Computer Science and Environmental and Sustainability Sciences, BS

The computer science and the environmental and sustainability sciences combined major focuses on the major environmental challenges facing our planet and provides broad training to understand how these challenges can be met through advances in computer science and artificial intelligence. Understanding these processes requires both the acquisition and computational analysis of large amounts of data—underscoring the synergistic relationship between computer science and environmental and sustainability sciences.

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/).

Computer Science Courses

Code	Title	Hours
Computer Science Overview		
CS 1200	First Year Seminar	1
CS 1210	Professional Development for Khoury Co-op	1
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 and CS 3001	Algorithms and Data and Recitation for CS 3000	4
CS 3200	Database Design	4
CS 3500	Object-Oriented Design	4
CS 3800	Theory of Computation	4
CS 4500	Software Development	4
or CS 4530	Fundamentals of Software Engineering	
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 4 credits of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:		4
CS 2500 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2500 or higher, except DS 4900		
IS 2000 or higher, except IS 4900		

Environmental and Sustainability Sciences Courses

Code	Title	Hours
Environmental and Sustainability Sciences Required Courses		
EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	5
ENVR 1200 and ENVR 1201	Dynamic Earth and Lab for ENVR 1200	4-5
or ENVR 2200	Earth's Changing Cycles	

ENVR 1400 and ENVR 1401	Foundations in Environmental and Sustainability Sciences and Lab for ENVR 1400	5
ENVR 2515	Sustainable Development	4
Skills		
Complete one of the following:		4-5
ENVR 3300 and ENVR 3301	Geographic Information Systems and Lab for ENVR 3300	
ENVR 5260	Geographical Information Systems	
Earth Oceans and Environmental Change		
Complete one of the following:		4-5
ENVR 2310 and ENVR 2311	Earth Materials and Lab for ENVR 2310	
ENVR 3125	Global Oceanic Change	
ENVR 3600	Oceanography	
ENVR 4500 and ENVR 4501	Applied Hydrogeology and Lab for ENVR 4500	
ENVR 5150	Climate and Atmospheric Change	
ENVR 5600	Coastal Processes, Adaptation, and Resilience	
ENVR 5670	Global Biogeochemistry	
Conservation, Restoration, and Management		
Complete one of the following:		4
EEMB 2400	Introduction to Evolution	
EEMB 3460	Conservation Biology	
EEMB 3465	Ecological and Conservation Genomics	
EEMB 4001	Landscape and Restoration Ecology	
ENVR 4505	Wetlands	
ENVR 5700	Streams and Watershed Ecology	
ENVR 5750	Urban Ecology	
Sustainable Planning and Development		
Complete one of the following:		4
ENVR 3200	Water Resources	
ENVR 3150	Food Security and Sustainability	
ENVR 5210	Environmental Planning	
ENVR 5350	Sustainable Energy and Climate Solutions	
ENVR 5600	Coastal Processes, Adaptation, and Resilience	
ENVR 5750	Urban Ecology	
ENVR 5800	Climate Adaptation and Nature-Based Solutions	
Environment and Society		
Complete one of the following:		4
ENVR 5750	Urban Ecology	
ENVR 5800	Climate Adaptation and Nature-Based Solutions	
POLS 2395	Environmental Politics and Policy	
PPUA 5260	Ecological Economics	
PPUA 5268	International Environmental Policy	
SOCL 2485	Environment, Technology, and Society	

Supporting Courses

Code	Title	Hours
Calculus		
MATH 1251	Calculus and Differential Equations for Biology 1	4
or MATH 1341	Calculus 1 for Science and Engineering	
MATH 1252	Calculus and Differential Equations for Biology 2	4
or MATH 1342	Calculus 2 for Science and Engineering	
MATH 3081	Probability and Statistics	4

Chemistry

CHEM 1211 and CHEM 1212 and CHEM 1213	General Chemistry 1 and Lab for CHEM 1211 and Recitation for CHEM 1211	5
CHEM 1214 and CHEM 1215 and CHEM 1216	General Chemistry 2 and Lab for CHEM 1214 and Recitation for CHEM 1214	5

Computing and Social Issues

Complete one of the following:		4
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
ENGL 2150	Literature and Digital Diversity	
HIST 2220	History of Technology	
INSH 2102	Bostonography: The City through Data, Texts, Maps, and Networks	
IS 1300	Knowledge in a Digital World	
or PHIL 1300	Knowledge in a Digital World	
PHIL 1145	Technology and Human Values	
SOCL 1280	The Twenty-First-Century Workplace	
SOCL 4528	Computers and Society	

Computer Science English Requirement

Code	Title	Hours
College Writing		
ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	
Advanced Writing in the Disciplines		
Complete one of the following:		4
ENGW 3302	Advanced Writing in the Technical Professions	
ENGW 3307	Advanced Writing in the Sciences	
ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Integrative Requirement

Code	Title	Hours
Complete one of the following:		4
ENVR 4050	Solving Emerging Environmental Challenges through Capstone	
ENVR 4971	Junior/Senior Honors Project 2	
ENVR 4997	Senior Thesis	
CS 4991	Research	

Required General Electives

Code	Title	Hours
Complete 20 credits of general electives.		20

Khoury College GPA Requirement

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

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Analyzing and Using Data
- Writing in the First Year
- Advanced Writing in the Disciplines
- Writing-Intensive in the Major
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Demonstrating Thought and Action in a Capstone
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Integrating Knowledge and Skills Through Experience is satisfied through co-op.

Program Requirement

136 total semester hours required

Plan of Study
Sample Plan of Study:
Four Years, Two Co-ops in Summer 2/Fall

Year 1

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CS 1200	1	CS 2510 and CS 2511	5	CS 3500	4	Elective	4
CS 1800 and CS 1802	5	CS 3200	4	Elective	4	Elective	4
CS 2500 and CS 2501	5	ENVR 2200	4				
ENGW 1111	4	ENVR skills course	4				
ENVR 1400 and ENVR 1401	5						
	20		17		8		8

Year 2

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
CHEM 1211 and CHEM 1212 and CHEM 1213	5	CHEM 1214 and CHEM 1215 and CHEM 1216	5	MATH 1252 or 1342	4	Co-op	
CS 3000	4	CS 1210	1	Elective	4		
EEMB 2302 and EEMB 2303	5	MATH 1251 or 1341	4				
ENVR 2515	4	ENVR Earth oceans course	4				
		Khoury elective	4				
	18		18		8		0

Year 3

Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours
Co-op		CS 3800	4	ENGW 3302	4	Co-op	
		ENVR conservation course	4	MATH 3081	4		
		ENVR sustainable course	4				
		Elective	4				
	0		16		8		0

Year 4

Fall	Hours	Spring	Hours
Co-op		CS 4500	4
		ENVR society course	4
		Integrative course	4
		Computing and social issues	4
	0		16

Total Hours: 137