EECS 126: Probability and Random Processes
Fall 2007

Practical Information

Lectures:	Tues/Thurs from 3:30–5 pm Location: 247 Cory Hall
Course webpage:	`http://inst.eecs.berkeley.edu/~ee126/`
Instructor	Name: Martin Wainwright *Email:* wainwrig AT SYMBOL eecs.berkeley.edu Office: 263 Cory Hall Office hours: Tuesday 5—6pm, 258 Cory Hall Thursday 12:30–1:30pm, 258 Cory Hall
TAs:	Name: Matt Johnson Email: mattjohnson AT SYMBOL berkeley.edu Office hours: To be announced Name: Zile Wei Email: zile AT SYMBOL eecs.berkeley.edu Office hours: To be announced
Textbook:	*Introduction to Probability*, by D. Bertsekas and J. Tsitsiklis. Available at the campus book store. In addition to attending lectures and discussions, doing problems and reading the textbook outside of class will be an integral part of the learning process.
Pre-requisites:	EECS 20, and MATH 53/54 (multivariate calculus; linear algebra) or equivalent.
Grading:	Homeworks (15%); Two midterms (20% each); and one final exam (45%). All exams are cumulative in nature, meaning that any topic covered in lecture, discussion or homework up to that date can be tested
Midterm exams:	Midterm #1: Thurs. October 4 Midterm #2: Thurs. November 15.

Note: All of the exams (both midterms, and final) are *strictly non-collaborative* in nature. Any form of cheating will not be tolerated as per this Department's Academic Dishonesty Policy; see `http://www.eecs.berkeley.edu/Policies/acad.dis.shtml`.

Homeworks: Problem sets will be posted by Thursday evening on the class webpage (roughly one per week), and will be due on Fridays *before* 6pm in the EE 126 box in 240 Cory Hall (Student Lounge). Late homeworks *will not* be accepted. If they choose, after attempting the problems on an individual basis, students can discuss homework assignments in groups of at most three. However, each student must write up his/her own solutions individually, and must explicitly name any collaborators at the top of the homework.

Course outline

This course is a 4-unit course that provides an introduction to the basics of probability and random processes. This material is central to many fields in electrical engineering and computer science, including statistical signal processing, communications, control theory, networking, machine learning, artificial intelligence, and algorithms. It builds on the foundation of EE 20, and provides necessary background for higher-level courses, work and research. The material in EE 120 is complementary to the material covered in this course.

- basics of probability (Chapter 1): sets, probabilistic models, sample spaces, conditioning, Bayes' rule, independence etc. (Time: approx. two weeks)
- discrete random variables (Chapter 2): definitions, examples, mass functions, expectation, mean, variance etc. (Time: approx. two weeks)
- general random variables (Chapter 3): continuous variables, density functions, conditioning, normal variables etc. (Time: approx. two weeks)
- further topics (Chapter 4): transforms, convolution, conditional expectation, least squares, bivariate normal (Time: approx. two to three weeks)
- Bernoulli and Poisson processes (Chapter 5): definitions, examples, properties (Time: approx. one to two weeks)
- Markov chains (Chapter 6): discrete time chains; classification; long-run behavior; absorption. (Time: approx. one to two weeks)
- Limits of random variables (Chapter 7): inequalities, law of large numbers, central limit theory (Time: approx. one to two weeks)

You should be aware that the material and learning process is cumulative in nature, in that later lectures will build upon the results of previous lectures and homeworks. For this reason, it is particularly important that you keep up with the class (i.e., by reviewing your lecture notes, doing the assigned reading, working on the homeworks etc.). Past experience shows that some hard work early on to learn the foundations well pays dividends later in the semester!