Course Syllabus	**EECS 3300 – Probabilistic Methods in Engineering**
Credits & Contact Hours	3 credit hours & three 50-minute lecture contact hours
Instructor's Name	Dr. Ezzatollah Salari
Textbook	Alberto Leon-Garcia, Probability, Statistics, and Random Processes for Electrical Engineering, Third Edition, 2008.
Course Information	Techniques for modeling and analysis of random phenomena in EECS, including communication, control, and computer Systems. Distribution, density, and characteristic functions. Computer generation. Function of random variables. Prerequisite: EECS 3210 Required for EE majors
Specific Goals-Student Learning Objectives (SLOs)	The student will be able to 1. Characterize probability models using probability mass function and probability density function for discrete and continuous random variables. 2. Describe conditional and independent events and conditional random variables. 3. Evaluate the mean and variance of different distributions 4. Calculate the cumulative distribution functions for both discrete and continuous random variables. 5. Characterize functions of random variables 6. Characterize jointly multiple discrete and continuous random variables 7. Use computer software to generate probability distribution functions
Topics	1. Basic Concepts of Probability Theory: a. Sample space, events, set operation, b. Axioms of probability, c. Counting Methods, d. Conditional probability and Bayes' rule, e. Independent events, and Binomial and Geometric probability laws. 2. Discrete and Continuous Random Variables: a. Bernoulli, Binomial, Geometric Random Variables, b. Probability density function, c. Some important continuous random variables,

    d. Cumulative distribution function,
    e. Functions of random variable,
    f. Expected value and variance of a random variable
3. Multiple Random Variables:
    a. Joint/conditional densities,
    b. Statistical independence,
    c. Functions of several random variables,
    d. Jointly Gaussian random variables
4. Sum of Random Variables:
    a. Mean and Variance of sums of random variables.