CS 450 Artificial Intelligence
Fall 2022
Schedule #: 21287

COURSE INFORMATION

Class Days: Tu Th
Class Times: 4 PM – 5:15 PM
Class Location: AH 3177
Mode: face-to-face
Learning platform: Canvas

Instructor: Professor Marie Roch
Phone: 619 594 5830
Web: https://roch.sdsu.edu
Email: use first name dot last name @ sdsu.edu
Office location: GMCS 530
Office hours: Tu 3:00-3:50 Th 5:30-6:20

COURSE DESCRIPTION

This is an elective course for computer scientists that teaches you the fundamentals of artificial intelligence. We will touch on a broad array of topics such as learning how an agent can search a problem space for sequences of actions that solve a problem (e.g. how to maneuver an autonomous vehicle), how certain problem configurations and actions can constrain the what can be done next (e.g. solving crossword puzzles), how to reason logically, and how machines can learn to predict categories from data.

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

- Construct intelligent agents capable of interacting with their environments.
- Understand and implement heuristic searches for problem solving and game playing (adversarial search)
- Understand first-order logic and its application to theorem proving.
- Analyze constraint satisfaction problems and resolve them through search.
- Understand and apply machine learning algorithms for classification tasks

COURSE ATTENDANCE

Do not come to campus if you do not feel well. Remain home and monitor your symptoms and seek medical attention as needed.

COURSE MATERIALS

Materials (including texts, readings, course fees, equipment, and any technology requirements)	Required or optional	Where and how it can be obtained
Russell, S. J., and Norvig, P. (2021). *Artificial Intelligence: A Modern Approach* (4^{e}, Prentice Hall, Upper Saddle River)	required	SDSU book store

See public course web site at: roch.sdsu.edu for recommendations on Python learning materials	optional	

COURSE DESIGN: MAJOR ASSIGNMENTS AND ASSESSMENTS

Consistent with University policy, I retain the right to adjust course design, including assignments, assessments and deadlines. Such changes will be announced to students.

A series of assignments (approximately five to six) will contain a combination of qualitative, quantitative, and programming assignments. Quantitative and qualitatative assignments must be done on your own. You must show your work for quantitative questions. Remember that qualitative answers must be in your own words. Programming assignments may be done with a partner provided that you follow pair programming methodology which will be covered through assigned readings.

A midterm and final exam will be given. Dates are on the public-facing web site roch.sdsu.edu.

COURSE SCHEDULE

See public course web site for week to week course schedule. The schedule may vary to meet the needs of students (e.g. more time spent on a difficult topic).

GRADING POLICIES

When feasible, portions of programs will be graded through an automated testing process. Automated testing will account for ≤ 70% of possible points. The remaining portion of your score will assess your design (20%) and appropriate levels of comments (10%). The course FAQ has information on both design and commenting.

Affidavits indicating that you performed the work yourself or with a classmate for pair programming projects are **mandatory** for all assignments. Failure to include affidavits will result in the loss of points. Instructions on affidavits and submission of materials are covered on the assignments web page.

Non-programming questions are graded on a coarse scale:

- excellent (E) – Great answer that went above and beyond what was expected; nothing or very little to change. A+
- good (G) – A very good answer. A
- mostly right (MR) – This answer shows reasonable understanding of the concept, but there are nuances that were missed. B
- right track (RT) – Answer demonstrates some understanding of the concept, but there are clear misconceptions. C

- valiant effort (VE) – The answer demonstrates a serious attempt to address the question, but fails to answer the question correctly. VE answers typically earn almost 40% of the available points; it is worth trying.

The assignments grade, consisting of all non-exam assessments, is computed by adding up the number of points scored and dividing by the number of points possible.

Grade weights:

assignments:	60%
midterm:	20%
final exam:	20% final is non-cumulative

Late policy: Unless announced otherwise, late assignments may be turned in until 10:30PM on the class day after which they are due (e.g. due on Thursday, submit on Tuesday before 10:30 PM) for a 10% penalty. On occasion, late assignments may not be accepted (e.g., when doing so permits me to release a solution key prior to an exam), but this will be announced well ahead of time.

STUDENT LEARNING OUTCOMES

CS 450 addresses the following CS Program course outcomes:

a) An ability to apply knowledge of computing and mathematics
b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
d) An ability to function effectively on teams to accomplish a common goal
h) Recognition of the need for and an ability to engage in continuing professional development
i) An ability to use current techniques, skills, and tools necessary for computing practice
j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
k) An ability to apply design and development principles in the construction of software systems of varying complexity.

COMMUNICATION

Students are provided with an SDSU Gmail account, and this SDSU email address will be used for all communications. University Senate policy notes that students are responsible for checking their official university email once per day during the academic term. For more information, please see Student Official Email Address Use Policy here.

Most complicated issues are best solved interactively in office hours. Faculty offices are small spaces with increased risk of spreading COVID-19, therefore you are required to wear a mask. In addition to office hours, I also respond to e-mail. When writing e-mail, please keep a professional tone, starting e-mails with a salutation, e.g., Dear Professor Roch. While I usually respond to e-mail within a day, it may take longer when my work load is high. I receive a very high volume of e-mail. If you have not heard back in two work days, please feel free to resend your message. Please note that e-mails that are sent hours before an assignment is due may not receive a response.

TECHNOLOGY

We will be using a public-facing SDSU hosted web site for general course information and assignment distribution roch.sdsu.edu. The Canvas learning management system will be used for assignment submission and other materials that do not appear on the public facing site.

MEDICAL-RELATED ABSENCES

I will make reasonable accommodations for medical related absences. In the case of exams, except in the case of dire emergency, please inform me of problems prior to a deadline.

