

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS (*Tentative*)

MATH 413/513 *Mathematical Statistics I*

Objectives: To learn how to construct and use probability models. In particular, to learn how probability models support the theory of statistical inference.

Intended for: Students in Mathematics or Physical Sciences.

Prerequisite: MATH 213, MATH 214 and MATH 310.

Text: "Introduction to Probability and Mathematical Statistics," by Bain and Engelhardt;
The Duxbury Advanced Series in Statistics and Decision Sciences, 2nd edition, 1992,
ISBN 0-534-92930-3.

Introduction to Probability

Weeks

Notation and terminology, definition of probability, properties of probability; counting techniques; 3.5

Conditional probability; independence; Bayes theorem

Random Variables and Distributions

Discrete distributions, continuous distributions, properties of expected value moment generating function

2.0

Special Distributions

Binomial, hypergeometric, Poisson, negative binomial, normal, gamma, beta distributions
3.0

Joint Distributions

Joint discrete and continuous distributions, independent random variables, marginal and conditional 3.5 distributions, expected value, correlation and conditional distribution

Limiting distributions

Central Limit Theorem, Sketch of proof

1.0

Functions of Random Variables (optional)

The CDF technique, transformation of random variables, sums of random variables

Tests

1.0

14.0

EVALUATION

Boardwork/Homework	10%
Quizzes	15%
Tests	45%
Final Exam	30%

*Graduate students will be assigned special homework/test problems or projects.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.