

MATHEMATICS (MATH)

MATH-627 Probability and Stochastic Modeling 4 Credits

Prerequisites: None

This is a calculus-based introduction to probability theory and stochastic modeling. Students will learn fundamentals of probability, discrete and continuous random variables, expectation, independence, Bayes' rule, important distributions and probability models, joint distributions, conditional distributions, distributions of functions of random variables, moment generating functions, central limit theorem, laws of large numbers. Markov chains and Markov Chain Monte Carlo methods will be discussed. Programming language R will be introduced and used throughout the course.

Lecture: 4, Lab 0, Other 0

MATH-637 Statistical Inference and Modeling 4 Credits

Prerequisites: MATH-627

A study of statistics including point and interval estimation, consistency, efficiency, and sufficiency, Minimum Variance Unbiased Estimators, Uniformly Most Powerful tests, likelihood ratio tests, goodness of fit tests, an introduction to non-parametric methods Linear models, including regression analysis and Analysis of Variance are included. Bayesian methods are introduced. Programming language R will be used throughout the course.

Lecture: 4, Lab 0, Other 0

MATH-650 Statistical Methods for Data Science 4 Credits

Prerequisites: None

This is a course on statistical methods for data science with an emphasis on statistical learning. It provides a set of tools for modeling and understanding big and complex data. This course concentrates on applications and practical execution of the methods rather than on mathematical details. Areas discussed include various regression models, classification methods, resampling, non-linear techniques, tree-based analysis, support vector machines, and unsupervised learning. Programming language R will be introduced and used throughout the course.

Lecture: 4, Lab 0, Other 0