SAMPLE SYLLABUS #1

# AP® Statistics

## Curricular Requirements

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|---|---|---|
| CR1 | Students and teachers have access to a college-level statistics textbook or resource in print or electronic format. | *See page:* 2 |
| CR2 | The course provides opportunities for students to interpret standard computer output and use approved graphing calculators with statistical computational capabilities to describe data, determine probabilities, and perform tests. | *See pages:* 2, 5 |
| CR3 | The course provides opportunities to develop student understanding of the required content outlined in each unit described in the AP® Course and Exam Description (CED). | *See page:* 2 |
| CR4 | The course provides opportunities for students to develop the skills related to Statistical Practice 1: Formulate Questions, as outlined in the CED. | *See pages:* 4, 5 |
| CR5 | The course provides opportunities for students to develop the skills related to Statistical Practice 2: Collect Data, as outlined in the CED. | *See pages:* 2, 3, 4, 5 |
| CR6 | The course provides opportunities for students to develop the skills related to Statistical Practice 3: Analyze Data, as outlined in the CED. | *See pages:* 2, 3, 4 |
| CR7 | The course provides opportunities for students to develop the course skills related to Statistical Practice 4: Interpret Results, as outlined in the CED. | *See pages:* 4, 5 |

# AP Statistics
# Sample Syllabus #1

## Textbook

Textbook provided on the AP Course Audit form. CR1

### Additional Resources:

- All students have access to a TI-84 graphing calculator. Students use the calculator regularly throughout the year to construct plots, to calculate probabilities, to find the least-squares regression line, to construct confidence intervals, and to perform tests of significance. The textbook presents computer output from Minitab that students are required to understand and interpret in order to answer the homework questions. CR2
- Desmos software (freeware) CR2
- Released AP questions are used extensively throughout the course
- Personal Progress Checks are used as formative assessments within each unit
- Applets such as the Rossman/Chance applets, and Stapplet.com. Many of these applets lead students through a process to help them understand a concept.
- AP Community

The course follows the five units outlined in the fall 2026 Course and Exam Description (CED). CR3 Throughout each unit, the four Statistical Practices are emphasized: *Practice 1: Formulate Questions; Practice 2: Collect Data; Practice 3: Analyze Data; Practice 4: Interpret Results.*

## Unit 1: Exploring One-Variable Data and Collecting Data

In this unit, students learn to:

- Distinguish between categorical and quantitative data
- Represent categorical data in a table and graphically
- Construct different types of univariate plots
- Describe the shapes of distributions
- Compute measures of center and compare the pros/cons of each
- Compute measures of spread (variability) and compare the pros/cons of each
- Use applets and software to compare the different types of displays and how the choice of settings can affect the appearance of the distribution
- Compare distributions of univariate data using back-to-back stemplots or parallel boxplots

**Activity 1:** Students collect data from their class, such as how many states and providences they have visited. They are asked to calculate the five number summary and construct multiple types of graphs (3.A). Students discuss with a partner the benefits of each type of graphical display (4.A, 4.C). CR6

**Activity 2:** Students work in class on an activity that requires them to collect data using different sampling methods (2.B). The class combines data from all students and students are asked to construct the appropriate graphical representation in order to compare the different sampling methods (3.A, 4.A). Students then need to determine the most appropriate sampling technique to use and describe why it is superior to the other methods (4.B, 4.C). CR5 CR6

**CR2**
The syllabus must include a brief description of one or more classroom activities, assignments, or projects in which students interpret standard computer output in at least one topic.

AND

The syllabus must include a brief description of one or more classroom activities, assignments, or projects in which students use approved graphing calculators in at least one topic.

Note: Approved graphing calculators are outlined in the AP® Exams Calculator Policy. Throughout the school year, students may use the web-based or app-based Desmos graphing calculator in place of or in addition to a handheld graphing calculator.

**CR3**
The syllabus must include an outline of course content by unit title or topic using any organizational approach to demonstrate the inclusion of required course content.

