

COURSE SYLLABUS

Statistics

Instructor: _____
Toi Graham, MA

Hello, and welcome!

Statistics is how data becomes knowledge! It is the study and application of data to solve problems. You see statistics in sports, in online shopping, and when a streaming service recommends a movie. You find it in medicine (diagnosing a disease) and business (predicting products consumers buy). It is also apparent in technology (determining when hardware might fail). Statistics is at the heart of every form of artificial intelligence. Even self-driving cars rely on statistics! Our goal in this course is to show you how to describe a dataset and use it to predict what may happen next. There are so many real-world applications!

Getting started with statistics is easier than you think. It may sound complicated, but it begins with concepts you already know.

Be open-minded, don't shy away from the work, and you will succeed. We'll help you every step of the way!

Course Description and Competencies

In this course, you will learn to represent and categorize data. You will learn about distributions of data, as well as the relationships between different sets of data. You will learn how to use data to calculate probabilities and make predictions. Then you will apply that knowledge to increase your understanding of statistics.

Like exercise, the best way to get better at using statistics is through repetition. And you will have lots of chances to do that through real-world practice exercises.

By the end of this course, you will be able to:

1. Summarize and describe data.
2. Explain the relationships between data.
3. Discern bias based upon data sampling methods.
4. Evaluate data collection methods.
5. Determine the probability of events happening.

12 quizzes

1 midterm exam

1 final exam

3 competency units

Note: Practice assessment scores will not count toward your final grade. These results are meant only to give you feedback on how you are doing.

Course Outline

Module:	Upon completion of this module, you will be able to:
1 The Shape of Data: Distribution	<ul style="list-style-type: none">A. Summarize the distribution of a categorical variable.B. Generate graphical displays of the distribution of a quantitative variable.C. Generate numerical measures of center and measures of spread of the distribution.
2 Exploring Relationships: Categorization and Classification	<ul style="list-style-type: none">A. Classify a data analysis scenario according to the “role-type classification.”B. Summarize relationships between variables.C. Graph the relationship between two quantitative variables.
3 Studying Studies: The Basics of Research	<ul style="list-style-type: none">A. Identify sampling methods.B. Explain how the design of a study impacts the conclusions that can be drawn.C. Determine how the features of a survey impact the quality of the collected data.
4 Navigating Uncertainty: Probability Fundamentals	<ul style="list-style-type: none">A. Define probability.B. Describe how probability quantifies uncertainty.C. Use relative frequency to estimate the probability of an event.
5 Predicting the Future: Finding Probability of Events	<ul style="list-style-type: none">A. Determine the sampling space of a random experiment.B. Find the probability of events when all outcomes are equally likely.C. Apply probability rules in order to find the likelihood of an event.
6 Forests and Trees: Conditional Probability and Independence	<ul style="list-style-type: none">A. Determine when two events are independent.B. Find the probability of two independent events.C. Use probability trees to find probabilities.
7 Heads or Tails: Random Variables	<ul style="list-style-type: none">A. Distinguish between discrete and continuous random variables.B. Find the probability distribution function of a discrete random variable.C. Find the mean and variance of a discrete random variable.D. Describe the binomial distribution.
8 Making Educated Guesses: Sampling Distributions	<ul style="list-style-type: none">A. Distinguish between a parameter and a statistic.B. Determine the sampling distribution of the sample proportion.C. Determine the sampling distribution of the sample mean.

Course Outline (cont.)

Module:	Upon completion of this module, you will be able to:
9 Estimation	<ul style="list-style-type: none">A. Use point estimation to estimate a population proportion based upon a sample proportion.B. Use point estimation to estimate a population mean based upon a sample mean.C. Determine confidence intervals for a population mean.D. Determine confidence intervals for a population proportion.
10 Hypothesis Testing	<ul style="list-style-type: none">A. Use hypothesis testing to determine population proportions based upon a sample.B. Use hypothesis testing to determine population mean based upon a sample.C. Identify type I and type II errors in hypothesis testing.
11 Inference for Relationships Part 1	<ul style="list-style-type: none">A. Infer relationships between a categorical independent variable and a quantitative variable based upon two independent samples.B. Infer relationships between a categorical variable and a quantitative variable based upon matched pair samples.C. Use ANOVA to infer relationships based upon three or more independent samples.
12 Inference for Relationships Part 2	<ul style="list-style-type: none">A. Infer relationships between a categorical independent variable and a categorical variable based upon two independent samples.B. Use the chi-square test to assess the relationship between two categorical values.C. Infer relationships between a quantitative variable and a quantitative variable based upon two independent samples.

Technology Requirements

We want you to have the tools to succeed! Since this course includes at least one proctored test, please be sure to have a working microphone, speakers, and an external webcam. Unfortunately, an internal webcam (built into many laptops) is not acceptable. For other details about the technology you'll need, review the [Computer System and Technology Requirements](#). If you have questions about your setup, contact support@academy.wgu.edu.

Key Contacts



Your Fellow Learners

Check out the Statistics Lobby in this course site. In this online community, you can ask questions and explore ideas. You can connect with your fellow learners. You will also find helpful videos and exercises. When you use this site, you will realize that other learners may have the same questions you have. You can all benefit from learning together!

Your Instructor

You can connect and schedule time with your [Course Instructor \(CI\)](#). Your CI is here to help you every step of the way.

Tutor.com

If you need academic support, don't hesitate to contact [Tutor.com](#). There, you have access to thousands of tutors. And they are available 24/7 from any internet-ready device. You can also benefit from instructional videos, study tools, and other assistance.

Technical Support

If you encounter technical issues, be sure to contact the Help Desk. Just submit a [Support Request](#) for assistance.

Program Support

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Accommodations

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