

**EE 605**  
**Probability and Stochastic Processes I**  
**Fall 2008**

**Textbook:** Sheldon Ross, *A First Course in Probability, Seventh Edition*, Prentice Hall, 2006.

**1. Combinatorial Analysis**

Basic Principles, Permutations, Combinations, Binomial and Multinomial Coefficients

**2. Axioms of Probability**

Sample Spaces, Events, DeMorgan's Laws, Axioms and Basic Propositions, Examples, Principle of Inclusion and Exclusion.

**3. Conditional Probability and Independence**

Definition and Properties, Theorem on Total Probability, Bayes' Theorem, Independence, Applications

**4-5. Discrete Random Variables**

Cumulative Distribution Function (CDF), Properties of CDF'S, probability mass function (pmf), Expected Value, Expected Value of a function of a random variable, moments, Variance, Bernoulli Random Variable, Binomial Random Variable, Poisson Random Variable, Geometric Random Variable, Negative Binomial and Hypergeometric Random Variables, Moment Generating Functions, Probability Generating Functions

**6,7,9. Continuous Random Variables**

Cumulative Distribution Function (CDF), Properties of CDF'S, probability density function (pdf), Expected Value, Variance Uniform Random Variable, Normal Random Variable, Exponential Random Variable, Memoryless property, Gamma/Erlangian Random Variables, Cauchy Distribution, CDF and pdf of  $Y = g(X)$ , Moment Generating Function, Normal approximation to the Binomial Distribution and the DeMoivre-Laplace Limit Theorem

**8. Midterm**

**Professor Heffes**

