

Did you ever wonder how baseball statistics are generated? Where those television, music video, and movie ratings come from? Did 9 out of 10 doctors really recommend some aspirin? Why are political polls often misleading? How can you tell if a survey of high school students is fair and unbiased? How do researchers analyze their results to draw conclusions about their experiments? If so, you are in the right class! Data and statistics appear virtually everywhere in the world around us and you will learn to differentiate between good data and bad data.

This college level introductory course in Statistics is designed to prepare you for the AP Statistics Exam. The exam is three hours long, and consists of Multiple-Choice questions (50%), Short Answer open-ended questions (37.5%) and one Long-Answer investigative problem (12.5%) covering four main topics: exploring data, planning studies, probability theory, and inferential reasoning. Doing well on this exam can mean earning college credit! Some activities and assignments are designed for developing concepts and understanding, while others focus on improving the way you communicate statistical knowledge.

Students also have the opportunity to receive college credit through Oregon Institute of Technology (OIT). If students choose to pay for the college credit, they will receive 4 credits for Math 243: Introduction to Statistics through OIT. Information regarding registering for the credit will be handed out during Semester 2. In order to receive the credit from the university, students must obtain a C or higher both semesters.

Contact: E-mail is best, or you can reach me at the school (541) 416-6900 ext. 3148

Required Materials: *Bring these items every day!*

1. A **3-ring binder** with 4 sections labeled: (1) Notes, (2) Homework, (3) AP Questions or FRAPPYs, & (4) In-Class Worksheets. Organization and good note taking is a must in this class, but your method is up to you. You will be writing a great deal as part of your assignments. Your notes and assignments should be written with great care and be easy to read. The notation used in this class can easily mean a different idea if written only slightly incorrectly. Be careful and take pride in your work!
2. Paper and **pencil**. No pens please (pens are okay for note taking). **I WILL NOT ACCEPT WORK COMPLETED WITH A PEN.**
3. A **graphing calculator** with statistical functions. The TI-83, TI-83 Plus, TI-83 Plus Silver Edition, TI-84 are by far the best for the AP Statistics exam. The TI-89 can be used, but it is not as compatible. I will only instruct with the TI-83/84 Plus, so if you hate reading calculator manuals, I recommend getting a TI-83/84 Plus so you can easily follow along in class.
4. **AP Statistics Textbook:** *The Practice of Statistics 5e*

Grades:

10% Formative assessments (worksheets, homework, FRAPPYs)

70% Standard Assessments (tests)

20% Final Exam/Final Project

90% to 100%.....A

80% to 89%.....B

70% to 79%.....C

60% to 69%.....D

Below 60%.....F

*Note: Grades are cumulative throughout the semester. Grades do not start over each quarter.

Basis for Grades:

1. Correctness, accuracy, and completeness
2. Attention to detail in your work
3. Written answers using complete and legible sentences
4. Timeliness

Tests: will use AP-Test style questions. You will always be supplied with the formula sheets that will be provided on the AP test. One half of each test will consist of multiple choice questions while the other half will consist of free response questions, just like the actual AP Exam. **Since this is an AP course, no test retakes are allowed.** *Missed tests can only be made up outside of class, prior to the next assessment.*

Homework: You will have daily homework assignments. **Keeping up with these assignments is critical to success in this course.** Homework will be checked off for completion at the end of each unit.

Makeup Policy: Work missed due to absences must be made up outside of class. When returning to school after an excused absence, students are allowed to make up their work until the end of the 9 week period. No makeup opportunity will be afforded to students who are unexcused or deliberately truant from class. Check Google Classroom or message me on remind for missed work.

End of Year Project Guidelines: (150 Points)

Either individually or in groups of 2, you will identify a researchable (testable) hypothesis with measurable variables, design a properly controlled randomized experiment to test it, carry out the experiment, and analyze the resulting data. The emphasis is on proper design and analysis techniques, not so much on gathering a large enough data set to be able to reach an authoritative conclusion. Remember, we are doing this since you have already taken the AP Exam/Final, so this project is taking the place of any homework and tests. It will count as another Unit Test Grade!!!! Your project is due the day of your scheduled final exam (TBD) where we will have class presentations (which will be discussed later on in this handout).

