

Computer Science and Biology, BS

The computer science and biology combined major reflects how research in biology, especially genetics, has become a computational science. The program provides a strong foundation in biology, chemistry, and mathematics, as well as software development and algorithms.

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 ²	
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	Algorithms and Data	4
CS 3200	Database Design	4
CS 3500 and CS 3501	Object-Oriented Design and Lab for CS 3500	5
CS 3800	Theory of Computation (integrative course)	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 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		

¹ Students entering through the biology department may take Biology at Northeastern (BIOL 1000).

² Students entering through the biology department may take Professional Development for Co-op (EESC 2000).

Biology Courses

Code	Title	Hours
Foundations of Biology		
BIOL 1107 and BIOL 1108	Foundations of Biology and Lab for BIOL 1107	5

Inquiries

BIOL 2299	Inquiries in Biological Sciences	4
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Molecular Biology

BIOL 2301 and BIOL 2302	Genetics and Molecular Biology and Lab for BIOL 2301	5
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BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611	5
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Biology Project Lab

BIOL 2309	Biology Project Lab	4
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Chemistry

CHEM 1161 and CHEM 1162 and CHEM 1163	General Chemistry for Science Majors and Lab for CHEM 1161 and Recitation for CHEM 1161	5
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CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	5
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CHEM 2313 and CHEM 2314	Organic Chemistry 2 and Lab for CHEM 2313	5
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Biology Capstone

Choose one:		4
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BIOL 4701	Biology Capstone	
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BIOL 4971	Junior/Senior Honors Project 2	
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BIOL 4900	Biology Research Capstone	
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Intermediate and Advanced Biology Electives **8-10**

Complete two biology courses (with corequisite labs if offered). Choose one of these two courses from the following list:

BIOL 2327	Human Parasitology	
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BIOL 3401	Comparative Vertebrate Anatomy	
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BIOL 3403	Animal Behavior	
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BIOL 3413	Current Topics in Organismal and Population Biology	
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EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	
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EEMB 2400	Introduction to Evolution	
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EEMB 2700 and EEMB 2701	Marine Biology and Lab for EEMB 2700	
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EEMB 3460	Conservation Biology	
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EEMB 3466	Disease Ecology	
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Choose the second elective from the following list:

BIOL 2311 to BIOL 4999		
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EEMB 2290 to EEMB 5515		
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EEMB 5548 to EEMB 5569		
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Biology Integrative Course

Complete one of the following:		4-5
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BINF 6308	Bioinformatics Computational Methods 1	
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BIOL 4707	Cell and Molecular Biology	
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BIOL 5569	Advanced Microbiology	
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BIOL 5581	Biological Imaging	
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BIOL 5587	Comparative Neurobiology	
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BIOL 5591	Advanced Genomics	
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EEMB 4548	Sociobiology	
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Supporting Courses

Code	Title	Hours
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Calculus

MATH 1251	Calculus and Differential Equations for Biology 1	4
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MATH 1252	Calculus and Differential Equations for Biology 2	4
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Probability and Statistics

Complete one of the following:

4-5

ENVR 2500 and ENVR 2501	Biostatistics and Lab for ENVR 2500
MATH 3081	Probability and Statistics

Computing and Social Issues

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

Intermediate or Advanced Science

Complete one course from the following:

4

BIOL 2327 to BIOL 3999
BIOL 4705 to BIOL 5999
CHEM 2311 to CHEM 5999
EEMB 2290 to EEMB 5999
ENVR 2310 to ENVR 5999
MATH 2280 to MATH 5999
PHYS 2303 to PHYS 5999
PSYC 2290 to PSYC 5999

Writing Requirements

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 16 credits of general electives		16

NUpath Requirements Satisfied

- Engaging with the Natural and Designed World
- Conducting Formal and Quantitative Reasoning
- Exploring Creative Expression and Innovation
- 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.

Khoury College GPA Requirement

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

Program Requirement

141 total semester hours required

Plan of Study

Sample Pattern:

Four Years, Two Co-ops in Summer 2/Fall

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
BIOL 1107 and BIOL 1108		5 BIOL 2299		4 BIOL 2301		4 Vacation		
CHEM 1161		4 CS 2510 and CS 2511		5 BIOL 2302		1		
CHEM 1162		1 ENGW 1111		4 Elective		4		
CHEM 1163		0 Elective		4				
CS 1200		1						
CS 1800 and CS 1802		5						
CS 2500 and CS 2501		5						
		21		17		9		0
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
CHEM 2311 and CHEM 2312		5 BIOL 3611		4 BIOL 2309		4 Co-op		
CS 3200		4 BIOL 3612		1 Elective		4		
CS 3500 and CS 3501		5 CHEM 2313 and CHEM 2314		5				
MATH 1251		4 CS 1210		1				
		CS 3000		4				
		MATH 1252		4				
		18		19		8		0
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		CS 3800		4 ENGW 3302		4 Co-op		
		BIOL elective		5 MATH 3081 or ENVR 2500 and ENVR 2501		4		
		BIOL integrative elective		4				
		Computing and social issues		4				
		0		17		8		0
Year 4								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
Co-op		BIOL 4701		4 BIOL Elective		4 Co-op		
		CS 4500		4 Elective		4		
		BIOL Intermediate/ Advanced elective		4				

Khoury Elective	4		
0	16	8	0

Total Hours: 141