

# Biology and Mathematics, BS

In the BS combined 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

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/>).

## Biology Requirements

Code	Title	Hours
<b>Introduction to College</b>		
BIOL 1000 or MATH 1000	Biology at Northeastern Mathematics at Northeastern	1
<b>Biology</b>		
<i>Foundations</i>		
BIOL 1107 and BIOL 1108	Foundations of Biology and Lab for BIOL 1107	5
<i>Inquiries</i>		
BIOL 2299	Inquiries in Biological Sciences	4
<i>Genetics</i>		
BIOL 2301 and BIOL 2302	Genetics and Molecular Biology and Lab for BIOL 2301	5
<i>Project Lab</i>		
BIOL 2309	Biology Project Lab	4
<b>Chemistry</b>		
<i>General Chemistry</i>		
CHEM 1161 and CHEM 1162 and CHEM 1163	General Chemistry for Science Majors and Lab for CHEM 1161 and Recitation for CHEM 1161	5
<i>Organic Chemistry</i>		
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
<b>Biochemistry</b>		
BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611	5
<b>Intermediate/Advanced Biology</b>		
Complete one of the following:		4-5
BIOL 2327 to BIOL 3999		
BIOL 4705 to BIOL 5999		
<b>Organismal and Evolutionary Biology Elective</b>		
Complete one of the following:		4-5
BIOL 2327	Human Parasitology	

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BIOL 3401	Comparative Vertebrate Anatomy
BIOL 3403	Animal Behavior
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
EEMB 3466	Disease Ecology

### Mathematics Requirements

Code	Title	Hours
<b>Calculus 1</b>		
MATH 1341 or MATH 1251	Calculus 1 for Science and Engineering Calculus and Differential Equations for Biology 1	4
<b>Calculus 2 and Calculus 3</b>		
MATH 1342 or MATH 1252	Calculus 2 for Science and Engineering Calculus and Differential Equations for Biology 2	4
MATH 2321	Calculus 3 for Science and Engineering	4
<b>Physics</b>		
PHYS 1161 and PHYS 1162	Physics 1 and Lab for PHYS 1161	5
<b>Required Mathematics Courses</b>		
MATH 1365	Introduction to Mathematical Reasoning	4
MATH 2341	Differential Equations and Linear Algebra for Engineering	4
MATH 3081	Probability and Statistics	4
<b>Mathematics Electives</b>		
Complete three of the following:		12
MATH 2331	Linear Algebra	
MATH 3001 to MATH 4899		

### Additional Requirements

Code	Title	Hours
<b>Experiential Learning Introduction</b>		
EESC 2000	Professional Development for Co-op	1
MATH 3000	Co-op and Experiential Learning Reflection Seminar 1	1
<b>Capstone</b>		
Complete one of the following to fulfill capstone requirement:		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	
<b>Biology/Mathematics Integrative Courses</b>		
Complete two of the following:		8-10
BINF 6308	Bioinformatics Computational Methods 1	
BINF 6309	Bioinformatics Computational Methods 2	
BIOL 3405	Neurobiology	
BIOL 5569	Advanced Microbiology	
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	
MATH 4581	Statistics and Stochastic Processes	
MATH 7343	Applied Statistics	
<b>Writing Requirement</b>		
ENGW 3307	Advanced Writing in the Sciences	4

### **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