

Computer Science and Mathematics, BS

The computer science and mathematics combined major was the first dual major created by the college. The mathematics requirements focus on courses that have computing applications or form the basis for further studies in mathematical theory. The program emphasizes the strong ties between computer science and mathematics that date back to the origins of machine computation in the 1930s and 1940s—and persist to this day.

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 (Integrative course)	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
CS 2800	Logic and Computation	4
Computer Science Required Courses		
CS 3000	Algorithms and Data	4
CS 3500 and CS 3501	Object-Oriented Design and Lab for CS 3500	5
CS 3800	Theory of Computation	4
CS 4300 or CS 4100	Computer Graphics Artificial Intelligence	4
CS 4500 or CS 4530	Software Development Fundamentals of Software Engineering	4
Khoury Elective Courses		
With adviser approval, a directed study, research, project study, or appropriate graduate-level course may also be taken as a computer science elective.		
Complete eight semester hours of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:		8
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		

Mathematics Courses

Code	Title	Hours
Calculus Courses		
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

Mathematics Courses

MATH 2331	Linear Algebra	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
MATH 3081	Probability and Statistics	4
MATH 3175	Group Theory	4
MATH 3527	Number Theory 1	4

Mathematics Electives

Complete three courses in the following range: MATH 3001 to MATH 4999 but not MATH 4000		12
--	--	----

Supporting Course

Code	Title	Hours
Complete one of the following:		4
AFAM 2600	Issues in Race, Science, and Technology	
CY 4170	The Law, Ethics, and Policy of Data and Digital Technologies	
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 or PHIL 1300	Knowledge in a Digital World	
PHIL 1145	Technology and Human Values	
SOCL 1280	The Twenty-First-Century Workplace	
SOCL 2485	Environment, Technology, and Society	
SOCL 4528	Computers and Society	

Computer Science Writing Requirement

Code	Title	Hours
College Writing		
ENGW 1111	First-Year Writing	4
Advanced Writing in the Disciplines		
ENGW 3302 or ENGW 3307 or ENGW 3315	Advanced Writing in the Technical Professions Advanced Writing in the Sciences Interdisciplinary Advanced Writing in the Disciplines	4

Required General Electives

Code	Title	Hours
Complete 28 semester hours of general electives.		28

Khoury College GPA Requirement

Minimum 2.000 GPA required in all CS, CY, DS, 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
- Demonstrating Thought and Action in a Capstone

Integrating Knowledge and Skills Through Experience is satisfied through co-op.

Program Requirement

132 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	Hours
CS 1200		1 CS 2510 and CS 2511		5 MATH 2321		4 Vacation		
CS 1800 and CS 1802		5 CS 2800		4 Elective		4		
CS 2500 and CS 2501		5 MATH 1342		4				
ENGW 1111		4 Elective		4				
MATH 1341		4						
		19		17		8		0
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
CS 3500 and CS 3501		5 CS 1210		1 MATH 3081		4 Co-op		
CS 3800		4 CS 3000		4 Elective		4		
MATH 2331		4 MATH 3527		4				
MATH 2341		4 Khoury elective		4				
		MATH elective		4				
		17		17		8		0
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		CS 4300		4 Elective		4 Co-op		
		ENGW 3302		4 Elective		4		
		MATH 3175		4				
		Math elective		4				
		0		16		8		0
Year 4								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		CS 4500		4 Elective		4		
		Computing and social issues		4 Elective		4		
		Khoury elective		4				
		Math elective		4				
		0		16		8		

Total Hours: 134