Department of Electrical & Computer Engineering

Probability and Random Processes

Course No: 14:332:321 Fall 2001

Class Hours: Mon & Thu 2nd Period (9:50-11:10 AM)

DESCRIPTION : Probability and its axioms, conditional probability, independence, counting, random variables and distributions, functions of random variables, expectations, order statistics, central limit theorem, random processes and their characterization, autocorrelation and crosscorrelation

INSTRUCTOR: Narayan Mandayam (WINLAB Room 119, 445-0876, narayan@winlab.rutgers.edu)

Office Hours : Thursday 11:30 AM - 12:30 PM

TEXT : *Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers* by Yates and Goodman, Wiley, 1999

Prerequisites: 14:332:322 or 50:750:234

Topical Course Outline:

1. Experiments, models, probability axioms
2. Conditional probability, independence, Bayes Theorem
3. Counting Methods, repeated trials
4. Discrete Random Variables, probability mass function (PMF), cumulative distribution function (CDF), expectation
5. Functions of one discrete random variable, conditional probability
6. Multiple discrete random variables, joint PMF, independence, covariance
7. Continuous random variables, probability density function (PDF), CDF, expectation
8. Functions of continuous random variables
9. Multiple continuous random variables, conditional probability, independence, covariance, maximum of many random variables
10. Sums of random variables, convolution, moment generating function
11. Large numbers, limit theorems
12. Statistical inference, hypothesis testing and mean square estimation
13. Random processes, stationarity
14. Random processes, autocorrelation, linear filtering, power spectral density

Course Requirements:
- Quizzes in Recitation (10%)
- Exam 1 (October 11, 2001) (20%)
- Exam 2 (November 15, 2001) (20%)
- Final (50%)

Weekly Homework Assignments: Homework Grades will be used to determine final grade in borderline cases