This course supports the assessment for RQT2. The course covers 4 competencies and represents 2 competency units.

Introduction

Overview
This course covers a broad overview of the field of probability and statistics.

Competencies
This course provides guidance to help you demonstrate the following 4 competencies

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.

- **Competency 209.5.2: Data Collection, Analysis, and Display I**
  The graduate designs and implements surveys, analyzes data, and summarizes and represents data using appropriate displays.

- **Competency 209.5.3: Counting Principles I**
  The graduate applies counting principles to determine probabilities.

- **Competency 209.5.4: Probability and Expected Value I**
  The graduate calculates probabilities for compound events and events involving discrete, normal, and binomial probability distributions; and solves problems involving probability.

Teaching Dispositions Statement
Please review the [Statement of Teaching Dispositions](#).

Course Mentor Assistance
As you prepare to successfully demonstrate competency in this subject, remember that course mentors stand ready to help you reach your educational goals. As subject matter experts, mentors enjoy and take pride in helping students become reflective learners, problem solvers, and critical thinkers. Course mentors are excited to hear from you and eager to work with you.

Successful students report that working with a course mentor is the key to their success. Course mentors are able to share tips on approaches, tools, and skills that can help you apply the content you're studying. They also provide guidance in assessment preparation strategies and troubleshoot areas of deficiency. Even if things don't work out on your first try, course mentors act as a support system to guide you through the revision process. You should expect to work with course mentors for the duration of your coursework, so you are welcome to contact them as soon as you begin. Course mentors are fully committed to your success!

Preparing for Success

The information in this section is provided to detail the resources available for you to use as you complete this course.
Learning Resources

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, you may need to manually enroll in or independently acquire other resources. Read the full instructions provided to ensure that you have access to all of your resources in a timely manner.

Automatically Enrolled Resources

You can access the learning resources listed in this section by clicking on the links provided throughout the course. You may be prompted to log in to the WGU student portal to access the resources.

Pearson E-text


*Note: The answers to odd-numbered exercises are found in the back of the text.*

Other Learning Resources

Lynda.com

WGU students have open access to the complete Lynda.com library of training videos. This resource can be used to help you become more comfortable with technology, such as Microsoft Office applications, software programs, and e-mail, in order to provide supplemental learning tools for your WGU courses. To access the main search page, click the link below.

- Lynda.com Video Library

Additional Preparations

Graphing Calculator

Acquire a graphing calculator and familiarize yourself with how to use it. Refer to the WGU Calculator and Scratch Paper Guidelines document for calculator permitted on WGU exams. If you are in a secondary mathematics program, refer to the WGU Calculator Recommendations for Secondary Math and Science Document for calculator suggestions for your degree program.

Elementary Statistics Overview

The first few sections of this course cover the many different types of data, how to collect data, and then how best to display the data you have collected.

Introduction to Statistics

You will be provided with a review of relevant introductory statistics concepts, the types of data you may encounter, the critical thinking process, and the elements of experimental design. You will explore the fundamentals of data collection and analysis. These concepts will form the basis for further extension into more advanced topics.
This topic addresses the following competencies:

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.
- **Competency 209.5.2: Data Collection, Analysis, and Display I**
  The graduate designs and implements surveys, analyzes data, and summarizes and represents data using appropriate displays.

### Introduction to Statistics

Read the following sections in [Chapter 1 Introduction to Statistics](#) from *Elementary Statistics* and complete the assigned exercises:

- section 1-1 ("Review and Preview") no exercises
- section 1-2 ("Statistical Thinking") 3,5,7,9,11,13,14,17,21,25,27
- section 1-3 ("Types of Data") 1-31 odd
- section 1-4 ("Critical Thinking") 1-29 odd

### Summarizing and Graphing Data

You will be provided with an overview of relevant chapter concepts, frequency distributions, histograms, scatter plots, and other interesting graphical representations.

This topic addresses the following competencies:

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.
- **Competency 209.5.2: Data Collection, Analysis, and Display I**
  The graduate designs and implements surveys, analyzes data, and summarizes and represents data using appropriate displays.

