

**OFFICIAL SYLLABUS**  
**STAT 480a - INTRODUCTION TO MATHEMATICAL**  
**STATISTICS**

(Adopted - Fall 2003)

**Catalog Description.** Probability models, distributions of random variables, generating functions. Prerequisite: Math 250.

**Textbook:** Introduction to Probability and Mathematical Statistics, 2nd edition, by Bain and Engelhardt

**Course Outline and Topics**

Chapter 1 Probability

- 1.2 Notation and Terminology
- 1.3 Definition of Probability
- 1.4 Some Properties of Probability
- 1.5 Conditional Probability
- 1.6 Counting Techniques

Chapter 2 Random Variables and Their Distributions

- 2.1 Introduction
- 2.2 Discrete Random Variables
- 2.3 Continuous Random Variables
- 2.4 Some Properties of Expected Values
- 2.5 Moment Generating Functions

Chapter 3 Special Probability Distributions

- 3.2 Special Discrete Distributions
- 3.3 Special Continuous Distributions
- 3.4 Location and Scale Parameters

Chapter 4 Joint Distributions

- 4.2 Joint Discrete distributions
- 4.3 Joint Continuous Distributions
- 4.5 Conditional Distributions
- 4.6 Random Samples

Chapter 5 Properties of Random Variables

- 5.2 Properties of Expected Values
- 5.3 Correlation
- 5.4 Conditional Expectation
- 5.5 Joint Moment Generating Functions

Chapter 6 Functions of Random Variables

- 6.2 The CDF technique
- 6.3 Transformation Methods
- 6.4 Sum of Random Variables
- 6.5 Order Statistics

**Any instructor should cover all of the material specified, additional sections are optional.**