

# Civil Engineering and Architectural Studies, BSCE

Civil engineering and architecture are two important disciplines that deal with the process of creating the built environment to satisfy societal needs. Both professions have critical functions that are essential in the development of society in terms of planning cities and designing more resilient infrastructure and rely on one another to accomplish it. The combination of these two professions creates great synergy as architects focus more on the functional and human aspects of development, while civil engineers concentrate on the structural elements of the design, ensuring durable structures that perform under normal and extreme loads.

Students successfully completing the program receive a rigorous engineering training education, enabling a high level of engineering knowledge as well as exposure to a broad range of architectural topics and design experiences.

Students also have the opportunity to undertake a co-op experience consistent with the policies and opportunities offered within the College of Engineering.

Our BS program in Civil Engineering and Architectural Studies is ABET accredited. Visit the Department of Civil and Environmental Engineering website (<https://cee.northeastern.edu/academics/undergraduate-studies/cee-accreditation/>) for program education outcomes.

## 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 (<http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<http://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
<b>Required Engineering</b>		
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
<b>Civil Engineering Project Elective</b>		
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	
<b>Senior Design Project</b>		
CIVE 4767	Senior Design Project—Structural	5
<b>Civil Engineering Technical Electives</b>		

Complete one of the following: 4

CIVE 3425	Steel Structure Design	
CIVE 5522	Structural Systems Modeling	

#### Supplemental Credit

1 semester hour from the following course counts toward the engineering requirement: 1

CIVE 3464	Probability and Engineering Economy for Civil Engineering	
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2 semester hours from the following course count toward the engineering requirement: 2

GE 1501	Cornerstone of Engineering 1 <sup>1</sup>	
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3 semester hours from the following course count toward the engineering requirement: 3

GE 1502	Cornerstone of Engineering 2 <sup>1</sup>	
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### Architectural Studies Requirements

Code	Title	Hours
ARCH 1110	Fundamental Architectural Representation	4
ARCH 1120	Fundamental Architectural Design	6
ARCH 1310 and ARCH 1311	Buildings and Cities, A Global History and Recitation for ARCH 1310	4
ARCH 2130	Site, Space, Program	6
ARCH 2140	Urban Housing	6
ARCH 2340 and ARCH 2341	Modern Architecture and Recitation for ARCH 2340	4
ARCH 3210 and ARCH 3211	Environmental Systems and Recitation for ARCH 3210	4

#### Architectural Electives

Complete two of the following: 8

ARCH 3370	Advanced Topics in Architectural History	
ARCH 3351	Architecture Topics Abroad: Theory	
ARCH 3352	Architecture Topics Abroad: Drawing	
ARCH 3450	Advanced Architectural Communication	
ARCH 4850	Urban and Architectural History Abroad	
ARCH 5115	Option Studio	
ARCH 5220	Integrated Building Systems	
ARCH 5310	Design Tactics and Operations	

### Supporting Courses: Mathematics/Science

Complete all Mathematics/Science courses with a minimum of 30 semester hours.

Code	Title	Hours
<b>Required Mathematics/Science</b>		
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	
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BIOL 1141	Microbes and Society
BIOL 1143	Biology and Society
CHEM 2311 and CHEM 2312 and CHEM 2319	Organic Chemistry 1 and Lab for CHEM 2311 and Recitation for CHEM 2311
CHEM 3410	Environmental Geochemistry
EEMB 1101 and EEMB 1102	Foundations in Ecology and Evolutionary Biology and Lab for EEMB 1101
EEMB 1450	Introduction to Marine Biology
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	Physics for Engineering 2 and Lab 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 <sup>1</sup>

**Professional Development**

Code	Title	Hours
<b>Professional Development</b>		
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 <sup>1</sup>
1 semester hour from the following course counts toward the professional development requirement:	1
GE 1502	Cornerstone of Engineering 2 <sup>1</sup>

**Writing Requirements**

Code	Title	Hours
A grade of C or higher is required:		
ENGW 1111	First-Year Writing	4
ENGW 3302 or ENGW 3315	Advanced Writing in the Technical Professions Interdisciplinary Advanced Writing in the Disciplines	4

**Integrative Courses**

Code	Title	Hours
This course is already required above and also fulfills the integrative requirement.		
CIVE 4767	Senior Design Project—Structural	

<sup>1</sup> 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) in approved situations.

## Engineering GPA Requirement

Minimum 2.000 GPA required in CIVE coursework.

