

Important
Note

Please ask questions early if anything about course policy is unclear. We hope this document is sufficient for you to understand how to engage with the course, but please be aware that the course structure is likely different from what you're used to.

The purpose of this document is to serve as the minimal working information you *need* to know how to engage with the course. More information may indeed be helpful, so feel free to ask.

Assignments

- **Exams.** There will be three exams for the course: Midterm 1, Midterm 2, and a Final. All three are in-class and closed-note.^a Midterm 1 and the Final are entirely new problems. Midterm 2 has a special format instead: it consists of two problems that are small variations of parts of Problem 1s from PSets 1–7 (see “Problem Sets” below for what Problem 1 means) – this is designed so that genuinely working through the PSets pays off directly.
- **Problem Sets.** We will “assign” eight problem sets plus one warmup problem set throughout the semester, however **Problem Sets will not be graded.** Each PSet has 2–3 problems: **Problem 1** is exam-style – we recommend attempting it individually, under exam-like conditions (roughly 1–3 hours), and writing it up as if you were submitting it for a grade. **Problem 2** is a more classic PSet problem. Some PSets also have an optional **Problem 3**, a challenge problem for those who want to explore beyond the course. Aside from this, problem sets will be treated like “typical” problem sets: we will answer questions on Ed, hold office hours, share staff solutions, etc.

The problem sets are where you really learn interesting skills, so they are the most important element of your learning experience. To incentivize you to work hard on them, they were designed so that genuinely working through the PSets is the best way to prepare for the exams. You will have an opportunity to get detailed feedback through a live 30-minute 1-on-1 meeting with a member of the course staff each week (see ‘Coaching’ for further details).

Because performance on the Problem Sets does not contribute to your grade, these assignments are fully open – you can use AI/collaboration/etc. in any manner you like. Of course, we strongly recommend engaging with the Problem Sets in a manner that benefits your learning (and future exam performance). We will give you advice on how to do this, but it is not a violation of course policy to ignore our advice.

^aThese are typical pencil-and-paper exams – no outside material (phone, laptop, AI, notes, etc.) are permitted.

Coaching

Every student will be assigned a TA or UCA as a “coach” for the semester. You will have the option to meet with your coach 1-on-1 for 30 minutes each week.^a You can use this meeting to ask your coach to live-“grade” a portion of your PSet and give you detailed feedback, for 1-on-1 help reflecting on how you approached the PSets, for 1-on-1 help completing the PSets, or anything you find useful. We will provide default suggestions, but you and your coach are free to go off-script in whatever manner you find most helpful.

Each week you show up engaged to a coaching meeting, you will accumulate **one credit, up to a maximum of eight.**^b See below for how credits factor into grades.

Note: we will *not* give “late days” or “accommodation credits” for missed coaching sessions, under any circumstances.^c

Note: your “performance” during these meetings will in no way impact the credits you earn – the purpose of these meetings is truly just to help you develop skills, and the purpose of credits is truly just to ease the transition from policies you're used to.^d

^aOr rather, almost every week – there may be a week or two with no meetings.

^b“Engaged” does not have a formal definition and is pass/fail. If you do anything reasonable, you will pass. If you do something unreasonable, you will not get credit for the meeting.

^cThis is because the sessions are not required for your grade. It is completely acceptable to miss a coaching session during any week (provided you give your coach advanced notice and are respectful of their time, etc.).

^dShort of being “disengaged” or “unreasonable,” which we will not provide formal definitions for.

Grading

- Let x denote the number of credits accumulated, which is between zero and eight.
- Combined Midterm (see definition below): $(60-3x)\%$. (For example, if you have zero credits, the Combined Midterm is 60% of your grade. If you have eight credits, the Combined Midterm is 36% of your grade).
- In-class Final: $(40-2x)\%$. (For example, if you have zero credits, the Final is 40% of your grade. If you have eight credits, the Final is 24% of your grade).
- PSet Engagement: $5x\%$. (For example, if you have zero credits, PSet Engagement is 0% of your grade. If you have eight credits, PSet Engagement is 40% of your grade). **You always earn full credit (100%) on this component** – x only determines how much weight it carries in your final grade.

