AP Statistics
Syllabus

Instructor: David Kern
Saratoga 207
DavidKern@NewmanSchool.org

My Schedule: A – Research and Design
B – AP Stats
D – AP Stats
E – Biopsychology
G – 9th Grade Flex (sem. 1)
H – H. Biopsychology

Course Description: This course introduces students to the major concepts and tools for collecting, organizing, analyzing, and drawing conclusions from data. Students explore data by recognizing patterns and departures from patterns, plan studies by determining what to measure and how to measure it, and anticipate patterns by producing models using probability concepts. They use both real data collection and computer simulations for their data collection. Students make statistical inferences to confirm the validity of their models. Algebra II is a prerequisite for this course. However, the course may not be taken in lieu of a calculus course.

Extra help: If you would like to come for extra help (which is very much encouraged), I ask that you consult my schedule above to find a time that works for both of us. You must let me know ahead of time by email, so that we may both plan accordingly.

Textbook: Peck, Olsen, & Devore. *Introduction to Statistics & Data Analysis*, 6th edition.

We will use the textbook to supplement our in-class work. As such, we will not always progress through the textbook in a linear fashion. Instead, specific sections of the text will be assigned which discuss relevant material.

Required technology: TI-83 or TI-84 graphing calculator

Best practices for class:
Please come to class ready to participate and engage with the material and one another. I've found the best way to do this is as follows:

- To have actively completed the assigned reading and practice problems
- To have an open mind about the material
- To be kind and respectful to one another

Grading system:
There will be approximately 1 quiz per unit and a comprehensive test at the end of each unit. Typically, tests are worth 60-70 points. Quizzes, whether announced or unannounced, range from 20 to 30 points. Homework is worth 10% of your grade. In addition, class participation each semester is worth approximately 50 points, nearly the equivalent of one test. So, again, please come to class ready to engage with the material and one another. The final exam for the fall is given in December, covering the first 5 units. The second semester, starting in January, covers units 6-11.

Course Policies:
Assignments and important announcements will be posted on the Newman website and via email. It is critical that you regularly check these places.

Absences:
When you know in advance that you will be absent from class:

- Strive to take responsibility for your schedule. Be proactive – schedule and complete quizzes and tests before you leave.

When you are unexpectedly absent from class:

- Complete assignments posted on the Newman website to the best of your ability
- Get the notes from a friend
- Schedule extra help
- Prepare for extra help and come with questions and ideas you'd like to discuss

Late assignments will be docked credit accordingly. Typically, this involves a one letter grade deduction for every day that the assignment is late. It is your responsibility to schedule a time to make-up missed or late assignments. After 24 hours, I reserve the right not accept late assignments unless there are reasonable mitigating circumstances.

Academic integrity:

Cheating and plagiarism are taken very seriously and will not be tolerated. Any cheating or plagiarism occurring on any assignment will result in a grade of F and will be reported.

Group work may be required for some assignments. However, you should **always** hand in your own version of your own work. If two students hand in identical work, that's plagiarism. Don't do it.

Course Overview

First Semester

Unit 1: Exploring and Describing Univariate Data

Population vs. sample
Types of displays: dot plots, histograms, stem-and-leaf plots, box plots
Description of shape
Measurements of center
Measurements of spread
Probability density functions
Normal distribution

Unit 2: Exploring and Describing Bivariate Data

Types of displays: two-way tables, bar graphs, segmented bar graphs, scatterplots
Regression analysis

Unit 3: Collecting Data through surveys, observational studies, and experiments

Methods of sampling
Types of bias
Experimental design

Unit 4: Probability

General probability rules
Probability models
Simulation

Unit 5: Probability (continued)

Discrete and continuous random variables
Means and variances of random variables
Binomial distribution
Geometric distribution
Normal distribution revisited

Second Semester

Unit 6: Statistical Inference introduction

Sampling distributions
Sampling distributions of sample proportion
Sampling distributions of sample mean

Unit 7: Confidence Intervals

Confidence intervals
Confidence intervals for a population mean
Confidence intervals for a population proportion

Unit 8: Testing Hypotheses I

Structure of tests
Significance level and p-value
Type I and Type II errors
One sample t-test
One proportion z-test

Unit 9: Testing Hypotheses II
Comparing two means
Comparing two proportions

Unit 10: Testing Hypotheses III
Chi-square: goodness of fit
Chi-square: independence
Chi-square: homogeneity

Unit 11: Testing Hypotheses IV
Inference for regression

The 2024 AP statistics exam will take place on the afternoon of Thursday, May 7th.