AP Statistics
Syllabus 2025-26

Course Overview

What is this course? The AP Statistics course introduces you to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment in the AP Statistics course: exploring data, sampling and experimentation, probability and simulation, and statistical inference.

What is this course like? The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics.

Who should take this class? The AP Statistics course is an excellent option for any secondary school student who has successfully completed a second-year course in algebra and who possesses sufficient mathematical maturity and quantitative reasoning ability. Because second-year algebra is the prerequisite course, AP Statistics is usually taken in either the junior or senior year.

Course Skills

The following four skills will be cycled throughout all units we learn in AP Statistics:

- Select methods for collecting and/or analyzing data for statistical inference
- Describe patterns, trends, associations, and relationships in data
- Explore random phenomena
- Develop an explanation or justify a conclusion using evidence from data, definitions, or statistical inference

Materials

- Charged Chromebook – homework will be both written and typed; you will be using your Chromebook every day in this class.
- Writing Utensil – notes will be given out as hard copies and you are expected to follow along and annotate them.
- Three Ring Binder or Folder – notes, homework, etc will always have a three-hole punch for you to keep organized in your binder.
- Graphing Calculator – TI-84 or TI-84 Plus is recommended. We have a classroom set if you are unable to obtain your own.
- Textbook – the College Board requires students to have access to a complete text. The textbook you will have access to in this course will be available in class after the first week or so of class.

Grading

- 50% Tests – AP Style Multiple Choice and Free Response Problems
- 10% Homework
- 40% Quizzes

Learning From Assignments

- Identify what your mistakes are and explained – This can include understanding of the question, operational errors, use of the wrong method, or something else. “I didn’t know how to answer the question” is not an acceptable answer. Your gaps/errors must be explained.
- Indicate how to solve the problem – Explain in a few words the process you will use to solve the problem.
- Work out the test problem(s) showing detail and arriving at a correct solution.

You should plan to do these things on your own to increase your understanding of the material.

You may reassess at any point during one of my availability hours that are posted on the board.

Student Responsibility

You must take responsibility for your own learning. Students will be given an agenda at the beginning of each new unit, and assignments will be posted in the Google Classroom. This agenda includes the focus of each day’s lesson, as well as assignments to be completed. Students should expect homework to be assigned almost daily.

Makeup Work

If a student is absent, he/she will be assigned a grade of zero (0) for all worked missed. It is the student’s responsibility to obtain and complete the work missed for each absence. When the missed work is completed, I will replace the 0 with the grade earned.

Check the class agenda to see what assignments were missed and what worksheets, if any, need to be picked up. Check the file for any worksheets and papers that may have been passed back in your absence.

Any assignments that were due on the date(s) of your absence are due immediately upon your return to class.

For any assignments that were given on the date(s) of your absence, you will be given 1 day per each day of your absence, plus an additional day to turn in those assignments.

If you are absent on days prior to the test, including review day, you are still responsible for taking the test. Any new material that was presented in your absence will not be counted against you on the test.

If you are absent on review day or test day, you will take the test on the day of your return, during class time. You will be responsible for making alternative arrangements to catch up on material covered in class, via tutoring sessions, scheduled with me.

AP Exam Information

The AP Statistics Exam is a two-part test.

Section	***Question Type***	***Number of Questions***	***Time Allowed***	***Percent of AP Score***
I	Multiple Choice ● Choices A – E	40 Single Response Questions	90 Minutes	50%
II	Free Response ● Handwritten Code	● Part A: Questions 1-5, 37.5% exam weight, takes about 65 minutes ● Part B: Question 6 Investigative Task, 12.5%, takes about 25 minutes	90 Minutes	50%

All students are expected and strongly encouraged to take the AP exam. Students scoring 3 or higher on the AP exam may qualify for a college course exception, dependent upon the college or university. Even if you do not score "well" on the exam, research shows that those students who take an AP exam, in addition to the course, are more likely to remain in college.

Help Sessions

If you find that you are confused on any topic, please do not hesitate to ask for help. Do not wait; it will only hurt you in the long run. Although there may not be enough time in class to get assistance, there are other means available to you.

Finally….

A strong association exists between regular class attendance and successful completion of the class. While it is understood that absences cannot be completely avoided, students are strongly encouraged to be present in school whenever possible, really and willing to learn.

So, put your best foot forward and let's have a great year!!

Course Sequencing

We will be utilizing the AP Statistics CED.

