CIS 5210 - Artificial Intelligence

Spring 2026

Instructor

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Course Description

This course provides a broad introduction to the field of artificial intelligence. The focus of the course is on developing algorithms for agents which sense and act in the world, so that they can make rational decisions. Topics include, search and shortest paths algorithms, knowledge representation, probabilistic reasoning, machine learning and neural networks, and natural language processing. All programming assignments will be in Python, and we have a quick review of the programming language at the start of this course.

Course Learning Objectives

- The aim of this course is to give you a broad overview of Artificial Intelligence.
- In this course we'll focus primarily on building algorithms that can be used for constructing AI agents that act rationally including search algorithms, constraint satisfaction problems, Markov Decision Processes, reinforcement learning, machine learning algorithms and Natural Language Processing.
- After the course, you will be able to apply AI algorithms in your own project and work.

Course Prerequisites

MCIT:

- CIT 5910 (Introduction to Software Development)
- CIT 5920 (Mathematical Foundations of Computer Science)
- CIT 5940 (Data Structures & Software Design)
- CIT 5960 (Algorithms and Computation)

MSE-DS:

Course requirements labelled 5910 - 5940 are waived.

- CIT 5960 (Algorithms and Computation)

MSE-AI:

- No course pre-requisites.

Course Materials

Course Textbook

Required: Artificial Intelligence: A Modern Approach (4th edition) by Russel and Norvig. Note that the 4th edition adds substantial new material over the 3rd edition, so you should buy the 4th edition. You can buy the textbook on Amazon or from the UPenn bookstore, where you can rent the digital version for $40.

Supplemental: Speech and Language Processing (3rd ed. draft) by Jurafsky and Martin. This textbook is currently free online while the textbook authors are revising it to write their 3rd edition. We will use it in the last third of the course.

Grading & Assessment

You must attempt all graded assignments to pass the course. If you have any questions or concerns about grading or progress in the course, please reach out to your instructor.

This course will use a variety of assessments to determine whether learners understand and can apply the key concepts and skills that the course teaches. This includes:

Type	%	Description
Individual Coding assignments	50%	There are 10 individual coding assignments in this course that will test core concepts. They are all equally weighted and will all be administered via Gradescope. All coding assignments will be autograded.
Exams	40%	There are 2 midterm exams, which are equally weighted. They will both be timed exams. The exams cover the textbook readings, lectures, and materials from homeworks. Timed Exam 1 covers modules 1, 2, 3, 4, 5, and 6, as well as some general python programming knowledge; Timed Exam 2 covers modules 7, 8, 9, 10, 11, 12, and 13.
Quizzes	10%	This course has 14 quizzes, which are all autograded in Canvas. These will be equally weighted.

Please read the instructions for each assignment very carefully to make sure you know where to submit to receive credit!

This course is not curved. Your overall score is computed as *0.3 * total exam score + 0.6 * total homework score + 0.1 * total quiz score*. A grade of A+ is reserved for the top 10% of the class; so, even if you have a grade of 98 or higher, if you are not in the top 10%, you will be awarded an A, rather than an A+. Here is how we assign letter grades based on your overall score:

Score	Grade
>= 98	A+
93-98	A
90-93	A-
87-90	B+
83-87	B
80-83	B-
75-80	C+
70-75	C
65-70	C-
50-65	D
below 50	F

Late Policy and Extension Requests
Students are expected to submit all assignments on time. Assignments submitted after the deadline will be penalized **10% per late day**, up to a maximum penalty of zero credit.
If you anticipate difficulty meeting a deadline, you may request an extension. Requests must be submitted using the **Extension Request Form** on the Course Resources page in Canvas. Each assignment requires its own request form.

