Policies

Note: The syllabus is subject to change

Communication

There will be several routes of communication for this course:

- The main mode of electronic communication between students and staff, as well as amongst students, is through Piazza. It is intended for general questions about the course, clarifications about assignments, student questions to each other, discussions about material, and so on. We strongly encourage students to participate in discussion, ask, and answer questions through this site. The course staff will monitor discussions closely.
- If you need to contact the course staff privately, you should email cs188@berkeley.edu. You may of course contact the professors or GSIs directly, but the course email will produce the fastest response.

Prerequisites

- **CS 61A or 61B:** Prior computer programming experience is expected (see below)
- **CS 70 or Math 55**: Facility with basic concepts of propositional logic and probability are expected (see below)

CS61A AND CS61B AND CS70 is the recommended background.

Course programming assignments will be in Python. We do not assume that students have previous experience with the language, but we do expect you to learn the basics very rapidly. Project 0 is designed to teach you the basics of Python, but if you want to get a head start here is a good tutorial: ACM Python Tutorial

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Extensions

Extensions for projects and homeworks are generally granted only if

a. you have submitted a DSP letter, or
b. you have a medical or family-related emergency.

In a project group, the DSP extension only applies to the student with accommodation. If both students in the group have accommodation, they need to email the staff individually.

For assignments whose solutions are set to released publicly after the deadline, extension can only be requested up to the solutions release time.

Assignments

This class includes **6-7 programming projects**, **~10 electronic homework assignments**, and **four written homework assignments**.

Late Policy

Written homeworks cannot be turned in late, you have to use your homework drops. Projects lose 20% of their total point value per day turned in late. However, projects also have slip days which can be used to delay the onset of the late policy. See the Homework Drop Policy.

Collaboration

Project 0 is to be completed alone. Projects 1 and after can be completed alone or in teams of two. If done in a team of two, the person who submits needs to tag the other team member on Gradescope. However, it is important that the submission reflects the understanding of both team members. Homework is to be submitted individually, but may be discussed in groups. If discussed in a group, acknowledge your collaborators in the submission per standard academic practice.

Please note that obtaining, sharing, and posting solutions to Electronic Homework, Written Homework, and Projects is a violation of academic integrity.

Please also note that sharing lecture recordings outside this class is prohibited due to privacy and accessibility concerns.

Project Slip Days

Programming projects must be turned in electronically by the listed due date and time. You will have a total of **5 slip days** to be used across **ALL** projects to extend a deadline. Note that slip days are counted by the granularity of days, rounded up to the nearest day. For example, if you have yet to use your two slip days: for a project due at 11:59PM Pacific Time on Friday, any submission from Friday 11:59PM to Saturday 11:59PM will use up one slip day, any submission from Saturday 11:59PM to Sunday 11:59PM will use up two slip days, and any submissions after Sunday 11:59PM will begin being penalized by the late policy. Slip days will be applied to your grades at the end of the semester in a manner which maximizes your project grades. **You may only use maximum two slip-days per project**.

Project Grading

Projects will by default be graded automatically for correctness, though we will review projects individually as necessary to ensure that they receive the credit they deserve. Projects can be submitted as often as you like; we strongly encourage you to keep working until you get a full score.

Homework

Electronic component of HW: Electronic homework (hosted on Gradescope) is meant to reinforce and give practice with concepts covered in class. They will be automatically graded for correctness, and you can submit as many times as you like up to the deadline; again we encourage you to work until you have fully solved the homework. Electronic homeworks will be released on Tuesdays and due the following Mondays at 10:59PM Pacific Time.

Written component of HW: Written homework (submitted into Gradescope) is meant to make you think beyond strict repetition of what is covered in class and is used to reinforce conceptual material that you will see on exams. Written homeworks will be release on Thursdays and will be due two weeks later on Wednesdays at 10:59PM Pacific Time.

Note: Homeworks have no slip days.

Homework Drop Policy

You will each be allowed to drop your **lowest** written homework and your **lowest** electronic homework. These may be distributed throughout the semester, and do not have to all be from the same homework. (When calculating final grades, this will happen automatically, we'll just use your highest scoring submissions.)

Note that this policy is also meant to deal with cases like internet issues while submitting, forgetting about the deadline, emergency situations, joining the class late, etc.

Ethics

Submissions should acknowledge all collaborators and sources consulted. All code and written responses should be original. We trust you all to submit your own work, but to protect the integrity of the course from anyone who doesn't want to play by the rules, we will actively be checking for code plagiarism (both from current classmates and previous semesters). We are not lenient about cheating; we sympathize with Kris Pister's policy.

Exams

The midterm exam time is 5-7 pm on 3/10.

The final exam time is 7-10 pm on 5/12.