Note: If the syllabus demonstrates a different approach than the unit outline in the fall 2026 CED, the syllabus must indicate where the required content of each unit in the CED will be taught. the syllabus must indicate where the required content of each unit in the CED will be taught.

## Unit 2: Probability, Random Variables, and Probability Distributions

In this unit, students learn to:

- Apply methods of simulation to estimate probabilities
- Apply the addition rule to compute probabilities
- Apply the multiplication rule to compute probabilities
- Construct Venn diagrams to organize information
- Construct tree diagrams to organize conditional probabilities
- Compute conditional probabilities
- Determine whether events are independent and/or mutually exclusive
- Apply the vocabulary of probability distributions
- Construct probability distributions
- Apply the concept of expected value
- Recognize the binomial distribution and calculate the corresponding probabilities
- Use calculators for the binomial distributions (pdf and cdf)
- Calculate z-scores and use the standard normal distribution to make comparisons
- Apply the central limit theorem
- Conduct simulations (by hand and with an applet) to generate approximate sampling distributions of a statistic such as the sample mean, sample proportion, etc.
- Describe center, shape, and spread of the sampling distribution of the sample means

**Activity 1:** Students work through exercises using data from the Titanic to explore probabilities, including independence, mutually exclusive, and conditional probabilities (3.C). **CR6**

**Activity 2:** Students construct sampling distributions of the sample means for the average gross domestic revenues of the top 200 movies in 2023 (2.A). Sampling distributions for n = 5, n = 10, and n = 30 are constructed and compared by combining sample means from all students. Students then simulate finding means for thousands of repeated samples and examine the center, shape, and spread of the sampling distributions (3.A, 3.B, 3.C, 4.A). The statistics are then compared to the population parameters (4.C). **CR5** **CR6**

**CR6**
The syllabus must include a brief description of one or more classroom activities, assignments, or projects in which students construct representations of data and calculate numerical statistical outputs to demonstrate a skill from Statistical Practice 3.

Note: The activity, assignment, or project must be labeled with the corresponding skill(s).

## Unit 3: Inference for Categorical Data: Proportions

In this unit, students learn to:

- Construct and interpret a confidence interval to estimate the proportion of success in a binomial population (formulaically and via a calculator)
- Conduct and interpret a test of significance to determine whether it is reasonable to conclude that the sample proportion could have been obtained by chance alone if the null were true
- Construct and interpret a confidence interval to estimate the difference in proportions of successes in two binomial populations (formulaically and via a calculator)
- Conduct and interpret a test of significance to determine whether it is reasonable to conclude that the difference in sample proportions from two binomial populations could have been obtained by chance alone if the null were true
- Conduct and interpret a chi-square test of homogeneity or independence
- Interpret computer output to conduct tests and construct confidence intervals using a calculator and software

**CR5**
The syllabus must include a brief description of one or more classroom activities, assignments, or projects in which students identify and justify methods for collecting data to demonstrate a skill from Statistical Practice 2.

Note: The activity, assignment, or project must be labeled with the corresponding skill(s).

- Discuss the importance of how the data were obtained
- Develop the understanding of the interpretation of a confidence interval and the l evel of confidence
- Develop an understanding of p-values and develop a conclusion by interpreting the p-value
- Develop an understanding of the concepts of power, Type I, and Type II errors

**Activity 1:** The class conducts a taste-test activity to introduce significance tests. Students use dice to simulate the distribution of the number of correct identifications based on random guessing (1.A). This simulation is then used to estimate the probability of obtaining the class result if the guesses were purely random (2.A, 2.E, 3.E, 4.B, 4.D, 4.E, 4.F, 4.G). CR5 CR6 CR7

**Activity 2:** The class is asked which candy has a higher proportion of yellow candy in two brands of multi-colored candies (1.A, 2.A). The class agrees on an appropriate inference method by checking the conditions (2.C, 4.E). The class identifies an appropriate alternative hypothesis (2.E) and then counts the candies to find the proportion of yellow candies in each sample (3.C, 3.D). Students calculate the test statistic and p-value (3.E) and interpret the results (4.F, 4.G). CR4 CR5 CR6 CR7

