

CS103 Course Information

Are there “laws of physics” in computing? Are there fundamental restrictions to what computers can and cannot do? If so, what do these restrictions look like? What would make one problem intrinsically harder to solve than another? And what would such restrictions mean for our ability to computationally solve meaningful problems?

In CS103, we'll explore the answers to these important questions. We'll begin with an introduction mathematical logic, proofs, and discrete structures (sets, relations, functions). These mathematical tools will enable the real heart of the course, which is to rigorously answer questions like “what does it mean for a computer to solve a problem?” and “what makes some problems (sorting) inherently harder than others (searching)?”

In the course of the quarter, you'll see some of the most impressive (and intellectually beautiful) mathematical results of the last 150 years. In some ways, I like to think of this course as a course in both art appreciation and practice. I'll bring you through a gallery and show you some of my favorite achievements of mathematical artistic beauty, and like a good tour guide help you understand what is special about what you're looking at. You'll also need to pick up the paintbrush yourself and write some proofs of your own. You'll learn how to think about computation itself and how to show that certain problems are impossible to solve. Finally, you'll get a sense of what lies beyond the current frontier of computer science, especially with regards to biggest open problem in math and computer science, the P - NP problem.

Instructors Cynthia Bailey Lee (she/her) (cbl@cs.stanford.edu or via staff email address below)
Office: Gates 190

TAs Fei Fang (she/her) (cs103-win1920-staff@lists.stanford.edu)
Anthony Galczak (he/him)
Reyna Hulett (she/her)
John Melloni (he/him)
Andrew Sharp (he/him)
Ryan Smith (he/they)
Amanda Spyropoulos (she/her)

Website cs103.stanford.edu
You should frequently check for new handouts, assignments, announcements, and other important information there.

It's a cliché because there is a lot of truth to it: **“It's in the syllabus!!”** (or in this case, this course information sheet). READ IT, PLEASE! It can be heartbreaking to have situations where students get into trouble over policies they didn't know about.

Course Grades

Your final course grade will be determined as follows:

- 5% (or 0%*) lecture participation
- 30% problem sets
- 27.5% midterm exam
- 37.5% (or 42.5%*) final exam

You must receive a passing grade on the final exam in order to pass the course. Letter grades will be assigned no more strictly than 90% A-, 80% B-, 70% C-, 60% D-, but often a more generous curve is adopted. Historically, the median grade tends to be in the neighborhood of the lowest B+ or highest B. *See Lectures section.

Getting help

The course staff can be reached at cs103-win1920-staff@lists.stanford.edu. We encourage you to use this list the same way you would use Piazza in other classes—for all sorts of homework and logistics questions. Email affords us more control over your privacy than the 3rd party Piazza website and its recruiting app. That said, we do still have a [Piazza forum](#) for those students who prefer it. Remember that posting ANY PART of problem set solutions/hints where other students can see it is a violation of the honor code.

Dr. Lee's office hours are held in her office, Gates 190. TA Office Hours are held in the basement of Huang engineering building. Feel free to stop by either one if you need any help with the course. Dr. Lee is also happy to talk about topics such as course and career advice, making grad school plans, etc.

Course Logistics and Policies

Units	Undergraduates must enroll for 5 units (this is department policy). If you are a matriculated graduate student, you may enroll for 3-5 units. Course requirements will be the same.
Prerequisites	CS106B/X as a prerequisite or corequisite.
Readings	There are online course notes for the first few weeks of material. The textbook is <i>Introduction to the Theory of Computation, Third Edition</i> by Michael Sipser. A recommended help for the proof-writing part of the course is <i>How to Read and Do Proofs</i> by Daniel Solow. There are copies of each of these books in reserve in the Engineering Library.
Honor Code	We expect you to abide by the letter and the spirit of the Stanford Honor Code. You are required to read and abide by the policies detailed in our handout on the Honor Code as it applies in CS103 and its problem sets. These policies may be different from those in other courses, and you are responsible for knowing and abiding by ours.
Lectures	Lectures will not be recorded this quarter (CS103 is offered via SCPD video once per year and it was autumn quarter this year). Attendance is highly encouraged for this course, due to the rigor of the material. Many students know that attending lecture is best for their learning in the course, but still find it a struggle to attend regularly. To help you feel motivated towards your own attendance goals, we offer a small amount of optional participation credit. Each lecture day that you answer questions using PollEverywhere (whether your responses are correct or not), you earn credit. You may miss up to 3 lecture days and still get full credit. If you do not wish to count participation, you may opt out at any time using a web form. <i>Please respect the spirit and letter of the honor code in recording your participation. Remember that you can always opt out rather than falsify credit.</i>
Exams	The dates of the exams are in the syllabus calendar. With the exception of OAE accommodations, there are no exceptions whatsoever to the final exam time. You should not enroll in CS103 unless you can make both exam times. Please pay special attention to start dates of internships, travel, and other commitments. <u>You will not be approved to have a different exam date/time due to such circumstances.</u> It is prohibited by the university to enroll in courses with conflicting final exams (this often but not always means conflicting lectures too). You should check your schedule now, and if necessary change your course list, as we never give exceptions to this policy. Varsity athletes may take exams on the road proctored by a coach, at the same date/time as the rest of the class. For the midterm <i>only</i> , students who have an academic conflict (e.g., exam in another course) <i>may</i> be approved for slightly shifted timeslots.

