

AP Statistics Syllabus – STUDENT COPY – 2023-24

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Textbook: *An Introduction to Statistics and Data Analysis, 5th Edition* by Peck, Olsen, Devore

Prerequisite: Grade $\geq B$ in ADV. Algebra 2 or equivalent and/or teacher recommendation

Grading Scale & Standards: Your grade each semester will be based on three major categories: student engagement (SE), student progression (SP), and student mastery (SM). Components within these categories are detailed below, including tests, quizzes, a *cumulative* Semester Exam, class work/teamwork activities, homework, and any projects.

Grading Standards (as seen in Infinite Campus):

Categories	Components
Student Mastery (SM) (70 %)	Tests & Semester Exam ($\approx 55\%$) Project ($\approx 15\%$)
Student Progression (SP) (30%)	Quizzes ($\approx 20\%$) Homework ($\approx 10\%$)
Student Engagement (SE) (<i>EC up to 5%</i>)	Class Participation* Self-Assessments Labs & Calculator Explorations

Percentage grades are translated into letter grades based upon the JCPS district guidelines and listed on *page 18* of your Student Agenda (see table below). The JCPS College Credit Grading Scale, as detailed on pages 15-16 in the SPPG

(<https://www.jefferson.kyschools.us/sites/default/files/forms/High%20School%20Student%20Progression%20Promotion%20and%20Grading%20Handbook%20SPPG.pdf>) will be used in this class.

You should always be able to calculate your current grade percentage based upon the total points you have earned in comparison to the total points possible at that time, including with the weighted measure of each.

For example, if you have earned 132 points out of a possible 160 in SM, 45 out of 50 points in SP, and maximum in SE, then your weighted average for all of the activities to date would be:

$$\frac{132}{160}(.70) + \frac{45}{50}(.30) + (EC \text{ up to } 0.05) = 0.8625$$

So your grade would be $\approx 0.863 = 86.3\%$, which is a “B”.

JCPS Grade %

A = 90 – 100 %
B = 80 – 89 %
C = 70 – 79 %
D = 60 – 69 %
U = below 60 %

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Course Description: Curriculum for this course follows the AP Statistics curriculum set by the College Board and is designed to prepare students for the AP Statistics exam in May. This syllabus is adapted from the course description given by the College Board. The full course description should be downloaded from www.Collegeboard.com and read completely. The purpose of the AP course in statistics is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. This course draws connections between all aspects of the statistical process, including design, analysis, and conclusions. Additionally, using the vocabulary of statistics this course will teach students how to communicate statistical methods, results and interpretations. Students will learn how to use graphing calculators and read computer output in an effort to enhance the development of statistical understanding.

Performance Standards: During this course, the student will be exposed to four broad conceptual themes and will be expected to demonstrate proficiency in:

- Exploring Data: Describing patterns and departures from patterns
- Sampling and Experimentation: Planning and conducting a study
- Anticipating Patterns: Exploring random phenomena using probability and simulation
- Statistical Inference: Estimating population parameters and testing hypotheses.

HOMEWORK: The expectation is students will spend approximately 30 to 45 minutes **each school night** (Monday – Friday) to complete their assignments. This routine should provide adequate practice to assist in developing an understanding of the relationships and concepts. Keep in mind this is an average; some students will require more time, and others less. Homework allows time to practice and reflect upon the ideas being introduced and should therefore be made a **daily routine**. If you are only working on homework 2 nights each week, you should expect to work 60 minutes or more each time. This creates more of a burden for you and typically does not establish the beneficial routine.

NOTE: You must earn at **least 85% on your HOMEWORK Notebook** to automatically have a chance to take any **Test RETAKES**!**

QUIZZES: There will be short quizzes, at least one every other week. These quizzes may be take-home, group work, or traditional depending on the activity. Some quizzes will be scheduled and others will be POP-quizzes. Quizzes must be made up outside of class (either before or after school). You will be able to drop your lowest quiz score for the semester.

TESTS: There will be a test before the end of each 6-week grading period. Some tests, or components of tests may be take-home, and these cases will always be delineated beforehand. Regardless of the format, ALL tests are to be completed by the individual student. No GROUP work or collaboration is allowed unless specifically stated by the instructor. If you are absent on a test day, you will have 3 days to make up the exam before incurring any late penalty (your first day back counts as DAY 1). **All tests lower than 60%** mandate a teacher conference with Mr. Lowber. **Test RETAKES** are available for *some tests*; but **retakes must be earned**!** Please recognize that assessments are used to clarify what each student does and does not understand. If you are solely placing your value in the resulting *SCORE* of the test and not on the concepts and materials that you are learning, then your energies are misappropriated.