In other words, the baseline grading scheme is 60% Combined Midterm, 40% Final. Every time you show up engaged to a coaching meeting, you take 5% off the exam weight and add 5% to your PSet Engagement score.^a

If $M_1, M_2 \in [0, 100]$ are your percentage scores on Midterm 1 and Midterm 2 (in either order), your **Combined Midterm** percentage is

$$\frac{M_1 + M_2}{2} + \frac{\min(M_1, M_2)}{4} \left(1 - \frac{M_1 + M_2}{200}\right).$$

This score is always at least your raw average, is increasing in both M_1 and M_2 , and never exceeds 100. It's designed to incentivize you to do well on the second midterm regardless of your performance on the first midterm, while still giving you a small bonus for doing well on both.^b

^aFor example, if you scored 80% on the combined midterm and final with no credits, your final grade would be 80%. If instead you had eight credits, your final grade would be $80 \cdot 0.60 + 100 \cdot 0.40 = 88\%$.

^bIf you find it confusing, plug in some numbers for M_1 and M_2 to see how it works.

Final Letter Grades

Below is as much detail as we are comfortable and able to share about how final letter grades are computed, as a function of your final numerical grade.

- Grades in this class are **not curved**, in the sense that your own numerical grades and final letter grades **do not depend on those of your classmates**.
- Individual exams are not curved/rescaled/etc. Your final numerical grade is calculated as $(0.60 - 0.03 \cdot \text{NUMCREDITS}) \cdot \frac{\text{COMBINEDMIDTERMScore}}{100} + (0.40 - 0.02 \cdot \text{NUMCREDITS}) \cdot \frac{\text{FinalPointsYouEarned}}{\text{TotalPossibleFinalPoints}} + 0.05 \cdot \text{NUMCREDITS}$, where COMBINEDMIDTERMScore is the Combined Midterm percentage defined above (using your Midterm 1 and Midterm 2 percentage scores).^a
- We guarantee that if your final numerical grade is at least 60%, you will pass (C- or better).
- The cutoff for an A is comparable to what one might expect in a typical US high school (say, around 93%, but not exactly equal), and the cutoff for an A- is slightly lower (say, slightly below 90%). The gaps between consecutive cutoffs spread out as the grades get closer to C-, which is 60% (e.g., the gap between B+ and B is larger than the gap between A- and B+).
- It is not possible to earn an A+ on the basis of high marks alone (including a 100%). We do not recommend changing your behavior in the course in the hopes of receiving an A+, although it is possible to get an A+ for extreme examples of Participation (see below).

^aIn case you find it helpful to rewrite this formula to isolate NUMCREDITS, it is equal to: $0.60 \cdot \frac{\text{COMBINEDMIDTERMScore}}{100} + 0.40 \cdot \frac{\text{FinalPointsYouEarned}}{\text{TotalPossibleFinalPoints}} + \text{NUMCREDITS} \cdot (0.05 - 0.03 \cdot \frac{\text{COMBINEDMIDTERMScore}}{100} - 0.02 \cdot \frac{\text{FinalPointsYouEarned}}{\text{TotalPossibleFinalPoints}})$.

Participation

Your final numerical grade is computed based only on exams and credits. However, the course staff understands that sometimes this number is not perfectly representative of your performance, so your final letter grade *may* also consider “participation” to a *small* extent. There is no such thing as “negative participation” which can hurt your grade — participation can only help. *We do not suggest “participating” solely for the sake of improving your grade* (there are more time-efficient ways if you only care about your grade, such as engaging with the PSets). That being said, we do think you will get more out of the course by “participating.” Below are some examples:

- Solving PSet Problem 3s.
- Participating in lecture/precept/office hours/Ed in a manner which benefits your classmates (e.g., answering questions, asking insightful questions).
- Teaching your instructor something new and interesting about theoretical computer science that you honestly engaged with and learned about outside of class. You shouldn’t do this just to get a better grade (it would be a huge waste of time if you did). It’s more meant to reward your engagement with theory outside the course. You can do this by going to office hours and interacting with your instructors.

