

# AP STATISTICS

2022-2023

---

---

## Textbook

Statistics and Probability with Applications. 4th Edition. Starnes, Tabor.

## Course Description

AP Statistics is equivalent to a one semester introduction to statistics, non-calculus based college course in statistics. This course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Four aspects are prevalent in AP Statistics: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Throughout the course we will use graphing calculators and statistical software to study data sets in the framework of statistics.

## Course Units

### 1 Exploring One-Variable Data

1. Introducing Statistics: What Can We Learn from Data?
2. The Language of Variation: Variables
3. Representing a Categorical Variable with Tables
4. Representing a Categorical Variable with Graphs
5. Representing a Quantitative Variable with Graphs
6. Describing the Distribution of Quantitative Variables
7. Summary Statistics for a Quantitative Variable
8. Graphical Representations of Summary Statistics
9. Comparing Distributions of a Quantitative Variable
10. The Normal Distribution

### 2 Exploring Two-Variable Data

1. Introducing Statistics: Are Variables Related?

2. Representing Two Categorical Variables

3. Statistics for Two Categorical Variables

4. Representing the Relationship Between Two Quantitative Variables

5. Correlation

6. Linear Regression Models

7. Residuals

8. Least Squares Regression

9. Analyzing Departures from Linearity

### 3 Collecting Data

1. Introducing Statistics: Does the Data We Collected Tell the Truth?

2. Introduction to Planning a Study

3. random Sampling and Data Collection

4. Potential Problems with Sampling

5. Introduction to Experimental Design

6. Selecting an Experimental Design

7. Inference and Experiments

## 4 Probability, Random Variables, and Probability Distributions

1. Introducing Statistics: Random and Non-Random Patterns?
2. Estimating Probabilities Using Simulation
3. Introduction to Probability
4. Mutually Exclusive Events
5. Conditional Probability
6. Independent Events and Unions of Events
7. Introduction to Random Variables and Probability Distributions
8. Mean and Standard Deviation of Random Variables
9. Combining Random Variables
10. Introduction to the Binomial Distribution
11. Parameters for a Binomial Distribution
12. The Geometric Distribution

## 5 Sampling Distributions

1. Introducing Statistics: Why Is my Sample Not Like Yours?
2. The Normal Distribution, Revisited
3. The Central Limit Theorem
4. Biased and Unbiased Point Estimates
5. Sampling Distributions for Sample Proportions
6. Sampling Distributions for Differences in Sample Proportions
7. Sampling Distributions for Sample Means
8. Sampling Distributions for Differences in Sample Means

## 6 Inference for Categorical Data: Proportions

1. Introducing Statistics: Why Be Normal?
2. Constructing a Confidence Interval for a Population Proportion
3. Justifying a Claim Based on a Confidence Interval for a Population Proportion
4. Setting Up a Test for a Population Proportion
5. Interpreting  $p$ -Values
6. Concluding a Test for a Population Proportion
7. Potential Errors When Performing Tests
8. Confidence Intervals for the Difference of Two Proportions
9. Justifying a Claim Based on a Confidence Interval for a Difference of Population Proportions
10. Setting Up a Test for the Difference of Two Population Proportions
11. Carrying Out a test for the Difference of Two Population Proportions

## 7 Inference for Quantitative Data: Means

1. Introducing Statistics: Why Should I Worry About Error?
2. Constructing a Confidence interval for a Population Mean
3. Justifying a Claim About a Population Mean Based on a Confidence Interval
4. Setting Up a Test for a Population Mean
5. Carrying Out a Test for a Population Mean
6. Confidence Intervals for the Difference of Two Means
7. Justifying a Claim About the Difference of Two Means Based on a Confidence Interval
8. Setting Up a Test for the Difference of Two Population Means
9. Carrying Out a Test for the Difference of Two Population Means

10. Skills Focus: Selecting, Implementing, and Communicating Inference Procedures

7. Skills Focus: Selecting an Appropriate Inference Procedure for Categorical Data

## **8 Inference for Categorical Data: Chi-Square**

1. Introducing Statistics: Are My Results Unexpected?
2. Setting Up a Chi-Square Goodness of Fit Test
3. Carrying Out a Chi-Square Test for Goodness of Fit
4. Expected Counts in Two-Way Tables
5. Setting Up a Chi-Square Test for Homogeneity or Independence
6. Carrying Out a Chi-Square Test for the Homogeneity or Independence

## **9 Inference for Quantitative Data: Slopes**

1. Introducing Statistics: Do Those Points Align?
2. Confidence Intervals for the Slope of a Regression Model
3. Justifying a Claim About the Slope of a Regression Model Based on a Confidence Interval
4. Setting up a Test for the Slope of a Regression Model
5. Carrying Out a test for the Slope of a Regression Model
6. Skills focus: Selecting an Appropriate Inference Procedure

## **Recommended Materials**

- Notebook, Pencils, Graphing Paper.
- Graphing Calculator (Ti-83/84, Nspire).

## **Rules and Expectations**

- Pay attention, follow class rules, stay on task.
- No food or drinks (water is fine).
- No Profanity.
- No cheating.
- Bathroom passes will not be issues within the first and last ten minutes of class.
- Phones/Headphones must be silent and out of sight unless instructed otherwise. During assessments, they must be off and put away, otherwise you forfeit your grade.
- Participate and ask questions.
- Stay positive, have fun.

## **Tardy Policy**

Any student who is late to class must obtain a pass from the front office. Disciplinary action is awarded after three tardies.

## Safety and Security Notice

In case of an emergency, I will not use Band, Remind, or social media to communicate.

## Make-up/Late Work

The only late work I accept are class assignments that I'll collect as homework. Otherwise, I do not accept late work. Notable exceptions to this rule are:

- Excused Absences: Due five days from absence.
- Unexcused Absences: Due two days from absence.

Additionally, if a student misses a test it's their responsibility to reschedule the test with one week, otherwise, it's an automatic **zero**.

## Grading

- |            |                            |
|------------|----------------------------|
| • 100-90 A | • Summative 40%            |
| • 89-80 B  | • Extension Activities 30% |
| • 79-70 C  | • Classwork 20%            |
| • 69-60 D  | • Homework 10%             |
| • 59-0 F   |                            |

## Assignment Grading Policies

My objective is to be clear and direct with what I'm grading, how I'm grading the assignment, and policies associated with each assignment type.

- **Homework:** Homework will be assigned throughout the week and be graded as one cumulative assignment. If  $n$  is any given school week, then the homework assignment is due on Tuesday of week  $n + 1$ .
- **Classwork:** We will have daily assignments that I will collect the same day. If an in class assignment is not finished then I will only accept it the **following** day; otherwise, **I will not accept late work**.
- **Quizzes:** I don't give pop quizzes, instead I conduct quizzes on **Wednesdays**, and quizzes will always be announced.
- **Tests:** As with quizzes, tests will always be announced and will take place on **Fridays**.

## Weekly Schedule

- Tuesday: Previous week's homework due.
- Wednesday: Quizzes
- Friday: Tests

## Your First Assignment

Your first assignment is to read over this syllabus with your parent/guardian and have them sign and date below. This will count as a homework assignment, and is therefore due \_\_\_\_\_.

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Signature: \_\_\_\_\_