Civil Engineering, BSCE (Boston)

Civil engineers play a vital role in human progress and well-being worldwide. Conceptualizing, innovating, designing, and building sustainable infrastructure and environments is fundamental in helping society progress. Modern challenges, including engineering a resilient and sustainable urban infrastructure; establishing clean water and a clean environment; and advancing technologies in computing, sensing, and human health, are all part of the development of society.

Civil engineers design and construct buildings, bridges, tunnels, dams, and river systems. They also plan, design, construct, and manage highways, railroads, canals, and airports; regulate rivers and control floods; and design and build systems for water distribution and environmental protection.

With a broad range of applications, our civil engineering students have the opportunity to explore a range of disciplinary and interdisciplinary tracks, including environmental and water systems, structural engineering, transportation engineering, geotechnical and geoenvironmental engineering, construction management, civil infrastructure security, environmental health, and sustainable resource engineering.

Our BS program in Civil Engineering is ABET accredited. Program educational outcomes can be found at the department's website (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), 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		
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
or CIVE 3425	Steel Structure Design	
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 Project		
Complete one of the following:		5
CIVE 4765	Senior Design Project—Environmental	

CIVE 4767	Senior Design Project—Structural	
CIVE 4768	Senior Design Project—Transportation	
Civil Engineering Technical Electives		
Complete three of the following:		11-12
CIVE 2324	Concrete Structure Design	
CIVE 3425	Steel Structure Design	
CIVE 3435	Environmental Pollution: Fate and Transport	
CIVE 4540	Resource Recovery and Waste Treatment Technologies Abroad	
CIVE 4542	Foundation Engineering and Design	
CIVE 4554	Highway Design	
CIVE 4566	Design for Sustainable Transportation: Netherlands	
CIVE 4575	Construction Management	
CIVE 4777	Climate Hazards and Resilient Cities Abroad	
CIVE 5221	Construction Project Control and Organization	
CIVE 5231	Alternative Project Delivery Systems in Construction	
CIVE 5250	Organic Pollutants in the Environment	
CIVE 5260	Environmental Fluid Mechanics	
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 5300 and CIVE 5301	Environmental Sampling and Analysis and Lab for CIVE 5300	
CIVE 5363	Climate Science, Engineering Adaptation, and Policy	
CIVE 5365	Climate Technologies for Decarbonization, Mitigation, and Adaptation	
CIVE 5373	Transportation Systems: Analysis and Planning	
CIVE 5376	Traffic Engineering and Sustainable Urban Street Design	
CIVE 5520	Structural Systems	
CIVE 5522	Structural Systems Modeling	
CIVE 5524	Vibration-Based Structural Health Monitoring	
CIVE 5525	Prestressed Concrete Design	
CIVE 5527	Sustainable Rehabilitation of Structures	
CIVE 5528	Resilient Structural Infrastructure	
CIVE 5536	Hydrologic and Hydraulic Design	
CIVE 5699	Special Topics in Civil Engineering	
SBSY 5100	Sustainable Design and Technologies in Construction	
SBSY 5200	Sustainable Engineering Systems for Buildings	
SBSY 5250	Building Performance Simulation	
SBSY 5300	Information Systems for Integrated Project Delivery	
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]	
1 semester hour from the following course counts toward the engineering requirement:		1
CIVE 3464	Probability and Engineering Economy for Civil Engineering	

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
Complete one of the following:		5
PHYS 1151 and PHYS 1152 and PHYS 1153	Physics for Engineering 1 and Lab for PHYS 1151 and Interactive Learning Seminar for PHYS 1151	
PHYS 1161 and PHYS 1162 and PHYS 1163	Physics 1 and Lab for PHYS 1161 and Recitation for PHYS 1161	
Science Elective		
Complete one of the following:		4-5
BIOL 1111 and BIOL 1112	General Biology 1 and Lab for BIOL 1111	
BIOL 1141	Microbes and Society	
BIOL 1143	Biology and Society	
CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	
CHEM 3410	Environmental Geochemistry	
EEMB 1101 and EEMB 1102	Foundations in Ecology and Evolutionary Biology and Lab for EEMB 1101	
EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	
ENVR 1200	Dynamic Earth	
ENVR 2200	Earth's Changing Cycles	
ENVR 2515	Sustainable Development	
ENVR 3125	Global Oceanic Change	
ENVR 3200	Water Resources	
ENVR 3600	Oceanography	
ENVR 5201	Geologic Field Seminar	
ENVR 5350	Sustainable Energy and Climate Solutions	
PHYS 1111	Introduction to Astronomy	
PHYS 1125	Introduction to Network Science: From the Human Cell to Facebook	
PHYS 1132	Energy, Environment, and Society	
PHYS 1155 and PHYS 1156 and PHYS 1157	Physics for Engineering 2 and Lab for PHYS 1155 and Interactive Learning Seminar for PHYS 1155	
PHYS 4623	Medical Physics	
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]	

Supporting Course

Code	Title	Hours
Economics		
ECON 1115	Principles of Macroeconomics	4
or ECON 1116	Principles of Microeconomics	

Professional Development

Code	Title	Hours
Professional Development		
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]	

[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) .

