

ARTIFICIAL INTELLIGENCE MINOR

Bowers College of Computing and Information Science

Program Website (<https://prod.cis.cornell.edu/undergraduate-opportunities/minors/artificial-intelligence/>)

Program Description

The Bowers Computing and Information Science (CIS) Artificial Intelligence (AI) minor is open to all undergraduates and is designed to provide students with a solid foundational understanding of the algorithms and techniques that underlie AI capabilities.

Grade Requirements

All qualifying courses must be taken at Cornell for a letter grade. Grades of S/U or SX/UX grades will not be accepted. Course substitutions or external coursework are also not allowed.

Each course must be completed with a grade of "C" or better to count toward the minor. Grades of "C-" will not be accepted.

Minor Requirements

Six courses are required in total:

- There are **four** required **Foundations of AI core courses**.
 - Two are technical classes – on computational AI methods for learning and reasoning, respectively. These are complemented by a course on the design and evaluation of human-AI systems and a course on AI ethics, governance, and policy.
- Students also select **two AI elective courses** from the course list provided.
- Students may count a maximum of two courses toward both the AI minor and their own major's requirements, though they may count other courses they take for the AI minor toward their major's elective requirements, provided their department approves.

Computer Science (CS) Majors

- You may count a maximum of two courses toward both the AI Minor and your CS core courses, CS electives, and/or CS practicum requirements for the CS major.
- You may, however, count other courses you take for the AI Minor toward your CS technical electives, external specialization, major-approved and/or advisor-approved elective coursework, but only if those courses meet the requirements for that category of elective.

Information Science (IS) Majors

The below notes are for students in both the College of Arts & Science and College of Agriculture and Life Sciences.

- You may count a maximum of two courses toward both the AI Minor and your IS core courses and/or IS concentration requirements for the IS major.
- You may, however, count other courses you take for the AI Minor toward your IS electives, but only if those courses meet the requirements for that category of elective.

Prerequisites

Please note that this is a highly technical minor. The majority of the required and elective courses have mandatory prerequisites that include computer programming, probability, calculus, and/or linear algebra. Please review each course's prerequisites starting with the Foundations courses, and plan your schedule accordingly.

Code	Title	Hours
Core Courses		
<i>Foundations of AI: Machine Learning</i>		
Select one of the following:		
CS 3780	Introduction to Machine Learning (formerly CS 4780)	4
ECE 4200	Fundamentals of Machine Learning	4
ORIE 3741	Learning with Big Messy Data (formerly ORIE 4741)	4
STSCI 3740	Data Mining and Machine Learning (formerly STSCI 4740)	4
<i>Foundations of AI: Reasoning</i>		
CS 3700	Foundations of AI Reasoning and Decision-Making (formerly CS 4700)	3
<i>Foundations of AI: Human-AI Interaction</i>		
INFO 4940	Special Topics in Information Science ¹	1-4
<i>Human-AI Interaction Design</i>		
<i>Foundations of AI: Ethics, Governance & Policy</i>		
Select one of the following:		
ENGRG 3605	Ethics of Computing and Artificial Intelligence Technologies	3
INFO 1260	Choices and Consequences in Computing	3
INFO 4210	Artificial Intelligence: Law, Ethics, and Politics	3
Electives		
Select two of the following:		
CS 4670	Introduction to Computer Vision	4
CS 4701	Practicum in Artificial Intelligence	2
CS 4740	Natural Language Processing	4
CS 4750	Foundations of Robotics	4
CS 4756	Robot Learning	4
CS 4782	Introduction to Deep Learning	4
CS 4783	Mathematical Foundations of Machine Learning	4
CS 4787	Principles of Large-Scale Machine Learning Systems	4
CS 4789	Introduction to Reinforcement Learning	3
CS 4860	Applied Logic	3
ECE 4160	Fast Robots	4
ENGRG 3605	Ethics of Computing and Artificial Intelligence Technologies ²	3
INFO 1260	Choices and Consequences in Computing ²	3
INFO 3350	Text Mining History and Literature	3
INFO 3950	Data Analytics for Information Science	3
INFO 4100	Learning Analytics	3
INFO 4120	Ubiquitous Computing	3
INFO 4130		3
INFO 4275		3
INFO 4300	Language and Information	3

INFO 4310	Interactive Information Visualization	3
INFO 4410	Re-Designing Robots	3
INFO 4940	Special Topics in Information Science	1-4
Advanced NLP for Humanities Research		
Law, Policy, and Politics of AI		
LING 4424	Computational Linguistics I	4
LING 4434	Computational Linguistics II	4
MAE 4180	Autonomous Mobile Robots	3
MAE 4810	Robot Perception	3
NBA 4920	AI for Business Applications	1.5-3
ORIE 4160	Topics in Data Science and OR	3
ORIE 4740	Statistical Data Mining I	4
ORIE 4742	Info Theory, Probabilistic Modeling, and Deep Learning with Scientific and Financial Apps	3
ORIE 4570	Reinforcement Learning with Operations Research Applications	3
PHIL 2621	Minds and Machines	3
PUBPOL 4210	Artificial Intelligence: Law, Ethics, and Politics ²	3
STS 3440	Data Science and Society Lab	3
STSCI 4030	Linear Models with Matrices	4
STSCI 4520	Statistical Computing	4
STSCI 4750	Understanding Machine Learning	4

¹ Note: Students graduating in Dec 2024 or May 2025 may use INFO 3450 Human-Computer Interaction Design as an alternative. This substitution is only permitted for Dec and May graduates during year 1 (academic year 2024-25) of the new minor.

² Cannot be used jointly to fulfill the Foundations of AI: Ethics, Governance & Policy.

Questions about the AI minor should be directed to cis.ai-minor@cornell.edu.