## Architecture GPA Requirement

Minimum 2.000 GPA required in all Architecture courses

## Program Requirements

141 total semester hours required

Note:

1. Students who wish to be considered for the two-year Master of Architecture Program at Northeastern **should** take Advanced Architectural Communication (ARCH 3450) as an elective and **should not** take Option Studio (ARCH 5115) or Integrated Building Systems (ARCH 5220) as architectural electives.
2. Students who wish to be considered for the two-year Master of Architecture Program at Northeastern must have satisfied the Structural Systems (ARCH 5230) requirement. This requirement is achieved in this combined major by taking the following three courses, as follows:
  - Statics and Solid Mechanics (CIVE 2221), including Recitation for CIVE 2221 (CIVE 2222)
  - Structural Analysis (CIVE 2320), including Recitation for CIVE 2320 (CIVE 2321)
  - And at least one design course from the following:
    - Concrete Structure Design (CIVE 2324)
    - Steel Structure Design (CIVE 3425)

## Plan of Study

### Sample Plan of Study

#### FOUR YEARS, 1 CO-OP IN SUMMER 2/FALL

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
CHEM 1151 (ND)		4 ARCH 1110 (EI)		4 MATH 2321 (FQ)		4 Vacation		
CHEM 1153	0	ARCH 1120 (ND, EI)		6 PHYS 1151 (ND)		3		
ENGW 1111 (WF)	4	GE 1502 (ER)		4 PHYS 1152 (AD)		1		
GE 1000	1	MATH 1342 (FQ)		4 PHYS 1153		1		
GE 1501	4							
MATH 1341 (FQ)	4							
		17		18		9		0
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
ARCH 1310 (IC, DD)		4 ARCH 2340 (IC, SI, WI)		4 CIVE 2324		4 Co-op		
ARCH 1311	0	ARCH 2341		0 GE 3300		4		
ARCH 2130	6	CIVE 2260		4				
CIVE 2221	4	CIVE 2261 (AD)		1				
CIVE 2222	0	CIVE 2320		4				
MATH 2341	4	CIVE 2321		0				
		CIVE 2334		4				
		ENCP 2000		1				
		18		18		8		0
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		ARCH 2140		6 Vacation		Vacation		
		ARCH 3210 (ND, AD)		4				
		ARCH 3211		0				
		CIVE 2331		4				

	CIVE 2340	4		
	CIVE 2341	1		
	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>

**Year 4**

Fall	Hours	Spring	Hours		
CIVE 3464	4	CIVE 4767 (EI, WI, CE)	5		
ENCP 3000	1	Architectural Elective	4		
ENGW 3302 or 3315 (WD)	4	Architectural Elective	4		
Civil Project Elective (WI)	4	Science Elective	4		
Civil Technical Elective (CIVE 3425 or CIVE 5522)	4				
	<b>17</b>		<b>17</b>		

Total Hours: 141

**FIVE YEARS, 3 CO-OPS IN SUMMER 2/FALL****Year 1**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1151 (ND)	4	ARCH 1110 (EI)	4	MATH 2321 (FQ)	4	Vacation	4
CHEM 1153	0	ARCH 1120 (ND, EI)	6	PHYS 1151 (ND)	3		
ENGW 1111 (WF)	4	GE 1502 (ER)	4	PHYS 1152 (AD)	1		
GE 1000	1	MATH 1342 (FQ)	4	PHYS 1153	1		
GE 1501	4						
MATH 1341 (FQ)	4						
	<b>17</b>		<b>18</b>		<b>9</b>		<b>0</b>

**Year 2**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
ARCH 1310 (IC, DD)	4	CIVE 2260	4	Vacation	4	Co-op	
ARCH 1311	0	CIVE 2261 (AD)	1				
ARCH 2130	6	CIVE 2320	4				
CIVE 2221	4	CIVE 2321	0				
CIVE 2222	0	CIVE 2334	4				
MATH 2341	4	ENCP 2000	1				
		GE 3300	4				
	<b>18</b>		<b>18</b>		<b>0</b>		<b>0</b>

**Year 3**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		ARCH 2340 (IC, SI, WI)	4	CIVE 2324	4	Co-op	4
		ARCH 2341	0	ENGW 3302 or 3315 (WD)	4		
		CIVE 2331	4				
		CIVE 2340	4				
		CIVE 2341	1				
		Civil Technical Elective (CIVE 3425 or CIVE 5522)	4				
	<b>0</b>		<b>17</b>		<b>8</b>		<b>0</b>

**Year 4**

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		ARCH 2140	6	Vacation	6	Co-op	6
		ARCH 3210 (ND, AD)	4				
		ARCH 3211	0				
		CIVE 3464	4				
		ENCP 3000	1				

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		Civil Project Elective (WI)	4		
	0		19	0	0
<b>Year 5</b>					
<b>Fall</b>	<b>Hours</b>	<b>Spring</b>	<b>Hours</b>		
Co-op		CIVE 4767 (EI, WI, CE)	5		
		Architectural Elective	4		
		Architectural Elective	4		
		Science Elective	4		
	0		17		

**Total Hours: 141**