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MATH 323: INTRODUCTION TO PROBABILITY

Spring semester 1997

1992-93 Bulletin description:

An introductory course in probability, with applications to the physical sciences and engineering. Topics will include: Discrete and continuous random variables, conditional probability and independent events, generating functions, special discrete and continuous random variables, laws of large numbers and the central limit theorem. Emphasis will be placed on computations with the standard distributions of probability theory and classical applications of them.

Textbook: Introduction to Probability 2nd Edition by Richard L. Scheaffer, PWS-Kent

Prerequisites: Math 226

Topics:

1. Probability: formal definition, counting rules, conditional probability and independence
2. Discrete Probability Distributions: random variables, expected values, the Bernoulli, binomial, geometric, negative binomial, Poisson and hypergeometric distributions, moment-generating and probability-generating functions
3. Continuous Probability Distributions: continuous random variables, the uniform, exponential, gamma, normal, beta and Weibull distributions
4. Multivariate Probability Distributions: bivariate and marginal distributions, independent random variables, multinomial distribution, conditional expectations, queues
5. Functions of Random Variables: methods of distribution functions, transformations and conditioning, order statistics, probability-generating functions, arrival times for the Poisson process, infinite-server queue
6. Approximations to Probability Distributions - Limit Theorems: convergence in probability and distribution, central limit theorem, renewal theory (reliability)