Unit 1: Exploring One Variable Data: VAR, UNC

Material Covered	***CED Topics***	***CED Skills***
Notes 1 – Representing Categorical Variables with Graphs o Vocab: Individuals, variables, categorical, quantitative, discrete, continuous o Creating one-way and two-way tables o Bar graphs	1.1, 1.2, 1.3, 1.4	1.A, 2.A, 2.B, 2.D
Notes 2 – Representing Quantitative Variables with Graphs o Histograms o Stem and Leaf (regular, back-to-back, and split stem) o Dotplots o Cumulative Relative Frequency Graphs (ogives)	1.5, 1.6	2.A, 2.B
Notes 3 – Describing and Summarizing Quantitative Variables o SOCS: Shape, outliers, center, spread o Mean, Median, Mode o Range, IQR, Standard Deviation o Percentiles and 5 number summary o Boxplots and modified boxplots	1.7, 1.8	2.A, 2.B, 2.C, 4.B
Notes 4 – Comparing Distributions o SOCS o AP Free Response Problem Practice	1.9	2.D
Notes 5 – The Normal Distribution o Z-Scores o Density Curves o Standard Normal Distribution	1.10	2.D, 3.A

Unit Assessments:

- Unit 1 Quiz: 10 multiple choice questions and 1 free response question
- Unit 1 Test: 20 multiple choice questions and 1 free response question

Unit Project: Misleading Graphs Activity

- Students find data to represent visually, both correctly and incorrectly.
- CED Skills: 2.A, 2.B, 2.D

Unit 2: Exploring Two Variable Data: VAR, UNC, DAT

Material Covered	***CED Topics***	***CED Skills***
Notes 1 – Two Categorical Variables o Compare numerical and graphical representations for two categorical variables. o Calculate and compare statistics for two categorical variables.	2.1, 2.2, 2.3	1.A, 2.C, 2.D
Notes 2 – Scatterplots and Correlation o Represent bivariate quantitative data using scatterplots o Describe the characteristics of a scatterplot. o Determine the correlation for a linear relationship. o Interpret the correlation for a linear relationship.	2.4, 2.5	2.A, 2.B, 2.C, 4.B
Notes 3 – Linear Regression o Calculate a predicted response value using a linear regression model. o Estimate parameters for the least-squares regression line model. o Interpret coefficients for the least-squares regression line model. o Represent differences between measured and predicted responses using residuals plots. o Describe the form of association of bivariate data using residual plots.	2.6, 2.7, 2.8	2.A, 2.B, 2.C, 4.B
Notes 4 – Influential Points and Departure from Linearity o Identify influential points in regression. o Calculate a predicted response using a least-squares regression line for a transformed data set.	2.9	2.A, 2.C

Unit Assessments:

- Unit 2 Quiz: 10 multiple choice questions and 1 free response question
- Unit 2 Test: 20 multiple choice questions and 1 free response question

Unit Project: COVID Vaccination Project

- Students explore two claims made about COVID vaccination data and use a linear regression analysis to analyze these claims.
- CED Skills: 2.A, 2.B, 2.C, 4.B

Unit 3: Collecting Data: VAR, UNC

Material Covered	*CED Topics*	*CED Skills*
Notes 1 – Planning a Study o Observational Study Vocab o Sampling Methods	3.1, 3.2, 3.3	1.A, 1.C, 4.A
Notes 2 – Potential Problems with Sampling o Sources of Bias o Sampling vs Non-sampling Error	3.4	1.C
Notes 3 – Selecting Random Samples and Introduction to Experiments o Table of Random Digits o Observational study vs Experiment	3.3, 3.5	1.B, 1.C
Notes 4 – Experimental Design o Principles of Experimental Design o Experimental Terms o Lurking vs Confounding o Experimental Design o Scope of Inference	3.6, 3.7	1.C, 4.B

Unit Assessments:

- Unit 3 Quiz: 10 multiple choice questions and 1 free response question
- Unit 3 Test: 20 multiple choice questions and 1 free response question

Unit Project: Sample Survey Project

- Students will design a survey to test a bias of their choosing. They will describe how they randomly select people to complete their survey and will then report their results in a visual aid.
- CED Skills: 4.A, 4.B, 1.B, 1.C