- **Timeline:** Extension requests must be submitted **at least 24 hours before the assignment deadline**.
- **Valid reasons:** Extensions will be granted for **religious observances** and **travel for job interviews**. Other extension requests are subject to review by course staff and will only be approved in cases of **exceptional circumstances**.
- **Length of extension:** Extensions are typically granted for **24 hours**, with a maximum of **48 hours**. Approved extensions will appear in Canvas and Gradescope by **Wednesdays at 5pm ET**.
- **Emergencies:** If you experience a genuine emergency (e.g., sudden illness requiring hospital visit, family crisis), you should still fill out the extension form as soon as possible. Repeated emergency requests will be referred to **Engineering Online advising staff**, who can help coordinate support across courses.

The assignment schedule is provided in advance so you can plan your work accordingly. The late policy ensures fairness for all students, while the extension request process is intended for **extraordinary and unavoidable circumstances only**.

Regrade Requests

Regrade requests are allowed up to 1 week after the grades are released. These requests must be made through Gradescope.

We welcome and encourage regrade requests, however, we kindly ask that you review your work thoroughly before submitting a request. Students have access to three unsuccessful requests, subsequent unsuccessful requests will result in a 1% deduction from your assignment grade. Thank you for your understanding and cooperation.

Other Course Activities

The following activities are not mandatory but will greatly support your success on the graded assignments.

Discussion Forum

Discussion forums are designed to give you optional extra practice with the material, and to see examples of how your classmates are thinking and working.

Additional Segments

The professor may add additional optional segments to support the class as needed, including recitation materials.

Creating a Welcoming Environment

All members of the course community – the instructor, TAs, and students – are expected to work together to create a supportive, inclusive environment that welcomes all students, regardless of their race, color, sex, sexual orientation, religion, creed, national origin (including shared ancestry or ethnic characteristics), citizenship status, age, disability, veteran status or any other class protected under applicable federal, state, or local law. **All participants in this course deserve to and should expect to be treated with respect by other members of the community.**

Discussion boards, messaging channels, recitations, office hours, and group working time should be spaces where everyone feels welcome and safe. In order to facilitate a welcoming environment, students of this course are expected to:

- Exercise consideration and respect in their speech and actions
- Attempt collaboration and consideration, including listening to opposing perspectives and authentically and respectfully raising concerns, before conflict
- Refrain from demeaning, discriminatory, or harassing behavior and speech

All members of the course community are expected to be familiar with and abide by the University's guidelines on general conduct and sexual harassment:

- University Code of Conduct: https://catalog.upenn.edu/pennbook/code-of-student-conduct/
- University Sexual Misconduct Policy: https://catalog.upenn.edu/pennbook/sexual-misconduct-resource-offices-complaint-procedures/

Students should also be familiar with other University guidelines regarding personal conduct:

- Conduct & Personal Responsibility guidelines in Pennbook: https://catalog.upenn.edu/pennbook/#policiesbytopictext
- University Principles of Responsible Conduct: http://www.upenn.edu/audit/oacp_principles.htm

If you are a victim of, witness, or are otherwise affected by unacceptable behavior:

- In cases of sexual harassment or assault, please consult DPS Special Services (https://www.publicsafety.upenn.edu/about/special-services/sensitive-crimes/ at 215-573-3333; this is a confidential resource.
- To report other bias incidents, please complete the Bias Incident Reporting Form: https://belonging.upenn.edu/diversity-at-penn/bias-motivated-incident-report
- For other violations of the code of student conduct, the Center for Community Standards and Accountability has an incident reporting form at https://csa.upenn.edu/community-standards/refer-caserequest-consultation

If you are unsure which office to contact, please contact the instructor or any Penn Engineering Online Learning staff member.

Getting and Giving Help

TA and Faculty Support

TAs will hold private office hours weekly where they will open a queue in the WaitWhile system.

Collaboration Guidelines

In the professional world of software development, collaboration—including using code that others have written—is both practical and ubiquitous.

However, to prepare for entering that professional context, you need to develop a full set of software development skills so that you are both able to create your own code and evaluate the quality of someone else's code that you might use.

In the context of this course, independent work and evaluation are critical. **Do not collaborate with others on individual graded assignments unless it is explicitly indicated.** The inappropriate collaboration will be considered cheating and considered under Penn's Code of Academic Integrity.

