

ISE 220: Probability Concepts in Engineering

Number of units: 03

Location and time: VHE 217, Tuesday/Thursday 8:00-9:20am

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Office hours: Monday 11am-12pm, GER 242B

Goal: The objective of the course is to introduce fundamental concepts of probability and reasoning under probabilistic models.

Textbook: Ross, S., A First Course in Probability, 9th edition, Pearson, 2015

Tentative Course Plan: (The exam dates may change)

- Week 1: (Aug 21 – Aug 23)
 - Probability, Counting Principles
- Week 2: (Aug 28 – Aug 30)
 - Sample Space, Events, Axioms of probability
- Week 3: (Sep 4 – Sep 6)
 - Equally likely outcomes
- Week 4: (Sep 11 – Sep 13)
 - Conditional Probability, Independent events, and Bayes formula
- Week 5: (Sep 18 – Sep 20)
 - Random variables, examples, probability mass function
- Week 6: (Sep 25 – Sep 27)
 - Expected value and variance
 - **First Midterm**

- Week 7: (Oct 2 – Oct 4)
 - Discrete random variable examples
- Week 8: (Oct 9 – Oct 11)
 - More examples on discrete random variables
- Week 9: (Oct 16 – Oct 18)
 - Continuous random variables, probability density function, expectation, variance
- Week 10: (Oct 23 – Oct 25)
 - Examples of continuous random variables
- Week 11: (Oct 30 – Nov 1)
 - Jointly distributed random variables, independent, sum of independent random variables
- Week 12: (Nov 6 – Nov 8)
 - **Second Midterm**
 - Conditional distributions
- Week 13: (Nov 13 – Nov 15)
 - Covariance, variance of sums, correlation
- Week 14: (Nov 20)
 - Properties of expectation, conditional expectation
- Week 15: (Nov 27 – Nov 29)
 - Inequalities and limit theorems

Course Requirement and Grading:

- First Midterm (20%)
- Second Midterm (20%)
- Final exam (30%)
- Homework assignments (20%)
- Participation (10%)

Homework assignments:

- All homework assignments are due by 4:30pm on the date indicated.
- Homework assignments must be submitted via Blackboard. Only one pdf file should be submitted for each homework assignment. You can submit latex pdf files or scanned images which are converted to pdf format.
- Late homework submissions are not accepted under any circumstances. Start your homework assignments early.
- You are encouraged to discuss homework assignments with other students. However, each student is required to submit his/her own personal work.

University policies:

- *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/academicsupport/centerprograms/dsp/home_index.html, (213) 740 – 0776n (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX), ability@usc.edu.
- *Statement on 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-affairs/SJACS/>. Information on intellectual property at USC is available at: <http://usc.edu/academe/acsen/issues/ipr/index.html>.
- *Emergency Preparedness/Course Continuity in a Crisis.* In case of emergency, when travel to campus is difficult, if not impossible, USC executive leadership will announce a digital way for instructors to teach students in their residence halls or homes using a combination of the Blackboard LMS (Learning Management System), teleconferencing, and other technologies. Instructors should be prepared to assign students a "Plan B" project that can be completed "at a distance". For additional information about maintaining your classes in an emergency, please access: <http://cst.usc.edu/services/emergencyprep.html>.