# CS205 Syllabus

## Artificial Intelligence (Winter 2024)

## Course Objectives

Students will gain a broad overview of modern approaches to Artificial Intelligence — problems, algorithms and techniques for deductive and inductive reasoning and search.

Students who successfully complete this course will be able to:

1. Understand and apply Search as a problem solving tool
2. Understand and apply Knowledge Representation techniques in research
3. Understand and apply Learning techniques in research
4. Identify and understand seminal works that lead to pivotal AI developments
5. Research and apply modern AI approaches to solve novel real problems or in research

## Course Details

**Prerequisites**: CS 170 or equivalent plus graduate standing
**Format**: The course consists of two 90-minute lectures per week
**Instructor**: Paea LePendu, Ph.D.
**Instructor Office Hours (OH)**: T/Th 4PM, W 4PM, or by appointment or drop-in, Bourns A-159D
**Lectures**: T/Th 2:30pm, North District A1010
**TA OH**: Douglas Adjei-Frempah, T 10-11AM, F 1-2PM, WCH 110 (TA Room)
**Additional Support**: Academic Resources Center (ARC), https://arc.ucr.edu/ and Student Disability Resource Center (SDRC), https://sdrc.ucr.edu/

**Recommended Textbook**: Artificial Intelligence: A Modern Approach, third edition by Russell and Norvig.

**Communication**: We will use Slack for all communication. Invite link: https://bit.ly/3RRJTEv

## Grading and other policies

Assignments — **25%** Projects — **25%** Exams — **40%** Participation — **10%**

**Standard +/- Scale**: 92% or less is the cutoff for an A- (similarly for B,C,D); 87% or higher is the cutoff for a B+ (and so on). A+ is reserved by instructor's discretion for top students. 59% or less is an F.

**Missing Class**: In-person attendance will be expected. Attendance counts toward the 10% participation portion of your grade. If you miss class due to illness, first of all, thank you for protecting the rest of us and minimizing contagion. Just like in situations prior to the pandemic, you are expected to keep up and make up the work somehow. Usually, forming a study group early and getting notes from a friend is the best option. Missing one class is not a big deal, you get one or two freebies (more than enough), but missing more starts to affect your grade. Talk to the instructor only if you must miss more than two lectures. Going to TA office hours is another good option. Utilizing professor office hours is also a good idea. Zoom (/recordings) will not be provided as a default remedy. This is a fully in-person class. Do not email the

professor (ever), "Did I miss anything important?" That may seem innocent and nice, but it is actually insulting because professors utilize time wisely, so of course you missed something important! Also, don't expect the professor to repeat a lecture you missed. It is not fair to others to do such a thing, least of all the professor who shows up to class every time. It is your responsibility to learn the material you missed and catch up or otherwise show up. However, I will make every effort to accommodate student needs. The SDRC is where you make accommodations, but you can also contact me, privately, as well. I will be flexible in responding to any evolving situation, including switching to remote learning options, if necessary. Therefore, syllabus changes are possible.

**Participation**: Students are expected to participate actively in lectures and activities. Active participation goes beyond mere attendance, which is B-level effort, but includes asking and answering questions, taking notes, nodding and making eye contact, emoting appropriately, utilizing office hours, and so forth.

**Late assignments** generally receive no credit. An extension can be obtained only if requested and approved in advance and will incur a minimum -20% penalty.

**Academic integrity** of the highest standards are expected of all students. The basic rule of thumb is simple: with respect to the intellectual contribution of all persons, **please do your own work, otherwise, offer due credit, including AI/Search. Period. It is not a trick.** You cannot get in trouble from me when you acknowledge help. However, some students may not realize that seeking, retaining, sharing or distributing prior homework or exam materials is not only a violation of integrity, but is also illegal as the University retains copyright. There are serious consequences for academic dishonesty. Please see the University policy for more detailed information: http://conduct.ucr.edu/policies/academicintegrity.html

**Collaboration**: Working in small groups of two or three is highly encouraged. On such work, similar or identical assignments as your classmates, or the use of tutors, are OK and not cheating. Google is not a "collaborator" -- use it sparingly and honestly, but work more closely with your classmates (you will learn more). If you work across teams, then offer credit appropriately to your new friends by writing in the margin, e.g., "Got help from Samantha." If you come across a solution online, you offer credit by writing, e.g., "Found online: http://blah.com." If the professor covered it in class or office hours, say so. You cannot get in trouble for acknowledging help. But the converse is true: you can get in trouble for failing to report. A good helper should ask questions rather than give answers, they "teach you to fish, not feed you the fish." Note: not all professors allow this level of collaboration, so be advised this is course specific.

**Cheating**: Don't cheat, it's not worth it. My policy is: if you cheat, you will fail the course; and I will make sure to escalate your case to the most punitive level possible (department and university). I will seek to have you dismissed if possible. Cheating is abhorrent to me and I take it as an insult. You are better off dropping the course than cheating. It's not worth it. Yet the remedy is easy: don't cheat. Here is what you should do instead: ask the instructor for help. Tell me: "I am very stressed, so much so, that I feel like I need to cheat. Please help me, so I don't do that." I promise, I will rescue you. I find it a sign of great courage to ask for help. So tell yourself, "I am courageous. I will ask for help. Cheating is cowardly." Again, we are extremely open to collaboration and team learning. Therefore, there will be a zero tolerance policy towards cheating, and any student caught cheating or helping another student cheat will immediately earn an "F" for the course, no exceptions. They will also be reported to the University. There are very serious consequences at the University level for academic dishonesty: Academic Integrity Policies. Note: not all professors apply the same penalties, so be advised this is course specific.

## Tentative Timetable (subject to change)

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| **Act 1: Knowledge Representation**<br>Week 1: Intro to logic: Ch 7, Ch 8<br>Week 2: Reasoning: Ch 9, Ch 10<br>Week 3: Ontology: Ch 11, Ch 12<br>**MIDTERM EXAM**<br><br>**Act 2: Search**<br>Week 4: Intro: Ch 1, Ch 2<br>Week 5: Problem solving: Ch 3, Ch 4<br>Week 6: Games: Ch 5, Ch 6<br>Week 7: Uncertainty: Ch 13, Ch 14<br>**MIDTERM EXAM** | **Act 3: Learning**<br>Week 8: Data vs knowledge: Ch 18, Ch 19<br>Week 9: Probabilistic models: Ch 20, 21<br>Week 10: NLP and robotics: Ch 22, Ch 25<br>**FINAL PROJECT PRESENTATIONS** |

Things you can look forward to (you can work on these in advance):

- Natural Deduction
- PacMan Game AI
- Machine Learning
- Reading and presenting research papers (MIT tips, GATech tips, Stanford tips)