

SYLLABUS – EE 364: Fall 2026 (4 units)

Introduction to Probability and Statistics for EE/CS

Instructor:	Brandon Franzke	Office:	EEB 504B
Email:	franzke@usc.edu	Hours:	Wednesday: 13:00 - 14:00 Thursday: 14:00 - 16:00

This course introduces the main concepts of modern probability and statistics. This course focuses on **reasoning** with *probabilistic uncertainty*. The course depends primarily on lecture material. Attendance is mandatory.

Lecture	Tuesday, Thursday (section: 30480)	12:00 – 13:50
Discussion	Friday (section: 30779)	11:00 – 11:50

Enrollment is in-person ONLY. Attendance is mandatory to all lectures. Taping or recording lectures or discussions is strictly forbidden without the instructor's explicit written permission.

Course materials

NOTE: Texts are secondary to in-class lecture material.

Required: *Probability and Statistical Inference*, 10th edition. Robert Hogg, Elliot Tanis, and Dale Zimmerman. Pearson Education. 2023.

Recommended: *Probability, Statistics, and Random Processes for Electrical Engineering*, Leon-Garcia, A., Pearson, 2008.

Recommended: *Schaum's Outline of Probability, Random Variables, and Random Processes*, 4th edition. Hwei Hsu. McGraw-Hill Education. 2019.

“No AI” policy. The use of AI tools is strictly prohibited and considered a serious violation of academic integrity. This includes all artificial intelligence technologies, including but not limited to large language models, text generators, and AI-assisted writing software, for any aspect of coursework — be it research, outlining, drafting, editing, or proofreading. Any suspected use of AI will be thoroughly investigated. Violations may result in severe consequences, including course failure and referral to the Office of Student Judicial Affairs and Community Standards for further disciplinary action.

“No technology” policy. Personal electronics are prohibited during lecture and discussion. Phones must be silenced and put away for the entire session. Laptops must remain closed. Slides are posted to the course website so you do not need a device to follow along. You will be asked to put away any device out in violation of this policy. Repeat offenders will be asked to leave for the day. **Exception:** a tablet lying flat on the desk, used with a stylus for handwritten notes or annotating course materials. A propped tablet counts as a laptop. Approved OSAS accommodations for assistive technology are always honored — email your letter as early as possible.

Course Outline

week of		
1	25 Aug	Introduction to probability. Logic and sets. Probability axioms.
2	01 Sep	Independence. Conditional probability. Bayes' Theorem.
3	08 Sep	Combinatorics. Binomial and multinomial probability.
4	15 Sep	Discrete probability and mass functions. Poisson Theorem.
5	22 Sep	Midterm 1. Continuous probability densities.
6	29 Sep	Expectation, variance. Transformed random variables.
7	06 Oct	Multiple random variables.
	08 Oct	No class Thursday, Fall recess.
8	13 Oct	Covariance and correlation. Uncertainty principles. Multivariate normal.
9	20 Oct	Midterm 2. Laws of large numbers. Monte Carlo sampling.
10	27 Oct	Bayesian statistics and conjugacy. Maximum likelihood estimation.
11	03 Nov	Entropy. Mixtures. Transforms.
12	10 Nov	Sample mean and sample variance. Central limit theorem. Confidence intervals.
13	17 Nov	Midterm 3. Statistical hypothesis testing.
14	24 Nov	Optimal estimation and least squares.
	26 Nov	No class Thursday, Thanksgiving Break.
15	01 Dec	Linear regression and multivariable regression. Review.
	15 Dec	Final Exam, 11:00 – 13:00.

Grading Procedure

Class grade depends on the best two out of three midterms and the final exam. Homework problems are optional and worth at most 10 points of extra credit. But you should work these and many more problems than these to master the material.

Midterm Exams. There are three midterm exams. 60 minutes each. 25 points per exam. Cumulative. **Closed book with no notes sheet.** You are expected to bring a non-graphing scientific calculator. The midterm exam score sums your 2 best exam scores — **dropping the exam with the lowest score.** No make-up exams. Missed exams earn 0 points.

Final Exam. 50 Points. Cumulative. The final exam is **closed book with no notes sheet.** You are expected to bring a non-graphing scientific calculator.

Homework Problems. Homework problems are checked but not graded. They count at most as 10 points if all homework sets are turned in and accurately worked. Homeworks are due by the posted due date. Late homework will not be accepted.

You may discuss homework problems with classmates but each student must submit their own original work. Turning in identical homework sets counts as cheating. Cheating warrants an F in the course.

Course Grade

A if 90.00 - 100 points, **B** if 80.00 - 89.99 points, **C** if 70.00 - 79.99 points, **D** if 60.00 - 69.99 points, **F** if 0 - 59.99 points. ("+" and "-" at $\approx 1.5\%$ of grade boundary).

Cheating

Cheating is not tolerated on homework or exams. Penalty ranges from F on exam to F in course to recommended expulsion.

Academic Accommodations

Any student requesting academic accommodations based on a disability is required to register with the Office of Student Accessibility Services (OSAS) each semester. A letter of verification for approved accommodations can be obtained from OSAS. Please be sure the letter is delivered to me as early in the semester as possible. OSAS is located in GFS 120 and is open 08:30 - 17:00, Monday through Friday. The phone number for DSP is (213) 740-0776.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of brightspace, teleconferencing, and other technology.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Civil Rights Compliance* <http://ocrc.usc.edu> or to the *Department of Public Safety* <https://dps.usc.edu/contact/feedback/>. This is important for the safety of the whole USC community. Another member of the university community - such as a friend, classmate, advisor, or faculty member - can help initiate the report, or can initiate the report on behalf of another person.

Academic Conduct

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the *USC Student Handbook*. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the *Office of Academic Integrity*.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university itself, such as suspension or even expulsion.

For more information about academic integrity see the student handbook <https://policy.usc.edu/studenthandbook/>, or the Office of Academic Integrity's website <https://academicintegrity.usc.edu/>, and university policies on Research and Scholarship Misconduct <https://policy.usc.edu/research-and-scholarship-misconduct/>.