

San José State University
Department of Computer Science
CS156, Introduction to Artificial Intelligence, Section 1, Fall 2016

Course and Contact Information

Instructor:	Rula Khayrallah
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Office Hours:	Tuesdays & Thursdays: 12:00-1:15 PM, Wednesdays: 1:00-3:00 PM
Class Days/Time:	TuTh: 1:30-2:45 PM
Classroom:	MacQuarrie Hall 422
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 until I inform you that it is needed for a given activity.

Canvas Course Site

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

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 Learning Outcomes (CLO)

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. By code or by hand translate sentences in first-order logic to conjunctive normal form (CNF).
3. By code or by hand find proofs by using resolution.
4. Explain the advantages and disadvantages of breadth-first search compared to depth-first search.
5. Explain the advantages and disadvantages of informed search, compared to uninformed search.

6. Explain the advantages and disadvantages of hill climbing.
7. Explain the advantages and disadvantages of forward checking in constraint satisfaction.
8. Explain the advantages and disadvantages of alpha-beta pruning.
9. Explain the advantages and disadvantages of the PDDL/STRIPS representation for planning.
10. Describe the frame problem.
11. Describe default reasoning.
12. Describe or implement at least one learning algorithm.

Texts/Readings

Recommended Textbook

Artificial Intelligence: A Modern Approach. 3rd Edition. Stuart Russell and Peter Norvig
ISBN: 9780136042594

Software

Python 2.7 <https://www.python.org/download/releases/2.7/>
PyCharm Community Edition 5.0 - recommended IDE

Course Requirements and Assignments

Homework Assignments:

We will have 8 homework assignments and most of them will consist of programming mini-projects. Assignments will be posted and submitted on Canvas. For full credit, they have to be submitted by the posted due date.

Weekly Quizzes:

We will also have weekly quizzes. Each quiz will consist of one question to check your understanding of the previous week's material. I will count the 10 best scores out of the 13 total quizzes in the semester. You must be in the classroom to take the quiz. Missed quizzes cannot be made up.

Midterm Exam:

The midterm exam will take place in the classroom during class time on Thursday October 13.

Final Exam:

The final exam will take place in the classroom on Friday December 16 from 12:15 to 2:30 pm.

Grading Information

The final grade in the course will be calculated based on the following percentages:

Homework Assignments: 40%

Weekly Quizzes: 10%

Midterm: 20%

Final Exam: 30%

No extra credit options will be given.

Late Work:

Late homework assignments will be accepted with a 20% penalty for each day or partial day late. Late days include weekend days. For example, an assignment worth 100 points, due on Wednesday by 11:59 pm will incur a penalty of 80 points if submitted at 8:00 am on Sunday. Everyone gets two free 'late days' for the semester.

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.

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](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>"

CS156 Introduction to Artificial Intelligence, Fall 2016, 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	AIMA	HW Due
1	Aug 25	Course Logistics - What is AI?	Chapter 1	
2	Aug 30	Python		HW1: Sep 7
2	Sep 1	Python		
3	Sep 6	Intelligent Agents	Chapter 2	
3	Sep 8	Problem Solving - Search	Sec 3.1-3.3	
4	Sep 13	Uninformed Search	Sec 3.4	HW2: Sep 21
4	Sep 15	Informed Search: greedy, A* search	Sec 3.5	
5	Sep 20	Heuristics	Sec 3.6	HW3: Sep 28
5	Sep 22	Hill Climbing	Sec 4.1	
6	Sep 27	Constraint Satisfaction Problems	Chapter 6	HW4: Oct 5
6	Sep 29	Constraint Satisfaction Problems		
7	Oct 4	Adversarial Search	Chapter 5	HW5: Oct 12
7	Oct 6	Adversarial Search		
8	Oct 11	Review		
8	Oct 13	Midterm		
9	Oct 18	Logical Agents	Chapter 7	
9	Oct 20	First-Order Logic	Chapter 8	
10	Oct 25	Inference in First-Order Logic	Chapter 9	HW6: Nov 2
10	Oct 27	Inference in First-Order Logic, Default Reasoning	Sec 12.6	
11	Nov 1	Planning	Chapter 10	
11	Nov 3	Uncertainty	Chapter 13	
12	Nov 8	Bayes Nets Representation	Sec 14.1-14.4	
12	Nov 10	Probabilistic Reasoning Over Time	Chapter 15	HW7: Nov 23
13	Nov 15	Hidden Markov Models		
13	Nov 17	Machine Learning, Naïve Bayes Classification	Chapter 20	
14	Nov 22	Perceptron	Chapter 18	HW8: Dec 9
14	Nov 24	Thanksgiving		
15	Nov 29	Neural Nets, Nearest Neighbors		
15	Dec 1	Unsupervised Learning: Clustering		
16	Dec 6	Machine Learning Applications		
16	Dec 8	Review		
Final	Dec 16	MacQuarrie Hall 422: 12:15-2:30 PM		