MATH 2342
Statistical Methods and Probability

The textbook for 2004-2005 is *Introduction to Probability and Statistics* by W. Mendenhall, R. Beaver, and B. Beaver (Duxbury Press, 2003, 11th Edition). Students will learn to use graphing calculators and SPSS software. A final statistical analysis using SPSS will be required.

Ch. 0 Introduction to Statistics

Ch. 1 Describing Data with Graphs
1.1 Variables and Data
1.2 Types of Variables
1.3 Graphs for Categorical Data
1.4 Graphs for Quantitative Data
1.5 Relative Frequency Histograms

Ch. 2 Describing Data with Numerical Measures
2.1 Describing a Set of Data with Numerical Measures
2.2 Measures of Center
2.3 Measures of Variability
2.4 Chebychev's Theorem and the Empirical Rule
2.6 Measures of Relative Standing
2.7 The Box Plot

Ch. 4 Probability and Probability Distributions
4.1 The Role of Probability in Statistics
4.2 Events and the Sample Space
4.3 Calculating Probabilities using Simple Events
4.4 Counting Rules
4.5 Event Relations (Unions, Intersections, Complements)
4.6 Conditional Probability and Independence
4.7 Bayes' Rule
4.8 Discrete Random Variables and Their Probability Distributions

Ch. 5 Useful Discrete Distributions
5.1 Introduction
5.2 The Binomial Probability Distribution
5.3 The Poisson Probability Distribution
5.4 The Hypergeometric Distribution

Ch. 6 The Normal Distribution
6.1 Probability Distributions for Continuous Random Variables
6.2 The Normal Probability Distribution
6.3 Tabulated Areas of the Normal Probability Distribution
6.4 The Normal Approximation to Binomial Probabilities

Ch. 7 Sampling Distributions

7.3 Statistics and Sampling Distributions
7.4 The Central Limit Theorem
7.5 The Sampling Distribution of the Sample Mean
7.6 The Sampling Distribution of the Sample Proportion

Ch. 8 Large-Sample Estimation

8.2 Statistical Inference
8.3 Types of Estimators
8.4 Point Estimators
8.5 Confidence Intervals for the Population Mean and Proportion
8.6 Estimating the Difference between Two Population Means
8.7 Estimating the Difference between Two Population Proportions

Ch. 9 Large-Sample Tests of Hypotheses

9.2 A Statistical Test of Hypothesis
9.3 A Large-Sample Test about a Population Mean
9.4 A Large-Sample Test of Hypothesis for the Difference between Two Population Means
9.5 A Large-Sample Test of Hypothesis for a Binomial Proportion
9.6 A Large-Sample Test of Hypothesis for the Difference between Two Binomial Proportions

Ch. 10 Inference from Small Samples

10.3 Small-Sample Inferences Concerning a Population Mean
10.4 Small-Sample Inferences for the Difference between Two Population Means
10.6 Inferences Concerning a Population Variance

Ch. 12 Linear Regression and Correlation

12.3 The Method of Least Squares
12.4 An Analysis of Variance for Linear Regression
12.5 Testing the Usefulness of the Linear Regression Model
12.7 Estimation and Prediction Using the Fitted Line
12.8 Correlation Analysis

Ch. 13 Multiple Regression Analysis

13.3 The Multiple Regression Model
13.4 A Multiple Regression Analysis