



CSE 410

Introduction to Artificial Intelligence

Lecture times: Tues, Thurs, 12:30pm-1:50pm, Fronczak Hall 422

Recitation time: Wed 4:00-4:50pm, Baldy 101

Credits: 4

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Course Description: Artificial Intelligence appears in many practical situations: from problems such as returning relevant text to a vague question to robotic cars that need to safely navigate chaotic traffic. As a result, AI is frequently in the news for both important ethical questions and practical breakthroughs. This course is an introduction to AI for junior and senior level students. The goal is to put these topics into a common perspective and to give you practical hands-on skill in solving AI problems through programming assignments.

Course Prerequisites: CSE 116 (Python Programming), EAS 305 or MTH 411 or STA 301

Requirements: The course grade will be based on \approx weekly homework assignments, two mid-terms, and a final exam. Homework is due before class on the due date, which is when the next homework will be released.

Grading Policy: The following items are designed to make your life easier and to give you some flexibility for planning your work:

- The lowest homework (after HW 0) will be dropped.
- You get 3 flexible extension days for handing in assignments. Use them wisely!
- The Final will contain minimal material that is covered in the two Mid-terms.
- You can submit programming assignments multiple times to see how they perform.
- Incomplete homework assignments can be turned in for partial credit.
- For complicated programming assignments, you will be given code templates and helper functions.

The following is designed to make my life easier and to make the class fair:

- All homework submissions + extensions will be handled through Autolab (i.e. couldn't use system is no excuse for late homework)
- Programming assignments will be graded automatically via test cases (name your functions correctly)

Grade Composition:

Assignments	70%
2 \times Mid-term & Final :	30%

Covered Topics and Schedule: The first half of the course covers decision making based on logic representations that allow AI agents to reason in new situations, e.g. playing games or creating

long term plans given goals and constraints. The second half of the course focuses on reasoning under uncertainty and how to interactively learn from data.

Rough schedule (each topic will take up 1-2 weeks)

1. Agents and searching for solutions
2. Logic review and encoding states & actions
3. Logic based planning tools
4. Uncertainty and Probability review
5. Bayes nets and inference
6. Markov Processes formulation, modeling, and analysis
7. Bayes Filters and applications
8. Planning for uncertain rewards
9. Reinforcement learning

Accessibility Resources: If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 25 Capen Hall, 645-2608, and also the instructor of this course .. The office will provide you with information and review appropriate arrangements for reasonable accommodations. <http://www.student-affairs.buffalo.edu/ods/>

Academic Integrity:

(Short) Don't cheat! You will be caught and punished. Our department is serious about graduating ethical and upstanding computer scientists. The policy has recently been updated and will be enforced.

(Long) All academic work must be your own. Plagiarism, defined as copying or receiving materials from a source or sources and submitting this material as one's own without acknowledging the particular debts to the source (quotations, paraphrases, basic ideas), or otherwise representing the work of another as one's own, is never allowed. Collaboration, usually evidenced by unjustifiable similarity, is never permitted in individual assignments. Any submitted academic work may be subject to screening by software programs designed to detect evidence of plagiarism or collaboration. For the complete policy please see:

<https://engineering.buffalo.edu/computer-science-engineering/information-for-faculty-and-staff/academic-integrity.html>

Approved Resources:

1. Any material posted in the slides.
2. Material from the text-book (will copy relevant content to slides). Note, the code solutions from the book's website are NOT approved unless they are explicitly posted on the piazza page.
3. Sites (one click away) from the approved resources list on the Piazza page. I will add to them as appropriate for throughout the semester.

Working with others: Please do help each other! This material is fun, but can be challenging. Discussing it with peers can deepen your understanding. You can talk *about* the homework problems and ways of approaching them, however, every person must write up solutions and code separately. We will compare all submissions with each other AND non-approved sources. If you can find something online, so we can we.