INTRODUCTION TO APPLIED PROBABILITY AND STATISTICS

MATH 1530

Course Description:

An elementary introduction to the basic concepts of probability, descriptive statistics, and statistical inference, including point estimation, confidence intervals, and hypotheses testing.
3 credits

Prerequisites:

ACT Math sub score at least 19, Math SAT at least 460, or Math SAT2016 at least 500 within last 2 years; Accuplacer or COMPASS score at least 3 within last 2 years; or MATH 1000 with C- or better within last 2 years; or MATH 1530 within last 2 years

Major topics:

1) Introduction to Statistics
    a. Statistical and Critical Thinking
    b. Types of Data
    c. Collecting Sample Data

2) Summarizing and Graphing Data
    a. Frequency Distributions
    b. Histograms
    c. Graphs that Enlighten and Graphs that Deceive

3) Statistics for Describing, Exploring, and Comparing Data
    a. Measures of Center
    b. Measures of Variation
    c. Measures of Relative Standing and Boxplots

4) Probability
    a. Basic Concepts of Probability
    b. Addition Rule
    c. Multiplication Rule: Basics
    d. Multiplication Rule: Complements and Conditional Probability
    e. Counting
    f. Probabilities through Simulations
    g. Bayes' Theorem

5) Discrete Probability Distributions
    a. Probability Distributions
    b. Binomial Probability Distributions
    c. Parameters for Binomial Distributions

6) Normal Probability Distributions
   a. The Standard Normal Distribution
   b. Applications of Normal Distribution
   c. Sampling Distributions and Estimators
   d. The Central Limit Theorem
   e. Assessing Normality
   f. Normal as Approximation to Binomial

7) Estimates and Sample Sizes
   a. Estimating a Population Proportion
   b. Estimating a Population Mean
   c. Estimating a Population Standard Deviation or Variance

8) Hypothesis Testing
   a. Basics of Hypothesis Testing
   b. Testing a Claim about a Proportion
   c. Testing a Claim about a Mean
   d. Testing a Claim about a Standard Deviation or Variance

9) Inferences from Two Samples
   a. Two Proportions

10) Correlation

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<u>**Textbooks**</u>**:**

Required: Essentials Of Statistics Pkg'd W/Mystatlab, Triola Pkg

Optional: Triola, Mario F. *Essentials of Statistics, 5th ed*. London: Pearson, 2014.

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