

# Industrial Engineering and Business Administration, BSIE (Boston)

The combined major in industrial engineering and business administration is designed to educate students in topics of both disciplines and the interface between them. Industrial engineering involves the design and analysis of systems that include people, equipment, and materials and their interactions and performance in the workplace. An industrial engineer collects this information and evaluates alternatives to make decisions that best advance the goals of the enterprise. Northeastern University's D'Amore-McKim School of Business offers students an opportunity to develop the skills needed to lead in today's technologically driven business world. We deliver a curriculum that combines knowledge in technology and data analytics with human skills such as critical thinking, creativity, and an entrepreneurial mindset. Students in this program will combine the disciplines in order to address complex problems with robust analysis, implementation of technology, and strong leadership.

## Program Requirements

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

## Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (<https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<https://catalog.northeastern.edu/undergraduate/university-academics/nupath/>).

NUpath requirement Difference and Diversity (DD) is not explicitly satisfied by required coursework. Students are responsible for satisfying this with general elective coursework.

## Industrial Engineering Requirements

Code	Title	Hours
<b>Required Engineering</b>		
IE 2310 and IE 2311	Introduction to Industrial Engineering and Recitation for IE 2310	4
IE 4510	Simulation Modeling and Analysis	4
IE 4516	Quality Assurance	4
IE 4522 and IE 4523	Human-Machine Systems and Lab for IE 4522	5
IE 4525	Logistics and Supply Chain Management	4
IE 4530 and IE 4531	Manufacturing Systems and Techniques and Lab for IE 4530	5
<b>Senior Capstone Design Project</b>		
MEIE 4701	Capstone Design 1	1
MEIE 4702	Capstone Design 2	5
<b>Supplemental Credit</b>		
2 semester hours from the following count toward the engineering requirement:		2
GE 1501	Cornerstone of Engineering 1 <sup>1</sup>	
3 semester hours from the following count toward the engineering requirement:		3
GE 1502	Cornerstone of Engineering 2 <sup>1</sup>	
1 semester hour from the following course counts toward the engineering requirement:		1
IE 3412 or MATH 3081	Engineering Probability and Statistics Probability and Statistics	
3 semester hours from the following course counts toward the engineering requirement:		3
IE 4512	Engineering Economy	
2 semester hours from the following course counts toward the engineering requirement:		2
IE 4515	Operations Research	
2 semester hours from the following course counts toward the engineering requirement:		2
IE 4520	Stochastic Modeling	

## Business Requirements

Code	Title	Hours
<b>Required Business Courses</b>		
ACCT 1201	Financial Accounting and Reporting	4
ECON 1115 or ECON 1116	Principles of Macroeconomics Principles of Microeconomics	4
INTB 1203	International Business and Global Social Responsibility	4
ORGB 3201 or ORGB 3203	Organizational Behavior Behavioral Aspects of Digital Transformation	4
STRT 4501	Strategy in Action	4
<b>Required Business Elective</b>		
Complete one of the following:		4
ACCT 2301	Profit Analysis for Managers and Advisors	
INNO 2301	Innovation!	
MISM 2301	Introduction to Information Systems and Digital Technologies	
MKTG 2201	Introduction to Marketing	

## Business Concentration

Complete one of the following business concentrations:

- Accounting (<https://catalog.northeastern.edu/undergraduate/business/concentrations/accounting/>)
- Accounting and Advisory Services (<https://catalog.northeastern.edu/undergraduate/business/concentrations/accounting-advisory-services/>)
- Brand Management (<https://catalog.northeastern.edu/undergraduate/business/concentrations/brand-management/>)
- Business Analytics (<https://catalog.northeastern.edu/undergraduate/business/concentrations/business-analytics/>)
- Corporate Innovation (<https://catalog.northeastern.edu/undergraduate/business/concentrations/corporate-innovation/>)
- Entrepreneurial Startups (<https://catalog.northeastern.edu/undergraduate/business/concentrations/entrepreneurial-startups/>)
- Finance (<https://catalog.northeastern.edu/undergraduate/business/concentrations/finance/>)
- Fintech (<https://catalog.northeastern.edu/undergraduate/business/concentrations/fintech/>)
- Healthcare Management and Consulting (<https://catalog.northeastern.edu/undergraduate/business/concentrations/healthcare-management-consulting/>)
- Management (<https://catalog.northeastern.edu/undergraduate/business/concentrations/management/>)
- Management Information Systems (<https://catalog.northeastern.edu/undergraduate/business/concentrations/management-information-systems/>)
- Marketing (<https://catalog.northeastern.edu/undergraduate/business/concentrations/marketing/>)
- Marketing Analytics (<https://catalog.northeastern.edu/undergraduate/business/concentrations/marketing-analytics/>)
- Social Innovation and Entrepreneurship (<https://catalog.northeastern.edu/undergraduate/business/concentrations/social-innovation-entrepreneurship/>)
- Supply Chain Management (<https://catalog.northeastern.edu/undergraduate/business/concentrations/supply-chain-management/>)

