Instructor: Dr. Chris Lee clee@roanoke.edu Trexler 270D

Office Hours: Have a question? Please stop by my office to chat. Regular office hours are listed below, and I welcome you to contact me to make an appointment outside of these hours:

Tue: 1:00 – 2:00 pm Wed: 2:15 – 3:15 pm, Thu: 1:00 – 2:00 pm.

Course Description: As we use our phones and surf the web, are we really exercising free will? Whether it be reading, shopping, or interacting socially, we'd like to think that we are in control of our choices. The reality is that web designers and marketers use conclusions drawn from vast amounts of data to carefully craft and control our web experiences and actions. This course provides an inquiry-focused introduction to the statistical methodologies necessary to successfully explore and answer this question. Along the way, students will develop an understanding of how data is collected and used in relation to virtually everything we do on the Internet.

Learning Outcomes: Some of the specific skills I hope you will obtain in this course are listed below. Being a critical consumer of information is important – all these activities will help you become one.

1. Use the methodologies of statistics to investigate a topic of interest and make important decisions.
2. Critique news stories that include statistical information, identifying potential sources of bias and both proper and improper cause and effect inference.
3. Articulate the importance and limitations of using data and statistical methods in decision-making.
4. Write about course topics clearly and effectively.

Required Text: *The Basic Practice of Statistics, 9th Edition*. Moore, Notz, and Fligner.
Hooked. Nir Eyal.

Attendance: Come to class and be prepared to actively participate - this is the best way for you to engage in the learning material and it makes our class meeting so much more fun! You should attend every class, but extenuating circumstances can arise that can make this difficult. If you cannot attend a class, please let me know. If circumstances cause you to miss more than 3 classes during the semester, you may be overextended and should consider dropping the class.

Reading and Participation: Participation is key to learning. We will strive to have an active, rather than passive, classroom environment. On Inquire is a day-by-day outline of the chapters that will be discussed in class. I fully hope that you will have read the upcoming chapter before the class meeting. You most certainly will not understand everything while you are reading ahead, but having read the section will allow you to ask questions and follow along better in class.

Late & Missed Work: Unfortunately, illnesses, death in the family, or other traumatic events are part of life. Such events are unwelcome and because I understand how difficult these times are, if you contact me within 24 hours of the event and provide documentation, I will be happy to extend deadlines and/or provide make-up work.

Expected Hours of Work: To be successful in this course it is anticipated that you will put in at least 12 hours of work inside and outside of class each week.

Academic Integrity: Students are expected to follow the integrity policy detailed in the handbook *Academic Integrity at Roanoke College*. Additionally, if you are ever uncertain as to how the College's policy pertains to any assignment or exam in this course, please ask me for clarification. The bottom line is that all work that a student submits for a grade must be ***solely*** the work of that student unless the instructor has given explicit permission for students to work together.

Retrieval Practice: A clear and most important goal of this course is to give you exposure to and understanding of basic statistical methods - the ability to use this information to make good choices, engage in thoughtful discussions, and determine the validity of information and arguments. There is a large difference between the intake of course information and the retrieval of such information. And, as shown by study after study, if you wish to be able to retrieve information you must PRACTICE retrieving information. To aid in this retrieval practice there are a variety of assessment activities throughout the term, the goal being higher frequency with less weight on any particular event. You will have multiple quizzes and tests throughout the semester.

Everything is Cumulative: You will find that virtually every day in class we will be combining information from previous chapters with material we are currently studying, and this pattern will carry over to all your graded work. I am committed to helping you put together a large course basket of knowledge this semester and to giving you frequent opportunities to practice retrieval of this knowledge. To that end, all quizzes, tests, and the final exam are cumulative. On any one of these approximately 50% of the assessment will be on fundamentals of previous material and 50% on new material.

Writing: While knowing statistics is important, it is useless if you cannot communicate the ideas and concepts you have learned, and more importantly, apply them to a topic such as whether we have free will on the internet. There are four writing assignments throughout the semester. These are an important and significant component of the course. These assignments will push you to address issues from a statistical standpoint and improve your writing and communication skills.

