

COURSE SYLLABUS

UC SANTA BARBARA

DEPARTMENT OF STATISTICS AND APPLIED PROBABILITY

PSTAT 182T: Tutorial in Actuarial Science

Instructor: Saat Mouti (saadmouti@pstat.ucsb.edu)

TA: Marie Borac (mborac@ucsb.edu)

Date: September 22, 2022

Office Hours: Fri 8:00-9:00 AM
Zoom

Class Hours: Mon 6:30-7:45 PM
Class Room: Buchanan Hall 1934

1 Course Description

Problem-solving sessions to prepare students for the actuarial examinations: Probability (Exam P) and Financial Mathematics (Exam FM).

The topic of the Tutorial will rotate from quarter to quarter. For the Fall 2022 quarter we will study Probability.

The syllabus has been aligned to the new SOA learning objectives, effective starting with the January 2023 administration of this exam.

2 Resources

Some of the SOA recommended materials will be provided in Gauchospace (GS).

3 Prerequisites

Prerequisites: PSTAT 120A. This class is not just another re-run of the theory, it is mostly hands-on problem solving.

4 Course Structure

1. A topic will be covered each week (see course schedule below). It is the student's responsibility to review the theory before class.
2. A brief summary of the week's material will be given by the TA during each session. Each class is followed by independent work by the students on a given problem set. Students will be required to submit their work to GS (Starting on week 2). To be able to complete the class assignments, the student is required to bring a device with internet connection (laptop, tablet, or smartphone)
3. Homework assignments will be posted each week. You are welcome to discuss the problem set with your classmates and during the TA's office hours.
4. A final exam, structured similarly to the test that the student will be taking, will be given at the end of the course.

On each type of assignment (except the final exam) the two lowest grades will be dropped. We are not interested in punishing you with the grade. We are interested in seeing progress and making sure you pass this exam!

5 Co-operation on Assignments

Since our goal is to improve problem solving skills co-operation is allowed, as long as it does not simply mean copying numeric calculations. To improve your problem solving skills, the homework will have to be written in the following format:

- Brief but meaningful justification of Calculation 1 (which formula applies and why)
- Calculation 1
- Brief but meaningful justification of Calculation 2
- Calculation 2
- etc. following the above pattern

Homeworks will be consistently graded so that 50% of the grade is the justification and 50% of the grade is correct numerical calculation.

We will not deduct points for similar justifications. If you have figured them out by collaborating it is okay, as long as they are correct and you understand what you did.

Note that providing only calculations is not going to earn a passing grade even if they are correct. We are totally firm on this and will not accept excuses.

6 Grading Policy

This is a pass/no pass class. The pass mark is 75%.

- 25% of your grade will be based on your work during sessions:
 - in-class quizzes (20%)
 - participation on Discord channel (30%)
 - active participation in group problem solving (50%)
- 20% of your grade will be determined by participation as follows:
 - Prepare questions from the review material and email to TA before each class. (25% of participation)
 - Present a solution to a homework problem to the whole class. Minimum one time per quarter. (25% of participation)
 - Attendance (50% of participation)
- 25% of your grade will be determined by the score on the MC final exam.

- 30% can be obtained by providing written full solutions to the Homework Assignments

7 Tentative Course Schedule

Week 1, Sep 18-Sep 24

Introduction, Resources, Diagnostic Test

Week 2, Sep 25-Oct 1

Ross: Review Chapters 1, 2, 3 before class

- Combinatorial Analysis
- Axioms of Probability
- Conditional Probability and Independence

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 1.

Homework Assignment 1.

Supplementary resource: Insurance Terminology.

Week 3, Oct 2-Oct 8

Ross: Review Chapter 4 (Discrete Random Variables), sections 4-1 through 4-7 before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 2.

Homework Assignment 2.

Week 4, Oct 9-Oct 15

Ross: Review Chapter 4 (Random Variables), sections 4-8 through 4-9 before class. Exclude the Zeta distribution (4.8.4).

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 3.

Homework Assignment 3.

Week 5, Oct 17-Oct 22

Ross: Review Chapter 5 (Continuous Random Variables), sections 5-1 through 5-5 before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 4.

Homework Assignment 4.

Week 6, Oct 23-Oct 29

Ross: Review Chapter 5 (Continuous Random Variables), section 5-6 (exclude Weibull and Cauchy) before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 5.

Homework Assignment 5.

Week 7, Oct 30-Nov 5

Ross: Review Chapter 6 (Jointly Distributed Random Variables), 6.1, 6.2, 6.3.3, 6.3.4, 6.4, 6.6 before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 6.

Homework Assignment 6.

Week 8, Nov 6-Nov 12

Ross: Review Chapter 7 (Properties of Expectation, Discrete Cases Only), 7.1, 7.4, 7.5, before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 7.

Homework Assignment 7.

Week 9, Nov 13-Nov 19

Ross: Review Chapter 8 (Limit Theorems), 8.1, 8.3, before class.

Prepare questions you have and upload them on GS. They are due each Sunday at 5:00 PM!

In-class Quiz 8.

Homework Assignment 8.

Week 10, Nov 24-Dec 3

Preparation for final exam.

Final Exam: TBD

8 Academic Integrity

Every student enrolled in this course must follow the UCSB Student Code of Conduct, and Academic Integrity Statement, available at judicialaffairs.sa.ucsb.edu and judicialaffairs.sa.ucsb.edu/CMSMedia/Documents/academicintegrityflyer.pdf. Students can collaborate and discuss concepts and problems, but final submission has to be individual work. Any student caught cheating will be penalized severely.