Probability for Electrical and Computer Engineers

This is a first course in probability emphasizing topics of special interest to electrical and computer engineers.

Textbooks:  
An Introduction to Applied Probability  
by Richard A. Roberts  
Schaum’s Outline of Theory and Problems of Probability, Random Variables, and Random Processes  
by Hwei Hsu

Prerequisite: APSC-171*.

Instructors:  
Section A: G. Zhu  
Section B: S. Kraut

Evaluation: Max of A or B:  
Scoring A: Homework 20%, Midterm 20%, Final 60%  
Scoring B: Homework 20%, Final 80%

Topics:  
- Basics Concepts of Probability Theory: sample spaces and outcomes; Boolean algebra and events; counting probability; axioms of probability; conditional probability; law of total probability and Bayes rule; independent events; sequences of independent trials.  
- Random Variables: definition; cumulative distribution functions; probability mass functions; probability density functions; important discrete and continuous random variables; uniform, Bernoulli, binomial, exponential, geometric, and Gaussian distributions; functions of a random variable; expectation; variance; moments and characteristic functions.  
- Multiple Random Variables: joint and marginal distributions; independence of two or more random variables; conditional probability and conditional expectation; expected value of functions of random variables; correlation and covariance.  
- Sums of Random Variables and Long-Term Averages: sums of random variables; convolution theorem and characteristic functions; central limit theorem; laws of large numbers.