Civil Engineering and Computer Science, BSCE (Boston)

The Bachelor of Science in Civil Engineering and Computer Science provides expertise in computational modeling and simulation of civil and environmental processes and systems. Students will be prepared for practice in the engineering and control of processes and systems vital for the sustainable development and management of civil and environmental infrastructure, as well as the fundamentals of program design, software development, and algorithms and data.

Computational and simulations-based approaches in engineering research and design practices have increased substantially in recent years in response to the rapidly increasing availability of data from remote and in-situ sensors as well as networked systems. Students who graduate with this combined major degree will have the breadth and depth of understanding and abilities to contribute to innovative and sustainable solutions to support global civil and environmental infrastructure demands.

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), Differences and Diversity (DD) and Integration Experience (EX) are not explicitly satisfied by required engineering courses. Students are responsible for satisfying these requirements with their general elective.

Engineering Requirements

Code	Title	Hours
Required Engineering		
CIVE 2221 and CIVE 2222	Statics and Solid Mechanics and Recitation for CIVE 2221	4
CIVE 2260 and CIVE 2261	Materials for the Built Environment and Lab for CIVE 2260	5
CIVE 2320 and CIVE 2321	Structural Analysis and Recitation for CIVE 2320	4
CIVE 2324	Concrete Structure Design	4
CIVE 2331	Fluid Mechanics and Hydraulics	4
CIVE 2334	Environmental Engineering: Principles, Technology, and Sustainability	4
CIVE 2340 and CIVE 2341	Geotechnical Engineering and Lab for CIVE 2340	5
GE 3300	Energy Systems: Science, Technology, and Sustainability	4
Civil Engineering Project Elective		
Complete one of the following:		4
CIVE 4534 and CIVE 4535	Water Treatment Systems Design and Lab for CIVE 4534	
CIVE 4542	Foundation Engineering and Design	
CIVE 4554	Highway Design	
CIVE 5536	Hydrologic and Hydraulic Design	
Senior Design Elective		
Complete one of the following:		5
CIVE 4765	Senior Design Project—Environmental	
CIVE 4767	Senior Design Project—Structural	
CIVE 4768	Senior Design Project—Transportation	
Supplemental Credit		
1 semester hour from the following course counts toward the engineering requirement:		1
CIVE 3464	Probability and Engineering Economy for Civil Engineering	

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
Required Computer Science		
All students can take a self-assessment to attempt to place out of CS 2000 and CS 2001. Students who place out of CS 2000 and CS 2001 will instead substitute 4-5 semester hours of CS, CY, or DS coursework at the 3000 level or higher not otherwise required in the degree.		
CS 1800 and CS 1802	Discrete Structures and Seminar for CS 1800	5
CS 2000 and CS 2001	Introduction to Program Design and Implementation and Lab for CS 2000	5
CS 2100 and CS 2101	Program Design and Implementation 1 and Lab for CS 2100	5
CS 3000 and CS 3001	Algorithms and Data and Recitation for CS 3000	4
CS 3100 and CS 3101	Program Design and Implementation 2 and Lab for CS 3100	5
CS 3200	Introduction to Databases	4
CS 4530	Fundamentals of Software Engineering	4
or CS 4535	Professional Practicum Capstone	
Khoury Approved Electives		
Complete 8 semester hours of the following:		8
Excluding any course required for major		
CS 2500 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2500 or higher, except DS 4900		
MKTG 4606	Digital, Analytics, Technology, and Automation Research Practicum	

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		
Complete one of the following science electives:		4
PHYS 1125	Introduction to Network Science: From the Human Cell to Facebook	
PHYS 1132	Energy, Environment, and Society	
ENVR 2515	Sustainable Development	
Supplemental Credit		
3 semester hours from the following course count toward the mathematics/science requirement:		3
CIVE 3464	Probability and Engineering Economy for Civil Engineering	
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
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:		
ENGW 1111	First-Year Writing	4
ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Required General Electives

Code	Title	Hours
Complete 4 semester hours of academic, nonremedial, nonrepetitive courses.		4

Integrative Course

Code	Title	Hours
Students will complete one of these courses as part of their required courses above:		
CIVE 4765	Senior Design Project—Environmental	
CIVE 4767	Senior Design Project—Structural	
CIVE 4768	Senior Design Project—Transportation	

