

Probability Theory  
MATH 407, Fall 2023, USC  
39629D: 10:00am  
Josh Swanson, Ph.D.

**Instructor and TA Information:**

Role	Name	Email	Office	Office Hours
Instructor	Josh Swanson	<a href="mailto:swansonj@usc.edu">swansonj@usc.edu</a>	KAP 438 D	W 12:00-1:30 pm
TA	Fan Yang	<a href="mailto:fyang399@usc.edu">fyang399@usc.edu</a>	<a href="#">Math Center</a>	<a href="#">See schedule</a>

**Course Content:** Probability spaces, discrete and continuous distributions, moments, characteristic functions, sequences of random variables, laws of large numbers, central limit theorem, special probability laws. The standard course content is the first 8 chapters of the textbook, which will be our starting point. I will include additional material on combinatorial probability and emphasize generating function methods throughout.

**Textbook:** *A First Course in Probability* (10th edition) by Sheldon Ross.

**Grading:** Your grade will consist of:

Lecture Participation	10%
Midterm	20%
Homework	30%
Final Exam	40%

There is no set translation from raw weighted grades to final letter grades. Instead, the course will be curved at the end of the semester to match typical score distributions for MATH 407. The median is likely to be a B, though it will be adjusted depending on overall class performance. To give you a sense for how you are doing during the semester, after the midterm you will get your class rank and a letter grade estimate.

**Lecture Participation:** To encourage engagement, a portion of your grade will come from lecture participation. This will typically take the form of brief group activities during MWF lecture, graded on completion. You may miss up to 20% of lecture participation points with no penalty to your grade (via  $\min(\text{raw} \cdot 100/80, 1)$ ), so you should not hesitate to stay home during the semester if necessary.

**Exams:** You are allowed one  $8.5 \times 11$  inch sheet of notes for each exam, front and back. You must create your note sheet yourself, though printing out your own work is acceptable. Calculators and all other electronic devices are not allowed. The final will be cumulative. You must be physically present for the exams. You cannot pass without taking the exams.

Midterm	Friday, October 6th, 2023	During lecture
Final	Monday, December 11th, 2023	8am-10am in lecture room

**Homework:** Since the vast majority of mathematical learning happens by doing rather than by passively listening, homework is a key portion of this class and is a substantial portion of your grade. You are strongly encouraged to *work together on homework* but you **must write up your solutions separately**. Homework will be posted on the course web site most weeks and will be due on Gradescope. See the calendar on Blackboard for the homework schedule. You may miss up to 10% of homework points with no penalty to your grade (via  $\min(\text{raw} \cdot 100/90, 1)$ ).

**Late Work and Absences:** You may ask your TA for a 1-2 day extension on homework once or twice during the semester for any reason. As noted above, you may automatically miss up to 10% of homework points and up to 20% of lecture participation points without penalty to your final grade, so you do not need to be explicitly excused for lecture absences unless you are out for more than a week. Lectures will not be recorded, however lecture notes will be posted on a Google Drive folder accessible from Blackboard.

If you have an emergency which prevents you from being able to physically take an exam (illness, death in the family, COVID-19 quarantine, etc.), contact me *as soon as possible* and we will work something out. If you miss the midterm for good reason, your final exam may be weighted more heavily to compensate.

**Exam Philosophy:** I put a lot of thought into grading. I believe strongly in difficult exams that test both your basic computational understanding of the material *and* your conceptual mastery. Consequently, my exams frequently have relatively low averages, often with no perfect scores, which can sometimes be a jolting experience for (particularly younger) students. The important thing to keep in mind is that your final grade will be curved. You will be assigned a reasonable final letter

grade which will be consistent with historical and contemporary norms for the course. Statistically, I am a slightly easy grader. From my experience teaching thousands of students, you have a roughly 99% chance of passing if you simply turn in every assignment, so focus on doing your best and have faith that grades will work themselves out.

**Academic Integrity:** You must follow the USC Student Conduct Code and act with academic integrity at all times. All of your submitted work must reflect your own understanding as the result of an honest effort and it must be written up separately in your own words. Copying from your fellow students or other sources is a serious violation. In particular, you may not use “tutoring” services which simply provide answers. Suspected violations will be reported to the Office of Academic Integrity.

**Accommodations:** It is important to me personally and the University broadly to provide reasonable accommodations for individuals with disabilities. Contact the Office of Student Accessibility Services (OSAS) *as early as possible* if you need accommodations.