Chemical Engineering and Physics, BSChE (Boston)

This intercollege combined major serves students who would like to explore their interest in physics while earning the benefit of a Bachelor of Science degree in chemical engineering. Upon completion, the successful student will understand the fundamental physics behind many chemical-based processes, resulting in the ability to design and practice in the field of engineering that deals with the movement of mass, heat transfer, and reactions involved in the processing of various materials.

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.

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
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]	

Mathematics/Science Requirement

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
PHYS 2371 and PHYS 2372	Electronics and Lab for PHYS 2371	4
PHYS 3600	Advanced Physics Laboratory	4
PHYS 3601	Classical Dynamics	4
PHYS 3602	Electricity and Magnetism 1	4
PHYS 5318	Principles of Experimental Physics	4
Supplemental Credit		
1 semester hour from the following course counts toward the mathematics/science requirement:		1
GE 1501	Cornerstone of Engineering 1 [1]	

Advanced Science Requirement

Code	Title	Hours
CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	5
CHEM 2313 and CHEM 2314	Organic Chemistry 2 and Lab for CHEM 2313	5
PHYS 2303	Modern Physics	4
PHYS 4115	Quantum Mechanics	4

Professional Development

Code	Title	Hours
Professional Development		
ENCP 2000	Introduction to Engineering Co-op Education	1
ENCP 3000	Professional Issues in Engineering	1
GE 1000	First-Year Seminar	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 all following ENGW courses.		
ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	
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

[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

2.000 minimum required in CHME coursework

Program Requirement

135 total semester hours required

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	PHYS 1155 and PHYS 1156 and PHYS 1157 (ND)	5		
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**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 2311 and CHEM 2312	5	CHEM 2313 and CHEM 2314	5	Vacation		Vacation	
MATH 2341	4	CHME 2310	4				
CHME 2308	4	PHYS 2303 (ND)	4				
PHYS 2371 and PHYS 2372 (ND)	4	CHME 2320	4				
		ENCP 2000	1				
	17		**18**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3312	4	CHME 4510	4	PHYS 3600 (ND, AD, WI)	4	Co-op	0
ENGW 3302 or 3315 (WD)	4	CHME 4512	4	General Elective	4		
CHME 3305 and CHME 3306	4	CHME 4701	4				
CHME 3322	4	PHYS 3601 (ND)	4				
		ENCP 3000	1				
	16		**17**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	CHME 4703 and CHME 4705 (EI, CE, WI)	4
		PHYS 3602 (ND)	4
		PHYS 4115 (ND, FQ)	4
		PHYS 5318 (ND, AD, WI, CE)	4
	0		**16**

Total Hours: 135

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	MATH 1342 (FQ)	4	PHYS 1155 and PHYS 1156 and PHYS 1157 (ND)	5		

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**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 2311 and CHEM 2312	5	CHEM 2313 and CHEM 2314	5	Vacation		Vacation	
MATH 2341	4	CHME 2310	4				
CHME 2308	4	CHME 2320	4				
PHYS 2371 and PHYS 2372 (ND)	4	PHYS 2303 (ND)	4				
		ENCP 2000	1				
	17		**18**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3312	4	Co-op	0	Co-op	0	PHYS 3600	4
ENGW 3302 or 3315 (WD)	4					General elective	4
CHME 3305 and CHME 3306	4						
CHME 3322	4						
ENCP 3000	1						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
CHME 4510	4	CHME 4703 and CHME 4705 (EI, CE, WI)	4
CHME 4512	4	PHYS 3602 (ND)	4
CHME 4701	4	PHYS 4115 (ND, FQ)	4
PHYS 3601	4	PHYS 5318 (ND, AD, WI, CE)	4
	16		**16**

Total Hours: 135

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	MATH 1342 (FQ)	4	PHYS 1155 and PHYS 1156 and PHYS 1157 (ND)	5		
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**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 2311 and CHEM 2312	5	CHEM 2313 and CHEM 2314	5	Vacation		Co-op	0
CHME 2308	4	CHME 2310	4				
MATH 2341	4	CHME 2320	4				

PHYS 2371 and PHYS 2372 (ND)	4	PHYS 2303 (ND)	4				
		ENCP 2000	1				
	17		**18**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CHME 3312	4	PHYS 3600 (ND, AD, WI)	4	Co-op	0
		CHME 3322	4	General Elective	4		
		ENGW 3302 or 3315 (WD)	4				
		PHYS 3601 (ND)	4				
		ENCP 3000	1				
	0		**17**		**8**		**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				
		CHME 3305 and CHME 3306	4				
		PHYS 3602 (ND)	4				
	0		**16**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	CHME 4703 and CHME 4705 (EI, CE, WI)	4
		CHME 4512	4
		PHYS 4115 (ND, FQ)	4
		PHYS 5318 (ND, AD, WI, CE)	4
	0		**16**

Total Hours: 135

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	MATH 1342 (FQ)	4	PHYS 1155 and PHYS 1156 and PHYS 1157 (ND)	5		
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**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 2311	4	Co-op	0	Co-op	0	Vacation	
CHEM 2312	1						
CHME 2308	4						
MATH 2341	4						
PHYS 2371 (ND)	3						
PHYS 2372 (EI)	1						
ENCP 2000	1						
	18		**0**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 2313 and CHEM 2314	5	Co-op	0	Co-op	0	PHYS 3600	4
CHME 2310	4					General elective	4
CHME 2320	4						
PHYS 2303	4						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHME 3312	4	Co-op	0	Co-op	0	Vacation	
CHME 3322	4						
ENGW 3302	4						
PHYS 3601	4						
ENCP 3000	1						
	17		**0**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
CHME 4510	4	CHME 4703 and CHME 4705 (EI, CE, WI)	4
CHME 4701	4	CHME 4512	4
CHME 3305 and CHME 3306	4	PHYS 4115 (ND, FQ)	4
PHYS 3602	4	PHYS 5318 (ND, AD, WI, CE)	4
	16		**16**

Total Hours: 135

Notes

PHYSICS COURSE OFFERING SCHEDULE

PHYS 2303 offered every fall, spring, and summer second half

PHYS 2371/PHYS 2372 offered every fall

PHYS 3600 offered every summer first half and summer second half

PHYS 3601 offered every fall and spring

PHYS 3602 offered every fall and spring

PHYS 3603 offered fall, spring all years, and summer first half (odd years)

PHYS 4115 offered every fall and spring

PHYS 4305 offered fall, spring all years, and summer second half (even years)

PHYS 4621 offered fall (even years) and spring (odd years)

PHYS 4623 offered fall (even years) and summer first half (even years)

PHYS 4651 offered fall (odd years) and spring (odd years)

PHYS 4652 offered every spring

PHYS 5318 offered every spring