Chemical Engineering and Environmental Engineering, BSChE (Boston)

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 Education Objectives can be found at the following websites:

- Accreditation - Department of Chemical Engineering (https://che.northeastern.edu/academics/undergraduate-studies/che-accreditation/)
- Accreditation - Department of Civil & Environmental Engineering (https://cee.northeastern.edu/academics/undergraduate-studies/cee-accreditation/)

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 requirements: Interpreting Culture (IC), Understanding Societies and Institutions (SI), Engaging Differences and Diversity (DD), and Integrating Knowledge and Skills Through Experience (EX) are not explicitly satisfied by required engineering coursework. Successful completion of a cooperative education experience fulfills the EX requirement. Students are responsible for satisfying unfulfilled NUpath requirements with general elective coursework.

Chemical Engineering Requirements

Code	Title	Hours
Required Engineering		
CHME 2308	Conservation Principles in Chemical Engineering	4
CHME 2310	Transport Processes 1	4
CHME 2320	Engineering Thermodynamics	4
CHME 3305 and CHME 3306	Chemical Engineering Laboratory and Recitation for CHME 3305	4
CHME 3312	Transport Processes 2	4
CHME 3322	Chemical Thermodynamics	4
CHME 4510	Chemical Engineering Kinetics	4
CHME 4512	Chemical Engineering Process Control	4
CHME 4701	Separations and Process Analysis	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]	

Environmental Engineering

Code	Title	Hours
Core Environmental Engineering Courses		
CIVE 2300 and CIVE 2301	Environmental Measurements in Natural and Engineered Systems and Lab for CIVE 2300	4
CIVE 2334	Environmental Engineering: Principles, Technology, and Sustainability	4

CIVE 3430	Engineering Microbiology and Ecology	4
CIVE 3435	Environmental Pollution: Fate and Transport	4
CIVE 3464	Probability and Engineering Economy for Civil Engineering	4
CIVE 4534 and CIVE 4535	Water Treatment Systems Design and Lab for CIVE 4534	4
Environmental Engineering Elective Courses		
Complete at least three courses from the following list:		12
CIVE 3335	Environmental Engineering Chemistry and Chemical Technologies	
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	

Capstone

Code	Title	Hours
CHME 4703 and CHME 4705	Chemical Process Design Capstone and Recitation for CHME 4703	4

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
Science Elective (Earth)		
Complete one of the following:		4-5
ENVR 1200	Dynamic Earth	
ENVR 2200	Earth's Changing Cycles	
ENVR 3125	Global Oceanic Change	
ENVR 3200	Water Resources	
ENVR 3600	Oceanography	
ENVR 5201	Geologic Field Seminar	
Supplemental Credit		
1 semester hour from the following course counts toward the mathematics/science requirement:		1
GE 1501	Cornerstone of Engineering 1 [1]	

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]	

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, nonrepetitive 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 coursework

2.000 minimum GPA required in all CIVE coursework

Program Requirement

132 total semester hours required

[1] 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, ONE CO-OP IN SUMMER SECOND HALF/FALL

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 and CHEM 1153 (ND)	4	GE 1502 (ER)	4	MATH 2321 (FQ)	4	Vacation	
ENGW 1111 (WF)	4	MATH 1342 (FQ)	4	CHME 2308	4		
GE 1000	1	Science Elective (Earth)	4				
GE 1501	4	PHYS 1151 and PHYS 1152 and PHYS 1153 (ND)	5				
MATH 1341 (FQ)	4						
	17		**17**		**8**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2320	4	CHME 2310	4	General elective	4	Vacation	
MATH 2341	4	CHME 3322	4	General elective	4		
CIVE 2300 and CIVE 2301	4	CIVE 3430	4				
CIVE 2334	4	CIVE 3435	4				
		ENCP 2000	1				
	16		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3305 and CHME 3306	4	CHME 4510	4	Vacation		Co-op	0
CHME 3312	4	CHME 4701	4				
ENGW 3302, 3307, or 3315 (WD)	4	CIVE 4534	3				
CIVE 3464	4	CIVE 4535	1				
		Environmental engineering elective	4				
		ENCP 3000	1				
	16		**17**		**0**		**0**

