

ARTIFICIAL INTELLIGENCE, BA

Degree: Bachelor of Arts (BA)

Major: Artificial Intelligence

Program Overview

The Bachelor of Arts degree program in artificial intelligence is a combination of a liberal arts program and an artificial intelligence major. Although it is less technical than the Bachelor of Science degree program in artificial intelligence, it is a professional program in the sense that graduates of this program can be employed as artificial intelligence or computing professionals. The Bachelor of Arts degree program in artificial intelligence is designed according to the latest ACM/AAAI curriculum guidelines for the artificial intelligence area and will give students a strong background in the fundamentals of artificial intelligence and machine learning while also providing students with flexibility to pursue a wide range of academic interests. This program is particularly suitable for students who want to combine expertise in artificial intelligence with expertise in another discipline. For example, students can major in another discipline in addition to artificial intelligence and routinely complete all of the requirements for the double major in a four year period, or students can major in artificial intelligence and take all of the pre-med courses in a four year period. In addition to an excellent technical education, all students in the department have the opportunity to develop professional, leadership and creativity skills.

Mission

The mission of the Bachelor of Arts degree program in artificial intelligence is to graduate students who have fundamental technical knowledge of their profession and the requisite technical breadth and communications skills to become leaders in creating the new techniques and technologies which will advance the field of artificial intelligence and its application to other disciplines.

Program Educational Objectives

Graduates from the Bachelor of Arts degree program in artificial intelligence will be prepared to:

1. Analyze real-world problems and create solutions based on the fundamentals of artificial intelligence, mathematics, and computing.
2. Work effectively, professionally, collaboratively, and ethically.
3. Assume leadership roles in industry, academia, public service, and entrepreneurship.
4. Successfully progress in advanced degree programs in artificial intelligence, computing, and related fields.

Learning Outcomes

- Be able to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Be able to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Be able to communicate effectively in a variety of professional contexts.
- Be able to recognize professional responsibilities and make informed

judgments in computing practice based on legal and ethical principles.

- Be able to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Be able to apply the theory, techniques, and tools of artificial intelligence, to understand the assumptions implicit in the tools, to make informed judgements about the societal benefits and risks of the applications they are building, and to employ the resulting knowledge to satisfy stakeholders' needs.

Undergraduate Policies

For undergraduate policies and procedures, please review the [Undergraduate Academics](#) section of the General Bulletin.

Combined Bachelor's/Master's Programs

Undergraduate students may participate in accelerated programs toward graduate or professional degrees. For more information and details of the policies and procedures related to accelerated studies, please visit the [Undergraduate Academics](#) section of the General Bulletin.

Program Requirements

Students seeking to complete this major and degree program must meet the [general requirements for bachelor's degrees](#) and the [Unified General Education Requirements](#). Students completing this program as a [secondary major](#) while completing another undergraduate degree program do not need to satisfy the [school-specific requirements](#) associated with this major.

Artificial Intelligence BA majors complete Required Courses, a Societal Impact Course, Technical Electives, and an Application Elective.

Required Courses

Code	Title	Credit Hours
MATH 121	Calculus for Science and Engineering I	4
MATH 122 or MATH 124	Calculus for Science and Engineering II Calculus II	4
MATH 307	Linear Algebra	3
STAT 301 or MATH 380	Introduction to Probability for Statistics Introduction to Probability	3
Choose one of the following:		3-4
CSDS 134	Programming in Python	
CSDS 132 & CSDS 237	Programming in Java and The Python Programming Language	
CSDS 233	Introduction to Data Structures	4
CSDS 302	Discrete Mathematics	3
CSDS 310	Algorithms	3
CSDS 330	Introduction to Artificial Intelligence	3
CSDS 340	Introduction to Machine Learning	3
CSDS 395A	Senior Project in Artificial Intelligence	4
Total Credit Hours		37-38

Societal Impact Course

Code	Title	Credit Hours
Choose one of the following:		3
CSDS 225	Current Issues in Artificial Intelligence, For Better or Worse	
CSDS 347	Responsible AI Engineering	
CSDS 443	Algorithmic Fairness	
PHIL 393	Ethics of Artificial Intelligence and Emerging Technology	
HUMN 250	Responsible AI: Cultivating a Just and Sustainable Socio-technical Future through Data Citizenship	

