

## **MA 4533 – Probability and Random Processes**

Textbook: Roy D. Yates and David J. Goodman, Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 2<sup>nd</sup> Edition, Wiley 2005

### **I. Introduction**

Random Experiments  
Probability Axioms and Rules  
Conditional Probability  
Bayes Theorem

### **II. Random Variables and Probability Distributions**

Discrete Random Variables and Density Functions  
Continuous Random Variables and Density Functions  
Joint Probability Distributions  
Binomial Distribution  
Poisson Distribution  
Normal Distribution

### **III. Mathematical Expectations**

Concepts of Moments  
Mean  
Variance  
Covariance  
Correlation Coefficient  
Linear Combinations of Random Variables

### **IV. Asymptotic Theory**

Law of Large Numbers  
Central Limit Theorem

### **V. Statistical Description of Data**

Frequency and Histogram  
Sample Mean  
Sample Variance

### **VI. Basic Stochastic Processes**

Concept of Random Processes  
Correlation Functions  
Spectral Density and White Noise  
Basic Time-Domain Analysis of Linear Systems  
Basic Frequency-Domain Analysis of Linear Systems