(—; 3-0-1) **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: *Probability and Random Processes for Electrical Engineering*, 2nd Edition by A. Leon-Garcia

Prerequisite: APSC-171*.

Exclusion: STAT-251*.

Instructor: F. Behnamfar

Evaluation: Max of A or B:
Scoring A: Homework 10%, Midterm 30%, Final 60%
Scoring B: Homework 10%, Final 90%

Topics:

- *Basics Concepts of Probability Theory:* axioms of probability; conditional probability; law of total probability and Bayes rule; independence of events; sequential experiments; uniform, Bernoulli, binomial and geometric distributions.
- *Random Variables:* definition; cumulative distribution functions; probability density functions; important discrete and continuous random variables; Poisson distribution; uniform, exponential and Gaussian distributions; functions of a random variable; expectation; variance; Markov and Chebyshev inequalities; moments and characteristic functions.
- *Multiple Random Variables:* vector random variables; pairs of random variables; joint and marginal distributions; independence of two or more random variables; conditional probability and conditional expectation; functions of two random variables; expected value of functions of random variables; correlation and covariance.
- *Sums of Random Variables and Long-Term Averages:* sums of random variables; laws of large numbers; central limit theorem.