Unit 4: Probability, Random Variables, and Probability Distributions: VAR, UNC

Material Covered	***CED Topics***	***CED Skills***
Notes 1 – Basic Probability and Simulations o Randomness Vocab o Simple Probability Formula o Probability Definition and Basic Probability Rules o Myth of "Law of Averages" o Simulations	4.1, 4.2, 4.3	1.A, 3.A, 4.B
Notes 2 – The Addition Rule o Mutually Exclusive o General Addition Rule	4.4	4.B
Notes 3 – Venn Diagrams, Unions, and Intersections o Venn Diagrams o Union and Intersection Notation	4.3, 4.4, 4.6	3.A, 4.B
Notes 4 – The Multiplication Rule and Conditional Probability o Multiplication Rule o Conditional Probability for Independent and Dependent Events o Proving Independence	4.5, 4.6	3.A
Notes 5 – Discrete and Continuous Random Variables o Random Variables and Probability Distributions o Discrete Random Variables o Continuous Random Variables o Mean (Expected Value) and Standard Deviation of a Discrete Random Variable	4.7, 4.8	2.B, 3.B, 4.B
Notes 6 – Combining Random Variables o Combining Two Random Variables o Linear Transformation of a Random Variable	4.9	3.B, 3.C

Notes 7 – Binomial and Geometric Probability Distributions o The Binomial Setting o Calculating Binomial Probabilities o Mean and Standard Deviation of Binomial Distributions	4.10, 4.11	3.A, 3.B, 4.B
Notes 8 – The Geometric Distribution o The Geometric Setting o Calculating Geometric Probabilities o Mean and Standard Deviation of Geometric Distribution	4.12	3.A, 3.B, 4.B

Unit Assessments:

- Unit 4 Quiz: 10 multiple choice questions and 1 free response question
- Unit 4 Test: 20 multiple choice questions and 1 free response question

Unit Project: Simulations Project

- Students complete three simulations, each using a different random tool: coins, a random number generator, and the table of random digits. They will assess a claim and perform a simulation to see if the claim is likely or unlikely.
- CED Skills: 3.A, 4.B

Unit 5: Sampling Distributions: VAR, UNC

Material Covered	***CED Topics***	***CED Skills***
Notes 1 – The Normal Distribution and Combining Normal Random Variables o Revisiting the Normal Distribution o Combining Normal Random Variables	5.2	3.A, 3.C
Notes 2 – Sampling Distribution of a Sample Proportion o Opening Activity o Sampling Distributions and Sampling Variability o Characteristics of a Sampling Distribution o Practice Problems	5.1, 5.4, 5.5	1.A, 3.B, 3.C, 4.B

Notes 3 – Sampling Distribution of a Difference in Sample Proportions o Comparing Two Proportions o Sampling Distribution of $\hat{p}_1 - \hat{p}_2$	5.6	3.B, 3.C, 4.B
Notes 4 – Sampling Distribution of a Sample Mean o Means vs Proportions o Sampling Distribution Conditions for Sample Means o Central Limit Theorem o Practice Problems	5.3, 5.7	3.B, 3.C, 4.B
Notes 5 – Sampling Distribution of a Difference in Sample Means o Comparing Two Means o Sampling Distribution of $\bar{x}_1 - \bar{x}_2$	5.8	3.B, 3.C, 4.B

Unit Assessments:

- Unit 5 Quiz: 10 multiple choice questions and 1 free response question
- Unit 5 Test: 20 multiple choice questions and 1 free response question

Unit Project: Normal Approximation for the Binomial

- Students explore how we can use the normal distribution as an approximation for the binomial when certain conditions are satisfied.
- CED Skills: 3.A, 3.B, 3.C, 4.B

Unit 6: Inference for Categorical Data: Proportions: VAR, UNC, DAT

Material Covered	***CED Topics***	***CED Skills***
Notes 1 – Confidence Intervals for Population Proportions o Opening Activity o Confidence Intervals: The Basics o Interpreting Confidence Intervals and Levels o Confidence Interval for Proportions o Sample Size and Margin of Error	6.1, 6.2, 6.3	1.A, 1.D, 3.D, 4.A, 4.B, 4.C, 4.D

Notes 2 – Significance Test for Proportions o Significance Tests: The Basics o One-Sided vs Two-Sided Test o P-Value o Significance Level o Hypothesis Test for a Population Proportion	6.4, 6.5, 6.6	1.E, 1.F, 3.E, 4.B, 4.C, 4.E
Notes 3 – Errors and Power o Type I and Type II Error o Factors Affecting Errors and Power	6.7	1.B, 3.A, 4.A, 4.B
Notes 4 – Relationship between Confidence Intervals and Significance Tests o Calculator Commands o Comparing CI with HT	6.3, 6.6	4.A, 4.B, 4.D, 4.E
Notes 5 – Comparing Population Proportions o Difference in Proportions o Confidence Interval for a Difference in Proportions o Significance Test for a Difference in Proportions o Calculator Commands	6.8, 6.9, 6.10, 6.11	1.E, 1.F, 3.D, 3.E, 4.B, 4.C, 4.D, 4.E

Unit Assessments:

