INQ 240 Statistics & Sports Industry
Spring 2023

Instructor: Amanda Yoder
Classroom: 362 Trexler Hall
Class Time: T/Th 6:15pm – 7:45pm
Office: 161 Trexler Hall
Email: anyoder@roanoke.edu

Office Hours:
- Thursday 5:30 – 6:15pm
- Please email me if you want to set up an appointment at a different time or over Zoom.

Textbook: Introduction to Statistics by OpenStax
- Purchase/rent book at bookstore or Amazon
- Free PDF online at
  https://openstax.org/details/books/introductory-statistics?Book%20details

Technology:
- Laptop
- TI-83 Emulator Software or TI-83, 83+, 84, 84+ Calculator (or emulator software).
- We will discuss technology in the first day of class. If you have questions, please see me.

Note:
Students who have completed Stat 210 may not take this course for credit. Students must receive a C or better in this course or Math 111 to declare a major in Business Administration. You may wish to discuss grade requirements with your advisor with regards to your major.

Academic Integrity:
You are expected to be familiar with the Academic Integrity Code outlined in the booklet, Academic Integrity at Roanoke College.

Course Objective: Students will gain an understanding of how decision making is accomplished using modern statistical techniques. Topics include descriptive statistics, graphical techniques, elementary probability, estimation, inferential statistics, linear correlation, and regression. Quantitative reasoning will also be emphasized.

Policy on expected number of hours of work per week: Per the Academic Catalog, "For each one-unit course, students are expected to complete 12 hours of work inside and outside of class each week." Realistically, this may vary due to the strength of the background of each individual student with respect to course content.

Attendance: Class attendance is a very important aspect of a student' success in this course. The student is expected to attend every class and is accountable for any missed classes. Your fourth and each additional absence will result in a 2-point reduction in your final course grade.

Covid: If you have a fever (temperature of 100.4 or higher) or other Covid symptoms, do not come to class. Call Health Services immediately and do not go to any public areas 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 related absences will be excused, but work and graded assignments will need to be completed even if deadlines are extended.

Grading:
Homework (weekly): 20%
Tests (4): 40%

Projects (3): 40%

Grades will be assigned using the scale below:

A 93-100	C 73-76
A- 90-92	C- 70-72
B+ 87-89	D+ 67-69
B 83-86	D 63-66
B- 80-82	D- 60-62
C+ 77-79	F Below 60

Late Work Policies:

<u>Homework</u> – Homework will be due on Thursdays at the beginning of class. Points will be deducted for late assignments.

<u>Tests</u> – A student can make up the quiz/test if it was missed due to an excused absence. An absence is excused by notifying prior to class that you will be absent due to a reason that is excused.

<u>Projects</u> – Need to be submitted on the due date by 11:59 PM the day it is due. No late projects are accepted unless excused.

Topics Covered in the Course:
1. Chapter 1 Sampling and Data
2. Chapter 2 Descriptive Statistics
3. Chapter 12 Linear Regression and Correlation
4. Chapter 3 Probability Topics
5. Chapter 6 The Normal Distribution
6. Chapter 7 The Central Limit Theorem
7. Chapter 8 Confidence Intervals
8. Chapter 9 Hypothesis Testing with One Sample
9. Chapter 10 Hypothesis Testing with Two Samples
10. Chapter 11 The Chi-Square Distribution

Projects:
1. **"Where's the Data" Assignment:**
   You must find an article about sports you are interested in that uses data analysis to make or prove a point. In the article you must find the data set or a description of the data set used to support the authors claim and what

sampling technique was used to collect the data. This assignment is worth 5% of the Project grade.

2. **Linear Regression Assignment:**
   You will find two sets of quantitative sports data to perform a linear regression test to determine if a relationship exists using an error of your choice. The results will be used to write a conclusion discussing your results and interpret what they mean with regards to your population. Include a discussion of what this means for you and the reader in terms of the conclusion. This assignment is worth 10% of the Project grade.

3. **Sports Article using Data Analysis Assignment:**
   After reading articles using data analysis to support an author's claim, you will become the author. Your task will be to use proper techniques to collect, organize, visualize, analyze and interpret data.

   This assignment is broken into two sections:
   1. **Article Proposal** Using full sentences answer questions about your idea for the written article. The purpose is to make sure you are headed in the right direction for the final project. This part is worth 5% of the Project grade.
   2. **Final Project** Use these results to write an interesting sports article which uses your results of your statistical study to prove or disprove a claim. Along with a report, you will need to present your project to the class with a 15 minute presentation. More information will be provided. This part is worth 20% of the Project grade.

Learning Outcomes:

All INQ240 sections share these 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.

Other:

- The Writing Center is located on the Lower Level of Fintel Library. Check out www.roanoke.edu/writingcenter
- Subject Tutoring is located on the Lower Level of Fintel Library in Room 005. Check out www.roanoke.edu/tutoring
- Co-Curricular Engagement: The MCSP Department offers a series of talks (MCSP Conversations) that appeal to a broad range of interests related to your fields of study. You are invited to be involved with all of these meetings. After attending, submit a one-page paper reflecting on the discussion. These reflection papers earn extra credit with 0.5% added to your course average for each attended, up to 2% total. In addition, you may request other appropriate events that can count. https://www.roanoke.edu/inside/a-z_index/math_cs_and_physics/conversation_series