Chemical Engineering and Environmental Engineering, BSChE

The Bachelor of Science in Chemical Engineering and Environmental Engineering provides expertise in addressing a variety of environmental challenges built on fundamentals in engineering, chemical, biological, and ecological principles. The coursework is designed to prepare students to tackle interconnected challenges in water, energy, air quality, and related fields, through chemical engineering skills in the engineering and control of processes involving chemicals that impact our environment, exploring ways to reduce acid rain and smog; to recycle and reduce wastes; to develop new sources of environmentally clean energy; and to design inherently safe, efficient, and “green” processes.

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 (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

NUpath Requirements

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

NUpath requirements Interpreting Culture (IC), Societies and Institutions (SI), and Differences and Diversity (DD) are not satisfied by required engineering courses. Students are responsible for satisfying these requirements with general electives.

Chemical Engineering

Code	Title	Hours
Required Engineering		
CHME 2308	Conservation Principles in Chemical Engineering	4
CHME 2310	Transport Processes 1	4
CHME 2320	Chemical Engineering Thermodynamics 1	4
CHME 3312	Transport Processes 2	4
CHME 3315 and CHME 3316	Chemical Engineering Experimental Design 1 and Recitation for CHME 3315	4
CHME 3322	Chemical Engineering Thermodynamics 2	4
CHME 4315 and CHME 4316	Chemical Engineering Experimental Design 2 and Recitation for CHME 4315	4
CHME 4510	Chemical Engineering Kinetics	4
CHME 4512	Chemical Engineering Process Control	4
Chemical Engineering Capstone		
CHME 4701	Separations and Process Analysis	4
CHME 4703 and CHME 4705	Chemical Process Design Capstone and Recitation for CHME 4703	4
Supplemental Credit		
2 semester hours from the following course count toward the engineering requirement:		2
GE 1501	Cornerstone of Engineering 1 [1]	
3 semester hours from the following course count toward the engineering requirement:		3
GE 1502	Cornerstone of Engineering 2 [1]	

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Students can substitute GE 1110 and GE 1111 for GE 1501 and 1502 in approved situations.

Environmental Engineering

Code	Title	Hours
Core Environmental Engineering Courses		
CIVE 2334	Environmental Engineering: Principles, Technology, and Sustainability	4
CIVE 2335	Environmental Engineering Chemistry	4
CIVE 3430	Engineering Microbiology and Ecology	4
CIVE 3435	Environmental Pollution Fate and Transport	4

CIVE 4534 and CIVE 4535	Water Treatment Systems Design and Lab for CIVE 4534	4
CIVE 5300 and CIVE 5301	Environmental Sampling and Analysis and Lab for CIVE 5300	4
Environmental Engineering Elective Courses		
Complete at least two courses from the following list:		8
CIVE 4540	Resource Recovery and Waste Treatment Technologies Abroad	
CIVE 4777	Climate Hazards and Resilient Cities Abroad	
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking	
CIVE 5271	Solid and Hazardous Waste Management	
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 5280	Remote Sensing of the Environment	
CIVE 5281	Coastal Dynamics and Design	
CIVE 5363	Climate Science, Engineering Adaptation, and Policy	
CIVE 5536	Hydrologic and Hydraulic Design	

Supporting Courses: Mathematics/Science

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

Code	Title	Hours
Required Mathematics/Science		
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
PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	5
Supplemental Credit		
1 semester hour from the following course counts toward the mathematics/science requirement:		1
GE 1501	Cornerstone of Engineering 1 [1]	

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Students can substitute GE 1110 and GE 1111 for GE 1501 and 1502 in approved situations.

Professional Development

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

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Students can substitute GE 1110 and GE 1111 for GE 1501 and 1502 in approved situations.

Writing Requirements

Code	Title	Hours
A grade of C or higher is required:		
ENGW 1111	First-Year Writing	4
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3307	Advanced Writing in the Sciences	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 8 semester hours of academic, nonremedial, nonrepetitve courses.		8

Integrative Course

Code	Title	Hours
This course is already required above and also fulfills the integrative requirement:		
CHME 2310	Transport Processes 1	4

Major GPA Requirement

2.000 minimum GPA required in CHME courses

2.000 minimum GPA required in all CIVE courses

Program Requirement

133 total semester hours required

Plan of Study
Four Years, One Co-op in Summer 2/Fall

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	CHME 2308	4	MATH 2321 (FQ)	4	Vacation	
CHEM 1153	0	GE 1502 (ER)	4	PHYS 1155 (ND)	3		
ENGW 1111 (WF)	4	MATH 1342 (FQ)	4	PHYS 1156 (AD)	1		
GE 1000	1	PHYS 1151 (ND)	3	PHYS 1157	1		
GE 1501	4	PHYS 1152 (AD)	1				
MATH 1341 (FQ)	4	PHYS 1153	1				
	17		17		9		0

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2310	4	CHME 3312	4	General elective	4	Vacation	
CHME 2320	4	CIVE 2335	4	General elective	4		
CIVE 2334	4	CIVE 3430	4				
MATH 2341	4	CIVE 3435	4				
		ENCP 2000	1				
	16		17		8		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3315 (AD)	4	CHME 4315 (AD, WI)	4	Vacation		Co-op	
CHME 3316	0	CHME 4316	0				
CHME 3322	4	CHME 4510	4				
ENGW 3302, 3307, or 3315 (WD)	4	CHME 4701	4				
CIVE 4534 (WI)	3	CIVE 5300	2				
CIVE 4535	1	CIVE 5301	2				
	16		16		0		0

Year 4

Fall	Hours	Spring	Hours
Co-op		CHME 4512	4
		CHME 4703 (EI, CE, WI)	4
		CHME 4705	0
		ENCP 3000	1
		Environmental engineering elective	4
		Environmental engineering elective	4
	0		17

Total Hours: 133

Five Years, Three Co-ops in Summer 2/Fall

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	CHME 2308	4	MATH 2321 (FQ)	4	Vacation	
CHEM 1153	0	GE 1502 (ER)	4	PHYS 1155 (ND)	3		
ENGW 1111 (WF)	4	MATH 1342 (FQ)	4	PHYS 1156 (AD)	1		
GE 1000	1	PHYS 1151 (ND)	3	PHYS 1157	1		
GE 1501	4	PHYS 1152 (AD)	1				
MATH 1341 (FQ)	4	PHYS 1153	1				
	17		17		9		0

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2310	4	CHME 3312	4	Vacation	0	Co-op	
CHME 2320	4	CIVE 2335	4				
CIVE 2334	4	CIVE 3430	4				
MATH 2341	4	CIVE 3435	4				
		ENCP 2000	1				
	16		17		0		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		CHME 3315 (AD)	4	Vacation		Co-op	
		CHME 3316	0				
		CHME 3322	4				
		ENGW 3302, 3307, or 3315 (WD)	4				
		CIVE 4534 (WI)	3				
		CIVE 4535	1				
	0		16		0		0

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		CHME 4315 (AD, WI)	4	General elective	4	Co-op	
		CHME 4316	0	General elective	4		
		CHME 4510	4				
		CHME 4701	4				
		CIVE 5300	2				
		CIVE 5301	2				
		ENCP 3000	1				
	0		17		8		0

Year 5

Fall	Hours	Spring	Hours
Co-op		CHME 4512	4
		CHME 4703 (EI, CE, WI)	4
		CHME 4705	0
		Environmental engineering elective	4
		Environmental engineering elective	4
	0		16

Total Hours: 133