Year 4

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

Total Hours: 132

FOUR YEARS, ONE CO-OP IN SPRING/SUMMER FIRST HALF

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 and CHEM 1153 (ND)	4	GE 1502 (ER)	4	MATH 2321 (FQ)	4	Vacation	
ENGW 1111 (WF)	4	Science Elective (Earth)	4	CHME 2308	4		
GE 1000	1	MATH 1342 (FQ)	4				
GE 1501	4	PHYS 1151 and PHYS 1152 and PHYS 1153 (ND)	5				
MATH 1341 (FQ)	4						
	17		**17**		**8**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2320	4	CHME 2310	4	General elective	4	Vacation	
MATH 2341	4	CHME 3322	4	General elective	4		
CIVE 2300 and CIVE 2301	4	CIVE 3430	4				
CIVE 2334	4	CIVE 3435	4				
		ENCP 2000	1				
	16		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3305 and CHME 3306	4	Co-op	0	Co-op	0	Vacation	
CHME 3312	4						
ENGW 3302, 3307, or 3315 (WD)	4						
CIVE 3464	4						
ENCP 3000	1						
	17		**0**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours
CHME 4510	4	CHME 4512	4
CHME 4701	4	CHME 4703 and CHME 4705 (EI, CE, WI)	4
CIVE 4534 and CIVE 4535	4	Environmental engineering elective	4
Environmental engineering elective	4	Environmental engineering elective	4
	16		**16**

Total Hours: 132

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 and CHEM 1153 (ND)	4	GE 1502 (ER)	4	MATH 2321 (FQ)	4	Vacation	
ENGW 1111 (WF)	4	Science Elective (Earth)	4	CHME 2308	4		
GE 1000	1	MATH 1342 (FQ)	4				
GE 1501	4	PHYS 1151 and PHYS 1152 and PHYS 1153 (ND)	5				
MATH 1341 (FQ)	4						
	17		**17**		**8**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2320	4	CHME 2310	4	General elective	4	Co-op	0
MATH 2341	4	CHME 3322	4	General elective	4		
CIVE 2300 and CIVE 2301	4	CIVE 3430	4				
CIVE 2334	4	CIVE 3435	4				
		ENCP 2000	1				
	16		**17**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 3305 and CHME 3306	4	Vacation		Co-op	0
		CHME 3312	4				
		ENGW 3302	4				
		CIVE 3464	4				
	0		**16**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 4510	4	Vacation		Co-op	0
		CHME 4701	4				
		CIVE 4534 and CIVE 4535	4				
		ENCP 3000	1				
		Environmental engineering elective	4				
	0		**17**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	CHME 4512	4

	CHME 4703 and CHME 4705	4	
	Environmental engineering elective	4	
	Environmental engineering elective	4	
	0	**16**	

Total Hours: 132

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 and CHEM 1153 (ND)	4	GE 1502 (ER)	4	MATH 2321 (FQ)	4	Vacation	
ENGW 1111 (WF)	4	Science Elective (Earth)	4	CHME 2308	4		
GE 1000	1	MATH 1342 (FQ)	4				
GE 1501	4	PHYS 1151 and PHYS 1152 and PHYS 1153 (ND)	5				
MATH 1341 (FQ)	4						
	17		**17**		**8**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2320	4	Co-op	0	Co-op	0	General elective	4
MATH 2341	4					General elective	4
CIVE 2300 and CIVE 2301	4						
CIVE 2334	4						
ENCP 2000	1						
	17		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2310	4	Co-op	0	Co-op	0	Vacation	
CHME 3322	4						
CIVE 3430	4						
CIVE 3435	4						
	16		**0**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3305 and CHME 3306	4	Co-op	0	Co-op	0	Vacation	
CHME 3312	4						
ENGW 3302	4						
CIVE 3464	4						
	16		**0**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
CHME 4510	4	CHME 4512	4
CHME 4701	4	CHME 4703 and CHME 4705	4
CIVE 4534 and CIVE 4535	4	Environmental engineering elective	4
ENCP 3000	1	Environmental engineering elective	4

Environmental engineering elective	4	
	17	**16**

Total Hours: 132