

Artificial Intelligence and Mathematics, BS (Boston)

The artificial intelligence and mathematics combined major combines computer science, data science, and mathematics into an integrated curriculum. The program provides the rigorous theoretical background necessary for success in the artificial intelligence field.

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 Courses

Code	Title	Hours
Computer Science Overview		
Complete the following in alignment with your home college:		
CS 1200 or INPR 1000 or INSC 1000	First Year Seminar First-Year Interdisciplinary Seminar Science at Northeastern	1
CS 1210 or EESC 2000	Professional Development for Khoury Co-op Professional Development for Co-op	1
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
CS 3200	Introduction to Databases	4
DS 3500	Advanced Programming with Data	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
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 12 semester hours from within the following ranges:		12
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 and EECE 2323	Fundamentals of Digital Design and Computer Organization and Lab for EECE 2322	
MKTG 4606	Digital, Analytics, Technology, and Automation Research Practicum	

Mathematics Courses

Code	Title	Hours
Problem-Solving Requirement		
MATH 1365	Introduction to Mathematical Reasoning	4

Calculus Requirements

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

Intermediate and Advanced Math Requirements

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 Elective Requirements

Complete four courses from within the following range:	16
MATH 3001 to MATH 4999 but not MATH 4000	

Integrative Requirements

Code	Title	Hours
Integrative Courses		
DS 4400	Machine Learning	4
DS 4420	Advanced Machine Learning	4

Computer Science Writing Requirements

Code	Title	Hours
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	

Required General Electives

Code	Title	Hours
Complete 24 semester hours of general electives.		24

Science GPA Requirement (Mathematics)

A minimum 2.000 GPA in MATH courses is required.

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

130 total semester hours required