Grading

Overall grades will be determined from:

- Programming Assignments (25%)
- Electronic Homework Assignments (10%)
- Written Homework Assignments (10%)
- Midterm (20%)
- Final exam (35%)

Grades are on the following fixed scale: (Refer to Notations for Intervals if you are not familiar with the notations below.)

Grade	Overall Percentage
A	[85, 100]
A-	[80, 85)
B+	[75, 80)
B	[70, 75)
B-	[65, 70)
C+	[60, 65)
C	[55, 60)
C-	[50, 55)
D+	[45, 50)
D	[40, 45)
D-	[35, 40)
F	[0 , 35)

The instructors may adjust grades upward based on class participation, extra credit, etc. The grade of A+ will be awarded at the instructors' discretion based on exceptional performance.

If you are taking the class PNP, you will need to attain a letter grade of C- or higher AND take the final to pass. If you are taking the class SUS, you will need to attain a letter grade of B- or higher AND take the final to pass.

Regrade Policy: If you believe an error has been made in the grading of one of your exams or assignments, you may resubmit it for a regrade. Regrades for cases where we misapplied a rubric in an individual case are much more likely to be successful than regrades that argue about relative point values within the rubric, as the rubric is applied to the entire class. Because we will examine your entire submission in detail, your grade can go up or down as a result of a regrade request.

Participation

What are participation points? A form of extra credit to bump students who are close to grade boundaries into the next grade bin. All grade bins are posted above.

How do I earn participation points? There are 3 distinct categories to accumulate up to a maximum total of 20 participation points in CS 188. This is meant to give all students the maximum flexibility to participate in a way they feel comfortable with.

So in summary, Participation Score = min(Lecture + Piazza + Section, 20), where Lecture, Piazza, and Section are subcategories in which you can earn anywhere from 0 to 20 points.

Lecture participation (max 20): Students will have the opportunity to interact with Professors Dawn Song and Stuart Russell during live lectures. Actively asking / answering questions during lecture will help you accumulate points in this category.

Piazza participation (max 20): At the end of the semester, a Piazza participation score will be assigned to all students, where we will roughly grade everyone on a scale that rewards thought-provoking questions or insightful answers. Staff will assign piazza grades manually based on these rough features, so there is no formula that exactly maps the number of contributions to the number of piazza points you will receive. To put things into perspective out of a maximum of 20 points, less than 6% of students from Spring 2020 earned 10 points and the class median was 1 point.

Section participation (max 20): We have discussion sections that span over a wide range of time, so please choose and regularly attend one section, especially if you are unable to attend live lectures. At the end of the semester, you will be asked to fill out a Google form to describe your interactions with 1 TA. This will be reviewed by the admin TA team and cross-checked by the TA you referenced in the form, and used to determine your section participation points.

Each participation point is worth 0.05% of your grade, capped at 20 points (equivalent to 1%, which is a fifth of the width of one grade bin).

Please note that we will not round up anyone's grades at the end of the semester beyond participation-point based extra credit. No exceptions. So please take this opportunity to earn extra credit and actively participate.

Inclusion

We believe in the crucial importance of creating a learning environment that is welcoming and respectful to students of all backgrounds. The following are specific steps that will help us in achieving this goal:

- If you feel your academic performance has been impacted negatively due to a lack of inclusion, or due to experiences outside of class such as current events or family matters, please reach out to the instructors and staff. Our job is not only to teach but to support you in every way we can.

- You may also consult a departmental Faculty Equity Advisor, or fill out the anonymous feedback form for the College of Engineering for equity and inclusion related feedback.
- If you have a preferred name or set of pronouns that differ from your legal name, you may designate a preferred name for the classroom by following these steps.
- If something happens in the course that runs counter to the goal of making every student feel safe, respected, and welcome, you can fill out this form to anonymously let the department know.
- As a member of the CS188 community, realize that you have an important duty to help other students feel respected in helping create an inclusive learning environment.

Support During Remote Learning

From the College of Engineering:

> We understand that your specific situation may present challenges to class participation. Please contact the instructors if you would like to discuss these and co-develop strategies for engaging with the course.
>
> The Student Technology Equity Program (STEP) is available to help you access a laptop, Wi-Fi hotspot, and other peripherals.
>
> You will be alerted as to when synchronous sessions are about to be recorded. If you prefer not to be recorded, you may turn your video and microphone off. Please set your Zoom name to be the name you would like instructors to call you. You may optionally include your personal pronouns. Please set your Zoom picture to an appropriate profile picture of you to foster a sense of community and enhance interactions. If you are not comfortable using an image of yourself, you may use an appropriate picture of an avatar. We encourage participating with your video on to foster a sense of commnuity and enhance interactions. However, we understand that some students are not comfortable with video or may not be able to participate by video.

Enrollment

Here are the policies that govern admission into classes, and here are some answers to frequently asked questions about admission. The course staff does not control enrollment!

