E2 202 Aug 3:0

Random Processes

Instructor

Parimal Parag
Email: parimal@iisc.ac.in

Teaching Assistant

Email:

Department: ECE

Course Time:

Lecture venue:

Detailed Course Page: http://ece.iisc.ernet.in/~parimal/random.html

Announcements

Brief description of the course

Basic mathematical modeling is at the heart of engineering. In both electrical and computer engineering,

uncertainty can be modeled by appropriate probabilistic objects. This fundamental course will introduce first

year graduate students in engineering to basics of probability theory, random variables, and random sequences.

Prerequisites

Syllabus

Probability Theory: axioms, continuity of probability, independence, conditional probability.

Random variables: distribution, transformation, expectation.

Random vectors: joint distribution, conditional distribution, expectation, Gaussian random vectors.

Convergence of random sequences: Borel-Cantelli Lemma, laws of large numbers, central limit theorem,

Chernoff bound.

Discrete time random processes: ergodicity, strong ergodic theorem, definition, stationarity, correlation functions in linear systems, power spectral density.

Structured random processes: Bernoulli processes, independent increment processes, discrete time Markov chains, recurrence analysis, Foster's theorem, reversible Markov chains, the Poisson process.

Course outcomes

Students would have basic understanding of probability theory, random variables, random vectors, and discrete valued random processes.

Grading policy

20% Assignments

15% Mid-term 1

15% Mid-term 2

50% Final

Assignments

Resources