Technical Electives

Code	Title	Credit Hours
Choose three of the following:		9
CSDS 323	Numerical Algorithms for Machine Learning	
CSDS 346	Machine Learning on Graphs	
CSDS 347	Responsible AI Engineering	
CSDS 350	Programming for AI/ML	
CSDS 352	Causality and Machine Learning	
CSDS 364	Computational Perception	
CSDS 365	Computer Vision	
CSDS 375	Designing High Performant Systems for AI	
CSDS 440	Machine Learning	
CSDS 480	Large Language Models	
CSDS 491	Probabilistic Models in AI	
CSDS 496	Sequential Decision Making	
CSDS 497	Foundations of Statistical Natural Language Processing	

Application Elective

Code	Title	Credit Hours
Choose one 3-4 credit course, or two 1.5 credit courses, from the following:		3-4
<i>Data Science</i>		
CSDS 234	Structured and Unstructured Data	
CSDS 312	Introduction to Data Science Systems	
CSDS 313	Introduction to Data Analysis	
CSDS 335	Data Mining for Big Data	
CSDS 438	High Performance Data and Computing	
<i>Image Processing</i>		
CSDS 361	Biomedical Image Processing and Analysis	
CSDS 463	AI in Medical Imaging	
CSDS 490	Digital Image Processing	
PQHS 416	AI in Medicine: Knowledge Representation and Deep Learning	
<i>Mathematics and Statistics</i>		
MATH 327	Convexity and Optimization	

STAT 327	Statistical Computing
MATH 431	Introduction to Numerical Analysis I
MATH 444	Mathematics of Data Mining and Pattern Recognition
<i>Robotics</i>	
CSDS 376	Mobile Robotics
CSDS 499	Algorithmic Robotics
ECSE 373	Introduction to Modern Robotics
<i>Security</i>	
CSDS 344	Computer Security
CSDS 356	Data Privacy
<i>Applied Artificial Intelligence</i>	
CSDS 102	Artificial Intelligence for All Disciplines
DSCI 353	Statistical and Machine Learning for Inference, Prediction and Reasoning
ECON 334	Economics of Artificial Intelligence and Digital Platforms
ECON 380	Computational Methods for Economic Modeling
ECON 381	Machine Learning for Predictive Analytics in Economics
MBAP 429H	Artificial Intelligence Applications in Healthcare Management
SCMG 462	Artificial Intelligence Fundamentals for Supply Chain Management
SCMG 463	Case Studies in Artificial Intelligence - Supply Chain Applications
SYBB 464	Artificial Intelligence for Biomedical Research

Sample Plan of Study

First Year		
Fall		Credit Hours
MATH 121	Calculus for Science and Engineering I	4
CSDS 134	Programming in Python	3
Academic Inquiry Seminar, Breadth, or Elective course^a		3
Open Elective		3
Open Elective		3
Credit Hours		16
Spring		
MATH 122 or MATH 124	Calculus for Science and Engineering II or Calculus II	4
CSDS 233	Introduction to Data Structures	4
Academic Inquiry Seminar, Breadth, or Elective course^a		3
Open Elective		3
Credit Hours		14
Second Year		
Fall		
CSDS 302	Discrete Mathematics	3
STAT 301 or MATH 380	Introduction to Probability for Statistics or Introduction to Probability	3

Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	3
Credit Hours	15
Spring	
MATH 307 Linear Algebra	3
CSDS 330 Introduction to Artificial Intelligence	3
Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	3
Credit Hours	15
Third Year	
Fall	
CSDS 340 Introduction to Machine Learning	3
Societal Impact Elective or Technical Elective	3
Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	3
Credit Hours	15
Spring	
CSDS 310 Algorithms	3
Societal Impact Elective or Technical Elective	3
Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	3
Credit Hours	15
Fourth Year	
Fall	
Application Elective	3
Technical Elective	3
Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	3
Credit Hours	15
Spring	
CSDS 395A Senior Project in Artificial Intelligence	4
Technical Elective	3
Breadth, or Elective course ^a	3
Open Elective	3
Open Elective	2
Credit Hours	15
Total Credit Hours	120

^a **Unified General Education Requirement.**