CS 188 | Introduction to Artificial Intelligence

Spring 2021

Lectures: Mon/Wed/Fri 3:00–3:59 pm, Online

Description

This course will introduce the basic ideas and techniques underlying the design of intelligent computer systems. A specific emphasis will be on the statistical and decision-theoretic modeling paradigm.

By the end of this course, you will have built autonomous agents that efficiently make decisions in fully informed, partially observable and adversarial settings. Your agents will draw inferences in uncertain environments and optimize actions for arbitrary reward structures. Your machine learning algorithms will classify handwritten digits and photographs. The techniques you learn in this course apply to a wide variety of artificial intelligence problems and will serve as the foundation for further study in any application area you choose to pursue.

See the syllabus for slides, deadlines, and the lecture schedule. Readings refer to fourth edition of AIMA unless otherwise specified.

Recordings

We make lecture and Q&A recordings available as links to Google Drive, which you can find posted together with other materials on the Syllabus page of this website shortly after the lecture. These links will work only if you are signed into your UC Berkeley Google account. The recordings are also available on Kaltura, which is a service that UC Berkeley partners with that facilitates the cloud recordings of Zoom meetings. All recordings on Kaltura have automatically-generated captions available by default alongside some other useful controls, such as playback speed adjustment.

To access the channel with recordings for this course, please go to this website and create an account if you don't have one already: https://kaltura.berkeley.edu

Once you have the account, you should be able to access and subscribe to videos in the channel by following this link.

Syllabus

W	Date	Lecture Topic	Readings	Section	Homework	Project
0	W 1/20	Intro to AI [pdf] [pptx] [lecture]	Ch. 1	N/A	HW0 - Math, diagnostic Electronic due 1/25 10:59 pm	Project 0 due 1/22 11:59pm
	F 1/22	Agents + Environments, part 1 [pdf] [pptx] [lecture] [q&a]	Ch. 2			
1	M 1/25	Agents + Environments, part 2 [pdf] [pptx] [lecture]	Ch. 2	Section 1, solutions, recording Exam prep 1, solutions, recording	HW1 - Uninformed search Electronic due 2/1 10:59 pm Written HW1 - Probability, uninformed search, and heuristics PDF due 2/10 10:59 pm on gradescope.	Project 1 due 2/5 11:59 pm
	W 1/27	Uninformed Search [pdf] [pptx] [lecture] [supplementary lecture] [q&a]	Ch. 3.1-4			
	F 1/29	Informed Search [pdf] [pptx] [lecture] [supplementary lecture] [q&a]	Ch. 3.5-6 Note 1			
					Piazza post on WHW1 self-grading, due 2/22 10:59 pm.	

W	Date	Lecture Topic	Readings	Section	Homework	Project
2	M 2/1	Local Search [pdf] [pptx] [lecture] [supplementary lecture] [q&a]	Ch. 4.1-2	Section 2, solutions, recording Exam prep 2, solutions, recording	Gradescope link. HW2 - Informed search and game trees Electronic due 2/8 10:59 pm	
	W 2/3	Games: minimax, alpha-beta [pdf] [pptx] [lecture] [q&a]	Ch. 5.1-3			
	F 2/5	Games: MCTS, chance [pdf] [pptx] [lecture] [q&a]	Ch. 5.4-5 Note 2			
3	M 2/8	Propositional Logic [pdf] [pptx] [lecture] [q&a]	Ch. 7.1-4	Section 3, solutions, recording Exam prep 3, solutions, recording	HW3 - Propositional logic and local search Electronic due 2/16 10:59 pm PDF Written HW2 - Games and logic PDF due 2/24 10:59 pm on gradescope. Piazza post on WHW2 self-grading, due 3/8 10:59 pm.	Project 2 due 2/19 11:59 pm
	W 2/10	Logical Inference: theorem proving, model checking [pdf] [pptx] [lecture] [q&a]	Ch. 7.5-6			
	F 2/12	Propositional Planning [pdf] [pptx] [lecture] [q&a]	Ch. 7.7			
4	M 2/15	Presidents' Day		Section 4, solutions, recording Exam prep 4, solutions, recording	HW4 - First order logic and probability Electronic due 2/22 10:59 pm PDF	
	W 2/17	FOL: Syntax, Semantics, Inference [pdf] [pptx] [lecture] [q&a]	Ch. 8.1-2, skim 9.1-4 Note 3			
	F 2/19	Probability, Independence, Naive Bayes [pdf] [pptx] [lecture] [q&a]	Ch. 12.1-6			
5	M 2/22	Bayes nets: syntax, semantics, examples [pdf] [pptx] [lecture] [q&a]	Ch. 13.1-2	Section 5, solutions, recording Exam prep 5, solutions, recording	HW5 - Probability and Bayes Nets Electronic due 3/2 10:59 pm PDF	
	W 2/24	Bayes nets: exact inference [pdf] [pptx] [lecture] [q&a]	Ch. 13.3			
	F 2/26	Bayes nets: stochastic inference (rejection, importance) [pdf] [pptx] [lecture] [q&a]	Ch. 13.4			

