![Wisconsin logo] WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

COMP SCI 540 section 001 Syllabus

Introduction to Artificial Intelligence

COURSE INFORMATION

Introduction to Artificial Intelligence
COMP SCI 540 001 (3 Credits)
2023 Spring [1234]

Description
Principles of knowledge-based search techniques, automatic deduction, knowledge representation using predicate logic, machine learning, probabilistic reasoning. Applications in tasks such as problem solving, data mining, game playing, natural language understanding, computer vision, speech recognition, and robotics.

Prerequisite(s)
(COMP SCI 300, 320 or 367) and (MATH 211, 217, 221, or 275) or graduate/professional standing or declared in the Capstone Certificate in Computer Sciences for Professionals

Breadth
N - Natural Science

Instruction Mode
Classroom Instruction

Section Level Com B
False

Department: Computer Sciences
College: Letters and Science

2023 Spring [1234]
Term Start Date: Tuesday, 24-Jan-2023 **Term End Date:** Monday, 15-May-2023

ADD TO CALENDAR

Instructors

Dyah Adila
✉ ADILA@WISC.EDU

Josiah HANNA
✉ JPHANNA@CS.WISC.EDU

Hugh Liu
✉ YINL@CS.WISC.EDU

Instructor Availability and Preferred Contact:

Detailed office hours for the instructor are available on the course website: https://pages.cs.wisc.edu/~jphanna/teaching/2023spring_cs540/office_hours.html

TA Availability and Preferred Contact :

Detailed office hours for TAs and peer mentors are available on the course website: https://pages.cs.wisc.edu/~jphanna/teaching/2023spring_cs540/office_hours.html

Course Learning Outcomes (CLOs):

- (Game Playing) Recall the concept of games. Perform the minimax game playing method on formulated game tasks. Apply alpha-beta pruning to speed up the minimax method.

- (Informed Search Methods) Understand important concepts in informed search. Differentiate from uninformed search. Solve the formulated search problem with the informed search method A*.

- (Uninformed Search Methods) Identify the formulation of search for problem solving tasks. Understand important concepts in uninformed search. Apply the search methods on the formulated search problem.

- (Reinforcement Learning) Understand the concepts of reinforcement learning. Identify and summarize its important features. Compute value function and Q function. Apply value iteration and Q learning on given problems.

- (Unsupervised and Supervised Learning) Identify and summarize important features about supervised learning and unsupervised learning. Differentiate between the two types of tasks.

- (Neural Networks and Deep Learning) Apply Perceptron learning rule on given problem instances. Implement neural networks using given software packages.

- (Local Search Methods) Identify the formulation of search for problem solving tasks. Apply the hill climbing method for local search problems. Identify and summarize the important features of the simulated annealing and genetic algorithms.

(Classic Learning Methods) Apply linear regression, hierarchical agglomerative clustering algorithm, k-means clustering, or K nearest neighbor algorithm on given problem instances. Judge if the method is appropriate for a given task.

INSTRUCTOR to STUDENT COMMUNICATION

Course Website and Digital Instructional Tools:

All course details are available on the course website: https://pages.cs.wisc.edu/~jphanna/teaching/2021fall_cs540/office_hours.html

Discussion Sessions:

We will use Piazza for asynchronous questions and discussions.

- Please check if someone has posted the same / similar question before you; it's much easier if we build on the thread.
- Use an informative "Summary" line to help others.

Required Textbook, Software and Other Course Materials:

The following textbook is optional, but may be useful: Articial Intelligence: A Modern Approach (4th edition). Stuart Russell and Peter Norvig. Pearson, 2020. ISBN 978-0134610993.

Homework and Other Assignments:

Homework assignments include written problems and programming (in Python).

Frequently-asked questions (FAQs) on homework assignments will be posted on Piazza.

Homework is always due the minute before class starts on the due date. Late submissions will not be accepted. Assignment grading questions must be raised with the TAs within 72 hours after it is returned. Note that a regrading request for a part of a homework question may trigger the grader to regrade the entire homework and could potentially take points off. Regrading will be done on the original submitted work, no changes allowed.

The TWO lowest homework scores are dropped from the final homework average calculation. This drop is meant for emergency usage. Additional drops, late days, or homework extensions will not be provided. We encourage you to use a

study group for doing your homework. Students are expected to help each other out, and if desired, form ad-hoc homework groups. However, each student must produce and turn in their own, unique work.

Potential updates on the policy will be posted on the course website.

EXAMS, QUIZZES, PAPERS, COURSE SCHEDULE and GRADING

Exams, Quizzes, Papers and Other Major Graded Work:

Exams, Quizzes, Papers & Other Major Graded Work:

There will be a midterm exam and a final exam. Makeup exams will not be scheduled. Please plan for exams at the scheduled times and let us know about any known exam conficts during the first two weeks of the semester. If an emergency arises that conficts with the exam times, email us as soon as possible. Emergency exam conficts will be handled on a case-by-case basis.

Exam grading questions must be raised with the instructor within 72 hours after the exam is returned. If a regrade request is submitted for a part of a question on the exam, the grader reserves the right to regrade the entire exam and could potentially take points off.

Potential updates on the policy will be posted on the course website.

Course Schedule/Calendar:

See the course webpage: https://pages.cs.wisc.edu/~jphanna/teaching/2023spring_cs540/office_hours.html

Grading:

The following weights are used:

- Midterm Exam: 15%
- Final Exam: 15%
- Homework Assignments: 70%

At the end of the semester, the final letter grades are given based on an approximate curve. The weights placed on the assignments will be strictly enforced. The final letter grade will be assigned based on the percentile of the averaged points in the class:

- A: Top 15-25% of course grades
- AB: next 15-25%
- B: next 0-20%
- BC: next 0-20%
- C: next 0-20%
- D/F: 0-5%

As student performance may vary from semester to semester, the instructors reserve the right to adjust this distribution. McBurney Center students should contact the instructors to specify any special requests for the exams or homework

assignments together with the supporting documentation provided by the McBurney Center. We will do our best to accommodate the requests.

ACADEMIC POLICIES and STATEMENTS

Syllabus Statements

https://guide.wisc.edu/courses/#SyllabusStatements