Engineering GPA Requirement

Minimum 2.000 GPA required in CIVE and GE courses

Khoury GPA Requirement

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

Program Requirements

139 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	4	GE 1502 (ER)	4	CS 1800 (FQ)	4	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4	CS 1802	1		
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	CIVE 2221	4		
GE 1000	1	PHYS 1152 (AD)	1	CIVE 2222	0		
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General elective (IC, DD)	4				
	17		**17**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2334	4	CIVE 2320	4	MATH 2341	4	Co-op	0
CIVE 2260	4	CIVE 2321	0	CIVE 2324	4		
CIVE 2261	1	CIVE 2331	4				
MATH 2321 (FQ)	4	CIVE 3464	4				
CS 2000 and CS 2001	5	CS 2100 and CS 2101	5				
		ENCP 2000	1				
	18		**18**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CIVE 2340	4	Vacation		Vacation	
		CIVE 2341	1				
		CS 3000	4				
		CS 3001	0				
		CS 3200	4				
		Science elective (SI)	4				
	0		**17**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours
ENCP 3000	1	GE 3300	4
CS 3100 and CS 3101	5	CS 4530 or 4535 (WI)	4
ENGW 3302 or 3315 (WD)	4	Senior design elective (EI, WI, CE)	5
Khoury Elective	4	Khoury Elective	4
Civil Project Elective	4		
	18		**17**

Total Hours: 139

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151	4	GE 1502 (ER)	4	CIVE 2221	4	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4	CIVE 2222	0		
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	CS 1800 (FQ)	4		
GE 1000	1	PHYS 1152 (AD)	1	CS 1802	1		
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General elective (IC, DD)	4				
	17		**17**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2334	4	CIVE 2320	4	Vacation		MATH 2341	4
CIVE 2260	4	CIVE 2321	0			CIVE 3464	4
CIVE 2261	1	CIVE 2331	4				
MATH 2321 (FQ)	4	Science elective (SI)	4				
ENCP 2000	1	CS 2100 and CS 2101	5				
CS 2000 and CS 2001	5						
	19		**17**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2324	4	Co-op	0	Co-op	0	Vacation	
CIVE 2340	4						
CIVE 2341	1						
CS 3000	4						
CS 3001	0						
CS 3200 (AD, FQ)	4						
	17		**0**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours
ENCP 3000	1	GE 3300	4
CS 3100 and CS 3101	5	CS 4530 or 4535 (WI)	4
ENGW 3302 or 3315 (WD)	4	Senior design elective (EI, WI, CE)	5
Khoury Elective	4	Khoury Elective	4
Civil Project Elective	4		
	18		**17**

Total Hours: 139

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151	4	GE 1502 (ER)	4	CS 1800 (FQ)	4	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4	CS 1802	1		
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	CIVE 2221	4		
GE 1000	1	PHYS 1152 (AD)	1	CIVE 2222	0		
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General elective (IC, DD)	4				
	17		**17**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2260	4	ENCP 2000	1	MATH 2341	4	Co-op	0
CIVE 2261 (AD)	1	CIVE 2320	4	CIVE 2324	4		
CIVE 2334	4	CIVE 2321	0				
MATH 2321 (FQ)	4	CIVE 2331	4				
CS 2000 and CS 2001	5	CIVE 3464	4				
		CS 2100 and CS 2101	5				
	18		**18**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	GE 3300	4	Vacation		Co-op	0
		CIVE 2340	4				
		CIVE 2341	1				
		CS 3000	4				
		CS 3001	0				
		CS 3200	4				
	0		**17**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	Civil Project Elective	4	Vacation		Co-op	0
		Khoury Elective	4				
		CS 3100 and CS 3101	5				
		ENCP 3000	1				
		ENGW 3302	4				
	0		**18**		**0**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	CS 4530 or 4535 (WI)	4
		Senior design elective (EI, WI, CE)	5
		Khoury Elective	4
		Science Elective	4
	0		**17**

Total Hours: 139

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151	4	GE 1502 (ER)	4	CIVE 2221	4	Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4	CIVE 2222	0		
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	CS 1800 (FQ)	4		
GE 1000	1	PHYS 1152 (AD)	1	CS 1802	1		
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General elective (IC, DD)	4				
	17		**17**		**9**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2260	4	Co-op	0	Co-op	0	MATH 2341	4
CIVE 2261 (AD)	1					CIVE 3464	4
CIVE 2334	4						
ENCP 2000	1						
MATH 2321 (FQ)	4						
CS 2000 and CS 2101	5						
	19		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2320	4	Co-op	0	Co-op	0	Vacation	
CIVE 2321	0						
CIVE 2331	4						
Science elective (SI)	4						
CIVE 2340	4						
CIVE 2341	1						
	17		**0**		**0**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2324	4	Co-op	0	Co-op	0	Vacation	
CS 3000	4						
CS 3001	0						

CS 3200 (AD, FQ)	4
CS 2100 and CS 2101	5
	17

			0	**0**	**0**

Year 5

Fall	Hours	Spring	Hours
ENCP 3000	1	GE 3300	4
CS 3100 and CS 3101	5	CS 4530 or 4535 (WI)	4
ENGW 3302 or 3315 (WD)	4	Senior design elective (EI, WI, CE)	5
Khoury Elective	4	Khoury Elective	4
Civil Project Elective	4		
	18		**17**

Total Hours: 139