Math 184 – Enumerative Combinatorics (Winter 2022)

- Lecture times and location: TuTh 12-1:20PM via Zoom (will be recorded and posted to Canvas), link found in Canvas
- Textbook: Miklós Bóna, *A Walk Through Combinatorics*, 3ed. (other editions fine)
- Course website: http://mathweb.ucsd.edu/~ssam/184/
- Instructor: Steven Sam ssam@ucsd.edu
- Office hours: via Zoom, see Canvas for details
- Discord invite link: see Canvas

Course description

The main topics are: counting techniques, combinatorial identities, generating functions, and inclusion-exclusion. We will do mathematical proofs in this course, so the ability to read and write proofs is needed.

I plan to follow Bóna's book, Chapters 2–5, 7, 8 (but not in order). A schedule of topics will be posted on the website and updated as necessary. I will add a few things not in the book, so a copy of my own notes will be kept on the website.

Expectations

Lectures will closely follow my custom notes. You'll get more out of the lecture if you skim the notes ahead of time and prepare questions. You can find more examples and exercises in the textbook. You are encouraged to work on homework with others, but solutions must be written up individually.

Any students may attend the office hours without appointment. Office hours are an underused resource, so feel free to drop in even if you don't have questions about homework. If you need to meet with me at another time, please email me to schedule.

For organizing discussion, there is a Discord server.

All students are expected to use this server, and **announcements will be made there instead of via email**. Any questions about the course or the material should be posted there. Please do not email me about general topics: it is more efficient to have everything in one place. Also, please refrain from posting solutions to homework, but hints are fine.

If there are issues that cannot be discussed publicly, please email me.

Academic integrity

https://academicintegrity.ucsd.edu/

You are free to collaborate on homework, but the final writeup must be done individually. If you work with other students, please list their names on your assignment (this will not affect your score). Please refrain from looking up solutions or soliciting help online, I really would rather help you myself so that I know which topics are giving students trouble.

You may not work with others during exams.

Grading policy

You get the maximum of the following two grading schemes:

- Homework: 1/6
- Quizzes (×3): 1/6 each
- Final: 1/3

- Homework: 1/6
- Quizzes (best 2): 1/6 each
- Final: 1/2

I do not follow "standard" cutoffs for letter grades but will not be any stricter. So, for example, a 90% score will guarantee an A- or higher, but the actual cutoff for an A- might be lower depending on how the course goes.

Exams

There are 4 **in-person** exams: 3 quizzes and the final exam. Make sure that you have no conflicts during the following times:

Quizzes are during discussion section in Weeks 4 (**Jan. 24**), 7 (**Feb. 14**), 10 (**Mar. 7**).

The final exam is scheduled for **March 15 11:30AM - 2:29PM**, location TBD.

As of the time I write this, the first 2 weeks of the quarter are fully remote. **If the university extends this further to weeks that include quizzes**, then the corresponding quizzes will instead be held remotely during the lecture time the next day (Tuesday) 1-1:50PM (the time before will be a short review session).

Homework

Homework is due via Gradescope every Friday by 11:59PM except weeks with an exam and week 1. So there will be 6 assignments. No late homework will be accepted, but the lowest score is dropped.

Solutions are graded for clarity and correctness. Correctness is just as important as communicating clearly. So, when appropriate, explanations should be given in complete sentences.

How to do well in this course

You cannot learn just from listening to lectures or reading notes. The homework is designed to engage you with the material. So take the homework seriously. Start it early each week and ask questions. Most exam problems will be variations of homework problems, and so if you understand how to solve all of the homework, the exams will be straightforward. Most of the learning takes place by solving problems, so I strongly discourage looking for solutions online or copying from others: every time you do this, you cheat yourself out of learning.

The quarter goes by very quickly and the material builds on itself. As soon as you think you are falling behind, do something about it. We have office hours and Discord, so take advantage of the resources available to you.

Additional logistics

Students that need special accommodations should talk to me as soon as possible.