KAP/AP STATS
Course Syllabus

The primary goal of the Cleveland Metropolitan School District is to become a premier school district in the United States of AmericA

KAP/AP STATISTICS 2014-15

SYLLABUS

Instructor: Timothy M. Hogan/ (216) 229-0070,
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Rooms: 369

Method of Evaluation: Your grade will be based on the point system. Points will be given for tests, quizzes, class work, homework, bell work and workbooks.

Attendance: Your success will depend largely upon your attendance. If you are absent, it is your responsibility to cover all material and complete all missed assignments.

Grading scale:

- A ------ 93% To 100%
- B ------ 85% TO 92%
- C ------ 75% TO 84%
- D ------ 65% TO 74%
- F ------- 0% to 64%

TEXTBOOK

- Peck, Olsen and Devore. *Introduction to Statistics and Data Analysis*, third edition. Belmont, CA: Brooks/Cole, 2009.

TECHNOLOGY

- All students will have a TI-Nspire to use in the classroom and on the AP Statistics Exam. The calculator will be used daily in the classroom. Emphasis will be placed on the Calculator Explorations that are in the textbook.
- Applets from the book resources and/or the internet will be used.

COURSE OUTLINE

CHAPTER 1: The Role of Statistics and the Data Analysis Process (7 days)

- Three Reasons to Study Statistics
- The Nature and Role of Variability
- Statistics and the Data Analysis Process
- Types of Data and Some Simple Graphical Displays
- Activity – Head Sizes

CHAPTER 2: Collecting Data Sensibly (10 days)

- Statistical Studies: Observation and Experimentation
- Sampling
- Simple Comparative Experiments
- More on Experimental Design
- Activity – McDonald's 100 Billion Burgers

CHAPTER 3: Graphical Methods for Describing Data (9 days)

- Comparative Bar Charts and Pie Charts
- Stem-and-Leaf Displays
- Frequency Distributions and Histograms
- Displaying Bivariate Numerical Data

CHAPTER 4: Numerical Methods for Describing Data (9 days)

- Describing the Center of a Data Set
- Describing Variability in a Data Set
- Summarizing A Data Set: Boxplots
- Interpreting Center and Variability: Chebyshev's Rule, the Empire Rule and *z* Scores
- Activity – Airline Passenger Weights

CHAPTER 5: SUMMARIZING BIVARIATE DATA (10 days)

- Correlation
- Linear Regression
- Assessing the Fit of a Line
- Nonlinear Relationships and Transformations
- Activity -- Age and Flexibility

CHAPTER 6: PROBABILITY (12 days)

- Chance Experiments and Events
- Definition of Probability
- Basic Properties of Probability
- Conditional Probability
- Independence
- General Probability Rules
- Estimating Probabilities Empirically Using Simulation
- Activity – Hot Hand

CHAPTER 7: RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS (15 days)

- Random Variables
- Probability Distributions for Discrete Random Variables
- Probability Distributions for Continuous Random Variables
- Mean and Standard Deviation of a Random Variable
- Binomial and Geometric Distributions
- Normal Distributions

CHAPTER 8: SAMPLING VARIABILITY AND DISTRIBUTIONS (8 days)

- Sampling Variability
- Sampling Distribution of a Sample Mean
- Sampling Distribution of a Sample Proportion

CHAPTER 9: ESTIMATION USING A SINGLE SAMPLE (12 days)

- Point Estimation
- Large-Sample Confidence Interval for a Population Proportion
- Confidence Interval for a Population Mean
- Activity—Verifying Signature

CHAPTER 10: HYPOTHESIS TESTING USING A SINGLE SAMPLE (8 days)

- Hypotheses and Test Procedures
- Errors in Hypotheses Testing
- Large –Sample Hypothesis Tests for a Population Mean
- Power and Probability of a Type II Error

CHAPTER 11: COMPARING TWO POPULATIONS OR TREATMENTS (7 days)

- Inferences Concerning the Difference Between Two Populations or Treatment Means Using Independent Samples and Paired Samples
- Large-Sample Inferences Concerning a Difference Between Two Population or Treatment Proportions
- Activity—Thinking About Data Collection

CHAPTER 12: ANALYSIS OF CATEGORICAL DATA AND GOODNESS-OF FIT TESTS (8 days)

- Chi-Square Test
- Tests for Homogeneity and Independence in a Two-way Table
- Activity – Color and Perceived Taste
- Activity – Pick a Number

CHAPTER 13: SIMPLE LINEAR REGRESSION AND CORRELATION: INFERENTIAL METHODS (9 days)

- Simple Linear Regression Model
- Inferences About the Slope of the Population Regression Line, of the Estimated Regression Line and Population Correlation Coefficient
- Checking Model Adequacy
- Activity – Are "Tall" Women from Big Families

REVIEW THROUGHOUT THE YEAR FOR THE AP EXAM (7 days)

- Study Island
- 5 Steps to a 5 Workbook
- Use the Internet for Practice Tests and Problems
- Review old AP exams

AP Exam in May (1 day)

POST AP EXAM (15 days)

- Multiple Regression Analysis
- Guest Speaker(s)
- Summary of two statistically related articles (individual and small group)
- Final Exam preparation/ review

DATA COLLECTION PROJECT (5 days)

PROJECT: Students will collect data, do a statistical analysis of the data, do a graphical representation and make an oral presentation of their project.

PROPOSAL: The proposal must describe the data that will be collected, how it will be collected (minimum sample size is 50) and how it will be graphically displayed.

WRITTEN REPORT: The report should include a title and have the following parts clearly labeled.

- Introduction: Why was your topic chosen and what was data collected?
- Methodology: Describe how the data was collected and how it was analyzed.
- Results: Present the data in a graphical manner (tables can also be used), so that conclusions can easily be made. Make sure that all labels are clearly visible.
- Conclusions: Draw conclusions from your data. Describe any difficulties that arose while you were collecting and analyzing the data. What could you have done to prevent these problems and did they influence your data or your analysis.

POSTER: The poster (graph and/ or tables) should accurately reflect your data and be easy to understand by anyone that reviews it. You may include significant pictures or even picture of your data being collected.

ORAL PRESENTATION: The presentation must be about 5 minutes in length. All members must equally participate. The poster can be used as a visual aid. Be prepared for questions after your presentation.