San José State University
Department of Computer Science
CS 156, Introduction to Artificial Intelligence, Section 1, Spring 2021

Course and Contact Information

Instructor:	Rula Khayrallah
Office Location:	Not applicable in Spring 2021
Telephone:	Not applicable in Spring 2021
Email:	rula.khayrallah@sjsu.edu
Office Hours:	Monday 3-4 PM, Wednesday 4-5 PM, Thursday 3-4 PM
Class Days/Time:	Tuesday/Thursday 10:30AM - 11:45AM
Classroom:	Online via Zoom
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: problem solving, search, deduction, intelligent agents, knowledge representation. Topics chosen from logic programming, game playing, planning, machine learning, natural language, neural nets, robotics.

Course Format

The course will be conducted online over Zoom with synchronous lectures and interactive activities.
We'll use iClicker to gather your feedback and check understanding during the lecture. iClicker helps me understand what you know, gives everyone a chance to participate, and allows you to review the material after class.

Canvas Course Site

Course materials such as syllabus, lecture notes, assignments and exams can be found on the Canvas Leaning Management System course website at http://sjsu.instructure.com. You are responsible for regularly checking with Canvas to learn of any updates.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:
1. By code or by hand find solution nodes in a state space using the A* algorithm.
2. Explain the advantages and disadvantages of breadth-first search compared to depth-first search.
3. Explain the advantages and disadvantages of informed search, compared to uninformed search.
4. Explain the advantages and disadvantages of hill climbing.
5. Explain the advantages and disadvantages of forward checking in constraint satisfaction.
6. Explain the advantages and disadvantages of alpha-beta pruning.
7. By code or by hand translate sentences in first-order logic to conjunctive normal form (CNF).
8. By code or by hand find proofs by using resolution.
9. Explain the advantages and disadvantages of the PDDL/STRIPS representation for planning.
10. Describe the frame problem.

11. Describe or implement at least one learning algorithm.

Recommended Textbook

Artificial Intelligence: A Modern Approach. 4th Edition. Stuart Russell and Peter Norvig
ISBN: 978-0134610993

Software

Python 3.7 available at https://www.python.org/downloads/release/python-374/
PyCharm Professional or Community Edition - recommended IDE

Course Requirements and Assignments

Homework Assignments

Homework assignments will be posted and submitted on Canvas. For full credit, they must be submitted by the posted due date and time. A detailed grading rubric is provided for all programming assignments. Please make sure you read and follow the grading rubric to ensure full credit.

Some assignments will be individual work. Others will be team assignments. I will make it clear whether the assignment is an individual assignment or a team assignment.

All work submitted on individual assignments must be your own. You may not share or copy code or answers from fellow students or from the web. Infractions will be detected and will lead to an automatic 0. If someone else copies your work, with or without your permission, you will be held responsible.

For team assignments, teams will consist of two students. The work must be done by both team members and both team members will receive the same grade. Teams may not share or copy code from other teams or from the web. Both team members will receive a zero if that happens regardless of who copied or shared the work. Both team members will also be reported to the Student Conduct and Ethical Development office.

Exams

We'll have 3 online exams in the semester, the last being the final exam.
The first two exams are scheduled during our regular class time as follows:
Exam 1: Tuesday, March 2
Exam 2: Thursday April 8
The final exam is cumulative and is scheduled for Wednesday, May 19, 9:45AM-12:00PM.

Proctoring Software and Exams

Exams will be proctored in this course through Respondus Monitor and LockDown Browser. If cheating is suspected the proctored videos may be used for further inspection and may become part of the student's disciplinary record. Note that the proctoring software does not determine whether academic misconduct occurred, but does determine whether something irregular occurred that may require further investigation. Students are encouraged to contact the instructor if unexpected interruptions (from a parent or roommate, for example) occur during an exam.

Academic Dishonesty

Students who are suspected of cheating will be referred to the Student Conduct and Ethical Development office and depending on the severity of the conduct, will receive a zero on the assignment or a grade of F in the course. Grade Forgiveness does not apply to courses for which the original grade was the result of a finding of academic dishonesty.

Class Participation

You are expected to attend all class meetings as you are responsible for all the material discussed. Since active participation is essential to ensure maximum benefit, we'll use iClicker to give everyone a chance to participate. The iClicker participation points may be used to give your final grade in the course a slight boost.

Workload

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.

