

Syllabus

CS3600 Introduction to Artificial Intelligence

Georgia Tech Europe - Spring 2025

General Information

Introduction to Artificial Intelligence is a three-credit undergraduate course emphasizing the building of agents, environments, and systems that can be considered as acting intelligently. In particular, you will learn about the methods and tools that will allow you to build complete systems that can interact intelligently with their environment by learning and reasoning about the world.

Objectives

There are three primary objectives for the course: To provide a broad survey of AI; To develop a deeper understanding of several major topics in AI; To develop the design and programming skills that will help you to build intelligent artifacts.

In practice, you should develop enough basic skills and background that you can pursue any desire you have to learn more about specific areas in IS, whether those areas are planning, knowledge representation, machine learning, vision, robotics or whatever. In particular, this class provides a useful foundation for a number of courses involving intelligence systems, including Machine Learning (CS4641), Knowledge-Based AI (CS4634), Computer Vision (CS4495), Robotics and Perception (CS4632), Natural Language Understanding (CS4650) and Game AI (CS4731).

Prerequisites

Someone once said that the trick to doing AI is coming up with a good representation. That's not quite all there is to it, but it's close enough, so to succeed at this class, you should know a bit about data structures and algorithms. At the very least, you will have to be able to read pseudocode and understand basic algorithms as they are presented to you.

Someone else one defined AI as finding fast algorithms for NP-hard problems. Again, that's not quite all there is to it, but it's not too far from the truth, so it also turns out that a familiarity with (or at least a lack of abject fear over) some basic theory helps to situate many of the algorithms.

As the semester continues, it turns out that a familiarity with basic probability theory will also be very useful; however, we will spend some time on that in class in order to refresh your memory.

Finally, you should feel pretty comfortable programming on your own. All projects will be implemented in Python. We will spend no time explaining languages in class; at this point in your career you've been exposed to several programming language and are expected to be able to readily acquire new programming language skills.

Instructor

Stéphanie Aravecchia

Office: 103

Office Hours: TBA

Email: stephanie.aravecchia@georgiatech-metz.fr (include 3600 in the subject line)

Course Topics

- Introduction to AI and Agents
- Uniformed Search
- Informed Search
- MDPs
- Reasoning with Uncertainty
- Probabilistic Reasoning over Time
- Decision Trees
- Neural Networks
- Monte Carlo Tree Search

Textbooks

Artificial Intelligence: A Modern Approach, 4th Edition (the purple edition) by Russell and Norvig. The text is required, and you will be doing readings from it every week. There will be a quiz most weeks on the reading.

Course Evaluation

The number of and value of each assignment type is show below (subject to change):

Item	Number (approx.)	Totals
Homework	10	55%
Quizzes	8	20%
Lecture Attendance		5%
Final Exam	1	20%
TOTAL		100%

Final Exam Procedures

The last two weeks of the semester are divided among Final Instruction Days, Reading Periods and Final Exam Days.

- The final exam will be given per the Georgia Tech Europe official schedule.

Academic Misconduct

- Academic misconduct is taken very seriously in this class and it greatly upsets your instructors because of the danger to you and your future. While you may think it is "just a homework", what we call academic misconduct can end a career instantly in the professional world. Let's just not encourage such a habit.
- If you get behind in your assignments, turn in what you've got and talk with your instructor, not necessarily in that order. You'll ultimately come out better than if you turn in someone else's work.
- Quizzes, timed labs and the final examination are individual work. Period.
- Homework assignments are collaborative at a high level - but you must turn in your own original work. In addition, many homework assignments will be evaluated via demo or code review. During this evaluation, you will be expected to be able to explain every aspect of your submission. Homework assignments will also be examined using electronic computer programs to find evidence of unauthorized collaboration.
- Studying is collaborative. You are encouraged to study old tests, do suggested problems, etc. together. Explaining an answer is one of the best ways to learn it.
- What is unauthorized collaboration? You must code each individual programming assignment by yourself. You may work with others at a high level, but each student should be turning in their own version of the assignment. You may teach each other, in the same manner that an Instructor or TA would teach you. If your collaboration and teaching is sufficiently detailed such that your submission appears substantially identical to that of another student, that is considered unauthorized collaboration. Submissions that are substantially identical will receive a zero and will be sent to the Dean of Students' Office of Student Integrity. Submissions that are copies that have been superficially modified to conceal that they are copies are also considered unauthorized collaboration.
- For this course, you may **not** submit code for grading that was written with the use of AI-based code completion software such as GitHub Copilot or ChatGPT. To do so would be considered a violation of academic integrity.
- You are expressly forbidden to supply a copy of your homework to another student via electronic means. If you supply an electronic copy of your homework to another student and they are charged with copying, you will also be charged. This includes *storing your code on any site* which would allow other parties to obtain your code, including (but not limited to) public repositories, etc.

Rules and Regulations

1. **You are responsible for turning in assignments on time. This includes allowing for unforeseen circumstances. You are also responsible for ensuring that what you turned in is what you meant to turn in and**

that you have followed the specific submission instructions for that assignment. Each assignment will have an official due date and time. For homework assignments only, a 24-hour grace period is automatically available for a 25% penalty. After the grace period no credit will be given for the assignment. It is your responsibility to plan and ensure that you have backups, early safety submissions, etc.

