizational Behavior
IEMS 343	Project Management for Engineers
IEMS 344	Leading Organizations and Teams
IEMS 345	Negotiations and Conflict Resolution
IEMS 395	Special Topics: Whole-brain Leadership

(Note that other 395 courses may not count here)

General Technical Elective Options

The following courses MAY BE USED as technical electives

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

Comp_Sci 150	Fundamentals of Programming 1.5
Econ 309	Elements of Public Finance
Econ 331	Economics of Risk and Uncertainty
Econ 336	Analytic Methods for Public Policy Analysis
Econ 339	Labor Economics
Econ 349	Industrial Economics
Econ 350	Monoply, Competition, and Public Policy
Econ 355	Transportation Economics and Public Policy
Econ 360-2	Investments
Econ 362	International Finance
Econ 380-1,2	Game Theory
Econ 381-1,2	Econometrics
Econ 383	Economic Forecasting
IMC 303	Integrated Marketing Communications Strategy
ISEN 220	Intro to Energy Systems for the 21st Century
ISEN 230	Climate Change and Sustainability

The following courses MAY NOT BE USED as technical electives

Chem 201	Chemistry of Nature and Culture
Math 310-1	Probability and Stochastic Processes
Math 311-1	MENU: Probability & Stochastic Processes
Math 314	Probability and Statistics for Econometrics
Math 385	Probability and Statistics for MMSS
Math 386-1	Econometrics for MMSS
Physics 311-1	Mathematical Tools for the Physical Sciences
Physics 311-2	Mathematical Tools for the Physical Sciences
Physics 335	Physics of Magic
Stat 320-1	Statistical Methods I
Stat 383	Probability and Statistics for ISP

Theme Requirements

The theme requirement consists of seven courses in humanities and social sciences.
At least three courses (the "theme") must be related in content.
Requires at least two courses in social sciences, and at least two courses in humanities
See the McCormick Undergraduate Engineering website for information on eligible course
Note that the following courses may NOT be used towards theme:
Any BUS_INST or Kellogg course

ECON 281	ECON 381-1	
ECON 380-1	ECON 381-2	ENGLISH 106-2
ECON 380-2	ENGLISH 106-1	GEOG 341
		PSYCH 201