Grading Information

Determination of Grades

The final grade in the course will be calculated based on the following percentages:
Homework Assignments: 40%
Exam 1: 15%
Exam 2: 15%
Final Exam: 30%

The iClicker participation points may be used to give your final grade a slight boost. Students with the highest score will get 1 bonus point. Students who violate the academic integrity policy are not eligible.
No extra credit options will be given.

Late Work

Late assignments will be accepted with a 1-point penalty for each day or partial day late. Late days include weekend days. For example, an assignment due on Monday by 5 PM will incur a penalty of 1 point if submitted at 8AM on Tuesday. Everyone gets two free 'late days' for the semester. No submissions will be accepted more than 2 days late.

Grade Scale

The letter grade will be determined based on the following scale:

A+ = 98% - 100%	A = 93% - 97%	A- = 90% - 92%
B+ = 87% - 89%	B = 83% - 86%	B- = 80% - 82%
C+ = 77% - 79%	C = 73% - 76%	C- = 70% - 72%
D = 60% - 69%		
F = below 60		

Classroom Protocol

Please join the virtual class meeting on time and be ready to ask questions, contribute answers and participate in all class activities.
- To help keep background noise to a minimum, make sure you mute your microphone when you are not speaking.
- Be mindful of background noise and distractions: find a quiet place to "attend" class, to the greatest extent possible. Avoid activities that could create additional noise, such as shuffling papers, listening to music in the background, etc.
- Position your camera properly: be sure your webcam is in a stable position and focused at eye level.

- Limit your distractions/avoid multitasking: you can make it easier to focus on the meeting by turning off notifications, closing or minimizing running apps, and putting your smartphone away (unless you are using it to access Zoom).
- If using a virtual background, it should be appropriate and professional and should NOT suggest or include content that is objectively offensive or demeaning.

Recording Zoom Classes

This course will be recorded for instructional purposes. The recordings will only be shared with students enrolled in the class through Canvas. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording).

Students are not allowed to record without instructor permission

Students are prohibited from recording class activities, distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

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.

CS 156 Introduction to Artificial Intelligence, Spring 2021, Course Schedule

Please note that this schedule is subject to change with fair notice. Any changes will be announced in class and posted on the Canvas course site.

Tentative Course Schedule

Week	Date	Topics	Readings AIMA	Homework
1	Jan 28	Course Logistics		HW 1 due Feb 2
2	Feb 2	What is AI?	Chapter 1	
2	Feb 4	Intelligent Agents	Chapter 2	
3	Feb 9	Python		HW 2 due Feb 15
3	Feb 11	Problem Solving and Search	Sec 3.1-3.3	
4	Feb 16	Uninformed Search	Sec 3.4	HW 3 due Feb 22
4	Feb 18	Informed Search: greedy, A* search	Sec 3.5	
5	Feb 23	Heuristics	Sec 3.6	HW 4 due Mar 4
5	Feb 25	Local Search	Sec 4.1	
6	Mar 2	Exam 1		
6	Mar 4	Constraint Satisfaction Problems	Chapter 6	HW 5 due Mar 11
7	Mar 9	Constraint Satisfaction Problems		
7	Mar 11	Adversarial Search	Chapter 5	HW 6 due Mar 22
8	Mar 16	Depth Limited Search, Expectimax		
8	Mar 18	Logical Agents	Chapter 7	
9	Mar 23	First-Order Logic	Chapter 8	
9	Mar 25	Resolution in First-Order Logic	Sec 9.5	HW 7 due Apr 9
10	Mar 30	Spring recess		
10	Apr 1	Spring recess		
11	Apr 6	Automated Planning	Chapter 11	
11	Apr 8	Exam 2		
12	Apr 13	Uncertainty	Chapter 12	HW 8 due Apr 21
12	Apr 15	Bayes Nets Representation	Sec 13.1-13.3	
13	Apr 19	Probabilistic Reasoning Over Time	Sec 14.1-14.2	
13	Apr 22	Machine Learning	Sec 19.1-19.2	
14	Apr 27	Naïve Bayes Classification	Sec 20.1-20.2	
14	Apr 29	Perceptron, Neural Nets	Sec 21.1-21.2	HW 9 due May 10
15	May 4	Nearest Neighbors	Sec 19.7	
15	May 6	Unsupervised Learning, Reinforcement Learning		
16	May 11	Applications		
16	May 12	Review		
Final	May 19	9:45AM-12:00PM		