- Unit 6 Quiz: 10 multiple choice questions and 1 free response question
- Unit 6 Test: 20 multiple choice questions and 1 free response question

Unit Project: Simulation Project

- Students use an applet to construct confidence intervals and interpret the values from these intervals. Students will explore the differences between confidence intervals and confidence levels.
- CED Skills: 1.D, 3.D, 4.A, 4.B, 4.C, 4.D

<u>Unit 7: Inference for Quantitative Data: Means:</u> VAR, UNC, DAT

Material Covered	***CED Topics***	***CED Skills***

Notes 1 – Confidence Intervals for Means o Intro Activity: Pulses o One Sample Z-Interval o t Distributions o One Sample T-Interval	7.1, 7.2, 7.3	1.A, 1.D, 3.C, 3.D, 4.A, 4.B, 4.C, 4.D
Notes 2 – Significance Tests for Means o One Sample Z-Test o One Sample T-Test o Interpreting Errors	7.4, 7.5	1.E, 1.F, 3.E, 4.B, 4.C, 4.E
Notes 3 – Margin of Error and Matched Pairs o Margin of Error for Means o Matched Pairs Data	7.3, 7.4, 7.5	1.E, 1.F, 3.E, 4.A, 4.B, 4.C, 4.D, 4.E
Notes 4 – Difference Between Two Means o Sampling Distribution of a Difference in Means o Two-Sample Z Statistic o Two-Sample T Statistic o Two-Sample T Interval for Means o Two-Sample T Test for Means	7.6, 7.7, 7.8, 7.9	1.E, 1.F, 3.D, 3.E, 4.B, 4.C, 4.E
Notes 5 – Choosing Your Inference Method o Comparing Inference Methods o Summarizing CI and HT for Means o Recapping CI and HT for Proportions	7.10	N/A

Unit Assessments:

- Unit 7 Quiz: 10 multiple choice questions and 1 free response question
- Unit 7 Test: 20 multiple choice questions and 1 free response question

Unit Project: Hypothesis Testing Project

- Students choose a claim to investigate. They gather data and perform a one sample or two sample t test, then conclude with their findings in a lab report.
- CED Skills: 1.E, 1.F, 3.E, 4.B, 4.C, 4.E

<u>Unit 8: Inference for Categorical Data: Chi-Square:</u> VAR, UNC, DAT

Material Covered	*CED Topics*	*CED Skills*
Notes 1 – Chi-Square Goodness of Fit Test o What is Chi-Square o Chi-Square Distribution o Chi-Square GOF Test	8.1, 8.2, 8.3	1.A, 1.E, 1.F, 3.A, 3.C, 4.B, 4.C, 4.E
Notes 2 – Chi-Square Test for Homogeneity o Chi-Square Test for Homogeneity o Follow Up Analysis	8.4, 8.5, 8.6	1.E, 1.F, 3.A, 4.B, 4.C, 4.E
Notes 3 – Chi-Square Test for Association/Independence o Chi-Square Test for Association/Independence	8.4, 8.5, 8.6	1.E, 1.F, 3.A, 4.B, 4.C, 4.E
Notes 4 – Comparing Three Chi-Square Tests o 2 Examples o Recap	8.7	N/A

Unit Assessments:

- Unit 8 Quiz: 10 multiple choice questions and 1 free response question
- Unit 8 Test: 20 multiple choice questions and 1 free response question

Unit Project: Distribution of Colors

- Students explore the formula for the Chi-Square statistics using a goodness of fit test from a bag of M&Ms.
- CED Skills: 1.E, 1.F, 3.A, 3.C, 4.B, 4.C, 4.E

<u>Unit 9: Inference for Quantitative Data: Slopes:</u> VAR, UNC, DAT

Material Covered	*CED Topics*	*CED Skills*
Notes 1 – Sampling Distributions and Confidence Intervals for Slopes o Sampling Distribution of b o Conditions for Regression Inference o Confidence Interval for b o Computer Output	9.1, 9.2, 9.3	1.A, 1.D, 3.D, 4.A, 4.B, 4.C, 4.D

Notes 2 – Hypothesis Testing for Slope o Significance Test for b o Regression Analysis	9.4, 9.5, 9.6	1.E, 1.F, 3.E, 4.B, 4.C, 4.E

Unit Assessments:

- Unit 9 Test: 10 multiple choice questions and 1 free response question

Unit Project: Height vs Chocolate Grab Inference

- Students perform linear regression inference to determine if your height determines how much candy you can grab from a bowl.
- CED Skills: 1.E, 1.F, 3.E, 4.B, 4.C, 4.E