

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

Course and Contact Information

Instructor:	Rula Khayrallah
Office Location:	Duncan Hall 282
Email:	rula.khayrallah@sjsu.edu
Office Hours:	Wednesdays 12:00-1:15pm
Class Days/Time:	MW 1:30-2:45pm
Classroom:	Duncan Hall 450
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.

Learning Outcomes

Course Learning Outcomes (CLO)

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

1. CLO1. By code or by hand find solution nodes in a state space using the A* algorithm.
2. CLO2. By code or by hand translate sentences in first-order logic to conjunctive normal form (CNF).
3. CLO3. By code or by hand find proofs by using resolution.
4. CLO4. Explain the advantages and disadvantages of breadth-first search compared to depth-first search.
5. CLO5. Explain the advantages and disadvantages of informed search, compared to uninformed search.
6. CLO6. Explain the advantages and disadvantages of hill climbing.
7. CLO7. Explain the advantages and disadvantages of forward checking in constraint satisfaction.
8. CLO8. Explain the advantages and disadvantages of alpha-beta pruning.
9. CLO9. Explain the advantages and disadvantages of the STRIPS representation for planning.
10. CLO10. Describe the frame problem.
11. CLO11. Describe default reasoning.
12. CLO12. Describe or implement at least one learning algorithm.

Texts/Readings

Textbook - recommended

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

Software:

Python 2.7 <https://www.python.org/download/releases/2.7/>

PyCharm Community Edition 5.0 - recommended IDE

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](#) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

We will have 9 homework assignments and some of them will consist of programming mini-projects. All assignments will be posted on Canvas. For full credit, they have to be submitted by the posted due date. Late 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 Thursday by 11:59pm will incur a 60 point penalty if submitted at 8:00 AM on Sunday. Everyone gets two free 'late days' for the semester.

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. Missed quizzes cannot be made up.

The midterm exam will take place in the classroom during class time on Wednesday March 23.

The final exam will also take place in the classroom on Wednesday May 18 from 12:15 to 2:30pm.

NOTE that [University policy F69-24](#) at <http://www.sjsu.edu/senate/docs/F69-24.pdf> states that "Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading."

Grading Policy

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

Quizzes - 10%

Homework - 40%

Midterm - 20%

Final Exam - 30%

No extra credit options will be given.

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

A+ = 98% - 100%

B+ = 87% - 89%

C+ = 77% - 79%

D = 60% - 69%

F = below 60

A = 93% - 97%

B = 83% - 86%

C = 73% - 76%

A- = 90% - 92%

B- = 80% - 82%

C- = 70% - 72%

Note that “All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades.” See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

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

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU’s policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See [University Policy S90–5](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the [SJSU catalog](http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html), at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes. Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor’s permission to record the course.

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

CS156 Introduction to Artificial Intelligence, Spring 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	Feb 1	Introduction	Chapter 1	
1	Feb 3	Intelligent Agents	Chapter 2	
2	Feb 8	Python		
2	Feb 10	Python - Pacman project infrastructure		
3	Feb 15	Problem Solving - Uninformed Search	Sec. 3.1-3.4	
3	Feb 17	Uninformed Search (continued)		hw1: Feb 18
4	Feb 22	Informed Search: greedy, A* search	Sec 3.5-3.6	
4	Feb 24	Hill Climbing	Sec 4.1	hw2: Feb 25
5	Feb 29	Constraint Satisfaction Problems	Chapter 6	
5	March 2	Constraint Satisfaction Problems		hw3: Mar 3
6	March 7	Adversarial Search	Chapter 5	
6	March 9	Adversarial Search		hw4: Mar 10
7	March 14	Logical Agents	Chapter 7	
7	March 16	First-Order Logic	Chapter 8	hw5: Mar 16
8	March 21	Review		
8	March 23	Midterm		
9	March 28	Spring Recess		
9	March 30	Spring Recess		
10	April 4	Inference in First-Order Logic	Chapter 9	
10	April 6	Inference in First-Order Logic		
11	April 11	Planning	Chapter 10	
11	April 13	Planning		hw6: Apr 14
12	April 18	Uncertainty	Chapter 13	
12	April 20	Uncertainty		hw7: Apr 21
13	April 25	Probabilistic Reasoning	Chapter 14	
13	April 27	Probabilistic Reasoning		hw8: Apr 28
14	May 2	Learning from Examples	Chapter 18	
14	May 4	Learning from Examples		
15	May 9	Learning Probabilistic Models	Chapter 20	
15	May 11	Learning Probabilistic Models		hw9: May 12
16	May 16	Review		
Final Exam	May 18	Duncan Hall 450: 12:15-2:30pm		