W	Date	Lecture Topic	Readings	Section	Homework	Project
6	M 3/1	Bayes nets: stochastic inference (Gibbs) [pdf] [pptx] [lecture] [q&a] [supp lecture pdf] [supp lecture pptx] [supp lecture recording]	Ch. 13.4 Note 4	Section 6, solutions, recording Exam prep 6, solutions, recording	HW6 - Bayes Net Sampling and HMMs Electronic due 3/8 10:59 pm PDF Written HW3 - Bayes nets and HMMs PDF due 3/19 10:59 pm on gradescope: links for written component and coding component.	Project 3 due 3/15 11:59 pm
	W 3/3	Markov models and filtering [pdf] [pptx] [lecture] [q&a]	Ch. 14.1-2			
	F 3/5	Markov models [pdf] [pptx] [lecture] [q&a]	Note 5		Piazza post on WHW3 self-grading, due 4/5 10:59 pm.	
7	M 3/8	DBNs, particle filtering [pdf] [pptx] [lecture] [q&a]	Ch. 14.5	Search review, solutions, Games review, solutions, Logic review, solutions, Bayes nets review, solutions, HMMs review, solutions. Piazza post with recordings of review sessions		
	W 3/10	Midterm 5-7 pm PT				
	F 3/12	Rationality, utility theory [pdf] [pptx] [lecture]	Ch. 16.1-3			
8	M 3/15	Decision nets, VPI, unknown preferences [pdf] [pptx] [lecture]	Ch. 16.5-7 Note 6	Section 8, solutions, recording Exam prep 8, solutions, recording	HW7 - Utility theory and HMMs Electronic due 3/30 10:59 pm PDF	Project 4 due 4/2 11:59 pm
	W 3/17	MDPs: V/Q/pi [pdf] [pptx] [lecture]	Ch. 17.1			
	F 3/19	MDPs: Value/Policy Iter (part 1) [pdf] [pptx] [lecture]	Ch. 17.2			
9	M 3/22	Spring Break				
	W 3/24	Spring Break				
	F 3/26	Spring Break				

W	Date	Lecture Topic	Readings	Section	Homework	Project
10	M 3/29	MDPs: Value/Policy Iter (part 2) [pdf] [pptx] [lecture]	Ch. 17.2 Note 7	Section 9, solutions, recording Exam prep 9, solutions, recording	HW8 - MDPs Electronic due 4/5 10:59 pm PDF	
	W 3/31	ML: Decision Trees (1) [pdf] [pptx] [lecture]	Ch. 19.1-3			
	F 4/2	ML: Decision Trees (2) [pdf] [pptx] [lecture]	Ch. 19.1-3			
11	M 4/5	ML: Linear Regression and Perceptrons [pdf] [pptx] [lecture]	Ch. 19.6	Section 10, solutions, recording Exam prep 10, solutions, recording	HW9 - Machine learning Electronic due 4/13 10:59 pm PDF	Project 5 due 4/16 11:59 pm
	W 4/7	ML: Statistical Learning, Naïve Bayes [pdf] [pptx] [lecture]	Ch. 20.1-2			
	F 4/9	No lecture				
12	M 4/12	ML: Neural Networks [pdf] [pptx] [lecture]	Ch. 21.1-5	Section 11 Exam prep 11		
	W 4/14	RL: Temporal Difference [pdf] [pptx] [lecture]	Ch. 22.1-2			
	F 4/16	No lecture				
13	M 4/19	RL: Q learning [pdf] [pptx] [lecture]	Ch. 22.3	Section 12 Exam prep 12		
	W 4/21	RL: Policy search, applications [pdf] [pptx] [lecture]	Ch. 22.5, 22.7			
	F 4/23	Fairness and ethics in AI [pdf] [pptx] [lecture]	Ch. 27.3			
14	M 4/26	Advanced topics I - Nicholas Carlini on Adversarial Machine Learning [pdf] [pptx] [lecture]				
	W 4/28	Advanced topics II [pdf] [pptx] [lecture]				

W	Date	Lecture Topic	Readings	Section	Homework	Project
	F 4/30	Future + wrapup [pdf] [pptx] [lecture]				
15	M 5/3	RRR				
	W 5/5	RRR				
	F 5/7	RRR				
16	M 5/10					
	W 5/12	Final 7-10 pm PT				
	F 5/14					

CS 188

Weekly Schedule

Office Hours

Staff

Policies

Assignments

Exams

Grading