San José State University
Department of Computer Science
CS 156, Introduction to Artificial Intelligence, Section 3, Spring 2020

Course and Contact Information

Instructor:	Rula Khayrallah
Office Location:	MacQuarrie Hall 218
Telephone:	(408) 924-5153
Email:	rula.khayrallah@sjsu.edu
Office Hours:	Drop-In: Monday 12-1 PM, Tuesday 10:30-11:30 AM By appointment only (15-minute slots): Wednesday 3-5 PM To schedule an appointment, please visit https://goo.gl/CXkgsE
Class Days/Time:	TuTh: 3-4:15 PM
Classroom:	SCI 311
Prerequisites:	CS 146 and either CS 151 or CMPE 135 with a grade of C- or better in each

Course Format

Class time will be spent in interactive lecture. You are required to bring your wireless laptop to class. Your laptop must remain closed except for designated 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. You must be in the classroom to participate in the iClicker activity.

Canvas Course Site

Course materials such as syllabus, lecture notes, assignments, questions of the week 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 Description (Required)

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 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. 3rd Edition. Stuart Russell and Peter Norvig
ISBN: 9780136042594

Software

Python 3.7 or later 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. 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. Other homework 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 0 if that happens regardless of who copied or shared the work.

Questions of the Week:

We will have a single question every week to check your understanding of the previous week's material. I will count the 10 best scores out of the 13 total questions in the semester. You must be in the classroom and must use the LockDown browser to access and answer the question on Canvas. Missed questions cannot be made up.

Midterm Exam:

The midterm exam will take place in the classroom during class time on Thursday March 12.

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.

Final Examination

The final exam will take place in the classroom on Thursday May 14 from 2:45-5:00 PM.

Grading Information

Determination of Grades

The final grade in the course will be calculated based on the following percentages:
Homework Assignments: 40%
Questions of the Week: 10%
Midterm: 20%
Final Exam: 30%

The iClicker participation points may be used to give your final grade a slight boost. Students with the highest participation 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 Tuesday by 5 PM will incur a penalty of 1 point if submitted at 11 PM 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

Regular attendance is an integral part of the learning process. 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.

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 2018, 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.

Course Schedule

Week	Date	Topics	Readings AIMA	QoW	HW Due date
1	Jan 23	Course Logistics – What is AI?	Chapter 1		HW1 Jan 28
2	Jan 28	Python			
2	Jan 30	Python			HW2 Feb 6
3	Feb 4	Intelligent Agents	Chapter 2	Q1	
3	Feb 6	Problem Solving and Search	Sec 3.1-3.3		
4	Feb 11	Uninformed Search	Sec 3.4	Q2	HW3 Feb 18
4	Feb 13	Informed Search: greedy, A* search	Sec 3.5		
5	Feb 18	Heuristics	Sec 3.6	Q3	HW4 Feb 25
5	Feb 20	Local Search	Sec 4.1		
6	Feb 25	Constraint Satisfaction Problems	Chapter 6	Q4	HW5 Mar 3
6	Feb 27	Constraint Satisfaction Problems			
7	Mar 3	Adversarial Search	Chapter 5	Q5	HW6 Mar 10
7	Mar 5	Stochastic Games			
8	Mar 10	Review		Q6	
8	Mar 12	Midterm			
9	Mar 17	Logical Agents	Chapter 7		
9	Mar 19	First-Order Logic	Chapter 8	Q7	
10	Mar 24	Inference in First-Order Logic	Chapter 9		HW7 Apr 7
10	Mar 26	Classical Planning	Chapter 10	Q8	
11	Mar 31	Spring Recess			
11	Apr 2	Spring Recess			
12	Apr 7	Uncertainty	Chapter 13	Q9	HW8 Apr 16
12	Apr 9	Bayes Nets Representation	Sec 14.1-14.4		
13	Apr 14	Probabilistic Reasoning Over Time		Q10	
13	Apr 16	Machine Learning			
14	Apr 21	Naïve Bayes Classification	Chapter 20	Q11	
14	Apr 23	Perceptron	Chapter 18		
15	Apr 28	Neural Nets, Nearest Neighbors		Q12	HW9 May 7
15	Apr 30	Unsupervised Learning: Clustering			
16	May 5	Machine Learning Applications		Q13	
16	May 7	Review			
Final	May 14	SCI 311: 2:45-5:00 PM			