

Artificial Intelligence and Biochemistry, BS (Boston)

The Artificial Intelligence and Biochemistry Major combines computer science, data science, biochemistry, biology, information science, mathematics, and statistics into an integrated curriculum. The program engages students in rigorous coursework designed to prepare students to interpret the ever-expanding knowledge base.

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 (<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/general-education-requirements/#nupathtext>).

Artificial Intelligence Requirements

Code	Title	Hours
Computer Science Overview		
Must be taken in alignment with your home college:		
CS 1200	First Year Seminar	1
or BIOC 1000	Biochemistry at Northeastern	
or INPR 1000	First-Year Interdisciplinary Seminar	
or INSC 1000	Science at Northeastern	
CS 1210	Professional Development for Khoury Co-op	1
or EESC 2000	Professional Development for Co-op	
Fundamental Courses		
All students can take a self-assessment to attempt to place out of CS 2000 and CS 2001. Students who place out of CS 2000 and CS 2001 will instead substitute with 4-5 semester hours of CS, CY, or DS coursework at the 3000 level or higher not otherwise required in the degree.		
CS 2000 and CS 2001	Introduction to Program Design and Implementation and Lab for CS 2000	5
CS 2100 and CS 2101	Program Design and Implementation 1 and Lab for CS 2100	5
DS 3500	Advanced Programming with Data	4
CS 3200	Introduction to Databases	4
MATH 1365 or MATH 1465	Introduction to Mathematical Reasoning Intensive Mathematical Reasoning	4
Artificial Intelligence Foundations		
DS 3000	Mathematical Foundations of Artificial Intelligence	4
DS 4200	Information Presentation and Visualization	4
DS 4300	Large-Scale Information Storage and Retrieval	4
DS 4400	Machine Learning	4
Khoury Approved Electives		
With advisor approval, directed study, research, project study, and appropriate graduate-level courses may also be taken as upper-division electives.		
Complete 4 semester hours from within the following options:		4
CS 2300 or higher, except CS 5010		
CY 2000 or higher, except CY 4930		
DS 2500 or higher, except DS 4900		
EECE 2160	Embedded Design: Enabling Robotics	
EECE 2322	Fundamentals of Digital Design and Computer Organization	
MKTG 4606	Digital, Analytics, Technology, and Automation Research Practicum	

Statistics Foundations

Complete one of the following: 4-5

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

Writing Requirement

Code	Title	Hours
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College Writing

ENGW 1111	First-Year Writing	4
or ENGW 1102	First-Year Writing for Multilingual Writers	

Advanced Writing in the Disciplines

ENGW 3302	Advanced Writing in the Technical Professions	4
or ENGW 3307	Advanced Writing in the Sciences	
or ENGW 3315	Interdisciplinary Advanced Writing in the Disciplines	

Biochemistry Requirements

Code	Title	Hours
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Biology Foundations

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

Chemistry Foundations

CHEM 1161 and CHEM 1162	General Chemistry for Science Majors and Lab 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

Mathematics Foundations

MATH 1341	Calculus 1 for Science and Engineering	4
MATH 1342	Calculus 2 for Science and Engineering	4

Biochemistry Foundations

BIOL 3611 and BIOL 3612	Biochemistry and Lab for BIOL 3611	5
CHEM 3331 and CHEM 3332 or CHEM 5620	Bioanalytical Chemistry and Lab for CHEM 3331 Protein Chemistry	3-5

Intermediate or Advanced Science Elective

Complete one course from the following: 3-5

BIOL 2301 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	

Integrative Requirement

Code	Title	Hours
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Integrative Courses

Complete one of the following: 4

BINF 6310	Introduction to Bioinformatics	
BIOL 5591	Advanced Genomics	

Complete one of the following:		4
BIOL 4701	Biology Capstone	
CHEM 4750	Senior Research	

Required General Electives

Code	Title	Hours
Complete 16 semester hours of general electives.		16

Science GPA Requirement (Biochemistry)

A minimum 2.000 GPA in the following course codes is required: BIOL, CHEM, MATH, PHYS.

NUpath Requirements Satisfied

- Advanced Writing in the Disciplines
- Analyzing and Using Data
- Conducting Formal and Quantitative Reasoning
- Demonstrating Thought and Action in a Capstone
- Engaging with the Natural and Designed World
- Writing in the First Year
- Writing-Intensive in the Major

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

Program Requirement

131 total semester hours required