Major in Artificial Intelligence

The undergraduate artificial intelligence program develops essential programming skills, rigorous algorithm analysis, and a strong foundation in artificial intelligence. Students learn to design, document, and optimize algorithms that solve complex problems efficiently and scalably. They analyze algorithm performance using combinatorial reasoning, asymptotic analysis, and execution tracing. Core AI paradigms—including symbolic reasoning, machine learning, and probabilistic inference—are examined through hands-on projects that implement and evaluate basic models while addressing ethical concerns and limitations.

The curriculum also emphasizes effective handling of large data sets and information processing for decision making. Advanced modules introduce natural language processing, generative AI, and computer vision, preparing students to develop and optimize sophisticated AI applications. Integral software engineering practices are reinforced as students write modular, maintainable code, use version control, and apply debugging techniques in collaborative projects.

Strong communication skills are cultivated through oral and written presentations and teamwork. Graduates emerge ready to tackle complex AI challenges, contribute innovative solutions, and pursue careers in AI development, information management, and research. This program fosters critical thinking, creativity, and ethical awareness, ensuring that students are well-prepared to lead in the evolving landscape of artificial intelligence.

Freshman Applicants:
Beginning in Fall 2021, NEIU adopted a test-optional admissions policy. This Artificial Intelligence program will follow the same standard: standardized test scores are not required for admission. Applicants, however, are encouraged to submit test scores in order to meet some scholarship and prerequisite requirements. Test scores also can be helpful with determining your placement in math and English courses. Scores will not be used to make an admissions decision. Applicants with a 2.5 cumulative high school grade-point average will be guaranteed admission.

Transfer Applicants:
Transfer students must have a cumulative grade point average (GPA) of 2.0 or higher on a 4.0 scale from all colleges, universities and trade schools attended. Upon admission, an evaluation of the prospective transfer student's credits will be undertaken to determine which and how many of the previously-earned credits will meet the degree requirements at Northeastern. A high school transcript is required if the applicant has completed fewer than 24 semester hours of college credit.

International Applicants:
An international applicant must fulfill all of the admission requirements and submit all the required documents that domestic applicants do. Additionally, they must demonstrate that they meet eligibility requirements for:

- Non-immigrant student visa status
- English language proficiency: TOEFL (Paper-based TOEFL: 500, Computer-based TOEFL: 173, Internet-based TOEFL: 61), IELTS (Composite score of 6.0)

University Core Curriculum Requirements

General Education Distribution Area	Cr. Hrs.
Fine Arts (FA)* 2 courses, from at least two of the following areas of study: Art, CMT (Mass Media or Theatre), Music (includes Dance).	6
Humanities (HU)* 3 courses, from at least two of the following areas of study: CMT (Communication), English, Linguistics. Philosophy, Women's and Gender Studies, World Languages and Cultures, (Note: No more than two foreign language courses may be used to fulfill this requirement.)	9
Behavioral/Social Sciences (SB)* 3 courses, from at least two of the following areas of study: African & African American Studies, Anthropology, Computer Science, Economics, Geography & Environmental Studies, History, Justice Studies, Latino & Latin American Studies, Political Science, Psychology, Sociology, Social Work	9
Natural Sciences (NS and NSL)** 3 courses, from at least two of the following areas of study; one course must have a laboratory component (NSL): Biology, Chemistry, Earth Science, Environmental Science, Physics (Note: If an FYE ANTH that counts as Natural Science is taken, only one Biology course may be used for Natural Science).	9

Engaged Learning Experiences

Students must complete, at Northeastern, three courses designated as Engaged Learning Experiences courses. One of the Engaged Learning Experiences courses must be at the 300-level, and one Engaged Learning Experiences course must be designated as "Boundary Crossing".

Discipline Specific (ELE-DS)

These courses have pre-requisites that are specific courses within a program of study. Discipline Specific courses give students a deeper understanding of how knowledge is created and applied in their field.