Calculators/Technology

- It is strongly recommended that all students have the equivalent of a TI-84, or TI-84+ graphing calculator for use in class, at home, and on the AP Exam.
- Students will use their graphing calculator extensively throughout the course. Most assignments, numerous in class activities and test will require the use of a graphing calculator.
- Students that do not have access to a graphing calculator will have great difficulty with the class.

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- The examples in class will be given using a TI-84+ (which is mostly similar to the TI 84). Please note that class time will not be spent to instruct students in the use of calculators other than the TI-84; and the key strokes on the TI-86 & TI-89 are completely different than the TI-84.
- Students may occasionally go to the computer lab and utilize statistics software, MS Excel as well as some Internet applets.
- Students are not required to have access to any statistical computer software. However, numerous examples of statistical software including MINITAB printouts will be reviewed in class and some homework and test problems will require understanding of MINITAB output to answer the questions.

HONOR CODE: Plagiarism is unacceptable behavior and in breach of the Academic Integrity Policy (*pages 15-20 in your Student Agendas*). A student found guilty of cheating or plagiarizing will receive a ZERO on the particular assignment, regardless of point value and parents will be notified, along with the assistant principal for determination of any further school action. The following are examples of cheating; however, this list is not all inclusive:

- Representing the work of others as your own (copying homework, letting someone copy your work etc.)
 - Looking at another student's paper during an exam or quiz.
 - Using prohibited materials (notes, etc.) on exams or quizzes.
 - Sharing calculators during exams or quizzes; Loading notes, examples or programs on any calculator
 - Discussing exams or quizzes with students in other sections of AP Stats who have not yet taken them.
- All these facts should be obvious. Simply stated: *Do your best but do your own work!*

Class Materials: The following materials are needed for this class:

- Text Book, each student provided individual copy by JCPS. **Needed occasionally in class.**
- Daily access to a graphing calculator of some type is strongly suggested (see calculator/technology section above and students are encouraged to visit the College Board website for a list of graphing calculators that are approved for the AP exam)
- Access to a computer with a spreadsheet program is highly recommended. The computer lab at school will be used occasionally during class, however, home access can accentuate the learning process.
- 3 ring binder with loose leaf paper or spiral notebook
- Pencil, pen, highlighter

Extra Class materials:

- Box of 8 (or more) AAA Batteries for calculators
- Hand sanitizer
- Ream of white or Color copy paper or Graph/Grid Poster paper
- 2 Boxes of Tissues

(NOTE: Extra class materials can be redeemed for a homework pass;
Due before the end of the first full week of school: 8/18/23)

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Project: Each student will have an individual and/or group project each semester. As an example, previously students have designed a simple survey and collected data on school athletic ticket sales to obtain specific information needed by the schools athletic department, been assigned specific pairs of physical attributes to measure on individuals to create a scatter plot and assess the strength & type (linear, quadratic, log, etc) of the relationship, required to individually develop questions & answers of which their groups develop a Jeopardy style game to be used in class for AP test review, etc. The instructor will give project assignments each semester & reserves the right to change projects to fit the needs of the school and the class.

Make-up Work/Absences: If you are absent for any reason, it is your responsibility to obtain all materials missed, including notes, homework solutions, assignments, etc. It is a good idea to also choose someone in class that you can call or email if you are absent. The timeline for turning in makeup work is outlined in your student planner. Other than as outlined in the student planner, all makeup work, disputed work, or makeup test **MUST** be completed prior to the start of semester finals for semester in question, or zero's will be given. If you miss an exam or quiz, you will take an alternate version of the assessment immediately upon your return. Any assignments that were assigned before you were absent & due on a day you miss must be handed in immediately upon your return. Since exams are announced well in advance, missing a single class period before an exam does not get you out of taking the exam on the scheduled date. If you are in class on the scheduled date of an exam or quiz, you will take it. Finals are taken on the day scheduled by the school, no exceptions. If you miss a final exam for any reason, you will need to arrange to take a make-up exam some time after the scheduled exam.

The AP Exam (Tuesday May 7th, 2024, 12:00 PM): It is assumed that all students are in this class with the intention of taking the AP exam in May. If you are a senior and already know the schools you are applying to for next fall, you should contact them to find out their policy for accepting AP credit. If, for any reason, you decide not to take the AP exam, you are still required to complete all work and participate in all review activities in class with respect to the AP exam.

Week 1	Morning 8 a.m. Local Time	Afternoon 12 p.m. Local Time
Monday, May 6, 2024	United States Government and Politics	Art History Chemistry
Tuesday, May 7, 2024	Human Geography Microeconomics	Seminar Statistics

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Fall Semester (organized by chapters in primary textbook):

Chapter 1: The Role of Statistics – SUMMER Reading!

