Instructor: Adam Childers childers@roanoke.edu

Office: Trexler 270G

 Phone: 540-375-2449

Office Hours: 9:40-10:40, Monday, Wednesday Friday, 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: 8:30-9:30 AM, Monday, Wednesday, Friday.

Meeting Place: For the first 2 weeks of the semester we will meet on synchronously on Zoom. For the remainder of the season in New Hall 106.

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

Supplementary Reading:

- Mathematical Statistics with Applications by Wackerly, Mendenhall and Scheaffer (Chapter 15 provided by instructor)
- "College students' social networking experiences on Facebook" by Pempek, Tiffany A., Yevdokiya A. Yermolayeva, and Sandra L. Calvert. Journal of Applied Developmental Psychology 30.3 (2009): 227-238.

- EasyWriter (Ed. 6), by Lunsford, Andrea A.

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)
- Non-parametric Statistics
- Confidence Intervals
- Analysis of Variance

Homework: Homework will be assigned regularly. The problems will be posted on Inquire with their due date. The homework will be graded for correctness and completeness.

Additionally, there will be reading assignments, quizzes, and reflections.

Labs: We will have serval labs throughout the semester that will focus learning statistical computing.

Tests: Tests will assess students understanding of material covered in class, take home readings, and homework assignments. The tests will be on

Friday, February 11th
Wednesday, March 2nd
Wednesday, March 30th
Monday, April 25th

Project: Due Tuesday, April 26th - In this project you will play the role of a member of a consulting team working with a local business or organization. You goal will be to help them understand how to improve their reach to constituents on Facebook. This project will be completed throughout the semester as you work towards presenting your business partner with a polished report that explains your statistical findings. Your first job will be to contact the organization and understand what goals they have for the impact of their Facebook page and what questions they have about how users are interacting with their page. You will then determine how to answer those questions using statistical methods and meet with another group to discuss your plan. Next your team will request relevant data from your business partner and analyze the data. The final project will be a report to your business partner that clearly articulates your statistical findings and their practical meanings. Before submitting your project to your business partner, you will have a peer review with another group to ensure your report is thoughtful and understandable. Finally, you will give an oral presentation to the class on your findings.

Final Exam: The final exam will be cumulative and will be on Tuesday, May 3rd at 2:00PM

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

Tests	50%
Homework/ Labs	20%
Project	15%
Final Exam	15%

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

Classroom Safety: The College has issued a mask mandate for the start of the semester that requires masks to be worn in indoor common spaces such as our classroom. You must wear a mask in this class. If you arrive without a mask, you will not be allowed to stay and may lose credit for attendance or in-class work. The Bookstore sells masks if you need to make a quick purchase. If the mandate is extended, you will be required to continue to wear a mask.

If you have a temperature of 100.4 or higher or other COVID symptoms, don't come to class. Call Health Services IMMEDIATELY. Do not come to class or go to any public area on campus. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them about COVID symptoms. If Health Services informs you that you should isolate and not attend class for multiple days, inform me so that we can make a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused but you will need to do the work and graded assignments even if we extend a deadline for you.

Attendance: Attendance is required and expected and is crucial to be successful in this course. An absence that is not discussed with the instructor prior to 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: I will not give make-up tests. If you miss a test and have discussed it with me before the class takes the test, I will use your final exam grade for replacement.

Make-up Work: No make-up work will be accepted. Any excused work will be replaced by the final exam.

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 jamovi for our statistical computing. You can download a free copy here: https://jamovi.org

We will be collecting data using the mobile application Classroom Stats though out the semester. Please download this free app onto your phone. It is available for Android and iOS and you can easily find it in the app store.

The Writing Center @ Roanoke College, located on the Lower Level of Fintel Library (Room 15), offers free tutorials focused on writing projects and oral presentations for students working in any field. Writers and presenters at all levels of competence may visit the Writing Center at any point in their process—including brainstorming, drafting, organizing, editing, or polishing presentation skills—to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 PM. Simply stop in, or schedule an appointment at www.roanoke.edu/writingcenter. Questions? Email writingcenter@roanoke.edu or call 540-375-4949.

Subject Tutoring, located on the lower level of Fintel Library (Room 5), is open 4-9 PM, Sunday-Thursday. Subject Tutors are highly trained, current students who offer free, one-on-one (and small group) tutorials in over 80 courses taught at Roanoke College, including: Business, Economics, Mathematics, INQ 240, Modern Languages, Lab Sciences, and Social Sciences. Check out all available subjects and schedule 30- or 60-minute appointments at www.roanoke.edu/tutoring. If you have a question, feel free to stop by, or contact us at subject_tutoring@roanoke.edu or 540-375-2590. See you soon!

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! 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.

Accessible Education Services (AES) is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Becky Harman, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Becky Harman at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Week	Day	Date	Topic
1	W	19-Jan	Introduction
1	F	21-Jan	Chapter 1: Intro to Data
2	M	24-Jan	Chapter 1: Intro to Data
2	W	26-Jan	Chapter 2.1: Numerical Data
2	F	28-Jan	Chapter 2.1: Numerical Data
3	M	31-Jan	Chapter 2.2: Categorical Data
3	W	2-Feb	Lab #1
3	F	4-Feb	Chapter 3.1: Probability
4	M	7-Feb	Chapter 3.2: Conditional Probability
4	W	9-Feb	Review
4	F	11-Feb	Test 1
5	M	14-Feb	Chapter 4.1: The Normal Distribution
5	W	16-Feb	Chapter 4.1: The Normal Distribution
5	F	18-Feb	Chapter 4.3: The Binomial Distribution
6	M	21-Feb	Chapter 5.1 Point estimates
6	W	23-Feb	Chapter 5.2 Confidence intervals proportion
6	F	25-Feb	Chapter 5.2 Confidence intervals proportion
7	M	28-Feb	Review
7	W	2-Mar	Test 2
7	F	4-Mar	Chapter 5.3 Hypothesis Testing Proportion
*	M	7-Mar	Relax
*	W	9-Mar	Regroup
*	F	11-Mar	Reenergize
8	M	14-Mar	Chapter 5.3 Hypothesis Testing Proportion
8	W	16-Mar	Chapter 6.1 - Inferences for a Single Proportion
8	F	18-Mar	Chapter 6.2 Difference in proportions
9	M	21-Mar	Chapter 6.3 Goodness of Fit
9	W	23-Mar	Chapter 6.4: Test for Independence
9	F	25-Mar	Lab #2
10	M	28-Mar	Review
10	W	30-Mar	Test 3
10	F	1-Apr	Chapter 7.1 One-sample means
11	M	4-Apr	Chapter 7.1 One-sample means
11	W	6-Apr	Chapter 7.2 Paired Data
11	F	8-Apr	Chapter 7.3 Difference of 2 means

12	M	11-Apr	Chapter 7.5 ANOVA
12	W	13-Apr	Inference Review
12	F	15-Apr	No Class - Good Friday
13	M	18-Apr	Chapter: 8.1 Linear Regression
13	W	20-Apr	Chapter: 8.2 Least Squares
13	F	22-Apr	Project Day
14	M	25-Apr	Test 4
14	T	26-Apr	Review
EXAM	M	3-May	Exam 2pm