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**Probability for Electrical and Computer
Engineers**

STAT-356*

This is a first course in probability emphasizing topics of special interest to electrical and computer engineers.

Textbooks: *An Introduction to Applied Probability*

by Richard A. Roberts

*Schaum's Outline of Theory and Problems of Probability, Random Variables,
and Random Processes*

by Hwei Hsu

Prerequisite: APSC-171*.

Instructors: Section A: G. Zhu

Section B: S. Kraut

Evaluation: Max of A or B:

Scoring A: Homework 20%, Midterm 20%, Final 60%

Scoring B: Homework 20%, Final 80%

Topics:

- *Basics Concepts of Probability Theory:* sample spaces and outcomes; Boolean algebra and events; counting probability; axioms of probability; conditional probability; law of total probability and Bayes rule; independent events; sequences of independent trials.
- *Random Variables:* definition; cumulative distribution functions; probability mass functions; probability density functions; important discrete and continuous random variables; uniform, Bernoulli, binomial, exponential, geometric, and Gaussian distributions; functions of a random variable; expectation; variance; moments and characteristic functions.
- *Multiple Random Variables:* joint and marginal distributions; independence of two or more random variables; conditional probability and conditional expectation; expected value of functions of random variables; correlation and covariance.
- *Sums of Random Variables and Long-Term Averages:* sums of random variables; convolution theorem and characteristic functions; central limit theorem; laws of large numbers.