

# Course Syllabus

## **Description:**

This course offers a combination of assessment and instruction in an online environment containing but not limited to the areas of exploring data, sampling and experimentation by planning and conducting studies, anticipating patterns using probability and simulation, and using statistical inference to analyze data and draw conclusions.

The purpose of this course is to provide students with a deep understanding of the concepts of statistics to prepare them for the AP Statistics Exam and for future higher education statistics courses.

**Estimated Completion Time:** 2 segments / 32–36 weeks.

## **Major Topics and Concepts:**

### **Segment 1: Module One: Exploring Data**

- 01.00 Segment One Diagnostic Test
- 01.01 Classifying Variables
- 01.02 Describing Data
- 01.03 Displaying Data
- 01.04 Exploring Data Mid-Module Check
- 01.05 Measuring Position
- 01.06 Normal Distribution
- 01.07 Exploring Data Discussion-Based Assessment
- 01.08 Exploring Data Exam Part One and Part Two

### **Module Two: Exploring Relationships**

- 02.00 Introduction to Exploring Relationships
- 02.01 Scatterplots and Correlation
- 02.02 Least-Squares Regression Part One
- 02.03 Exploring Relationships Mid-Module Check
- 02.04 Least-Squares Regression Part Two
- 02.05 Transformations
- 02.06 Exploring Relationships Discussion-Based Assessment
- 02.07 Exploring Relationships Exam Part One and Part Two

### **Module Three: Collecting Data**

- 03.00 Introduction to Collecting Data
- 03.01 Sampling and Surveys
- 03.02 Experiments Part One
- 03.03 Collecting Data Mid-Module Check
- 03.04 Experiments Part Two
- 03.05 Correlation Versus Causation

- 03.06 Collecting Data Discussion-Based Assessment
- 03.07 Collecting Data Exam Part One and Part Two

#### **Module Four: Probability and Random Variables**

- 04.00 Introduction to Probability and Random Variables
- 04.01 Randomness and Simulations
- 04.02 Probability
- 04.03 Probability and Random Variables Mid-Module Check
- 04.04 Random Variables
- 04.05 Binomial Random Variables
- 04.06 Geometric Random Variables
- 04.07 Segment One Discussion-Based Assessment
- 04.08 Segment One Exam Part One and Part Two

#### **Segment 2**

#### **Module Five: Sampling Distributions and Confidence Intervals**

- 05.00 Segment Two Diagnostic Test
- 05.01 Sampling Distributions and Proportions
- 05.02 Sample Means
- 05.03 Sampling Distributions and Confidence Intervals Mid-Module Check
- 05.04 Confidence Intervals for Proportions
- 05.05 Confidence Intervals for Means
- 05.06 Sampling Distributions and Confidence Intervals Discussion-Based Assessment
- 05.07 Sampling Distributions and Confidence Intervals Exam Part One and Part Two

#### **Module Six: Proportions**

- 06.00 Introduction to Proportions
- 06.01 Hypothesis Testing—One Proportion
- 06.02 Errors, Power, and Significance
- 06.03 Proportions Mid-Module Check
- 06.04 Confidence Intervals—Two Proportions
- 06.05 Hypothesis Testing—Two Proportions
- 06.06 Proportions Discussion-Based Assessment
- 06.07 Proportions Exam Part One and Part Two

#### **Module Seven: Means and Slope**

- 07.00 Introduction to Means and Slope
- 07.01 Hypothesis Testing—One-Sample Mean
- 07.02 Comparing Two Means
- 07.03 Means and Slope Mid-Module Check
- 07.04 Matched Pairs
- 07.05 Linear Regression and Interval for Slope
- 07.06 Means and Slope Discussion-Based Assessment
- 07.07 Means and Slope Exam Part One and Part Two

## **Module Eight: Chi-Square**

- 08.00 Introduction to Chi-Square
- 08.01 Chi-Square Goodness-of-Fit Test
- 08.02 Chi-Square Test for Inference
- 08.03 Chi-Square Mid-Module Check
- 08.04 Exploring and Collecting Data Review
- 08.05 Probability, Sampling, and Inference Review
- 08.06 Segment Two Discussion-Based Assessment
- 08.07 Segment Two Exam Part One and Part Two

### **Course Assessment and Participation Requirements:**

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple-choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.