I. Your report/project must include the following:

- Summary of what your project is about
- Clearly state your null and alternative hypotheses
- Describe how you carried out the experiment
- Include all the data you gathered (perhaps in an appendix or table)
- Present the data graphically and/or in tables
- Use appropriate data summaries (mean, standard deviation, other measures)
- Describe the test of your hypothesis and show your calculations
- Make some conclusions about your hypothesis, using a confidence level and a test with a P-value.
- **Worth 100 points of the project**

II. Oral presentation

- Must be between 5 – 10 minutes in length
- You can do this in a variety of ways, i.e. a poster board, handout, PowerPoint presentation, a video, pretty much anyway you want to present your project – it is up to you with the amount of creativity you wish to partake
- Clearly state the hypothesis and why you chose it
- Clearly explain how you carried out your experiment
- Present the highlights of your gathered data with a few nice visuals (tables and/or graphs)
- Give your conclusion and discuss the confidence in your results
- **Worth 50 points of the project**

***NEW SCHOOL-WIDE POLICY REGARDING CELL PHONES:** cell phones will not be allowed to be used or visible during scheduled class time (including in the halls) this year without exception. Please see page 17 of the student / parent handbook for more information.

Standards covered:

adv.S.1 Exploratory Data: Analyze summary measures of sets of data.

adv.S.1.1 Construct, interpret, and summarize numerical characteristics of univariate data sets to describe patterns and departure from patterns, using measures of center, spread, and position.

adv.S.1.2 Compare distributions of univariate data by comparing center and spread, clusters and gaps, outliers, and other unusual features and comparing shapes.

adv.S.1.3 Explore bivariate data by analyzing patterns, correlation, linearity, least-squares regression line, residual plots, outliers, influential points, and transformations to achieve linearity.

adv.S.1.4 Explore categorical data using frequency tables and bar charts; investigating marginal, joint and conditional relative frequencies; and by comparing distributions.

adv.S.2 Sampling and Experimentation: Plan, conduct, and analyze well-designed methods of data collection.

adv.S.2.1 Describe the methods of data collection. Evaluate how appropriate each method is relative to the purposes of various types of inquires and hypotheses under investigation given various population distributions.

adv.S.2.2 Plan, analyze, and conduct a survey, and/or observational study; describe characteristics of a well-designed and well-conducted survey; explore various sampling methods including investigating sources of bias.

adv.S.2.3 Plan, analyze, and conduct an experiment; describe characteristics and components of a well-designed and well-conducted experiment; explore various methods of experimental designs; and associated sources of bias and confounding.

adv.S.2.4 Explore the generalizability of results and types of conclusions that can be drawn from observational studies, experiments, and surveys. Understand when each method is most appropriate, and explain the differences between the three methods.

adv.S.3 Anticipating Patterns: Understand how probability can be applied as a tool used for anticipating what the distribution of data should look like under a given model.

adv.S.3.1 Analyze probability by exploring such topics as "Law of Large Numbers," addition and multiplication rule, conditional probability and independence, discrete random variables and their probability distributions, simulations of random behavior and mean, standard deviation, and learn how to select appropriate linear transformations of a random variable.

adv.S.3.2 Explore the independence versus dependence of two random variables. Determine the mean and standard deviation for sum or difference of independent random variables.

adv.S.3.3 Analyze the properties of the normal distribution; use tables of the normal distribution; and explore a normal distribution as a model for measurements.

adv.S.3.4 Explore sampling distributions to include: sampling distribution of a sample of proportion and mean; Binomial Distribution and Geometric Distribution; applying the Central Limit Theorem; investigating sampling distributions of a difference between two independent sample proportions and means; simulating a sampling distribution and; applying t-distributions and Chi-square distributions to the analysis of samples.

adv.S.4 Statistical Inference: Estimate population parameters and test hypotheses.

adv.S.4.1 Investigate the following: estimating population parameters, margins of error, confidence intervals, and properties of point estimators.

adv.S.4.2 Explain the logic, meaning, and properties of confidence intervals and meaning of confidence levels. Apply this understanding to large sample confidence intervals for a: proportion, difference between two proportions, mean, difference between two means, and slope of a least-squares regression line.

adv.S.4.3 Explain the logic of significance testing, null and alternative hypotheses; p-values; one-and two-sided tests; concepts of Type I and Type II errors; concept of power.

adv.S.4.4 Apply various large sample tests for a proportion – i.e. difference between two proportions, mean, difference between two means, Chi-square test, and slope of a least squares regression line.

adv.S.4.5 Understand how to read the results of a regression, and use this to make predictions of future events with a stated confidence.

Notification of the Right to Object to the Use of Materials

Any resident of the district may raise objection to instructional materials used in the district's educational program despite the fact that the individuals selecting such materials were duly qualified to make the selection and followed the proper procedure and observed the criteria for selecting such material.

The first step in expressing objection is consultation with the classroom teacher or library staff and providing a brief written complaint. The staff member receiving a complaint regarding instructional materials shall try to resolve the issue informally through the discussion of the original assignment or the opportunity for an alternative assignment.

If not satisfied with the initial explanation or an alternative assignment, the person raising the questions will meet with a building administrator who, if unable to resolve the complaint, will provide a Request for Reconsideration form which will be given to the superintendent for action.