2. It is your responsibility to schedule and attend makeups for any evaluations you miss during an excused absence. You must email your instructor regarding the assignment(s), assessment(s), lecture(s), or lab(s) you need to be excused from or need an extension for. Vacations, weddings, personal travel, work conflicts, graduations, etc. are NOT APPROPRIATE excuses. Contact your instructor to make arrangements. You are responsible for following up with your instructor promptly to make sure your make-up work is received, and your correct grades are shown in Canvas.
3. All grades as entered in Canvas on the final day of class will be considered your final grades for each assignment at that time (with the exception of any final homework, quizzes, or timed labs that have not yet been graded). While we do all we can to avoid errors in grade recording, it is ultimately your responsibility to verify your correct grades are entered in Canvas and to notify us of any clerical errors.
4. In general, programming assignments should be turned in with all files needed to compile and run the program. The TA grading your submission should be able to make and run your program without adding files, repairing things etc.
5. Quizzes and examinations must be taken at the scheduled date and time. Please do not ask for special treatment because you (or your parents) have purchased non-refundable airline tickets.
6. If you need a certain grade in order to stay in school, maintain a scholarship, etc., the time to worry about this is right from the beginning of the course, not during the week before finals. Get help early! Grades are based on demonstrated performance and not individual need-based factors external to the course. Please do not request special consideration based on this type of situation. There is no "extra credit" given in this course.
7. If you find yourself earning grades that disappoint you, do not delay in seeking help. Your fellow students, the TA, and your instructor are all available to you.
8. Final grades will be available from OSCAR normally the Tuesday following the end of term. Once you have taken the final exam you should direct any and all questions to your instructor, not your TAs. You may review your final and discuss your grades during the **following semester** in which you are attending Georgia Tech. Grades will not be discussed during the break except in emergency cases.
9. If you encounter a major personal problem (family/illness/etc.), please contact the Dean of Student's office. The Dean's staff and associated resources are there to help you and are authorized to verify your situation and to send notifications to all your instructors making them aware you are having difficulty (without disclosing your details) and requesting extensions,

etc. that may be necessary. If you have issues of any kind that affect your performance in the course: Personal problems, illness, accidents, etc., please seek help from the Dean of Students' office, your instructor, or another trusted individual.

10. The official announcements and any email from the class should be checked and read every day. Our official course site is at <http://canvas.gatech.edu>. Make sure you log in at least once to *check that your Notification preferences for Announcements* do not delay them. Announcements about course matters will be posted to Canvas. Complaints, questions about your personal problems, etc. should be discussed with your instructor in person or via email.
11. Out of consideration to your fellow students, please turn off cell phone alerts, beepers, wristwatch alarms, etc. Also, make every effort to be on time for class in-person classes. Important announcements are often made at the very beginning of the class period. If you are unavoidably late to an in-person class, please sit near the door and try to avoid as much disruption to the class as possible.
12. If you are graduating and need this course to do so, please inform your instructor as soon as possible.
13. The deadline for re-grades is 2 weeks after an assignment grade is posted or returned to you unless it is otherwise specified to be sooner. After this deadline no grade changes will be made.
14. You are responsible for backing up your computer. We highly recommend some sort of automatic off-site backup or cloud storage (<https://dropbox.gatech.edu> is a great option). If you have a catastrophic computer failure, we will work with you while you get your hardware fixed, but we cannot accept having no backup as a reason for an extension.
15. Note that in unusual circumstances, grades may need to be changed to correct grading errors after they are released. You will be notified if changes occur and will have the opportunity to request reconsideration.

Lectures

Lectures are held on **TBA**. Attendance in class is required and will be taken during class. Officially excused absences will be accommodated. More than 2 officially unexcused absences will result in a deduction of 0.5% from the 2% lecture attendance grade for each additional unexcused absence (resulting in a loss of up to 2% of your final grade).

Homework

- There will be approximately 10 homework assignments, which should be submitted by the published due date (see Canvas).
- Homework assignments will be largely based on material covered in lecture; lab evaluations and the final exam may be based on the homework materials.
- Late policy
 - All **homework** deliverables are due at the times shown in the Canvas. These times are subject to change so please check Canvas. 10 pt

- o Your deliverable may be submitted (and resubmitted) up to 24 hours after the official deadline **with a 25% penalty**; Canvas or Gradescope will mark your submission as “late.”
- o Submit early and often. **We will only grade your most recent submission.** Don't worry about the version numbers Canvas assigns.
- o Any deliverable submitted after the grace period will get **zero** credit.
- o We will **not** consider late submission of any missing parts of a deliverable. To make sure you have submitted everything, download your submitted files to double check. If your submitting large files, you are responsible for making sure they get uploaded to the system in time.
- o No penalties will be applied for excused medical reasons or emergencies. Should one arise, you should contact the Dean of Students office to arrange for an excused absence, and notify your

Quizzes

- There will be approximately 8 quizzes, taken in class. Each quiz will cover all the material covered in class since the last quiz.