### Summarizing and Graphing Data

Read the following sections in [Chapter 2 Summarizing and Graphing Data](#) from *Elementary Statistics* and complete the assigned exercises:
Statistics and complete the assigned exercises:

- section 2-1 ("Review and Preview") no exercises
- section 2-2 ("Frequency Distributions") 1-31 odd
- section 2-3 ("Histograms") 3-17 odd
- section 2-4 ("Graphs That enlighten and Graphs That deceive") 1-25 odd

Statistics for Describing, Exploring, and Comparing Data
You will be provided with a review of relevant chapter concepts, measures of center, measures of variation, measures of relative standing, and exploratory data analysis.

This topic addresses the following competencies:

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.
- **Competency 209.5.2: Data Collection, Analysis, and Display I**
  The graduate designs and implements surveys, analyzes data, and summarizes and represents data using appropriate displays.

Statistics for Describing, Exploring, and Comparing Data

Read the following sections in Chapter 3 Statistics for Describing, Exploring, and Comparing Data from Elementary Statistics and complete the assigned exercises:

- section 3-1 ("Review and Preview") no exercises
- section 3-2 ("Measures of Center") 3-37 odd
- section 3-3 ("Measures of Variation") 4,5,7,9,10,12,14,17,18
- section 3-4 ("Measures of Relative Standing and Boxplots") 2 and 17-33 odd

Using Your Graphing Calculator to Find Single-Variable Statistics

Go to the following link to find directions to an Atomic Learning tutorial for finding Single-Variable Statistics with your TI calculator.
Elementary Probability

The activities for this subject will introduce you to a variety of elementary probability concepts.

Probability

You will be provided with a review of relevant chapter concepts, fundamental probability concepts, the addition rule, the multiplication rule, complements and conditional probability, probability through simulations, and counting. Consider when it is appropriate to use these various rules as you work through the activities in this section.

This topic addresses the following competencies:

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.

- **Competency 209.5.3: Counting Principles I**
  The graduate applies counting principles to determine probabilities.

- **Competency 209.5.4: Probability and Expected Value I**
  The graduate calculates probabilities for compound events and events involving discrete, normal, and binomial probability distributions; and solves problems involving probability.

Probability

Read the following sections in [Chapter 4 Probability](#) from *Elementary Statistics* and complete the assigned exercises:

- section 4-1 ("Review and Preview") no exercises
- section 4-2 ("Basic Concepts of Probability") 1–47 odd
- section 4-3 ("Addition Rule") exercises 1–37 odd
- section 4-4 ("Multiplication Rule: Basics") exercises 5–29 odd
- section 4-5 ("Multiplication Rule: Complements and Conditional Probability") 3-31 odd
- section 4-6 ("Counting") 3-33 odd

[Problem Simulation Using Excel](#)
Using Your Graphing Calculator to Find Permutations and Combinations

Read the following document to find directions to an Atomic Learning tutorial for finding permutations and combinations with your TI calculator:

- Mathematics Technology Tips

Probability and Statistics I, Task 1

You now have the competency necessary to complete Probability and Statistics I, Task 1. The following activities include resources that may be helpful as you complete this task.

This topic addresses the following competencies:

- Competency 209.5.1: Problem Solving I
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.
- Competency 209.5.3: Counting Principles I
  The graduate applies counting principles to determine probabilities.
- Competency 209.5.4: Probability and Expected Value I
  The graduate calculates probabilities for compound events and events involving discrete, normal, and binomial probability distributions; and solves problems involving probability.

Excel Help

Use the following help document to view an example of using Excel to simulate probabilities:

- Excel Example

Complete: Task 1 Performance Task

Complete the following task in TaskStream:

- Probability & Statistics I: Task 1

For details about this performance assessment, see the "Assessment" tab in this course.

Probability Distributions

A probability distribution is a way to represent outcomes and their associated probabilities. The activities for this section will introduce you to selected probability distributions. Different probability distributions have different shapes, and those shapes provide insight into the nature of the distribution. The study of probability distributions will help you to better visualize elementary statistics and probability concepts in the context of real-world applications.

This topic addresses the following competencies:

- Competency 209.5.1: Problem Solving I
The graduate applies the principles of probability and statistics to solve problems and to make predictions.

- **Competency 209.5.3: Counting Principles I**
  The graduate applies counting principles to determine probabilities.

