Course Title: AP Statistics

Course #: 1465-1466

Course Description: Students learn the four major themes of outlined by the College Board for AP Statistics: Exploratory data analysis, planning a study, anticipating patterns, and statistical inference. Motivated math students may take this course concurrently with Pre-Calculus or AP Calculus. Students are encouraged to take the AP Statistics Exam in May.

This course is ideal for students who will be going on to college and majoring in humanities, social sciences, psychology, etc. If a student is planning on majoring in a science, engineering, or in a math field, it is necessary to have at least Pre-Calculus completed prior to graduation. Students are strongly encouraged to take the AP Exam in May.

UC/CSU Approval: “c” approved

Grade Level: 10-12

Estimated Homework Per Week: 1.5 - 3 Hours per week

Prerequisite: Completion of Algebra 2 with a grade of “B” or higher OR completion of Algebra 2/Trig Honors, Precalculus, Pre-Calculus Honors, Calculus, AP Calculus AB, or AP Calculus BC, with a grade of “C” or higher.

Recommended Prerequisite Skills: Students enrolling into A.P. Statistics should...
  ● Think and process information at an honors and/or A.P. level.
  ● Reason quantitatively and be able to set-up and solve word problems.
  ● Read at a high level to process information provided in paragraph form.
  ● Write effectively to support and validate a claim.
  ● Understand slope and intercept of linear relations.
  ● Be able to use their graphing calculators to graph functions and calculate zeros.

Course Grade Scale:
  ● Homework = 15%
  ● Mid-Chapter Quizzes = 25%
  ● Chapter Tests = 40%
  ● Semester Final Exam = 20%
Major Assessments/Units/Topics:  A.P. Statistics is comprised of 4 Major Themes of Study -  
The course will be arranged into the following units/chapters:

A. Exploratory Data Analysis  
1. Organizing Quantitative Data with Number and Graphs  
   a. Graphs - bar graphs, pie graphs, dotplots, stemplots, histograms, and boxplots  
   b. Statistics - median, mean, range, standard deviation, Interquartile Range  
   c. Describing and comparing distributions including outlier calculations  
   Quiz mid-way through this unit and a chapter test at the end

2. Density Curves and the Normal Distribution  
   a. Measure of relative position - percentiles and z-scores  
   b. Concept of a density curve as a way to summarize a distribution  
   c. The Normal Distribution  
   Quiz mid-way through this unit and a chapter test at the end

3. Correlation and Regression  
   a. Scatterplots and correlation coefficients  
   b. Least-squares regression equations  
   c. Analyzing Residuals, interpreting r-squared, and the standard error of the line.  
   Quiz mid-way through this unit and a chapter test at the end

B. Planning a Study  
1. Designing a Survey  
   a. Effective and ineffective sampling methods  
   b. Challenges to gathering accurate sample data  

2. Designing an Experiment  
   a. Completely Randomized Designs  
   b. Blocking Strategies and Minimizing Confounding  
   Quiz mid-way through this unit and a chapter test at the end

C. Probability  
1. Probability Theory  
   a. Addition and Multiplication Rules  
   b. Complement Rule  
   c. Conditional Probability and Baye’s Theorem  
   Quiz mid-way through this unit and a chapter test at the end

2. Random Variables  
   a. Mean and Standard Deviation of Discrete Random Variables  
   b. Rules for Means and Variances when combining multiple random variables  
   c. The Binomial random variable  
   Quiz mid-way through this unit and a chapter test at the end
3. Sampling Distributions
   a. Sampling distributions of the sample proportion
   b. Sampling distribution of the sample mean and the Central Limit Theorem

Quiz mid-way through this unit and a chapter test at the end

D. Statistical Inference
1. Confidence Intervals
   a. One proportion confidence interval for a proportion
   b. One sample confidence interval for a mean

Quiz at the end of this unit

2. Hypothesis Testing
   a. One proportion Z-Test on a proportion
   b. One sample t-Test on a mean

Quiz on this unit and a test on Units 1 and 2 of Statistical Inference

3. Comparing Two Populations
   a. Comparing two proportions with a two proportion z confidence interval and a two Proportions
   b. Comparing two means with a two sample t-interval and a two sample t-test

Quiz at the end of this unit

4. Analyzing Distributions of Categorical Data
   a. Chi-Square test for Goodness of Fit
   b. Chi-Square test for Homogeneity and Independence

Quiz at the end of this unit and a test over topics 3 and 4 of this unit