

San Francisco State University
Department of Mathematics
Course Syllabus

MATH 340
Probability and Statistics I

Prerequisites

[MATH 228](#) with a grade of C or better (may be taken concurrently).

Bulletin Description

Basic concepts of probability and statistics. Data analysis, probability distributions, confidence intervals, and hypothesis.

Course Objectives

Probability spaces, elementary combinatorics, random variables, independence, expected values, moment generating functions, selected probability distributions, limit theorems and applications. Student should have a thorough understanding of

- Axioms of Probability
- Conditional Probability
- Independence
- Combinatorics
- Random Variables, Probability Density Functions, Cumulative Distribution Functions
- Multivariate Distributions
- Limit Theorems

Evaluation of Students

Instructors' assessment is usually based on homework, quizzes, computer assignments, in class exams, and in class final.

Course Outline

- Introduction to Probability
- Definition of probability space; Axiomatic development, derivation of laws of probability, conditional probability, independence, Bayes's Theorem (3 weeks)

- Random Variables; discrete and continuous random variables, discrete and continuous probability densities, cumulative distribution function (2 weeks)
- Some Special Distributions; Discrete Uniform, Bernoulli, Binomial, Hypergeometric, Geometric, Negative Binomial, Poisson, Multinomial, Uniform, Normal, Gamma, Exponential(3 weeks)
- Mathematics Expectation; Expected value and its properties, variance and its properties, moment generating function and its properties (2 week)
- Multivariate Distributions; Joint densities, marginal densities, transformation of random variables, order statistics, conditional distributions, independence of random variables, conditional expectation(2 weeks)
- Limit Theorems; Chebychev's Inequality, Law of Large Numbers, Central Limit theorem.(2 weeks)

Textbooks and Software

Mathematical Statistics and Its Applications, Larson and Marx, Prentice Hall
 Probability and Statistics Inference, Hogg and Tanis, Prentice Hall

Submitted by:

Date: July, 1, 2003