Boundary Crossing (ELE-X)

These are courses that cross disciplinary boundaries and/or cross boundaries through engagements outside the classroom or University allowing students to see how knowledge gained in one field might inform other fields or other aspects of society.

Math/Quantitative Reasoning (MA)

1 Math course, that has intermediate Algebra as prerequisite OR is a course listed on the General Education Distributive Learning List of Approved Courses. Any 3 hour college level math course, beyond Intermediate Algebra, meets this requirement.

* Majors in Fine Arts, Humanities or Social/Behavioral Sciences, may waive up to 6 credit hours of General Education requirements in the corresponding distribution area.

** Majors in Natural Sciences may waive up to 9 credit hours of General Education requirements in the Natural Sciences distribution area.

Students should also be aware of all other university requirements to obtain a degree - NEIU requirements (https://catalog.neiu.edu/graduation-requirements/bachelors-degree/)

Program Requirements for Artificial Intelligence degree:

For this major, students are required to take in total 62 credit hours which includes Math required course, foundational courses, required major courses and two electives.

Code	Title	Hours
Math Courses		**8**
MATH-173	College Algebra	4
MATH-187	Calculus I	4
Foundational Courses		**12**
CS-200	Programming Fundamentals	4
CS-201	Discrete Structures	3
CS-303A	Object-Oriented Programming And Data Structures	5
Major Courses		**36**
CS-235	Artificial Intelligence For All	3
CS-308	Operating Systems	3
CS-315	Modern Database Management	3
CS-319	Writing Intensive Program: Fundamentals Of Software Engineering	3
CS-322	Applied Research And Statistical Data Analysis	3
CS-324	Introduction To The Design Of Algorithms	3
CS-335	Artificial Intelligence	3
CS-343	Introduction To Natural Language Processing	3
CS-348	Computer Ethics And Public Policy	3
CS-351	Data Wrangling For Data Analysis	3
CS-352	Programming For Artificial Intelligence	3
CS-359	Machine Learning	3
Electives (Select two from the following)		**6**
CS-327	Computational Methods In Biology	3
CS-342	Introduction To Human Computer Interaction	3

CS-349	Introduction To The Internet Of Things	3
MNGT-351	Data Visualization And Management	3
MNGT-379	Business Analytics	3
or any CS 300-level courses, approved by the department		
Total Hours		**62**

NO SUBSTITUTIONS ARE ALLOWED FOR MAJOR COURSES.

This sample curricular map is provided to guide you in the planning of your progression for this major. This guide should not replace regular consultations with your program advisor. **All students need to fulfill the 120 credit hours minimum in order to graduate.** We recommend that students in this program take **ENGL-101: Writing I** during their first semester or as early as possible. For specific recommendations of courses not identified, please consult your program advisor.

First Year		
Term 1		**Hours**
MATH-173	College Algebra	4
MATH-187	Calculus I	4
CS-200	Programming Fundamentals	4
CS-201	Discrete Structures	3
	Term Hours	**15**
Term 2		
CS-235	Artificial Intelligence For All	3
CS-303A	Object-Oriented Programming And Data Structures	5
CS-322	Applied Research And Statistical Data Analysis	3
	Term Hours	**11**
Second Year		
Term 1		
CS-315	Modern Database Management	3
CS-335	Artificial Intelligence	3
CS-351	Data Wrangling For Data Analysis	3
	Term Hours	**9**
Term 2		
CS-308	Operating Systems	3
CS-324	Introduction To The Design Of Algorithms	3
CS-348	Computer Ethics And Public Policy	3
CS-352	Programming For Artificial Intelligence	3
	Term Hours	**12**
Third Year		
Term 1		
CS-319	Writing Intensive Program: Fundamentals Of Software Engineering	3
CS-343	Introduction To Natural Language Processing	3
CS Elective		3
	Term Hours	**9**
Term 2		
CS-359	Machine Learning	3
CS Elective		3
	Term Hours	**6**
	Total Hours:	**62**