CSE 440 Introduction to Artificial Intelligence
(Spring 2022)

This course will focus on the fundamental issues underlying the design of intelligent systems. It covers classical AI topics including knowledge representation, reasoning, search, constraint satisfaction, application and current topics. The techniques student learn in the course will prepare you to solve real-world problems using intelligent system. Course programming assignments will be in Python.

General Information

**Lecture Hours:** Tuesday, Thursday 10:20 AM-11:40 AM, 1/10/2022 - 5/6/2022

**Lecture Room:** Online & Brody 134

**Instructor**

Prof. Hui Liu

**Email:** liuhui7 at msu dot edu

**Office Hours:** Tuesday, Thursday 12:00 PM-1:00 PM

**Office Room:** Online

Teaching Assistants

Wentao Wang

**Email:** wangw116 at msu dot edu

**Office Hours:** Tuesday, Thursday 2:00 PM-3:00 PM

**Office Room:** Online

Sherwin Soroushian

**Email:** soroush3 at msu dot edu

**Office Hours:** Monday 1:00 PM-2:00 PM, Wednesday 11:00 AM-12:00 PM

**Office Room:** Online

**Requisites**

- **Prerequisite:** (CSE 331) and (MTH 314 or ECE 280)
- **Restrictions:** Open to juniors or seniors in the College of Engineering or in the Computer Science Major or in the Lyman Briggs Computer Science Coordinate Major or in the Lyman Briggs Computer Science Major or in the Data Science Major.

Preference Books


Course Assessment
Homework assignments (35%)
Projects (20%)
Midterm exam (25%)
Final exam (20%)
Quizzes (extra credit 5%)

Grading Criteria

4.0, 90%+
3.5, 85%
3.0, 80%
2.5, 75%
2.0, 70%
1.5, 65%
1.0, 60%-+

Course Policy

- Homework assignments are due before midnight on the due date. Late submissions will be deducted 25% of the total possible assignment grade (if submitted after the deadline but on the same day) or 50% (if submitted a day after the deadline). Assignments submitted more than one day after the deadline will not be accepted (unless you receive permission from the instructor).
- You are encouraged to form study groups to learn the materials in class. However, all submitted assignments (including computer programs) must be your own work. If plagiarism is detected, the students involved will automatically receive a 0 for the grade and will be reported to the university.
- The instructor reserves the right to modify the course content and class schedule during the semester.
- Make-ups for examinations may be arranged if your absence is caused by documented illness or personal emergency. A written explanation (including supporting documentation) must be submitted to your lecture instructor; if the explanation is acceptable, an alternative to the examination will be arranged. When possible, make-up arrangements must be made in advance.
- All students are expected to be responsible users of the computer system provided for this course. Account usage guidelines published by the Department of Computer Science and Engineering are posted at http://www.cse.msu.edu/facility/policy.php.
- The Department of Computer Science expects all students to adhere to MSU's policy on Integrity of Scholarship and Grades. Information about MSU policy regarding academic integrity is available at https://www.msu.edu/~ombud/academic-integrity/index.html.
- Students who require accommodation under the Americans with Disabilities Act (ADA) with MSU's Resource Centers for Disabilities (RCPD) should bring their Verified Individualized Services and Accommodations (VISA) form to the instructor at the beginning of the semester as possible.
CSE 440 Course Schedule

Lecture slides and materials will be released on this page.

- Lecture 1: Introduction (01/11)
  - Slides: lecture1.pdf

- Lecture 2: Uninformed Search (01/13)
  - Slides: lecture2.pdf

- Lecture 3: Heuristic Search (01/18)
  - Slides: lecture3.pdf
  - Assignment 1

- Lecture 4: Adversarial Search I (01/20)
  - Slides: lecture4.pdf

- Lecture 5: Adversarial Search II (01/25)
  - Slides: lecture5.pdf

- Lecture 6: Constraint Satisfaction Problem I (01/27)
  - Slides: lecture6.pdf

- Lecture 7: Constraint Satisfaction Problem II (02/01)
  - Slides: lecture7.pdf
  - Assignment 2

- Lecture 8: Markov Decision Process I (02/03)
  - Slides: lecture8.pdf

- Lecture 9: Markov Decision Process II (02/08)
  - Slides: lecture9.pdf
  - Assignment 3

- Lecture 10: Reinforcement Learning I (02/10)
  - Slides: lecture10.pdf

- Lecture 11: Reinforcement Learning II (02/15)
  - Slides: lecture11.pdf

- Lecture 12: Reinforcement Learning III (02/17)
  - Slides: lecture12.pdf
  - Assignment 4

- Lecture 13: Probability (02/22)
  - Slides: lecture13.pdf

- Lecture 14: Bayesian Networks: Representation (02/24)
  - Slides: lecture14.pdf

- Lecture 15: Midterm Review (03/01)
  - Slides: lecture15.pdf

- Lecture 16: Bayesian Networks: Independence (03/15)
  - Slides: lecture16.pdf
  - Assignment 5

- Lecture 17: Bayesian Networks: Inference (03/17)
  - Slides: lecture17.pdf

- Lecture 18: Bayesian Networks: Sampling (03/22)
  - Slides: lecture18.pdf
  - Assignment 6

- Lecture 19: HMM I (03/24)

- Lecture 20: HMM II (03/29)
• Assignment 7

• Lecture 21: Machine Learning: Introduction (03/31)

• Lecture 22: Machine Learning: Decision Tree (04/05)

• Lecture 23: Machine Learning: Naive Bayes (04/07)
  o Assignment 8

• Lecture 24: Machine learning: Perceptrons and Logistic Regression (04/12)

• Lecture 25: Machine Learning: Neural Networks I (04/14)

• Lecture 26: Machine Learning: Neural Networks II (04/19)

• Lecture 27: Machine Learning: Clustering (04/21)
  o Assignment 9

• Lecture 28: Final Review (04/26)

• Lecture 29: Q&A (04/28)
CSE 440 Course Exams

Exams related information will be released on this page.

**Mid-term Exam**
- Date: 03/03/2022, 10:20 AM–11:40 AM
- Location: Online on Mimir

**Final Exam**
- Date: 05/06/2022, 07:45 AM–09:45 AM
- Location: Holden Hall C134