

Mrs. Schreckengost

Period 4 Room 260

AP Statistics

Wheaton HS Math Office: 217 Phone: 301-929-2069

Email: Ashley_M_Schreckengost@mcpsmd.org

Expectations

- Positive – Respect yourself and our classroom. Follow school rules. Disruptions will not be tolerated. Passes to lockers, nurse and the bathroom will be given only in emergencies.
- Prompt – Make it a point to attend class on time. If you are absent, it is your responsibility to make up any missed work. All make-up work will be kept in a binder in the classroom where it can be easily retrieved. The assignment must be turned in the day after you return, unless you make arrangements with me.
- Prepared – Have all the necessary materials in class daily. This includes but is not limited to a **MATH ONLY** notebook/binder, pencil, calculator (TI 83 or 84), and your textbook. Other supplies such as colored pencils and graph paper may be needed at times.
- Productive – You will be evaluated on how well you meet the course objectives. It is important that all assignments be completed and turned in on time.
- Question – Speak up in class! Ask and answer questions. If you need additional assistance, see me for extra help.
- Quality – Do your best at all times. Never give up!

Grading

50% Summative – Unit Tests, big quizzes

40% Formative – Quizzes, Daily quizzes, AP problems, collected assignments, projects

10% Homework – Checked daily for completeness. Each assignment is worth 5pts. Late assignments may get 3 pts if they are turned in **before the date of the test on that unit.**

*All tests are announced in advance. If you are absent the day of an announced assessment, you must arrange a time, outside of class, to make up the assessment. Unannounced quizzes may not be made up unless you have an excused absence.

*There are **NO Summative RETAKES** in the course.

*You may choose to retake **ONE** designated formative assessment per quarter. The retake must occur within 1 week of the return of the assessment. If you are absent the day of an assessment, you forfeit the right to a retake since you have had more time to study.

*Once a test for a unit has been completed, no make-up work for that unit will be given out or accepted. This is the **final deadline** for any make-up or missing work.

* There is a new attendance policy and it will be followed in this course. Five unexcused absences will result in an automatic E for the course. You can appeal, but it will be at my discretion if I overturn the grade.

*An unexcused absence will result in a zero for the assignment that day. In addition unexcused tardies will result in a zero for the warm-up/activity given during that time period.

*This is an AP course, and I expect AP level work from you.

*If I see it, I will take it. This applies to cell phones, pagers, headphones, calculators used for games, and any other inappropriate material for school.

AP EXAM: Wednesday May 16 @12pm

If you are in this class you are expected to take the AP Exam!

Philosophy

Students who take my AP Statistics course will receive a challenging, enlightening and purposeful course. The course emphasizes the broad topics and statistics and is aimed at making the students better thinker so they will be able to draw connections between all aspects of statistics and between statistics and what they encounter daily. Students are required to be able to write and verbalize their thoughts using appropriate vocabulary and sound conclusions. The TI83 graphing calculator is used to help students visualize graphs, analyze data, compute values and perform statistical tests.

Outline of Topics

Fall Semester

- Week 1 Introduction to Statistics Activity: Differences between categorical and quantitative data
- Week 2-3 Exploring Data.
Graphical displays of univariate data including boxplots, stemplots, dotplots, histograms, frequency tables, cumulative frequency tables. Explore measures of spread, center and shape. Calculating summary data such as mean, median, mode, range, interquaterile range, standard deviation and outliers
Comparison of groups of data and making decisions based on graphical displays.
Project: Finding graphs in a newspaper and critiquing. Students must use appropriate statistical language in their descriptions.
- Week 4-5 Normal Distribution
Properties of the normal distribution and the standard normal distribution. Explore the effects of different standard deviations and linear transformations of data.
Standardizing data with the Z-score formula to compare different sets of data.
Normal quartile plots to determine if transforming data gives a linear set of data.
- Week 6-8 Sampling, Experimental Design, and Randomness
Explore different ways to collect survey data and discuss bias in each method
Using the random number table.
Discuss experimental design, blocking, confounding and lurking variables
Students will design and carry out their own survey questionnaires.
Project: Students must find a newspaper article related to sampling or experimental design and critique the development. These articles are then presented to the class. This project stresses the importance of statistics in the real world and gets students to start using the vocabulary they have been learning.
- Week 9-10 Probability
Go over the basic probability rules and Venn Diagrams.
Simulations as a mean to solving probability problems.
- Week 11-12 Random Variables and Sampling Distributions
Simulations of probability distributions
Finding expected values and standard deviations of probability distributions and means and standard deviations of sums and differences of independent random variables.
Students will create their own Casino games to explore probability and expected value.
Students must make an argument for why their design should be used by the Casino using statistical language.
- Week 13-15 Sampling Distributions

Binomial probabilities, binomial distributions, and normal approximations to the binomial distribution.

Geometric probabilities and geometric distributions.

Introduction of the Central Limit Theorem.

Semester 1 midterm

Spring Semester

- Week 1-2 Confidence Intervals
Estimating population means and proportions, critical values, margins of error, sample size and introduction of the t-table
Estimating the difference in two means and proportions.
Interpreting the meaning of a confidence interval
Create confidence intervals using a graphing calculator.
- Week 3-4 Single Sample Inference
Large sample inference for both means and proportions
Null and alternative hypothesis, test statistics, conditions, assumptions, alpha-values, p-values, rejection regions, critical values, reject vs. fail to reject, conclusions, and significance
Small sample inference for means
Using a t-table, degrees of freedom.
Type I and Type II error and power
Perform tests using a graphing calculator.
- Week 5 Two Sample Inference
Two sample test for the difference in means and proportions
Steps to a hypothesis test and discussion of pooling.
Perform tests using a graphing calculator.
- Week 6 Contingency and two-way tables
Chi-squared distribution and calculation of a chi-squared value.
Steps to a hypothesis test.
Goodness of fit test, homogeneity and independence.
Perform tests using a graphing calculator.
- Week 7-8 Correlation and Regression
Lines of best fit, residuals, explanatory and response variables, patterns in data.
Reading computer print-outs – Students use outputs to find lines of best fit make predictions and determine if linear models are appropriate.
Interpretation of correlation and differences between correlations and causation.
- Week 9 Inference for Regression
Simple linear regression with hypothesis testing of the slope of a regression line.
Creating confidence intervals for slope of a regression line.
- Week 10-12 Review for the AP exam.
Final Project: The purpose of this assignment is to tie together all the topics that the student has encountered this year and draw connections between all aspects of statistics. Each student must come up with some question or situation they want to investigate. Once a topic has been selected, the student must design an experiment or a survey, collect the data, analyze the data using an appropriate hypothesis test and draw conclusions from their results. Students will then be required to present their findings to the class using correct statistical vocabulary.