Below are some non-examples of participation:

- Attending lecture (please attend lecture anyway!).
- Impressing your Coach (in order to maintain the ‘purity’ of Coaching, your ‘performance’ during Coaching sessions will have no impact on your grade at all, positive or negative. Your Coach is there to help you develop skills to prepare for the exam).
- Attending office hours or precept (please attend office hours and precept insofar as you find them helpful!).

Policy on Large Language Models

This course is explicitly **AI-forward**: AI is directly relevant to how we’ve designed the course, and outside of exams we won’t police how you use it – it’s up to you to decide what’s useful.

- **On exams, you may not use AI or LLMs at all** (the exams are in-class, and you may not use anything except your pencil and paper).
- **You are permitted to use LLMs in any manner you like when completing the PSets**, as your PSet performance does not impact your grade.
- **We will give you guidance on how to use LLMs at some points**, but this isn’t the focus of the course. You won’t need to use LLMs to succeed in the course, but in some situations you will be encouraged to use them.

The above is the course policy. See below for advice (but it is not a violation of course policy to ignore our advice).

Unsolicited Thoughts

What follows is not related to course policy, but may help you interact with the course better.

What's up with the credits? We fully believe the baseline grading scheme of 60% Combined Midterm, 40% Final is fair, and would be completely comfortable having that as the grading scheme.

However, we also understand you may be used to having PSet performance count towards your grade, and this serving as the primary motivation to stay on track with your own prep. Due to LLMs, it is no longer a sensible policy to have PSet performance count towards grades. We believe this system of credits is a reasonable compromise: it allows you to earn credit for engaging with the PSets, while not having PSet performance directly impact your grade.

How will PSets help me do better on the exams? The primary skill you'll develop throughout this course is rigorous, creative problem-solving (together with logically-clear presentation of said solutions). Your performance on the exams will largely correlate with your development of this skill, and engaging with the PSets will help you develop this skill. Importantly, *this is not a skill you can cram – it just takes time to develop*. An analogy to have in mind might be competitive sports – you can't cram conditioning,^a and need to steadily condition every week for a competition three months out. There will certainly be aspects specific to the exam topics you'll want to touch up closer to the exam, but ultimately a steady development of improved problem-solving ability is your best bet.

Will you really give me eight credits if I show up to one-on-one coaching without having done the PSet? Yes, but: (a) you must be respectful of the coach's time (i.e. you are honest with them about where you're at, work together to make good use of your time with them anyway, and make a realistic plan to get more out of the session next week), and (b) if the only time you spend 'training' for the exams is the 30-minute coaching sessions, you risk getting close to zero on the exams (and therefore risk failing the course, even with eight credits)! If you want to do well on the exams, you should plan to spend the same time on this course as you would if the PSets were graded.

What should you do if you loooooove this stuff? If you loooooove this stuff, and want to know what it would look like to pursue advanced research in Theoretical Computer Science, *try the PSet Problem 3s!* To be clear, you might spend more time on a Problem 3 than you do on the rest of a PSet, and you might not find a solution. These problems give a taste of the style of research questions asked, and also give a taste of what "the struggle" of theoretical research feels like (but they won't be research-level questions). If you enjoy the struggle of these problems (independent of whether you eventually solve it), you'll likely enjoy the struggle of theoretical research too.

If you spend several hours on a Problem 3 and want to discuss these with an instructor, office hours are an appropriate place to do this. If you are feeling in good shape for the course material, you can also use your weekly coaching session to discuss them, but your coach might not have thought about that problem (and so they might not know how to solve it).

If you loooooove some of the themes in the course, but not necessarily the theoretical aspects, you can also reach out to the course staff to ask for pointers to further material, or just to discuss the topics in general.

^aYes, depending on your competition level, you may be able to cram technique and make meaningful touchups. But it's physically impossible to 'cram' a faster mile two weeks out.