## Business Experiential Learning

Code	Title	Hours
Complete at least one of the following experiences:		0-8
BUSN 4945	In-the-Field Experiential Professional Practicum	
COOP 3945	Co-op Work Experience	
COOP 3946	Co-op Work Experience—Half Time	
COOP 3947	Co-op Work Experience Abroad—Half Time	
COOP 3948	Co-op Work Experience Abroad	
EEBA 2945	Internship Experience	
EEBA 2948	Internship Experience Abroad	

## Supporting Courses: Mathematics/Science

Complete all mathematics/science courses with a minimum of 30 semester hours.

Code	Title	Hours
<b>Required Mathematics/Science</b>		
CHEM 1151 and CHEM 1153	General Chemistry for Engineers and Recitation for CHEM 1151	4
MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4
MATH 2321	Calculus 3 for Science and Engineering	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	5
<b>Supplemental Credit</b>		
1 semester hour from the following counts toward the mathematics/science requirement:		1
GE 1501	Cornerstone of Engineering 1 <sup>1</sup>	
3 semester hours from the following course count toward the mathematics/science requirement:		3
IE 3412 or MATH 3081	Engineering Probability and Statistics Probability and Statistics	
1 semester hour from the following course counts toward the mathematics/science requirement:		1
IE 4512	Engineering Economy	
2 semester hours from the following course count toward the mathematics/science requirement:		2
IE 4515	Operations Research	
2 semester hours from the following course count toward the mathematics/science requirement:		2
IE 4520	Stochastic Modeling	

## Professional Development

Code	Title	Hours
<b>Professional Development</b>		
ENCP 2000	Introduction to Engineering Co-op Education	1
ENCP 3000	Professional Issues in Engineering	1
GE 1000	First-Year Seminar	1
<b>Additional Required Courses</b>		
1 semester hour from the following counts toward the professional development requirement:		1
GE 1501	Cornerstone of Engineering 1 <sup>1</sup>	
1 semester hour from the following counts toward the professional development requirement:		1
GE 1502	Cornerstone of Engineering 2 <sup>1</sup>	

## Writing Requirements

Code	Title	Hours
A grade of C or higher is required in each course.		
ENGW 1111	First-Year Writing	4
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	
or ENGW 3304	Advanced Writing in the Business Administration Professions	

## Required General Elective

Code	Title	Hours
Complete 4 semester hours of academic, nonremedial, nonrepetitive courses. It is recommended to select a course that fulfills the NUPath DD requirement.		4

## Integrative Course

Code	Title	Hours
This course is already required above and also fulfills the integrative requirement:		
MEIE 4702	Capstone Design 2	

**Major GPA Requirement**

2.000 minimum GPA required in IE, ME, MEIE, and business courses

**Program Requirement**

136 total semester hours required

<sup>1</sup> Students can substitute Engineering Design (GE 1110) and Engineering Problem Solving and Computation (GE 1111) for Cornerstone of Engineering 1 (GE 1501) and Cornerstone of Engineering 2 (GE 1502).

**Plan of Study****Sample Plans of Study****FOUR YEARS, TWO CO-OPS IN SPRING/ SUMMER FIRST HALF**

Year 1							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ACCT 1201		4 INTB 1203		4 ENGW 1111		4 MATH 2341	4
CHEM 1151 and CHEM 1153		4 GE 1502		4 MATH 2321		4 ECON 1115	4
GE 1000		1 MATH 1342		4			
GE 1501		4 PHYS 1151 and PHYS 1152 and PHYS 1153		5			
MATH 1341		4					
	17		17		8		8
Year 2							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Business bucket core		4 Co-op		0 Co-op		0 ENGW 3302, 3315, or 3304	4
ENCP 2000		1				ORGB 3201	4
IE 2310 and IE 2311		4					
IE 3412 or MATH 3081		4					
IE 4512		4					
	17		0		0		8
Year 3							
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Business concentration elective		4 Co-op		0 Co-op		0 Business concentration elective	4
IE 4510		4				STRT 4501	4
IE 4515		4					
IE 4516		4					
	16		0		0		8
Year 4							
Fall	Hours	Spring	Hours				
Business concentration elective		4 Business concentration elective		4			
ENCP 3000		1 DD NUpath		4			
IE 4520		4 IE 4530 and IE 4531		5			
IE 4522 and IE 4523		5 MEIE 4702		5			
IE 4525		4					
MEIE 4701		1					
	19		18				

