SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Artificial Intelligence Section 01

CS 156

Summer 2025 In Person 3 Unit(s) 06/02/2025 to 08/08/2025 Modified 05/27/2025

Contact Information

Instructor: Dr. Amith Kamath Belman

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Office: MH 411

Office Hours

Thursday, 11:15 AM to 12:15 PM, In person at MH 411

Course Information

Lecture

Tuesday, Thursday, 9:00 AM to 11:00 AM, MH 225

Course Description and Requisites

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.

Prerequisite(s): CS 146 (with a grade of "C-" or better); Allowed Majors: Computer Science, Data Science, Applied and Computational Mathematics or Software Engineering; or instructor consent.

Letter Graded

Classroom Protocols

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.

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.

Recording and Privacy

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

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Goals

To give students a broad understanding of the basic principles and techniques in use today for building "intelligent" software systems. Understand fundamentals of AI and machine learning. Concentration will be on how-to and also the mathematical foundations of AI. This class has a balance between the theory and practical demonstrations of how to solve AI tasks in python and AI applications in various fields.

Course Learning Outcomes (CLOs)

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 and implement at least one learning algorithm.

Course Materials

Artificial Intelligence: A Modern Approach

Author: Stuart Russell and Peter Norvig
Publisher: Pearson
Edition: 4th
ISBN: 978-0134610993
Optional

Software

Python 3

PyCharm Professional or Community Edition - recommended IDE

Course Requirements and Assignments

Homework

Homework assignments will be posted and submitted on Canvas. For full credit, they must be submitted by the posted due date and time.

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. All students involved in academic integrity violations will be held responsible.

Use of AI is not permitted, unless clearly stated and permitted by the instructor, for each assignment question. If a question requires AI assistant usage in any capacity, the instructor will specify it. All other cases of usage will be considered academic integrity violations.

Questions of the Week (QOW)

We will have a single question every week to check your understanding of the previous week's material. I will count the 8 best scores out of the 9 total QOWs in the semester. You must be in the classroom and must use the LockDown browser to access and answer the question on Canvas.

Missed QOWs cannot be made up.

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 as the tool for participation. About 2 to 4 iClicker activities will be held in every class session. The iClicker participation points may be used to give your final grade in the course a slight boost, up-to 1%.

Midterm Exam

The midterm exam will take place in the classroom during class time on June 26th.

Final Exam

The final exam is scheduled during class time on August 7th.

✔ Grading Information

The final grade in the course will be calculated based on the homework assignments, questions of the week, midterm and final exam.

Makeup exams, QOWs will only be given in cases of illness (documented by a physician) or in documentable, extreme emergency cases.

The iClicker points may be used to give your final grade a slight boost. Students with 80% iClicker score and above will get 1% bonus towards their final grade. Students who violate the academic integrity policy are not eligible.

No other extra credit options will be given. Missed i-clicker activities cannot be made up.

Late Work

No submissions will be accepted more than 2 days late.

Late assignments will be evaluated with a 10% penalty for each day or partial day late. Late days include weekend days.

For example, Assignment due on Tuesday by 5 PM:

- will incur a penalty of 10% if submitted anytime between 5:01 PM on Tuesday to 5:00PM on Wednesday.
- will incur a penalty of 20% if submitted anytime between 5:01 PM on Wednesday to 5:00PM on Thursday.
- will not be graded if submitted after 5:01PM on Thursday.

Everyone gets two free 'late days' for the semester.

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.

Criteria

Type	Weight	Topic	Notes
Homework Assignments	25%		
Questions of the week	15%		
Midterm Exam	30%		
Final Exam	30%		

Breakdown

Grade	Range	Notes
A +	98 to 100%	
A	93 to 97.99%	
A -	90 to 92.99%	
B +	87 to 89.99%	
B	83 to 86.99%	
B -	80 to 82.99%	
C +	77 to 79.99%	
C	73 to 76.99%	
C -	70 to 72.99%	
D	60 to 69.99%	
F	below 60%	

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

Tentative Course Schedule.

NOTE: The course schedule is subject to change with fair notice. Changes will be announced on Canvas.

Week and Dates	Topics	Reading	Exams, QOW, Assignments
Week 1 Jun 3, 5	Course Logistics, IClicker Setup, What is AI?, Intelligent Agents, Python Essentials, Problem Solving and Search,	AIMA Chapter 1, 2, 3.1-3.3	Jun3: Pre-course Survey Take-home syllabus quiz. Jun5: HW1 , Due Jun 12
Week 2 Jun 10, 12	Uninformed Search, Informed Search (greedy, A*), Heuristics, Local Search,	AIMA Chapter 3.4-3.6, 4.1	Jun 10: QOW 1 Jun 12: HW2, Due Jun 18th
Week 3 Jun 17, 19	Constraint Satisfaction Problems	AIMA Chapter 6	Jun 17: QOW 2 HW3, Due Jun 22nd Jun 19: no Class.

Week 4 Jun 24, 26	Adversarial Search, and Review Midterm	AIMA Chapter 5	Jun 24: QOW 3 Jun 26: Midterm
Week 5 Jul 1, 3	Logical Agents, First order and Propositional Logic Automated Planning	AIMA Chapter 7,8,9.5,11	Jul1: QOW 4 HW4, Due Jul 7th
Week 6 Jul 8, 10	Uncertainity and Bayes Nets Representation Machine Learning, Naive Bayes	AIMA Chapter 12, 19.1-19.2,20.1-20.2	Jul 8: QOW 5 HW5, Due Jul 14th
Week 7 Jul 15, 17	Perceptron, Gradient Descent, Neural Nets, Nearest Neighbors	AIMA Chapter 21.1-21.2, 19.7	Jul 15: QOW 6 HW 6, Due Jul 21st
Week 8 Jul 22, 24	Neural Nets, Nearest Neighbors Unsupervised Learning,	AIMA Chapter 17, 22	Jul 22: QOW 7 HW7, Due Jul 28th
Week 9 Jul 29, 31	Reinforcement Learning, Applications	AIMA Chapter 17,22,27	Jul 29: QOW8
Week 10 Aug 5, 7	Ethics and Final Review, Final Exam	AIMA Chapter 27	Aug 5: QOW 9 Aug 7th: Final Exam