

Course Missive

What's CS22?

Suppose you have 9 identical donuts to distribute amongst a group of 4 friends, including you. You wonder to yourself: How many ways could we distribute these donuts amongst us? You could end up with all the donuts or none whatsoever or anywhere in between, and the same goes for each of your other friends.

Suppose we tell you the number of ways to distribute the donuts is exactly equal to the number of samples of 3 donuts you could take from a box of a dozen different donuts. Would you believe us? What would we need to do to convince you it's true?

In this class, we consider assertions about the world of discrete mathematics, and we think about how we can convince each other that these assertions are true or false. It's one thing to be told that an assertion is true or false: it's another to be convinced of it. Convincing other people that an assertion is true or false requires understanding *why it is*. Understanding *why* things are true in the world of discrete mathematics is therefore a major part of this class.

The math in this class has a very different flavor from math in high school like algebra or trigonometry. It is much less mechanical than that, much more creative than that, and much more about understanding than that.

In this class, our world will consist of Set Theory, Number Theory, Logic, Combinatorics, Probability, and Graph Theory. If you've never heard of these before, not to worry: **you're in exactly the right place**. This course assumes no prior experience with these topics, and we'll be building the ideas within these topics from the bottom-up.

What sort of skills will I develop in this course?

First and foremost, one skill you will develop is writing good proofs. What is a good proof? This is something we'll talk about a lot, but for now, we'll say this: a good proof for a claim makes *all members* of the 22 community understand *why* the claim is true.

Writing a good proof is a skill that requires:

- 1) Being able to communicate aloud with other people about mathematical ideas,

- 2) Having a toolbox of techniques you can draw from to approach a question,
- 3) Being fluent in reading and using different notations, and,
- 4) Being able to write arguments that engage a diversity of individuals.

Time

Getting the most out of this course will take up a lot of your time. Everyone is different, and we therefore can't tell you exactly how much time you'll end up spending on this course. However, we'll just say this: the critical reviews for this course are not exaggeratory. Please keep this in mind as you're planning out your schedule for this semester! Also, if you don't have the time to put in the work this semester, please remember that it's offered every spring, and we recommend taking it when you have more time on your hands.

Course Components

Lectures

Professor Littman will hold lectures on Mondays, Wednesdays, and Fridays from 1:00pm to 1:50pm in MacMillan Room 117. Course-related announcements may be made in class, and, while you are not required to attend, you are responsible for anything covered in lecture. We will release lecture slides, but they are meant to reinforce what you learned in lectures, not replace them. Another available resource to reinforce the material from lecture is the course textbook, which can be found (for free!) on our course website.

Homework

Homeworks are released every Thursday, and they are due the following Wednesday at 12:55pm on Gradescope. You get **three** late homework passes to be used at 3 times of your choosing throughout the semester. The late deadline is the next day, Thursday, at 12:55pm.

Note that these homework passes **do not stack**: that is, you cannot turn in an assignment more than one day late.

Any subsequent late homework will receive no credit. Extensions on assignments can only be requested by contacting Professor Littman at michael_littman@brown.edu; only he can grant extensions. He will want to see a medical or dean's note.

After the second homework, all submissions must be typed up using something called **LaTeX**. To give you some time to learn it, we will allow non-LaTeX submissions for the first two assignments. Starting from Homework 3, **any handwritten or non-LaTeXed submissions will receive no**

credit. Resources for learning LaTeX are available on the course website; note that you may hand-draw diagrams on your submission.

Exams

There will be two midterms and a final. The midterms will be held in the evenings on March 11th and April 15th. The final will be held on May 11th from 9am-12pm. If you have any conflicts with the exams, please email cs0220headtas@lists.brown.edu **at least one week before the scheduled exam time.**

Due to the COVID-19 outbreak, the second midterm and the final exam will be take-home and open-note, and the release/due dates are indicated on the course website. You must complete both assessments independently.

Hours

Hours will be held throughout the week (see the calendar on our course website for times and locations). If any changes are made to the hours schedule, these changes will be reflected in the calendar.

Like all writing, writing good proofs is a social act and you will benefit from communicating with other folks in the class. Hours provides a space that allows you to collaborate with other students in the class on homework problems with the guidance of a TA. More on collaboration can be found in our collaboration expectations document (<https://cs.brown.edu/courses/csci0220/static/files/documents/collab.pdf>). TAs are there to help you discover the answers to your questions and help you develop strategies that you can use to solve future problems. **While attending TA hours is not required in this course, it is often the key ingredient to succeeding.**

Due to the COVID-19 outbreak, all hours will happen remotely over Zoom. The links are posted on the TA Hours Google Calendar on the course website.

Recitation

Each week, there will be two identical recitation sessions (see the calendar for times and locations). At recitation, you'll have the chance to work with other students and TAs to hone your understanding of concepts learned in lecture, practice solving problems related to the homework, and explore any questions related to the course material that excite you. **You are strongly encouraged to attend, but they are not required.**

Piazza

When you have questions about an assignment or the course material in general, we encourage you to use Piazza! It's an online forum that allows you to ask questions either publicly to the class (including the TAs) or privately to just the TAs. More details about Piazza will be covered on Homework 0.

Grading

The following is an approximate guide to the grading breakdown:

<i>Type</i>	<i>Percentage</i>
Homework	45%
Midterm Exams (2)	30%
Final Exam	25%

Accommodations

Please inform Professor Littman early on in the term if you have a disability or other condition that might require accommodations or modification of any of the course procedures. If you would like to discuss the process for requesting accommodations, you can contact Student and Employee Accessibility Services at 401-863-9588 or seas@brown.edu.

Contacting Us

If you have any administrative questions about the course, you can email the TA list at cs0220tas@lists.brown.edu at any time. If you'd like for your question to be read only by the HTAs and the professor, or if you have thoughts on how to improve the class, you can reach us at cs0220headtas@lists.brown.edu. We are all passionate about ensuring that *all students* have a positive experience in this course, so your suggestions are absolutely welcome!