

Statistics in an Online World  
HNRS 240 / Spring 2026

Instructor: Adam Childers [childers@roanoke.edu](mailto:childers@roanoke.edu)

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Office Hours: 12:00-1:00 MW, 10:00-11:00 Tues, and by appointment. Please send me an email to schedule an appointment if you need to meet at another time.

Zoom Link: <https://roanoke-edu.zoom.us/j/5403752449>

Meeting Time: 9:40-10:40PM, Monday, Wednesday, Friday.

Meeting Place: Trexler 263

Required Texts: OpenIntro Statistics Fourth Edition by David Diez, Mine Cetinkaya-Rundel, Christopher D Barr I would recommend buying a physical copy but you can download the electronic copy for free! You can find the book using the URL: <https://www.openintro.org/stat/textbook.php>

Course Objective: The objective of this course is to explore probability and statistics through social media, smartphone use, and online retailers. The focus of this course will be asking questions and then developing the statistical techniques necessary to answer those questions. Armed with probability theory and statistical techniques we will determine how to summarize, analyze, and communicate key features of a data set. As applications, we will investigate how to quantify and improve the effectiveness of technology including websites and social media, how to use statistics to help businesses improve their presence on Facebook, and how online retailers and social media sites use consumer data.

Learning Outcomes:

1. Students will be able to use the methodologies of statistics to
  - a. Investigate a topic of interest and make decisions based on the results.
  - b. Design and carry out a simple statistical experiment.
  - c. Critique news stories and journal articles that include statistical information. In the critique, students will recognize variability and its consequences, identify potential sources of bias and both proper and improper cause and effect inference.
2. Students will be able to articulate the importance and limitations of using data and statistical methods in decision-making.
3. Students will be able to write about course topics clearly and effectively.
4. Students will be able to interpret quantitative information related to the course topic.
5. Students will be able to connect course content to communities beyond the classroom.

Course Topics:

- Descriptive Statistics
- Graphical Methods
- Correlation and Regression
- Estimation
- Elementary Probability
- Test of Hypothesis (z-tests, t-tests and Chi-square test)
- Confidence Intervals
- Analysis of Variance

Homework: There will be practice HW assigned daily on Inquire. I will let you know when the HW will be collected for a grade.

Quizzes: We will have short quizzes occasionally to help prepare for the tests.

Labs: We will have several labs throughout the semester that will focus on learning statistical computing. The labs will be completed in Minitab. You can access the software as a web application using your Roanoke College login through the following URL: <https://app.minitab.com/>

Tests: Tests will assess students' understanding of the material covered in class, take-home readings, and homework assignments. There will be 4 tests during the semester.

Project: In this project, you will play the role of a member of a consulting team working with the organization Deaf Dogs Rock. Your goal will be to help them understand how to improve their interaction with their followers on Facebook. This project will be completed throughout the semester as you work towards creating a polished report that explains your statistical findings to the leadership of Deaf Dogs Rock.

**Final Exam: The final exam will be cumulative and will be April 23<sup>th</sup> at 8:30AM.**

Grading: Grades will be assigned based on written assignments, quizzes, tests, and a final exam as follows,

Tests	50%
Homework/ Labs/Quizzes	20%
Project	15%
<b>Final Exam</b>	<b>15%</b>

Grades will be determined based on the following:

A	> 93	B	83 – 86.9	C	73 – 76.9	D	63 – 66.9
A-	90 – 93	B-	80 – 82.9	C-	70 – 72.9	D-	60 – 62.9
B+	87 – 89.9	C+	77 – 79.9	D+	67 – 69.9	F	< 60

Attendance: Attendance is required and expected and is crucial to be successful in this course. An absence that is not discussed with the instructor before class is considered unexcused. Regardless of whether the absence is excused or not, you are responsible for all the material covered in class.

Missed Test: If you have to miss a test and have discussed it with me before the class takes the test, we can work together to re-schedule the test up to two days after the scheduled date. If it is not possible to take the test in that time period, I will replace that test grade with your final exam grade.

Make-up Work: No make-up work will be accepted. Any excused work will be replaced by the final exam. If an assignment is not turned in before the deadline and you have not contacted me about the assignment, it is considered unexcused.

Expected Hours of Work: This course expects you to spend at least 12 hours of work each week inside and outside of class.

Technology: We will be using Minitab for our statistical computing. You can access the web application for free using your Roanoke College email. <https://app.minitab.com/>

**Academic Integrity System: Students are expected to adhere to the Academic Integrity policies of Roanoke College. All work submitted for a grade is to be your own work! I encourage collaboration on homework but when you write up your solutions you should never be looking at someone else's work. Note that looking at or using your cell phone during a test or quiz is considered a violation of Academic Integrity regardless of your purpose or intent in doing so. If you use generative AI in any way on an assignment, you need to specify exactly how you used it, or it will be considered an Academic Integrity Violation.**

Schedule: This is the intended schedule but could change. Please check Inquire for any updates or changes.

Date	Day	Topic
12-Jan	Monday	Introduction
14-Jan	Wednesday	Chapter 1: Intro to Data
16-Jan	Friday	Chapter 1: Intro to Data
21-Jan	Wednesday	Chapter 2.1: Numerical Data
23-Jan	Friday	Chapter 2.1: Numerical Data
26-Jan	Monday	Chapter 2.2: Categorical Data
28-Jan	Wednesday	Lab #1
30-Jan	Friday	Chapter 3.1: Probability
2-Feb	Monday	Chapter 3.2: Conditional Probability
4-Feb	Wednesday	Review
6-Feb	Friday	Test 1
9-Feb	Monday	Chapter 4.1: The Normal Distribution
11-Feb	Wednesday	Chapter 4.1: The Normal Distribution
13-Feb	Friday	Chapter 4.3: The Binomial Distribution
16-Feb	Monday	Chapter 5.1 Point Estimates
18-Feb	Wednesday	Chapter 5.2 Confidence Intervals Proportion
20-Feb	Friday	Chapter 5.2 Confidence Intervals Proportion
23-Feb	Monday	Review
25-Feb	Wednesday	Test 2
27-Feb	Friday	Activity – Central Limit Theorem
9-Mar	Monday	Chapter 5.3 Hypothesis Testing Proportion
11-Mar	Wednesday	Chapter 5.3 Hypothesis Testing Proportion
13-Mar	Friday	Chapter 6.1 - Inferences for a Single Proportion
16-Mar	Monday	Chapter 6.3 Goodness of Fit
18-Mar	Wednesday	Chapter 6.4: Test for Independence
20-Mar	Friday	Lab #2 – Categorical Variable Analysis
23-Mar	Monday	Review
25-Mar	Wednesday	Test 3
27-Mar	Friday	Chapter 7.1 One-Sample Means
30-Mar	Monday	Chapter 7.1 One-Sample Means
1-Apr	Wednesday	Chapter 7.2 Paired Data
6-Apr	Monday	Chapter 7.3 Difference of Two Means
8-Apr	Wednesday	Chapter 7.5 ANOVA
10-Apr	Friday	Lab #3 – Quantitative Response Analysis
13-Apr	Monday	Chapter: 8.1 Linear Regression

15-Apr	Wednesday	Chapter: 8.2 Least Squares
17-Apr	Friday	Project Day
20-Apr	Monday	Test 4
21-Apr	Tuesday	Review
23-Apr	Thursday	Exam 8:30AM