If you do not feel well, stay home. If you are diagnosed with COVID-19, contact Student Affairs at vpsafrontdesk@sdsu.edu to notify the university and initiate the process of contacting your instructors. If you have a serious ongoing injury or illness during the semester, contact Student Health Services, they can help you navigate determining what can be done.

FINDING HELP ON CAMPUS

Need help finding an advisor, tutor, counselor, or require emergency economic assistance? The **SDSU Student Success Help Desk** is here for you. Student assistants are available via Zoom **Monday through Friday, 9:00 AM to 4:30 PM** to help you find the office or service that can best assist with your particular questions or concerns. You may also wish to contact the College of Sciences Student Success Center: https://cossuccess.sdsu.edu/

ACADEMIC HONESTY

The University adheres to a strict policy prohibiting cheating and plagiarism. Examples of academic dishonesty include but are not limited to:

- Copying, in part or in whole, from another's test or other examination;
- Obtaining copies of a test, an examination, or other course material without the permission of the instructor;
- Collaborating with another or others in coursework without the permission of the instructor;
- Falsifying records, laboratory work, or other course data;
- Submitting work previously presented in another course, if contrary to the policies of the course;

- Altering or interfering with grading procedures;
- Assisting another student in any of the above;
- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work);
- Copying and pasting work from an online or offline source directly and calling it one's own;
- Using information found from an online or offline source without giving the author credit;
- Replacing words or phrases from another source and inserting one's own words or phrases.

Unauthorized recording or dissemination of virtual course instruction or materials by students, especially with the intent to disrupt normal university operations or facilitate academic dishonesty, is a violation of the Student Conduct Code. This includes posting of exam problems or questions to on-line platforms. Violators may be subject to discipline.

The California State University system requires instructors to report all instances of academic misconduct to the Center for Student Rights and Responsibilities. Academic dishonesty will result in disciplinary review by the University and may lead to probation, suspension, or expulsion. Instructors may also, at their discretion, penalize student grades on any assignment or assessment discovered to have been produced in an academically dishonest manner.

CLASSROOM CONDUCT STANDARDS

SDSU students are expected to abide by the terms of the Student Conduct Code in classrooms and other instructional settings. Violation of these standards will result in referral to appropriate campus authorities. Prohibited conduct includes:

- Willful, material, and substantial disruption or obstruction of a University-related activity, or any on-campus activity.
- Participating in an activity that substantially and materially disrupts the normal operations of the University or infringes on the rights of members of the University community.
- Unauthorized recording, dissemination, or publication (including on websites or social media) of lectures or other course materials.
- Conduct that threatens or endangers the health or safety of any person within or related to the University community, including:
    1. Physical abuse, threats, intimidation, or harassment.
    2. Sexual misconduct.

ACCOMMODATIONS

SDSU via the Student Ability Success Center (SASC) provides accommodations for students with documented disabilities or medical conditions covered under the Americans with Disabilities Act (ADA). In keeping with current public health guidance, I cannot provide arrangements to students without an ADA-qualified disability or medical condition.

If you are a student with a disability and are in need of accommodations for this class, please contact the Student Ability Success Center at sascinfo@sdsu.edu (or go to sdsu.edu/sasc) as soon as possible. Please know accommodations are not retroactive, and I cannot provide accommodations based upon disability until I have received an accommodation letter from the Student Ability Success Center. SASC registration and accommodation approvals may take up to 10-14 business days, so please plan accordingly.

STUDENT PRIVACY AND INTELLECTUAL PROPERTY

The Family Educational Rights and Privacy Act (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. Students maintain intellectual property rights to work products they create as part of this course unless they are formally notified otherwise, however they must remember that faculty frequently provide scaffolding for assignments that consist of material contributions to the final product that they do not own. You are welcome to show these to a potential employer, but faculty products should not be posted a public web site.

ACADEMIC SUPPORT SERVICES

A complete list of all academic support services—including the Writing Center and Math Learning Center—is available on the Student Affairs' Academic Success website. Counseling & Psychological Services (619-594-5220, sdsu.edu/cps) offers a range of psychological services for students. Emergency support is available after hours at the same phone number. The San Diego Access and Crisis Line can also be accessed 24 hours/day (1-888-724-7240).

SDSU ECONOMIC CRISIS RESPONSE TEAM

If you or a friend are experiencing food or housing insecurity, technology concerns, or any unforeseen financial crisis, it is easy to get help! Visit sdsu.edu/ecrt for more information or to submit a request for assistance.

SDSU's Economic Crisis Response Team (ECRT) aims to bridge the gap in resources for students experiencing immediate food, housing, or unforeseen financial crises that impact student success. Using a holistic approach to well-being, ECRT supports students through crisis by leveraging a campus-wide collaboration that utilizes on- and off-campus partnerships and provides direct referrals based on each student's unique circumstances. ECRT empowers students to identify and access long-term, sustainable solutions in an effort to successfully graduate from SDSU. Within 24 to 72 hours of submitting a referral, students are contacted by a member of ECRT and are quickly connected to the appropriate resources and services.

For students who need assistance accessing technology for their classes, visit our ECRT website (sdsu.edu/ecrt) to be connected with the SDSU library's technology checkout program. The technology checkout program is available to both SDSU and Imperial Valley students.

LAND ACKNOWLEDGEMENT

For millennia, the Kumeyaay people have been a part of this land. This land has nourished, healed, protected and embraced them for many generations in a relationship of balance and harmony. As members of the San Diego State University community, we acknowledge this legacy. We promote this balance and harmony. We find inspiration from this land, the land of the Kumeyaay.

DIVERSITY AND INCLUSION

The learning environment should be accessible to all people. I make a concerted effort to help all students learn. As a woman, first-generation college student, and a Mexican-American, I regularly engage in activities designed to provide individuals with the tools to succeed. We *all* rise together.