Writing Assignment 1: This is personal, reflective opinion writing. You will be asked to describe some of your daily activities on the internet and think through how you may be being manipulated, or if you are above manipulation and are truly doing whatever you'd like on the internet.

Article Analysis: For this assignment, you will critique an article from an established news source. The topic of the article will be the use of statistics by online entities. You will use the knowledge you have gained thus far in the course to critique the methods used by the author.

Project: Prior to the date this project is started, you will have read the entire book *Hooked: How to Build a Habit-Forming Product* by Nir Eyal. You will then propose your own product that you would like to bring to market. This may be a competitor to Facebook, a photo-sharing site, a new game, or any other similar product. Your initial product design will be well thought out. Then, you will apply the statistical concepts you have learned in this course. You will design and identify the important features of statistical studies of data you will measure about users of your products. You will describe how you will apply this quantitative information to make decisions or draw conclusions about needed changes to your product to increase success. Finally, you will discuss how you will handle uncertainty in the data you propose to measure. How will uncertainty affect your analysis and the continued development of your product?

Course Grade: Components of a student's grade will be weighted as follows:

Tests: 50% Quizzes: 10% Homework: 10% Final Exam: 15% Short Writing: 5% Project: 10%

A scale will for final grades will not be lower than the scale given below.

0	*60*	*63*	*67*	*70*	*73*	*77*	*80*	*83*	*87*	*90*	*93*
F	*D-*	*D*	*D+*	*C-*	*C*	*C+*	*B-*	*B*	*B+*	*A-*	*A*

INQ 240 Daily Schedule - Spring 2025

Jan 13	**Intro / Welcome**	
Jan 15	1 - Picturing Distributions with Graphs	**Paper 1 Due**
Jan 17	2 - Describing Distributions with Numbers	
Jan 20	**No class meeting**	
Jan 22	2 - Describing Distributions with Numbers	
Jan 24	3 - The Normal Distribution	**Quiz**
Jan 27	3 - The Normal Distribution	
Jan 29	4 - Scatterplots and Correlation	
Jan 31	**"Hooked" book discussion, chapters 1-2**	
Feb 3	4 - Scatterplots and Correlation	**Quiz**
Feb 5	**Review**	
Feb 7	**Test 1**	
Feb 10	6 - Two-Way Tables	
Feb 12	8, 9 - Producing Data	
Feb 14	12 - Introducing Probability	**Quiz**
Feb 17	12 - Introducing Probability	
Feb 19	13 - General Rules of Probability	
Feb 21	**"Hooked" book discussion, chapters 3-5**	
Feb 24	13 - General Rules of Probability	**Quiz**
Feb 26	**Review**	**Critique Assignment Distributed**
Feb 28	**Test 2**	
Fall Break		
Mar 10	15 - Sampling Distributions	
Mar 12	16 - Confidence Intervals: The Basics	
Mar 14	16 - Confidence Intervals: The Basics	**Quiz**
Mar 17	**Project Assignment / Group Work In-Class**	**Critique Due**
Mar 19	17 - Tests of Significance: The Basics	**Project Distributed**
Mar 21	17 - Tests of Significance: The Basics	
Mar 24	**Review**	**Quiz**
Mar 26	**Test 3**	
Mar 28	**Project Work Day / No Class Meeting**	
Mar 31	20 - Inference about a Population Mean	
Apr 2	22 - Inference about a Population Proportion	
Apr 4	**Project Work Day / In-Class**	**Quiz**
Apr 7	22 - Inference about a Population Proportion	
Apr 9	25 - The Chi-Square Test	
Apr 11	25 - The Chi-Square Test	
Apr 14	**Review**	**Quiz**
Apr 16	**Test 4**	
Apr 21	**Review**	
Apr 22	**no class meeting / office hours instead**	**Project Due**
Apr 24	**Final Exam 8:30-11:30am (9:40am CLASS)**	
Apr 25	**Final Exam 8:30-11:30am (10:50am CLASS)**	