**Activity 3:** Students are told that researchers are interested in determining the percentage of time a digital sensor correctly detects a signal during repeated trials. The class discusses different methods for estimating the sensor's accuracy rate (1.A). Students are then asked to hypothesize the proportion of trials in which the sensor will correctly detect the signal (2.E). Data will be collected using a randomized testing activity, and students will conduct a one-sample z-test for a population proportion (2.C, 4.E). Students carry out the test using their approved graphing calculator. (3.B, 3.C, 3.E, 4.B, 4.D, 4.E, 4.F, 4.G). CR4 CR5 CR6 CR7

## Unit 4: Inference for Quantitative Data: Means

In this unit, students learn to:

- Construct and interpret a confidence interval to estimate a population mean (formulaically and via a calculator)
- Conduct and interpret a test of significance to determine whether it is reasonable to conclude that the sample mean could have been obtained by chance alone if the null were true
- Construct and interpret a confidence interval to estimate the difference in means from two populations (formulaically and via a calculator)
- Conduct and interpret a test of significance to determine whether it is reasonable to conclude that the difference in sample means from two populations could have been obtained by chance alone if the null were true
- Interpret computer output to conduct tests and construct confidence intervals using a calculator and software
- Discuss the importance of how the data were obtained to further understand the concepts of power, Type I, and Type II errors
- Further develop the understanding of the interpretation of a confidence interval and the level of confidence
- Further develop an understanding of p-values and develop a conclusion by interpreting the p-value
- Draw conclusions from an observational study and learn how these conclusions differ from those that can be drawn from a randomized experiment
- Link the design of an experiment to the type of analysis and the conclusions that can be drawn

**CR7**
The syllabus must include a description of one or more classroom activities, assignments, or projects in which students interpret results and justify conclusions with statistical inference procedures and methods to demonstrate skill 4.E, 4.F, or 4.G.

Note: The activity, assignment, or project must be labeled so that the corresponding skill(s) are evident.

**CR4**
The syllabus must include a brief description of one or more classroom activities, assignments, or projects in which students determine an investigative question for a statistical study to demonstrate a skill from Statistical Practice 1.

Note: The activity, assignment, or project must be labeled with the corresponding skill.

**Activity 1:** Matched Pairs Activity. Students throw pool noodles with dominant and non-dominant hands and do a complete significance test with results. Students are required to interpret confidence intervals or p-values from significance tests (4.F) and draw conclusions for the investigative questions based on the statistical inference results (4.G). CR7

**Activity 2:** Students will be given a set of data of items purchased from an online-only retailer and the website of a brick-and-mortar retailer's website. Students will be asked to compare the two sets of data (4.A). They will check conditions to justify the appropriateness of finding a confidence interval for the difference in the means of the distributions (4.E) and justify a claim based on a confidence interval (4.G). CR7

## Unit 5: Regression Analysis

In this unit, students learn to:

- Analyze patterns in scatterplots and describe the pattern
- Find and interpret in context the regression line through an elliptical pattern of data points
- Use correlation to determine the measure of spread of the points from the line
- Use their approved graphing calculator or applet to create scatterplots, to calculate and plot regression lines, and to construct and interpret residual plots
- Interpret standard computer output from the textbook

**Activity 1:** Students will use their dominant hands to grab as many candies as they can and then count how many they were able to grab from the bag (2.A). Students will calculate the correlation coefficient using technology (4.A). CR5

**Activity 2:** Students will collect measurements of their height, arm span, kneeling height, and hand span in order to test Leonardo da Vinci's theory of human proportions (1.A, 2.A). They will calculate the expected slope under da Vinci's hypotheses and compare it to the slope of the least-squares regression line (4.A). Students will explore correlation and residual plots in order to determine if the linear regression model is the most appropriate model (2.C, 4.A). This will be done using standard computer output. CR2 CR4 CR5