- **Competency 209.5.4: Probability and Expected Value I**
  The graduate calculates probabilities for compound events and events involving discrete, normal, and binomial probability distributions; and solves problems involving probability.

### Discrete Probability Distributions

Read the following sections in [Chapter 5 Discrete Probability Distributions](#) from *Elementary Statistics* and complete the assigned exercises:

- section 5-1 ("Review and Preview") no exercises
- section 5-2 ("Probability Distributions") 1-23 odd
- section 5-3 ("Binomial Probability Distribution") 3-43 odd
- section 5-4 ("Parameters for Binomial Distributions") 1-19 odd

### Uniform Distribution

Read the following section in Chapter 6 [Normal Probability Distributions](#) from *Elementary Statistics* and complete the assigned exercises:

- beginning of section 6-2 ("The Standard Normal Distribution") 3,5,6,7

### Probability and Statistics 1, Task 2

The following activities and resources may be helpful as you complete your second task.

This topic addresses the following competencies:

- **Competency 209.5.1: Problem Solving I**
  The graduate applies the principles of probability and statistics to solve problems and to make predictions.

- **Competency 209.5.3: Counting Principles I**
  The graduate applies counting principles to determine probabilities.

- **Competency 209.5.4: Probability and Expected Value I**
  The graduate calculates probabilities for compound events and events involving discrete, normal, and binomial probability distributions; and solves problems involving probability.
Experimental and Observational Studies

Two of the most commonly used research designs are the experimental study and the observational study. Read definitions of each below:

- **Experimental Study Design**
- **Observational Study**

Experimental studies require a control group. Observational Studies require the collection of baseline data. Baseline data is data that is collected and used for comparison against data collected about the behavior under investigation.

The following is a description of a real-world observational study, including the collection of baseline data. In this study, and in the upcoming task, two groups are compared, and one group is identified as the baseline.

- **Hand Washing Among Public Restroom Users At the Minnesota State Fair**

The following episodes of the documentary series about statistics, “Against All Odds,” detail these types of studies, and how these studies determine either correlation or causation.

- **Against All Odds – Episode 111: The Question of Causation**
- **Against All Odds – Episode 112: Experimental Design**

**Task Template**

Be sure you are logged into the WGU portal, and then access the following template to download and save the Task 2 template:

- **RQT Task 2 Template**

Save a copy of this template to your desktop and print a copy for your personal use.

This document helps you organize the writing and has comments to help you to think about structuring the project you will complete for this task.

**Complete: Task 2**

Complete the following task in TaskStream:

- Probability & Statistics I: Task 2

For details about this performance assessment, see the "Assessment" tab in this course.

**Final Steps**

Congratulations on completing the activities in this course! This course has prepared you to complete the assessments associated with this course. If you have not already been directed to
complete the assessments, schedule and complete your assessments now.

The WGU Library

The WGU Library
The WGU Library is available online to WGU students 24 hours a day.

For more information about using the WGU Library, view the following videos on The WGU Channel:

Introducing the WGU library

*Note: To download this video, right-click the following link and choose "Save as...": [download video.]*

Searching the WGU library

*Note: To download this video, right-click the following link and choose "Save as...": [download video.]*

Center for Writing Excellence: The WGU Writing Center

If you need help with any part of the writing or revision process, contact the Center for Writing Excellence (CWE). Whatever your needs—writing anxiety, grammar, general college writing concerns, or even ESL language-related writing issues—the CWE is available to help you. The CWE offers personalized individual sessions and weekly group webinars. For an appointment, please e-mail writingcenter@wgu.edu.

Feedback

WGU values your input! If you have comments, concerns, or suggestions for improvement of this course, please submit your feedback using the following form:

- [Course Feedback]

Accessibility Policy

Western Governors University recognizes and fulfills its obligations under the Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 and similar state laws. Western Governors University is committed to provide reasonable accommodation(s) to qualified disabled learners in University programs and activities as is required by applicable law(s). The Office of Student Accessibility Services serves as the principal point of contact for students seeking accommodations and can be contacted at ADASupport@wgu.edu. Further information
on WGU’s Accessibility policy and process can be viewed in the student handbook at the following link:

- [Policies and Procedures for Students with Disabilities](#)