Chemical Engineering and Computer Science, BSChE

The Bachelor of Science in Chemical Engineering and Computer Science provides expertise in computational modeling and simulation of chemical processes. The curriculum is designed to prepare students to practice in the engineering and control of processes involving chemicals, biotechnology feedstocks, and pharmaceuticals, as well as the fundamentals of program design, software development, and algorithms and data.

Program educational objectives can be found on the department website (https://che.northeastern.edu/academics/undergraduate-studies/che-accreditation/).

Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

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.

Engineering Requirements

Code	Title	Hours
Required Engineering		
CHME 2308	Conservation Principles in Chemical Engineering	4
CHME 2310	Transport Processes 1	4
CHME 2320	Chemical 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
Chemical Engineering Capstone		
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]	

Computer Science Requirements

Code	Title	Hours
Computer Science Fundamental Courses		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 2500 and CS 2501	Fundamentals of Computer Science 1 and Lab for CS 2500	5
CS 2510 and CS 2511	Fundamentals of Computer Science 2 and Lab for CS 2510	5
Computer Science Required Courses		
CS 3000	Algorithms and Data	4
CS 3200	Introduction to Databases	4
CS 3500 and CS 3501	Object-Oriented Design and Lab for CS 3500	5
CS 4500 or CS 4530	Software Development Fundamentals of Software Engineering	4
Khoury Elective Courses		
With advisor approval, a directed study, research, project study, or appropriate graduate-level course may also be taken as a computer science elective.		
Complete 8 semester hours of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:		8
CS 2500 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2000 or higher, except DS 4900		
IS 2000 or higher, except IS 4900		

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
Complete one of the following:		4-5
BIOL 1111	General Biology 1	
PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	
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 in each course:		
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	

Integrative Courses

Code	Title	Hours
This course is already required above and also fulfills the integrative requirement.		
CHME 4512	Chemical Engineering Process Control	

Required General Electives

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

[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) .

Major GPA Requirement

Minimum 2.000 GPA required in all CHME coursework

Minimum 2.000 GPA required in all CS, CY, DS, and IS courses

Program Requirement

136 total semester hours required

Plan of Study
Sample 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 and CHEM 1153 (ND)	4	GE 1502 (ER)	4	CHME 2308	4	Vacation	
ENGW 1111 (WF)	4	MATH 1342 (FQ)	4	MATH 2321 (FQ)	4		
GE 1000	1	PHYS 1151 and PHYS 1152 and PHYS 1153 (ND)	5				
GE 1501	4	General elective	4				
MATH 1341 (FQ)	4						
	17		**17**		**8**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111	4	CHME 2310	4	CS 3200 (FQ, AD)	4	Co-op	0
CHME 2320	4	CS 2510 and CS 2511 (ND, AD)	5	CS 3500 and CS 3501 (ND, AD)	5		
CS 1800 and CS 1802 (FQ)	5	ENCP 2000	1				
CS 2500 and CS 2501 (ND, FQ)	5	MATH 2341	4				
		General elective	4				
	18		**18**		**9**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 3312	4	Vacation		Vacation	
		CHME 3322	4				
		CS 3000	4				
		ENGW 3302, 3307, or 3315	4				
	0		**16**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours
CHME 3305 and CHME 3306	4	CHME 4512	4
CHME 4510	4	CHME 4703 and CHME 4705 (EI, WI, CE)	4
CHME 4701	4	CS 4530 (WI)	4
Khoury elective	4	ENCP 3000	1
		Khoury elective	4
	16		**17**

Total Hours: 136

FOUR YEARS, ONE CO-OP IN SPRING/SUMMER 1

Year 1

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

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111	4	Co-op	0	Co-op	0	Vacation	0
CHME 2320	4						
CS 1800 and CS 1802 (FQ)	5						
CS 2500 and CS 2501 (ND, FQ)	5						
ENCP 2000	1						
	19		**0**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2310	4	CHME 3312	4	CS 3200	4	Vacation	
CS 2510 and CS 2511	5	CHME 3322	4	CS 3500 and CS 3501	5		
MATH 2341	4	CS 3000	4				
General elective	4	ENGW 3302	4				
	17		**16**		**9**		**0**

Year 4

Fall	Hours	Spring	Hours
CHME 3305 and CHME 3306	4	CHME 4512	4

CHME 4510	4	CHME 4703 and CHME 4705 (EI, WI, CE)	4	
CHME 4701	4	CS 4530 (WI)	4	
Khoury elective	4	ENCP 3000	1	
		Khoury elective	4	
	16		**17**	

Total Hours: 136

FIVE YEARS, THREE CO-OPS IN SUMMER 2/FALL

Year 1

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

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111	4	CHME 2310	4	Vacation		Co-op	0
CHME 2320	4	CS 2510 and CS 2511 (ND, AD)	5				
CS 1800 and CS 1802 (FQ)	5	ENCP 2000	1				
CS 2500 and CS 2501 (ND, FQ)	5	MATH 2341	4				
		General elective	4				
	18		**18**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 3312	4	CS 3200 (FQ, AD)	4	Co-op	0
		CHME 3322	4	CS 3500 and CS 3501 (ND, AD)	5		
		CS 3000	4				
		ENGW 3302, 3307, or 3315 (WD)	4				
	0		**16**		**9**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 3305 and CHME 3306	4	Vacation		Co-op	0
		CHME 4510	4				
		CHME 4701	4				
		ENCP 3000	1				
		Khoury Elective	4				
	0		**17**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	CHME 4512 (EI, CE, WI)	4
		CHME 4703 and CHME 4705	4
		CS 4530 (WI)	4

		Khoury elective	4
	0		**16**

Total Hours: 136

FIVE YEARS, THREE CO-OPS IN SPRING/SUMMER 1

Year 1

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

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
BIOL 1111	4	Co-op	0	Co-op	0	Vacation	
CHME 2320	4						
CS 1800 and CS 1802 (FQ)	5						
CS 2500 and CS 2501 (ND, FQ)	5						
ENCP 2000	1						
	19		**0**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 2310	4	Co-op	0	Co-op	0	Vacation	
CS 2510 and CS 2511	5						
MATH 2341	4						
General elective	4						
	17		**0**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3312	4	Co-op	0	Co-op	0	ENGW 3302, 3307, or 3315	4
CHME 3322	4					Khoury elective	4
CS 3000	4						
CS 3200	4						
	16		**0**		**0**		**8**

Year 5

Fall	Hours	Spring	Hours
CHME 3305 and CHME 3306	4	CHME 4512 (EI, CE, WI)	4
CHME 4510	4	CHME 4703 and CHME 4705	4
CHME 4701	4	CS 4530 (WI)	4
CS 3500 and CS 3501	5	Khoury elective	4
ENCP 3000	1		
	18		**16**

Total Hours: 136