Unless otherwise noted, you are not allowed to work in groups on the homework assignments. You can discuss homework problems with others (you must explicitly list who you discussed problems with on each homework submission), but *all code must be your own independent work.* You are not allowed to upload your code to publicly accessible places (like public github repositories), and you are not allowed to access anyone else's code. If you discover someone else's code online, please report it to the course staff via a private note on Ed Discussion.

Discussion forums and recitations ***are*** collaborative—please take advantage of those times to work with your colleagues. For general communication with your colleagues, use your Slack channels or Slack direct messages.

Forming study groups to understand the material is also a good idea, as long as you stay on the conceptual level and are *not* collaborating on the graded assignments directly.

Note: When in doubt always ask the instructor or TA first, to avoid any potential collaboration that can lead to academic dishonesty.

Do not cheat. **Please note that searching for solutions online is the same as cheating**. **Posting solutions online is also considered cheating.** If you are caught posting solutions or code to a **publicly accessible location** (like StackOverflow or GitHub), it will be considered cheating. If you do use GitHub (or similar cloud-based code management system) to set up a remote code repository, **YOU ARE REQUIRED TO KEEP THAT REPOSITORY PRIVATE**.

You can further read Penn's Code of Academic Integrity page on this subject matter, as well as the SEAS Graduate Student guidelines on the code of ethics.

Plagiarism Policy

The first instance of homework plagiarism will be handled by the instructor and may include escalation to the Center for Community Standards and Accountability.

Second instances or exam plagiarism will be turned over immediately to the University of Pennsylvania Center for Community Standards and Accountability.

Regardless of previous work in the course, the penalty for plagiarism is the failure of the course (regardless of current course average), and potential permanent notation on your academic record that will follow you to all future academic institutions and possibly future employers. If you are unfamiliar with what constitutes plagiarism at Penn, visit Penn's Code of Academic Integrity.

Please note that searching for solutions or code online is a violation of academic integrity. Sharing solutions or code with another student (unless working on a group project or other collaborative assignment) is also a violation of academic integrity. This includes posting solutions and code publicly online, even after you've completed the course. If you discover publicly viewable solutions for the assignments of this course, please let the course staff know immediately. Ignorance of this policy is not an excuse for failing to abide by it.

Guidelines for the Use of Generative AI in this Course
We recognize the increasing prevalence and power of Artificial Intelligence (AI) tools, and encourage their responsible and ethical use to enhance your learning experience. However, it's essential to develop a strong understanding of fundamental processes before relying on AI. To that end:

Examples of acceptable uses of AI

- Comprehension and Expansion: You are encouraged to use AI to clarify and expand your understanding of course materials.
- Research and Information Gathering: AI can supplement your research and information gathering, aiding your exploration of complex concepts.

Examples of unacceptable uses of AI

- Assignment Completion: Avoid using AI for generating code or text for assignments, peer reviews, or content summaries.
- Assessment Assistance: Do not seek AI help for quizzes, exams, or assessments.
- Academic Integrity: Do not present AI-generated content without citation and as your own work.

Engaging in unacceptable use of AI tools will result in academic consequences, which may include grade penalties, academic warnings, or other actions as determined by your instructor and the university's academic integrity policies.

Note that these guidelines may differ from those in other courses. If you have questions or concerns, don't hesitate to reach out. Ultimately, AI can be a valuable educational tool when used responsibly and aligned with our course policies.

Access to Materials and Content Before and After Graduation

If you would like to retain copies of your submitted assignments **for personal use (**please do not make them public), you must download them from Gradescope, Canvas, Codio, and any other platforms that you submit to during the semester in which you are taking that course.

Access to course materials and your submissions is not guaranteed after the completion of a course. Therefore, we recommend that students download any assignments or materials they would like to keep before a course concludes.

Recording Notice

Public office hours, recitations, and other live events will be recorded, used, and may be made available to class participants during the current semester as well as students who take the class in future semesters.