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 24 SH of academic, nonremedial, nonrepetitive courses.		24

Major GPA Requirement

2.000 minimum GPA required in CIVE coursework

Program Requirement

134 total semester hours required

Plan of Study

Sample Plan of Study

FOUR YEARS, TWO CO-OPS IN SUMMER SECOND HALF/FALL

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	CIVE 2221	4	General Elective	4
CHEM 1153	0	MATH 1342 (FQ)	4	CIVE 2222	0	General Elective	4
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	MATH 2321 (FQ)	4		
GE 1000	1	PHYS 1152 (AD)	1				
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General Elective	4				
	17		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2260	4	CIVE 2320	4	CIVE 2324	4	Co-op	0
CIVE 2261 (AD)	1	CIVE 2321	0	General Elective	4		
CIVE 2334	4	CIVE 2331	4				
ECON 1115 or 1116 (SI, AD)	4	CIVE 2340 and CIVE 2341	5				
MATH 2341	4	ENCP 2000	1				
		General Elective	4				
	17		**18**		**8**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CIVE 3464	4	ENGW 3302 or 3315 (WD)	4	Co-op	0
		GE 3300	4	General Elective	4		
		Civil Project Elective (WI)	4				
		Civil Tech. Elective	3				

		ENCP 3000	1				
	0		**16**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours
Co-op	0	CIVE 4765, 4767, or 4768 (EI, CE, WI)	5
		Civil Tech. Elective	4
		Civil Tech. Elective	4
		Science Elective	4
	0		**17**

Total Hours: 134

FOUR YEARS, TWO CO-OPS IN SPRING/SUMMER FIRST HALF

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	CIVE 2221	4	General Elective	4
CHEM 1153	0	MATH 1342 (FQ)	4	CIVE 2222	0	General Elective	4
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3	MATH 2321 (FQ)	4		
GE 1000	1	PHYS 1152 (AD)	1				
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General Elective	4				
	17		**17**		**8**		**8**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2260	4	Co-op	0	Co-op	0	General Elective	4
CIVE 2261 (AD)	1					General Elective	4
CIVE 2320	4						
CIVE 2321	0						
CIVE 2334	4						
ENCP 2000	1						
MATH 2341	4						
	18		**0**		**0**		**8**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2324	4	Co-op	0	Co-op	0	CIVE 3464	4
CIVE 2331	4					ENGW 3302 or 3315 (WD)	4
ECON 1115 or 1116 (SI, AD)	4						
CIVE 2340	4						
CIVE 2341	1						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours
ENCP 3000	1	CIVE 4765, 4767, or 4768 (EI, CE, WI)	5
Civil Project Elective (WI)	4	Civil Tech. Elective	4
Civil Tech. Elective	3	Civil Tech. Elective	4
Science Elective	4	General Elective	4
GE 3300	4		
	16		**17**

Total Hours: 134

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	Vacation		Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4				
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3				
GE 1000	1	PHYS 1152 (AD)	1				
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General Elective	4				
	17		**17**		**0**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2221	4	CIVE 2260	4	Vacation		Co-op	0
CIVE 2222	0	CIVE 2261 (AD)	1				
CIVE 2334	4	CIVE 2320	4				
ECON 1115 or 1116 (AD, SI)	4	CIVE 2321	0				
MATH 2321 (FQ)	4	ENCP 2000	1				
		GE 3300	4				
		MATH 2341	4				
	16		**18**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CIVE 2331	4	CIVE 2324	4	Co-op	0
		CIVE 2340	4	General Elective	4		
		CIVE 2341	1				
		Civil Tech. Elective	4				
		Science Elective	4				
	0		**17**		**8**		**0**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op	0	CIVE 3464	4	General Elective	4	Co-op	0
		ENCP 3000	1	General Elective	4		
		ENGW 3302 or 3315 (WD)	4				
		Civil Project Elective (WI)	4				
		Civil Tech. Elective	3				
	0		**16**		**8**		**0**

Year 5

Fall	Hours	Spring	Hours
Co-op	0	CIVE 4765, 4767, or 4768 (EI, CE, WI)	5
		Civil Tech. Elective	4
		General Elective	4
		General Elective	4
	0		**17**

Total Hours: 134

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

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	GE 1502 (ER)	4	Vacation		Vacation	
CHEM 1153	0	MATH 1342 (FQ)	4				
ENGW 1111 (WF)	4	PHYS 1151 (ND)	3				

GE 1000	1	PHYS 1152 (AD)	1				
GE 1501	4	PHYS 1153	1				
MATH 1341 (FQ)	4	General Elective	4				
	17		**17**		**0**		**0**

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2221	4	Co-op	0	Co-op	0	Vacation	
CIVE 2222	0						
CIVE 2260	4						
CIVE 2261 (AD)	1						
CIVE 2334	4						
ENCP 2000	1						
MATH 2321 (FQ)	4						
	18		**0**		**0**		**0**

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2320	4	Co-op	0	Co-op	0	CIVE 3464	4
CIVE 2321	0					MATH 2341	4
CIVE 2331	4						
ECON 1115 or 1116 (AD, SI)	4						
CIVE 2340	4						
CIVE 2341	1						
	17		**0**		**0**		**8**

Year 4

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CIVE 2324	4	Co-op	0	Co-op	0	General Elective	4
ENGW 3302 or 3315 (WD)	4					General Elective	4
Civil Tech. Elective	3						
Science Elective	4						
	15		**0**		**0**		**8**

Year 5

Fall	Hours	Spring	Hours
Civil Project Elective (WI)	4	CIVE 4765, 4767, or 4768 (EI, CE, WI)	5
Civil Tech. Elective	4	Civil Tech. Elective	4
General Elective	4	General Elective	4
ENCP 3000	1	General Elective	4
GE 3300	4		
	17		**17**

Total Hours: 134