Withdraw and Incomplete Grades

In order to be eligible for an Incomplete, University policy says you must have completed a “substantial” part of the course work in “satisfactory” fashion. This means that Incompletes are appropriate for serious medical or family emergencies that occur late in the quarter, which prevent you from completing the course despite having done well up to that point. Incomplete grades are *not* for problems arising from overscheduling, not doing as well as you had wanted in the course, or similar circumstances. Withdrawing is the appropriate option in those circumstances.

Problem Sets

There will be ten total problem sets in CS103, given out about once per week. With the exception of Problem Set 0, which must be done individually, you are welcome to work on them individually or in pairs (max 2 people). For pairs, submit only once!

Submit homework on the **Gradescope** website. Most students should be automatically registered already, or you may register yourself by entering the **code MJ8VBY**. You are responsible for the correctness, completeness, and timeliness of your submission to Gradescope. That means you need to allow plenty of time before the deadline for any hiccups in the process, and to double-check to catch errors such as uploading the wrong or an empty file, forgetting partner’s name, etc.

All students are granted up to 3 free “late days” for the quarter. Unlike some other courses, these are **24 hours late days**, so if the deadline is 2:30pm Friday, then submission any time from 2:31pm Friday to 2:29pm Saturday uses 1 late day, and from then to 2:29pm Sunday uses 2 late days. Late days are deducted from both partners. **No submissions are accepted beyond 2:30pm Sunday**, because at that point the solutions will be released. Using more than 3 late days for the quarter incurs a 20% deduction in points for that assignment (including if you have no late days remaining but your partner does and you submit late together).

Problem Sets are weighted equally except for pset0. They sometimes include extra credit, but this can only raise the total problem set portion of the grade to 100%.

Equity and Inclusion

I strive to create an inclusive and equitable classroom. Since much of your experience in the course is with your peers, I also depend on you to help each other feel welcome and obtain excellence, rather than mistaking Stanford or this class for a zero-sum game.

- **Classroom environment:** For some reason, it seems unusually common in computer science classes that some students ask questions that are not really questions so much as opportunities to demonstrate knowledge of jargon or facts that are beyond the scope of the topic at hand. This can have a discouraging effect on other students. If you find yourself wanting to make such a question or comment in lecture, I encourage you to consider office hours as a better venue for exploring that topic with me.
- **Name and pronouns:** I want you to be you in our class. You are always welcome to write your preferred name on all class assignments and exams. For in-person (office hours), our staff’s names and pronouns are listed above for your reference, and we will happily use your pronouns.
- **Office of Accessible Education accommodations:** If you have an OAE letter, please present it to me (by email) at your earliest convenience, so I can ensure that the course materials and staff support comply with your needs. I am always willing to do what it takes to support you, but I ask that you have your exam scheduling requests submitted *no later than 7 days prior to the exam*.
- **Class expenses:** All students should retain receipts for books and other course-related expenses, as these may be qualified educational expenses for tax purposes. If you are an undergraduate receiving financial aid, you may be eligible for additional financial aid for required books and course materials if these expenses exceed the aid amount in your award letter. For more information, review your award letter or visit the Student Budget website: <https://financialaid.stanford.edu/undergrad/budget/index.html>.