Private office hours will also be offered and are not recorded. Students who do not wish to attend the publicly-recorded office hour may attend the private office hours.

Spring 2026 Course Schedule and Important Dates

Assignment due dates are available in Canvas. All dates are subject to change. Please check Ed Discussion for announcements regarding schedule changes. Please check the Canvas Calendar for the most up-to-date information on due dates etc.

	CIS 5210| Spring 2026						
	Note: Weeks run Monday through Sunday						
	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Week 1	1/4	1/5	1/6	1/7	1/8	1/9	1/10
		First Day of Classes					
Week 2	1/11	1/12	1/13	1/14	1/15	1/16	1/17
	Week 1 Quizzes Due	Homework 1 Due	Course Selection Period				

			Ends / Add Deadline					
			[All students: 1.0 CU Courses and ALL 0.5 CUs]					
Week 3	1/18	1/19	1/20	1/21	1/22	1/23	1/24	
	Week 2 Quiz Due	Martin Luther King, Jr. Day	Course Drop Period Ends / Course Drop Deadline					
			[1.0 CU Courses and 0.5 CU 1st Seven Weeks]					
			Homework 2 Due					
Week 4	1/25	1/26	1/27	1/28	1/29	1/30	1/31	
	Week 3 Quiz Due	Late Course Drop Period Ends/ Late Course Drop Deadline						
		[0.5 CU 1st Seven Weeks]						
		Homework 3 Due						
Week 5	2/1	2/2	2/3	2/4	2/5	2/6	2/7	
	Week 4 Quiz Due	Last Day to						

		Withdraw from a Course						
		[0.5 CU 1st Seven Weeks]						
		Homework 4 Due						
Week 6	2/8	2/9	2/10	2/11	2/12	2/13	2/14	
	Week 5 Quiz Due	Homework 5 Due						
Week 7	2/15	2/16	2/17	2/18	2/19	2/20	2/21	
	Week 6 Quiz Due					Timed Exam 1 Opens		
Week 8	2/22	2/23	2/24	2/25	2/26	2/27	2/28	
	Late Drop Period Ends / Late Drop Deadline	First Day of the Term						
	[1.0 CU Courses]	[.5 CU 2nd Seven Weeks]						
	Last Day of the Term	Logical Agents Optional Assignment Due						
	[0.5 CU 1st Seven Weeks]							
	Timed Exam 1 Due							

	Week 7 Quiz Due							
Week 9	3/1	3/2	3/3	3/4	3/5	3/6	3/7	
	Week 8 Quiz Due	Homework 6 Due						
Spring Break	3/8	3/9	3/10	3/11	3/12	3/13	3/14	
	Week 9 Quiz Due	Spring Break	Spring Break	Spring Break	Spring Break	Spring Break	Spring Break	
		Course Drop Period Ends / Course Drop Deadline						
		[0.5 CU 2nd Seven Weeks]						
Week 10	3/15	3/16	3/17	3/18	3/19	3/20	3/21	
	Spring Break	Classes Resume						
		Homework 7 Due						
Week 11	3/22	3/23	3/24	3/25	3/26	3/27	3/28	
	Week 10 Quiz Due	Late Course Drop Period Ends / Late Course Drop Deadline						
		[0.5 CU 2nd Seven Weeks]						

		Last Day to Withdraw from a Course						
		[1.0 CU Courses]						
		Homework 8 Due						
Week 12	3/29	3/30	3/31	4/1	4/2	4/3	4/4	
	Week 11 Quiz Due	Last Day to Withdraw from a Course						
		[0.5 CU 2nd Seven Weeks]						
		Homework 9 Due						
Week 13	4/5	4/6	4/7	4/8	4/9	4/10	4/11	
		Week 12 Quiz Due						
Week 14	4/12	4/13	4/14	4/15	4/16	4/17	4/18	
	Week 13 Quiz Due	Homework 10 Due				Final Exam Period Begins		
Week 15	4/19	4/20	4/21	4/22	4/23	4/24	4/25	
	Last Day of the Term							
	Final Exam Due							
