

Biology and Mathematics, BS

In the Bachelor of Science in Biology and Mathematics degree program, science courses lay the groundwork for strong basic training in mathematics, chemistry, and physics that are relevant to biology. In biology courses, students broadly explore the organization and processes of life—from molecules and cells through organs and organ systems to populations, ecosystems, and evolution. In mathematics courses, students pursue mathematical reasoning, differential equations, and linear algebra, as well as statistics and probability. The fields of biology and mathematics are integrated in a range of course offerings including bioinformatics, applied statistics, advanced genomics, and biological imaging.

Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

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/>).

Biology Requirements

Code	Title	Hours
Introduction to College		
BIOL 1000 or MATH 1000	Biology at Northeastern Mathematics at Northeastern	1
Experiential Learning Introduction		
EESC 2000	Professional Development for Co-op	1
MATH 3000	Co-op and Experiential Learning Reflection Seminar 1	1
Biology Core Courses		
BIOL 1107 and BIOL 1108	Foundations of Biology and Lab for BIOL 1107	5
BIOL 2299	Inquiries in Biological Sciences	4
BIOL 2301 and BIOL 2302	Genetics and Molecular Biology and Lab for BIOL 2301	5
BIOL 2309	Biology Project Lab	4
BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611	5
Organismal and Evolutionary Biology Elective		
Complete one of the following:		4-5
BIOL 2327	Human Parasitology	
BIOL 3401	Comparative Vertebrate Anatomy	
BIOL 3413	Current Topics in Organismal and Population Biology	
EEMB 2302 and EEMB 2303	Ecology and Lab for EEMB 2302	
EEMB 2400	Introduction to Evolution	
EEMB 2700 and EEMB 2701	Marine Biology and Lab for EEMB 2700	
EEMB 3460	Conservation Biology	

2 Biology and Mathematics, BS

EEMB 3466	Disease Ecology	
EEMB 3600	Animal Behavior	

Intermediate/Advanced Biology Electives

Complete one of the following: 4-5

BIOL 2327 to BIOL 3999

BIOL 4705 to BIOL 5999

Supporting Courses for Biology

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
---	---	---

CHEM 2311 and CHEM 2312	Organic Chemistry 1 and Lab for CHEM 2311	5
----------------------------	--	---

CHEM 2313 and CHEM 2314	Organic Chemistry 2 and Lab for CHEM 2313	5
----------------------------	--	---

Writing

ENGW 1111	First-Year Writing	4
-----------	--------------------	---

ENGW 3307 or ENGW 3315	Advanced Writing in the Sciences (Preferred) Interdisciplinary Advanced Writing in the Disciplines	4
---------------------------	---	---

Mathematics Requirements

Code	Title	Hours
------	-------	-------

Calculus 1

MATH 1341	Calculus 1 for Science and Engineering	4
-----------	--	---

Calculus 2 and Calculus 3

MATH 1342	Calculus 2 for Science and Engineering	4
-----------	--	---

MATH 2321	Calculus 3 for Science and Engineering	4
-----------	--	---

Physics

PHYS 1161 and PHYS 1162	Physics 1 and Lab for PHYS 1161	5
----------------------------	------------------------------------	---

Required Mathematics Courses

MATH 1365	Introduction to Mathematical Reasoning	4
-----------	--	---

MATH 2341	Differential Equations and Linear Algebra for Engineering	4
-----------	---	---

MATH 3081	Probability and Statistics	4
-----------	----------------------------	---

Mathematics Electives

Complete three of the following: 12

MATH 2331	Linear Algebra	
-----------	----------------	--

MATH 3001 to MATH 4899

Capstone and Integrative Requirements

Code	Title	Hours
------	-------	-------

Capstone

Complete one of the following: 1-4

BIOL 4701	Biology Capstone	
-----------	------------------	--

BIOL 4900	Biology Research Capstone (concurrent with BIOL 4991 or BIOL 4994, which may be used toward Intermediate/Advanced Biology)	
-----------	--	--

BIOL 4971	Junior/Senior Honors Project 2	
-----------	--------------------------------	--

MATH 4020	Research Capstone	
-----------	-------------------	--

MATH 4025	Applied Mathematics Capstone	
-----------	------------------------------	--

MATH 5131	Introduction to Mathematical Methods and Modeling	
-----------	---	--

Biology/Mathematics Integrative Courses

Complete two of the following: 8-10

BINF 6200	Bioinformatics Programming	
-----------	----------------------------	--

BINF 6310	Introduction to Computational Methods in Bioinformatics	
-----------	---	--

BIOL 3405	Neurobiology	
-----------	--------------	--

BIOL 5581	Biological Imaging
BIOL 5591	Advanced Genomics
CS 2500 and CS 2501	Fundamentals of Computer Science 1 and Lab for CS 2500
CS 2510 and CS 2511	Fundamentals of Computer Science 2 and Lab for CS 2510
EEMB 5130	Population Dynamics
MATH 4581	Statistics and Stochastic Processes
MATH 7343	Applied Statistics

Biology and Mathematics Combined Major Credit/GPA Requirements

Complete 93 semester hours in the major with a cumulative GPA of 2.000.

Program Requirements

139 total semester hours required

Plan of Study

Sample Pattern: Four Years, Two Co-ops in Spring/Summer 1

Year 1								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
BIOL 1000 or MATH 1000		1 BIOL 2299		4 BIOL 2301		4 Vacation		
BIOL 1107 and BIOL 1108	5	CHEM 2311		4 BIOL 2302		1		
CHEM 1161	4	CHEM 2312		1 SI NUpath elective		4		
CHEM 1162	1	MATH 1342		4				
CHEM 1163	0	MATH 1365		4				
ENGW 1111	4							
MATH 1341	4							
	19			17		9		0
Year 2								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
BIOL 2309		4 Co-op		0 Co-op		0 MATH elective		4
CHEM 2313	4	Elective		4		Elective with lab		5
CHEM 2314	1							
EESC 2000	1							
MATH 2321	4							
MATH 2341	4							
	18			4		0		9
Year 3								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
BIOL 3611		4 Co-op		0 Co-op		0 ER NUpath elective		4
BIOL 3612	1			ENGW 3307		4 Elective		4
MATH 3000	1							
PHYS 1161	4							
PHYS 1162	1							
PHYS 1163	0							
MATH elective	4							
MATH elective	4							
	19			0		4		8
Year 4								
Fall	Hours	Spring	Hours	Summer 1	Hours	Summer 2	Hours	Hours
MATH 3081		4 Biology/mathematics integrative course		4				

4 Biology and Mathematics, BS

Biology/mathematics integrative course	4 Capstone option	4
DD NUpath elective	4 IC NUpath elective	4
Organismal and evolutionary biology elective	4 Intermediate/advanced biology elective	4
	16	16

Total Hours: 139