



PROBABILITY & STATISTICS

21:640:327 (3 credits)

COURSE DESCRIPTION:

An introduction to the mathematical field of Probability and Statistics. Designed largely for STEM majors, as well as students seeking a more advanced insight to related material. [Students interested in a general Statistics course should consider 21:640:211 (Statistics I).]

PREREQUISITE:

Successful completion with a grade of “C” or better in 21:640:135 (Calculus I) or 21:640:119 (Basic Calculus) or 21:640:155 (Honors Calculus).

TEXTBOOK:

“Probability and Statistics for Engineers and Scientists” (4th edition), by Hayter, published by Cengage.

DEPARTMENT WEB SITE: <http://www.ncas.rutgers.edu/math>

THIS COURSE COVERS THE FOLLOWING CHAPTERS AND SECTIONS:

Chapter 1: Probability Theory

- 1.1 Probabilities
- 1.2 Events
- 1.3 Combinations of Events
- 1.4 Conditional Probability
- 1.5 Probabilities of Event Intersections
- 1.6 Posterior Probabilities

Chapter 2: Random Variables

- 2.1 Discrete Random Variables
- 2.2 Continuous Random Variables
- 2.3 The Expectation of a Random Variable
- 2.4 The Variance of a Random Variable
- 2.6 Combinations and Functions of Random Variables

Chapter 3: Discrete Probability Distributions

- 3.1 The Binomial Distribution
- 3.3 The Hypergeometric Distribution

Chapter 5: The Normal Distribution

- 5.1 Probability Calculations via the Normal Distribution
- 5.2 Linear Combinations of Normal Random Variables
- 5.3 Approximating Distributions with the Normal Distributions (Coverage of section 5.3.2 “The Central Limit Theorem” only)

Chapter 7: Statistical Estimation and Sampling Distributions

7.1 Point Estimates

7.2 Properties of Point Estimates

7.3 Sampling Distributions

Chapter 8: Inferences on a Population Mean

8.1 Confidence Intervals

8.2 Hypothesis Testing

Chapter 9: Comparing Two Population Means

9.3 Analysis of Independent Samples

Chapter 10: Discrete Data Analysis

10.1 Inferences on a Population Proportion

10.2 Comparing Two Population Proportions

10.3 Goodness of Fit Tests for 1-Way Contingency Tables

10.4 Testing for Independence in 2-Way Contingency Tables

Chapter 12: Simple Linear Regression and Correlation

12.1 The Simple Linear Regression Model

12.2 Fitting the Regression Line

12.3 Inferences on the Slope Parameter

Department of Mathematics & Computer Science

Smith Hall 216, 101 Warren Street, Newark, New Jersey 07102

Phone: (973) 353-1004 Fax: (973) 353-5270