EE-270 Stochastic Processes  
Syllabus - Fall 2010  
August 24, 2010

Course Description:
Probability theory, random variables, and stochastic processes. Response of linear systems to random inputs. Applications in electrical engineering.

Course Prerequisite:
EE 171 Signals Systems and STAT 151.

Textbook
Probability, Random Variables and Stochastic Processes by A. Papoulis & S.U.Pillai

Course Objectives
To provide a thorough understanding of probability theory and stochastic processes so that students can solve theoretical and applied probability problems with confidence. I expect to cover all topics up to and including Markov processes.

Topics covered:
Note: The course will generally follow the course text book. However material from other texts will frequently be utilized.

1. Basics
2. Independence and Bernoulli Trials
3. Random Variables
5. Function of a Random Variable
6. Mean, Variance, Moments and Characteristic Functions
7. Two Random Variables
8. One Function of Two Random Variables
9. Two Functions of Two Random Variables
10. Joint Moments and Joint Characteristic Functions
11. Conditional Density Functions and Conditional Expected Values
12. Principles of Parameter Estimation
13. The Weak Law and the Strong Law of Large numbers
14. Stochastic Processes
15. Spectrum Estimation
16. Mean Square Estimation (Filtering & Prediction, Kalman Filters)
17. Entropy
18. Markov Chains
19. Markov Processes

Reference Textbooks

1. Modern Probability Theory and Its Applications, by Emanuel Parzen


3. Probability and Random Processes with Applications to Signal Processing