E1222 Aug. 3:0

Stochastic Models and Applications

Instructor

P.S. sastry
Email: sastry@iisc.ac.in

Teaching Assistant

Email:

Department: EE

Course Time: Tue, Thu, 11:00 - 12:30

Lecture venue: B306 EE dept

Detailed Course Page:

Announcements

Brief description of the course

This course is a postgraduate course on probability and stochastic processes. It is assumed that the students are familiar with multivariable calculus and that they have some idea of elementary probability (e.g. as part of an undergraduate course on mathematics). The course would be useful for first year Masters or Ph.D. students. It is a hardcore course for the MTech program in Systems Engineering. The course is a mathematics course and the students are encouraged to solve a large number of problems. There would be about 5-6 (optional) tutorial classes, which would be held outside the regular class times, to help students learn to solve problems.

Prerequisites

There are no formal prerequisites. However, students should be familiar with multivariate calculus.

Syllabus

Probability spaces, conditional probability, independence, random variables, distribution functions, multiple random variables and joint distributions, functions of random variables, moments, characteristic functions and moment generating functions, conditional expectation, sequences of random variables and convergence concepts, laws of large numbers, central limit theorem, stochastic processes, Markov chains, Poisson process.

Course outcomes

Students would acquire a rigorous understanding of basic concepts in probability theory. They would learn some important concepts concerning multiple random variables such as Bayes rule for random variables, conditional expectation and its uses etc. They would also learn stochastic processes, including Markov Chains and Poisson Processes. The course would provide the background needed to study topics such as Machine Learning, Adaptive Signal Processing, Estimation Theory etc.

Grading policy

50% for mid-term tests and 50% for final exam. (Normally three midterm tests are conducted).

Assignments

Resources

Ross S M,Introduction to Probability Models, academic Press and Hardcourt Asia,

P.G.Hoel, S.C.Port and C.J.Stone, Introduction to Probability Theory,

P.G.Hoel, S.C.Port and C.J.Stone, Introduction to Stochastic Processes,

V.K.Rohatgi, Introduction to Probability Theory and Mathematical Statistics, Wiley