University of Houston
Mathematics Department
MATH 2311
Introduction to Probability and Statistics

Text: *Basic Statistics: An Inferential Approach,* Dietrich and Kerns. This textbook will be used for all sections (on-line and lecture sections). On-line sections should view **www.math.uh.edu/~hdecell** for particulars relating to the on-line section of Math 2311. All sections should view **http://www.uh.edu/webct** **for general Web CT information.**

Availability: Textbook is available on-line at no cost to students. Students using the on-line version of the textbook should download (free) **Adobe Acrobat Reader** from: **http://www.adobe.com/products/acrobat/readermain.html** in order to open the .pdf textbook files.

Hardcopy: A hard copy of the textbook is also available for $24.84 (tax included) from the University Copy Center located in the University Center. **Request Packet #32**

Prerequisite: Math 1310 (College Algebra) or Math 1311

Notes: May not apply toward a degree in Mathematics. Students with prior credit for Math 3338 or Math 3339 may not enroll or receive credit for Math 2311.

Course Description: Probability, correct probabilistic reasoning, distributions, graphical and descriptive methods, sampling, estimation, hypotheses, statistical inference.

Course Content: **USING NUMBERS TO DESCRIBE DATA**

Introduction: The Qualifying Exam for Registered Nurses
3.1 Measures and Central Tendency
3.2 Measures of Variability
3.3 Measures of Relative Standing
3.4 Using Numerical Measures to Describe Data Sets
3.5 Using Numbers to Make Inferences

PROBABILITY: A MEASURE OF RELIABILITY

4.1 Experiments and Sample Spaces

4.2 Events and Probability
4.4 Compound Events and Complements
4.5 Conditional Probability and Independence
Chapter Summary

INTRODUCTION TO SAMPLING DISTRIBUTIONS

Introduction: The Blind Taste Test
5.1 Statistics and Sampling Distributions
5.2 The Mean of a Sampling Distribution
5.3 The Variability of a Sampling Distribution
5.4 The Binomial Experiment

THE CENTRAL LIMIT THEOREM AND THE NORMAL DISTRIBUTION

6.1 The Central Limit Theorem
6.2 Calculating Probabilities for the Sample Mean

INFERENCES ABOUT ONE POPULATION

Introduction: A Gallup Report
7.1 The Elements of a Test of a Hypothesis
7.2 A Large Sample Test of Hypothesis about a Population Mean, μ
7.4 A Large Sample Confidence Interval for a Population Mean, μ
7.5 Small Sample Inferences about a Population Mean, μ
7.6 Large Sample Inferences About a Proportion, π
7.7 Selecting the Sample Size
7.8 Inferences About a Population Variance, σ^2
Chapter Summary

INFERENCES COMPARING TWO POPULATIONS

Introduction: Comparing City Living and Country Living
8.1 Independent and Dependent Samples
8.2 Large Sample Inferences About $\mu_1 - \mu_2$, the Difference between Two Population Means: Independent Samples
8.3 Small Sample Inferences About $\mu_1 - \mu_2$, the Difference Between Two

Population Means: Independent Samples

8.4 Inferences About $\mu_1 - \mu_2$, the Difference Between Two Populatio n Means: Dependent samples

8.5 Large–Sample Inferences About $\pi_1 - \pi_2$, the Difference Between Two Population Proportions: Independent Samples

8.6 Selecting the Sample Sizes

8.7 Comparing Two Population Variances σ_1^2 and σ_2^2: Independent Samples

Chapter Summary

LEAST SQUARES: A STRAIGHT LINE RELATIONSHIP

Introduction: Analyzing Crime Rates

9.1 Exploratory Data Analysis: The Scatterplot

The Equation of a Straight Line

Fitting the Model: The Method of Least Squares