Math 180A: Introduction to Probability

Winter 2023

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Course Description

Math 180A is an introductory upper-division probability course for students who have taken calculus. It serves as a prerequisite for further courses in stochastic processes, statistics, and financial mathematics, including Math 180B/C, Math 181A/B, and Math 189. A list of topics covered in the course, together with a tentative lecture schedule, is posted on the course webpage.

Prerequisites

The prerequisite is calculus at the level of **Math 20C** or **MATH 31BH**. In addition, prior or concurrent enrollment in **Math 109** is strongly recommended. Students should be comfortable with topics from calculus including single and multiple integrals, the fundamental theorem of calculus, and sequences and series. If you are unsure about your level of preparation, I encourage you to reach out!

Note that Math 109 is a prerequisite for Math 180B, so if you plan to take Math 180B next quarter, it is important to complete Math 109 by the end of this quarter.

Textbook

There is no required textbook, but I recommend using at least one of these books as a reference:

- Lecture Notes for Introductory Probability by Janko Gravner at UC Davis

- *A First Course in Probability*, 8th Edition, by Sheldon Ross. Earlier (and presumably, later) editions are also fine.

Gravner's notes are more concise, and may be a good starting point (e.g., reading before lecture) or review resource. The Ross book is more comprehensive, and includes more examples, proofs, and some additional topics; it may be a better resource for more detailed study. There is a spreadsheet on the course webpage detailing which lecture topics correspond to which section in each book.

Homework

There will be weekly homework assignments, due on **Wednesdays** at 11:59pm Pacific Time, with the exception of Homework 0 (due **Fri, Jan. 13**). They will be posted on the course webpage, and submitted through Gradescope.

- Collaboration on homework is encouraged. However, you should think about the problems yourself before discussing them with others, and **you must write up your solutions by yourself and understand anything that you hand in.**

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- Do not look for solutions to the homework problems online or in other textbooks/sources. **In particular, the use of solution manuals, homework from previous quarters, and "homework help" resources like Chegg is not permitted.** If you accidentally find a solution to a homework problem in an outside source, you need to cite that source, and you still need to explain the solution in your own words.

- The 11:59 deadline was chosen to prevent confusion and accommodate a variety of schedules, but I encourage you to turn it in earlier! As a (very) small incentive, I'll send a "meme of the week" to everyone who submits their homework before the beginning of the lecture on the due date.

Quizzes and Exams

There will be two in-person midterm exams held in class on the following dates.

Fri, Feb 3	(Week 4)
Fri, Mar 3	(Week 8)

The final exam will be in-person on **Monday, Mar 20**, from **3-6pm**, location TBA.

For quizzes and the final exam:

- You may bring one 8.5 x 11 inch sheet of *handwritten* notes (double-sided).
- Calculators and other electronic devices are not allowed.
- Bring your student ID.

Grading

Your final numerical grade will automatically computed as the highest of the following options:

- **25%** Homework (drop 1), **20%** each Midterm, **35%** Final Exam
- **25%** Homework (drop 1), **30%** <u>best</u> Midterm, **45%** Final Exam

There are no makeup exams; this grading scheme is intended to accommodate emergencies that require missing a midterm exam (in which case, your grade will be computed using the second option).

Letter grade: your course grade will be determined by your numerical grade at the end of the quarter, and will be based on the following scale. This scale is guaranteed, but may be adjusted to be more generous; for example, if your cumulative average is 80, your final grade will be *at least* B-.

A+	A	A-	B+	B	B-	C+	C	C-
97	93	90	87	83	80	77	73	70

Regrades: homework and exams will be graded and returned on Gradescope. Regrade requests can be made using the built-in regrade request feature in Gradescope **during a specified 60-hour window of time**; no requests will be accepted afterward. You should submit a separate request for each problem in which you believe an error in grading was made, and explain clearly and politely why you think an error was made. Also, although we will correct errors in grading, we will not modify our grading rubric or negotiate about partial credit.

Miscellany

If you miss class: there is a rough schedule posted on the course webpage of what will be covered in each lecture, together with the corresponding sections of both books. If you need to miss a lecture for any reason, I recommend reading from either book. You are also encouraged to discuss what was covered in the lecture and ask questions of one of your classmates. So be sure to make a friend and get the contact information of a fellow student during the first week of classes!

If disaster strikes: in the event that the public health situation necessitates a return to remote learning (either temporarily or for the remainder of the quarter), I may make changes to the course, including to the length, format, and number of exams. In making such a decision, I would follow university guidance and the recommendation of the math department. In any event, we will try to give as much advance notice as possible.

Accommodations

Students requesting accommodations for this course due to a disability need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD). You should make arrangements in advance to discuss your accommodations with me **no later than the end of Week 2** (feel free to reach out even if you're still waiting for your AFA!). We will make every effort to arrange for whatever accommodations are recommended by the OSD.

Academic Integrity

UC San Diego's Policy on Integrity of Scholarship outlines the academic honesty expected of all students, and details the consequences for academic dishonesty. Your integrity has great value: always cultivate and protect it.

Typo Bounty

If you find an error on the syllabus, website, homework assignments, etc., let me know! You will receive a small prize, redeemable in office hours ☺