Chapter 2: Experimental Design – SUMMER Reading!

The Data Analysis Process & Collecting Data Sensibility

- 2.1 The data analysis process
- 2.2 Sampling
- 2.3 Stat studies: Observational & Experimental
- 2.4 Simple comparative experiments
- 2.5 More Experimental Designs
- 2.6 More Observational Designs

Chap 3 Graphical Methods for describing Data (Graphical displays include, but are not limited to using boxplots, dot plots, stem plots, histograms, frequency plots, parallel boxplots, and bar charts.

- 3.1-3.2 Graphical Methods
- 3.3 Graphical Displays
- 3.4 Scatter Plots

Activity 3.1 Locating States

Chap 4 Numerical Methods for Describing Data

- 4.1 Numerical Summaries
- 4.2 Variance, SD & IQR
- 4.3 Box Plots
- 4.4 Empirical Rule

Possible Activities 4.1 Collecting & Summarizing Numerical Data. & 4.2 Boxplot Shapes

Graphing Calculator Exploration

Chapter 5: Summarizing Bivariate Data

- 5.1 Correlation
- 5.2 Linear Regression
- 5.3 Residual Plots
- 5.4 Non linear data
- 5.5 Interpreting Results

Activity 5.1 Exploring Correlation & Regression Technology – Computer lab

Chapter 6: Probability

- 6.1 Chance experiments
- 6.2 Definitions of Probability
- 6.3 Basic Properties of Probability
- 6.4 Conditional Probability
- 6.5 Independence
- 6.6 General Probability Rules
- 6.7 Estimating p , both empirically & with simulations

Possible Activities: 6.1 - Hershey Kiss, Lucky Day & 6.2 Euro coin dilemma

Chapter 7: Random Variables & Probability Distribution

- 7.1 Random Variables
- 7.2 Probability Dist for Discrete Random Variables
- 7.3 Probability Dist for Continuous Random Variable
- 7.4 Mean & SD
- 7.5 Binomial & Geometric Random Variable
- 7.6 Normal Distribution

Chapter 8 (*Hoping to begin before winter break*)

Chapter 8: Sampling Variability and Sampling Distributions

- 8.1 Stats & Sampling Variability

1st Semester Final EXAM (This assessment is cumulative)

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Spring Semester

Chapter 8 (*Please complete reading during winter break!*)

Chapter 8: Sampling Variability and Sampling Distributions

8.1 Stats & Sampling Variability

8.2 The sampling distribution of a sample mean

8.3 The sampling distribution of the sample proportion

Graphing Calculator Exploration

Chapter 9: Estimation Using a Single Sample

9.1 Point Estimation

9.2 Large sample CI for pop prop

9.3 CI for a pop mean

9.4 Chap wrap up

Activity 9.1 Getting a feel for CI

Activity 9.2 An alternative CI for Pop Proportion

Graphing Calculator Exploration

Chapter 10: Hypothesis Testing Using a Single Sample

10.1 Hypo & test procedures

10.2 Errors in Hypo testing

10.3 Large sample Hypo test for pop prop

10.4 Hypo test for pop mean

10.5 Power & the Probability of Type II Error

10.6 Chap wrap up:

Graphing Calculator Exploration

Chapter 11: Comparing Two Populations or Treatments

11.1 Inferences between 2 pop/treat mean using Independent samples

11.2 Inferences between 2 pop/treat mean using paired samples

11.3 Large sample Infer between 2 pop/treat prop

11.5 Chap wrap up

Graphing Calculator Exploration

Chapter 12: The Analysis of Categorical Data & Goodness of Fit Tests

12.1 Chi-sq for univariate categorical data

12.2 Test for homogeneous & Independent in a 2way table

12.3 Chap Wrap up

Activity 12.1 Pick a number, any number

Graphing Calculator Exploration

Chapter 13: Simple Linear Regression & Correlation: Inferential Methods

13.2 Infer about slope of pop regression line

13.5 Infer about pop Correlation Coefficient

13.6 Chap wrap up

Review for AP test

Continue with Chapter 13 & possibly Chapter 14 and 15 if time permits

2nd Semester Final

AP Exam – Thursday, May 7th, 2024 at 12:00 pm to 3:30 pm.

NOTE: All students who are registered and complete the AP Statistics Exam will automatically earn a **minimum of an 80%** for the **Spring FINAL Exam**. Those who do not take the AP Exam will receive their actual score, graded similarly as the Fall semester final.