



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Probability and Random Variables

ECE 6001

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Probability, random variables, and random vectors for analysis and research in electrical engineering. Distribution functions, characteristic functions, functions of random variables and vectors, Markov chains.

Prerequisites and Co-requisites:

Prereq: Grad standing.

Course Goals / Objectives:

- Learn the mathematical foundations and tools of probability theory
 - Learn probability spaces, univariate and multivariate distribution and density functions, expectation and conditional expectation, characteristic functions, functions of random variables and vectors, and Markov chains
 - Learn the basics of estimation theory, including least-square estimation and Bayesian decision theory, and Markov chains
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Course Topics:

- Preliminaries, Axioms, Probability Spaces
 - Bayes' Rule and all its component concepts
 - Random Variables, Distributions, and Densities
 - Conditional and Joint Distributions and Densities
 - Functions of Random Variables
 - Expectations
 - Random Vectors, Covariance Matrices
 - Least Square Estimation
 - Bayesian Decision Theory
 - Bernoulli Process
 - Poisson Process
 - Markov Chains
 - Weak Law of Large Numbers
 - Central Limit Theorem
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Designation:

Elective