San José State University
Department of Computer Science
CS 156, Introduction to Artificial Intelligence, Section 4, Spring 2022

Course and Contact Information

Instructor:	Rula Khayrallah
Office Location:	Not applicable in Spring 2022
Telephone:	Not applicable in Spring 2022
Email:	rula.khayrallah@sjsu.edu
Office Hours:	Online via Zoom: Tuesday 3-4 PM, Wednesday 4-5 PM
Class Days/Time:	Tuesday/Thursday 12:PM-1:15PM
Classroom:	MH 222
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

Our first five meetings will be conducted online over Zoom with synchronous lectures and interactive activities. At this time, our first in-person meeting is planned for Tuesday February 15. Please note that in-person meetings may be suspended in response to public health and campus guidance.
In both modalities, 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
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.

Check Your Understanding Quizzes

Weekly Check Your Understanding (CYU) quizzes will cover the week's material and help students get ready for the upcoming lectures. During the online portion of the class, these quizzes will usually be released after Thursday's lecture and they will be due before Tuesday's lecture. You may not copy or share answers. Infractions will be detected and will lead to an automatic 0 and a report to the Student Conduct and Ethical Development office.
Once we move to in-person meetings, these short quizzes will be completed in the classroom.
I will count the 10 best scores out of the 12 total quizzes in the semester.

Misterm Exam

The midterm exam will take place in the classroom, on Canvas, during class time on Thursday March 17.

Final Exam

The final exam is scheduled according to the SJSU Final Exam Schedule on Tuesday, May 24, 9:45AM-12PM.

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: 30%
CYU Quizzes: 10%
Midterm: 30%
Final Exam: 30%

The iClicker participation points may be used to give your final grade a slight boost. Students with the highest scores will get up to 1 bonus point. Students who violate the academic integrity policy are not eligible.
No other 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:

Grade	*Percentage*
A plus	*98 to 100%*
A	*93 to 97%*
A minus	*90 to 92%*
B plus	*87 to 89 %*
B	*83 to 86%*
B minus	*80 to 82%*
C plus	*77 to 79%*
C	*73 to 76%*
C minus	*70 to 72%*
D	*60 to 69%*
F	*below 60*

Classroom Protocol

During the online portion of the class, please join the virtual class meeting on time and be ready to ask questions, contribute answers and participate in all class activities.
Once we move on to in-person meetings, please arrive to class on time and make sure your cell phones are silent during the lecture. Your laptop must remain closed except for designated activities.

COVID-19 Safety

All students must view the CoS COVID-19 Training slides and the SJSU Phased Adapt Plan website and acknowledge reading them. By working together to follow these county and SJSU safety practices, we can keep our college safer. Students who do not follow COVID-19 Safety practice(s) outlined in the training, the SJSU Phased Adapt Plan, or instructions from their instructors or CoS Safety Staff may be dismissed from CoS buildings, facilities or field sites. Please review this training as needed throughout the semester, as updates will be implemented as changes occur (and posted to the same links).

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 2022, 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	CYU	Homework
1	Jan 27	Course Logistics			HW 1 due Feb 1
2	Feb 1	What is AI?	Chapter 1		
2	Feb 3	Intelligent Agents	Chapter 2		
3	Feb 8	Python		CYU 1	HW 2 due Feb 15
3	Feb 10	Problem Solving and Search	Sec 3.1-3.3		
4	Feb 15	Uninformed Search	Sec 3.4	CYU 2	HW 3 due Feb 22
4	Feb 17	Informed Search: greedy, A* search	Sec 3.5		
5	Feb 22	Heuristics	Sec 3.6	CYU 3	HW 4 due Mar 1
5	Feb 24	Local Search	Sec 4.1		
6	Mar 1	Constraint Satisfaction Problems	Chapter 6	CYU 4	HW 5 due Mar 8
6	Mar 3	Constraint Satisfaction Problems			
7	Mar 8	Adversarial Search	Chapter 5	CYU 5	HW 6 due Mar 15
7	Mar 10	Resource Limits, Expectimax			
8	Mar 15	Review		CYU 6	
8	Mar 17	Midterm			
9	Mar 22	Logical Agents	Chapter 7		
9	Mar 24	First-Order Logic	Chapter 8		
10	Mar 29	Spring Recess			
10	Mar 31	Spring Recess			
11	Apr 5	Resolution in First-Order Logic	Sec 9.5	CYU 7	HW 7 due Apr 12
11	Apr 7	Automated Planning	Chapter 11		
12	Apr 12	Uncertainty	Chapter 12	CYU 8	HW 8 due Apr 21
12	Apr 14	Bayes Nets Representation	Sec 13.1-13.3		
13	Apr 19	Probabilistic Reasoning Over Time	Sec 14.1-14.2	CYU 9	
13	Apr 21	Machine Learning	Sec 19.1-19.2		
14	Apr 26	Naïve Bayes Classification	Sec 20.1-20.2	CYU 10	
14	Apr 28	Perceptron, Neural Nets	Sec 21.1-21.2		HW 9 due May 10
15	May 3	Nearest Neighbors, Unsupervised Learning	Sec 19.7	CYU 11	
15	May 5	The Ethics of AI			
16	May 10	Applications		CYU 12	
16	May 12	Review			
Final	May 24	MH 222: 9:45AM--12:00PM			