

University of Southern California
ISE 220 – Probability Concepts in Engineering

TTh 9:30-10:50 am – GFS 223

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Catalog Course Description:

Techniques for handling uncertainties in engineering design: discrete and continuous random variables; expectations, probability distributions and transformations of random variables; limit theorems; approximations and applications.

Text:

A First Course in Probability, by Sheldon Ross, Pearson, 10th edition (2019), ISBN: 9780134753683

Supporting Text book:

Statistics for Business and Economics, by Anderson D.R., D.J. Sweeney and T.A. Williams, Thompson/South-Western, 12th edition (2014), ISBN: 1-133-27453-6

Course Expectations and Policies:

Course Expectations: To ensure a cooperative learning environment, each student is expected to read the text before each class meeting time, and prepare to actively participate during class discussions, team-related activities, presentations and writings. Students are expected to engage in behaviors that enhance the learning environment. Our goal is to optimize the learning experience for all the students; therefore, disruptive behaviors such as not listening, texting or using electronic devices, etc. are prohibited and will not be tolerated.

Participation and Attendance Policy: It is expected that students will attend class regularly and participate in the class discussion throughout the semester. participation involves actively listening and volunteering answers to questions and moving the discussion along toward a shared understanding. Participation grade will be assigned at the end of the semester based on objective (attendance, contribution to class discussions, interaction with TA/Instructor inside and outside the classroom) and subjective (contributing meaningful questions/answers, illustrating comprehension of course material) assessment by the instructor.

Due Dates/Make up Work: Exams must be taken as scheduled. Assignments are due as scheduled. Make-ups will be allowed only if the student has contacted the professor before the due date, detailing a serious problem. There is no late submission for in-class exercises.

Academic Integrity: USC seeks to maintain an optimal learning environment. General Principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *SCampus*, The Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://usc.edu/dept/publications/SCAMPUS/gov/> Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review should there be any suspicion of academic dishonesty. The Review process can be found at: <http://usc.edu/student-affaris/SJACS/> Information on intellectual property at USC is available at: <http://usc.edu/academe/acsen/issues/ipr/index.html>.

Classroom Access: Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213)740-0776.

Electronic Device Policy: You are allowed to use laptop/tablets to access your textbook, retrieve course information, and take notes only and as long as it does not disrupt the class and students' participation. Please do not use devices for any purpose unrelated to the class or during class presentations as this may result in the confiscation of the device. Other electronic devices (e.g., cell phones, iPods, etc.) should be turned off/silenced and put away for the entire duration of the class.

Statement for Students with Disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday. Website and contact information for DSP http://sait.usc.edu/academicssupport/centerprograms/dsp/home_index.html (213)740-0776(Phone), (213)740-6948(TDD only), (213)740-8216(FAX), ability@usc.edu

Online communication policy: Our goal is to respond to emails and online communication as fast as possible. However, please allow at least 24 hours for us to respond. The TA and the instructor will be less available during the weekend and national and university holidays.

Grades:

The final course grade will be determined based on the following weights:

Exam 1	22.5 %
Exam 2	22.5 %
Final Exam.	25 %
Homework	20 %
Participation/in-class exercises.....	10 %

According to USC policy: “No student is allowed to retake a final examination or do extra work in a course after the semester has ended for purposes of improving his/her grade.” https://arr.usc.edu/forms/ARR_Grade_%20Handbook.pdf

Exams:

Exams consist of true/false, multiple choice, short answers and essay questions. If you cannot take an exam on the scheduled date and time, you must provide documents from a responsible party (doctor, court, police, etc.) and you must arrange to take the exam before the following class meeting. The final exam date/time is set USC and cannot be rescheduled.

Assignment Submission:

Homework descriptions will be posted on blackboard and assignments are due at the beginning of the class. You are encouraged to submit your assignments online. Electronic submission must be in MS Office formats.

NOTE:

Course materials and grades will be posted on Blackboard System. Please make sure that you have access to the blackboard and your **USC account** is up and running.

Due to administrative processes, this syllabus is subject to change. It is the student’s responsibility to verify with the instructor regarding any updates.

Tentative Course Outline¹:

Week of		Topics	Assignment Due	Book Chapter
01	Aug 26	Introduction and Logistics of the course Data and Probability		
02	Sep 2	Probability and Basic Principles of Counting		CH1
03	Sep 9	Sample Space, Events, Axioms of probability	Homework 1	CH2
04	Sep 16	Conditional Probability and Bayes' Theorem	Homework 2	CH3
05	Sep 23	<i>Exam Review</i> <u>September 26 – Exam 1</u>	Homework 3	
06	Sep 30	Random Variables, Discrete Distribution		CH4
07	Oct 7	Expected Value & Variance	Homework 4	CH4
08	Oct 14	Binomial Probability, Poisson Random Variable October 17 – Fall Recess – University Holiday		CH4
09	Oct 21	Continues Probability Distribution, expectation and variance	Homework 5	CH5
10	Oct 28	<i>Exam Review</i> <u>October 31 – Exam 2</u>		
11	Nov 4	Normal and Exponential Random Variables		CH5
12	Nov 11	Jointly Distributed Random Variables	Homework 6	CH6
13	Nov 18	Properties of Expectation, Conditional Expectation	Homework 7	CH7
14	Nov 25	<i>Review Session</i> November 28 – Thanksgiving – University Holiday		
15	Dec 2	Limit Theorems, Normal approximation to Binomial Final Review	Homework 8	CH8
Thursday, December 12		<u>Final Exam (11 am-1 pm)</u>² - Mandated by USC Schedule		

¹ Schedule may be revised to accommodate the content and pace of the class learning process. Due dates and case studies are subject to change.

² **Confirm the time and date of the exam on the USC website.**