CS 156 Introduction to Artificial Intelligence

Course Information

- Instructor: Genya Ishigaki
    - Telephone: (408) 924-5076
    - Email: genya.ishigaki@sjsu.edu
    - Office Hours:
        - Mondays & Wednesdays 2:00 PM - 3:00 PM
        - Location: MacQuarrie Hall 215
        - You do NOT need to make an appointment for these office hours. You can simply stop by my office.
- Class Days/Time: Mondays & Wednesdays 10:30 PM - 11:45 PM
- Class mode: In-person
- Class Location: MacQuarrie Hall 422
- Prerequisites: CS 146 and either CS 151 or CMPE 135 with a grade of C- or better in each

Course Description

Basic concepts and techniques of artificial intelligence: intelligent agents, problem solving, search, logic, knowledge representation, machine learning and natural language.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Understand philosophical groundwork, history and trends in AI.
- Understand the common AI techniques, their theoretical basis and how they are used in real world applications.
- Apply the AI techniques and theories learnt to solve real world problems e.g. Building a classifier to determine how likely an email is spam.

Textbook

- Artificial Intelligence: A Modern Approach. 3rd Edition. Stuart Russell and Peter Norvig ISBN: 9780136042594
    - AIMA Supplemental Materials
    - AIMA Exercises

Supplemental Reading

- Michael A. Nielsen, Neural Networks and Deep Learning, Determination Press, 2015.

Other Equipment

- Python development environment (Python 3.7 or later)
    - Anaconda

- - Google Colab

Grading

Exams, Assignments, and Projects

- Four unit exams (Exam 1,2,3,4)
  - The worst-scored exam will be dropped automatically at the end of the semester.
  - All exams are planned to be conducted during the regular class hours.
- Four programming assignments (PA 0,1,2,3,4,5)
  - PA0: Coding practice project
  - PA1,2,3,4,5: AI projects
  - The worst-scored PA among PA1 to PA5 will be dropped automatically at the end of the semester.

Item	% in Final Grade
Exam 1,2,3,4	42% (14% each; The worst one will be dropped.)
Programming Assignment (PA) 0	10%
Programming Assignment (PA) 1,2,3,4,5	48% (12% each; The worst one will be dropped.)

Grading Table

Total Grade	Letter Grade
97% and above	A plus
92% to 96%	A
90% to 91%	A minus
87% to 89%	B plus
82% to 86%	B
80% to 81%	B minus
77% to 79%	C plus
72% to 76%	C
70% to 71%	C minus
67% to 69%	D plus
62% to 66%	D
60% to 61%	D minus
59% and below	F

Extra-credits and Reworks

The worst-scored exam among the four exam papers will be dropped automatically. Also, the worst-scored exam among the five AI programming assignments will be dropped automatically. No additional extra-credit assignments or rework opportunities will be given.

Late Submission

Late submissions within 24 hours will be deducted 10% of its final grade. Submissions over 24 hours late will have 20% grade deducted. Late submissions over 2 days will not be accepted.

Attendance

I will not take attendance for classes. Students not attending either of the first two classes will be dropped to make room for students on the waiting list. Attempting to get marked as present (by having someone else attend in your place or using technological deceptions) will be considered academic dishonesty and at a minimum will result in you getting dropped from the course.

Grading Policy

The University Policy S16-9, Course Syllabi (http://www.sjsu.edu/senate/docs/S16-9.pdf) requires the following language to be included in the syllabus:

"Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus."

Fall 2022 Announcement: COVID-19 and Monkeypox

Students registered for a College of Science (CoS) class with an in-person component should view the CoS COVID-19 and Monkeypox Training slides for updated CoS, SJSU, county, state and federal information and guidelines, and more information can be found on the SJSU Health Advisories website. By working together to follow these safety practices, we can keep our college safer. Failure to follow safety practice(s) outlined in the training, the SJSU Health Advisories website, or instructions from instructors, TAs or CoS Safety Staff may result in dismissal from CoS buildings, facilities or field sites. Updates will be implemented as changes occur (and posted to the same links).

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as **academic integrity, accommodations**, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/. Make sure to review these policies and resources.

Tentative Schedule and Topics

Date	Topic	Reference	Note
8/22	Overview		
8/24	What is AI?		

Date	Topic	Reference	Note
8/29	Python Recap		
8/31	Intelligent Agents	Chapter 2	
9/5	Labor Day - No class		
9/7	Uninformed Search Strategies	Chapter 3.4	
9/12	Coding: Uninformed Search Algorithms		PA0 Due
9/14	Informed Search Strategies	Chapter 3.5	
9/19	Exam 1, Search in Complex Environments	Chapter 4	
9/21	Search in Complex Environments	Chapter 4	
9/26	Coding: Informed Search Algorithms		PA1 Due
9/28	Adversarial Search and Games	Chapter 6	
10/3	Adversarial Search and Games	Chapter 6	
10/5	Constraint Satisfaction Problems	Chapter 5	
10/10	Exam 2, First-Order Logic	Chapter 8, Chapter 9	
10/12	Logic Programming Implementation		PA2 Due
10/17	Bayes net	Chapter 12	
10/19	Probabilistic Reasoning	Chapter 13	
10/24	Machine Learning	Chapter 19.3	
10/26	Coding: Decision Trees		PA3 Due
10/31	Exam 3, Deep Learning	Chapter 22	
11/2	Deep Learning	Chapter 22	
11/7	Deep Learning Implementation		
11/9	Markov Decision Process	Chapter 16	
11/14	Reinforcement Learning	Chapter 23	
11/16	Coding: Reinforcement Learning		PA4 Due
11/21	Deep Reinforcement Learning	Chapter 23	
11/23	Non-Instructional Day - No class		
11/28	Philosophy, Ethics, and Safety of AI	Chapter 28	
11/30	Explainability		
12/5	Exam 4		