

Syllabus

- Lecture: TTh 11:00–12:30, BUR 208
- Text: “Introduction to Probability,” by D. P. Bertsekas and J. N. Tsitsiklis, 2nd edition, Athena Scientific, 2008.
- Instructor: Ari Arapostathis — Office: ENS 348B — Phone: 471-3265
e-mail: ari@ece.utexas.edu
(if you are mailing from a domain other than “utexas.edu” your message might get blocked—use instead the address ari_ut@me.com)
- Office Hours: TTh 9:30–10:30
- Teaching Assistant: Derya Malak — e-mail: deryamalak@utexas.edu
Office ENS 138; Office Hours: MW 9:30–11:30, TTh 2:00–3:00
- Use of *Blackboard*: In this class I use Blackboard—a Web-based course management system with password-protected access at <http://courses.utexas.edu>—to distribute course materials, to communicate and collaborate online, to post grades, to submit assignments, and to give you online quizzes and surveys. You can find support in using Blackboard at the ITS Help Desk at 475-9400, Monday through Friday, 8:00 a.m. to 6:00 p.m., so plan accordingly.
- Prerequisites: Electrical Engineering 313 with a grade of at least C-.
- Course Description: The catalogue description of the course is as follows: Probability, random variables, statistics, and random processes, including counting, independence, conditioning, expectation, density functions, distributions, law of large numbers, central limit theorem, confidence intervals, hypothesis testing, statistical estimation, stationary processes, Markov chains, and ergodicity. We’ll follow the following schedule:
- Introduction: sets, models of probability, conditional probability and the Bayes rule, independence and counting (permutations and combinations) (4 lectures)
 - Discrete Random Variables: probability mass function, functions of random variables, expectation, variance, joint distribution, conditioning (4 lectures)
 - Continuous Random Variables: cdf, pdf, normal r.v., conditioning, functions of r.v.s, generation of random numbers, multiple r.v.s and the joint distribution (4 lectures)
 - Further Topics: transforms and the MGF, sums of r.v.s, conditional expectation, tower rule, covariance and correlation, MMSE, LMSE, bivariate normal distribution (3 lectures)

- Random Processes: introduction, stationarity, ergodicity, autocorrelation, power spectral density, random processes through linear systems, the Poisson process (3 lectures)
- Limit Theorems: the Chebyshev and Markov inequalities, the weak law of large numbers, the central limit theorem (2 lectures)
- Markov chains and ergodicity (4 lectures)
- Topics in Statistics: confidence intervals, point estimators unbiased and consistent estimators, hypothesis testing, the MAP (Maximum A-Posteriori) and ML (Maximum Likelihood) criterion (2 lectures)

- Assignments, Exams:
- There will be 10 homework assignments consisting of 5–8 problems. Due to limited resources for grading, only 5 of the assigned problems will be graded per homework, for a maximum total score of 10 points per problem.
 - The assignment has to be turned in during class, on the day it is due, before the lecture starts. There will be a 20% penalty on homework that is turned in late on the same day. Homework that is not turned in on the day due won't be accepted. However, I am going to drop the two homework assignments carrying the smallest score from the calculation of your homework grade.
 - Two 1 1/2-hour midterm exams (in class) on Tuesday, March 4 and Tuesday, April 22 and a final examination on Monday, May 12, 2:00–5:00 pm (subject to verification with the registrar). Exams are *closed book*. However, you are allowed to have an 8.5×11 sheet of notes (both sides), which must bear your name in capital letters at the top of the first page and which you must hand in together with the exam.
 - No make-up midterms (instead, if a legitimate reason for missing the midterm is present, I will modify the grading weighting to 30%, 25%, 45%).

Grading Policy: Homework: 25% — Midterms: 40% — Final: 35%.

Evaluation: Course evaluation during the last week of classes.

Feedback Statement: During this course I will be asking you to give me feedback on your learning in informal as well as formal ways, including through anonymous surveys about how my teaching strategies are helping or hindering your learning. It's very important for me to know your reaction to what we're doing in class, so I encourage you to respond to these surveys, ensuring that together we can create an environment effective for teaching and learning.

University Notices and Policies

University of Texas Honor Code. The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Documented Disability Statement. The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or <http://www.utexas.edu/diversity/ddce/ssd>

Use of E-Mail for Official Correspondence to Students. E-mail is recognized as an official mode of university correspondence; therefore, you are responsible for reading your e-mail for university and course-related information and announcements. You are responsible to keep the university informed about changes to your e-mail address. You should check your e-mail regularly and frequently. I recommend daily, but at minimum twice a week to stay current with university-related communications, some of which may be time-critical. You can find UT Austin's policies and instructions for updating your e-mail address at <http://www.utexas.edu/its/policies/emailnotify.php>

Religious Holy Days. By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, I will give you an opportunity to complete the missed work within a reasonable time after the absence.

Behavior Concerns Advice Line (BCAL). If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>