**Total Hours: 136**

**FOUR YEARS, TWO CO-OPS IN SUMMER SECOND HALF/FALL**

<b>Year 1</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
ACCT 1201		4 GE 1502		4 ENG 1111		4 ECON 1115	4
CHEM 1151 and CHEM 1153		4 INTB 1203		4 MATH 2321		4 MATH 2341	4
GE 1501		4 MATH 1342		4			
GE 1000		1 PHYS 1151 and PHYS 1152 and PHYS 1153		5			
MATH 1341		4					
	<b>17</b>		<b>17</b>		<b>8</b>		<b>8</b>
<b>Year 2</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Bussiness bucket core		4 Business concentration elective		4 ENG 3302, 3315, or 3304		4 Co-op	0
IE 2310 and IE 2311		4 ENCP 2000		1 ORGB 3201		4	
IE 3412 or MATH 3081		4 IE 4510		4			
IE 4512		4 IE 4515		4			
		IE 4516		4			
	<b>16</b>		<b>17</b>		<b>8</b>		<b>0</b>
<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Co-op		0 Business concentration elective		4 Business concentration elective		4 Co-op	0
		IE 4520		4 MEIE 4701		1	
		IE 4522 and IE 4523		5 STRT 4501		4	
		IE 4525		4			
	<b>0</b>		<b>17</b>		<b>9</b>		<b>0</b>
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>				
Co-op		0 Business concentration elective		4			
		DD NUpaht		4			
		ENCP 3000		1			
		IE 4530 and IE 4531		5			
		MEIE 4702		5			
	<b>0</b>		<b>19</b>				

Total Hours: 136

**FIVE YEARS, THREE CO-OPS IN SPRING/SUMMER FIRST HALF**

<b>Year 1</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
ACCT 1201		4 GE 1502		4 Vacation		Vacation	
CHEM 1151 and CHEM 1153		4 INTB 1203		4			
GE 1000		1 MATH 1342		4			
GE 1501		4 PHYS 1151 and PHYS 1152 and PHYS 1153		5			
MATH 1341		4					
	<b>17</b>		<b>17</b>		<b>0</b>		<b>0</b>

<b>Year 2</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
ECON 1115 or 1116		4 Co-op		0 Co-op		0 Vacation	
ENCP 2000		1					
ENGW 1111		4					
IE 2310 and IE 2311		4					
MATH 2321		4					
		<b>17</b>		<b>0</b>		<b>0</b>	<b>0</b>
<b>Year 3</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Business bucket core		4 Co-op		0 Co-op		0 ENGW 3302, 3315, or 3304	4
IE 3412 or MATH 3081		4				ORGB 3201	4
IE 4512		4					
MATH 2341		4					
		<b>16</b>		<b>0</b>		<b>0</b>	<b>8</b>
<b>Year 4</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
Business concentration elective		4 Co-op		0 Co-op		0 Business concentration elective	4
ENCP 3000		1				STRT 4501	4
IE 4510		4					
IE 4515		4					
IE 4516		4					
		<b>17</b>		<b>0</b>		<b>0</b>	<b>8</b>
<b>Year 5</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>				
Business concentration elective		4 Business concentration elective		4			
IE 4520		4 DD NUpaht		4			
IE 4522 and IE 4523		5 IE 4530 and IE 4531		5			
IE 4525		4 MEIE 4702		5			
MEIE 4701		1					
		<b>18</b>		<b>18</b>			

Total Hours: 136

**FIVE YEARS, THREE CO-OPS IN SUMMER SECOND HALF/ FALL**

<b>Year 1</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
ACCT 1201		4 GE 1502		4 Vacation		Vacation	
CHEM 1151 and CHEM 1153		4 INTB 1203		4			
GE 1000		1 MATH 1342		4			
GE 1501		4 PHYS 1151 and PHYS 1152 and PHYS 1153		5			
MATH 1341		4					
		<b>17</b>		<b>17</b>		<b>0</b>	<b>0</b>
<b>Year 2</b>							
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>	<b>Summer 1</b>	<b>Hours</b>	<b>Summer 2</b>	<b>Hours</b>
ECON 1115 or 1116		4 Business bucket core		4 Vacation		Co-op	0
ENGW 1111		4 ENCP 2000		1			

