



INQ 240 – C4 Statistical Reasoning : Here's to Your Health ! Spring 2026

Start Date: January 12, 2026

End Date: April 28, 2026

Class Meetings:

Block 3, Monday, Wednesday, Friday 10:50 – 11:50 am, Bast 214

Contacting your Instructor : Naomi Clements

Office: Trexler 180

Office Hours: Thursday 1 – 2:30 pm, and by appointment

Email: clements@roanoke.edu

The best way to contact me is by email. I will return your email within 24 hours.

Math, Computer Science, Physics Department Office: Trexler Hall, Room 270

Campus Safety: (540) 375-2310

Course Description: Statistical Reasoning: Students will gain an understanding of how decision making is accomplished using modern statistical techniques. Topics include descriptive statistics, graphical methods, elementary probability, estimation, statistical inference, linear correlation, and regression. **Specific Area of Inquiry:** Students will apply the techniques of data analysis to data sets and statistical studies that deal with health related issues.

Intended Learning Outcomes By the end of this course, students will be able to

- ◆ use the methodologies of statistics to investigate a topic of interest and make decisions based on the results.
- ◆ use the methodologies of statistics to design and carry out a simple statistical experiment.
- ◆ use the methodologies of statistics to 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.
 - ◆ articulate the importance and limitations of using data and statistical methods in decision making.
 - ◆ write clearly and effectively about health topics using the concepts and language of statistics.
 - ◆ interpret quantitative information related to health statistics.

Course Materials

Course Textbook: Title: Statistics Informed Decisions Using Data Seventh Edition
Author: Michael Sullivan III Publisher: Pearson
ISBN # 9780138317409

An e textbook and supplemental materials may be rented for \$9.99- \$15.99 per month for 6 months at Pearson.com. Search for Sullivan Statistics 7th edition

Additional Course Materials:

Microsoft Excel, available on computers in the library, **and a TI-83 or TI-84 Scientific/Graphing calculator**. CAS calculators, computers, cell phones, math help websites and online calculators may not be used on proctored events such as quizzes, tests, and/or exams.

Teaching and Learning Methods: The course material will be divided into 3 units with a test at the end of each unit. Class time will consist of explanation, student questions, working through assignment questions, and writing assignments. Every effort will be made to answer all student questions. The Questions Done in Class are to be turned in for a grade. Questions for More Practice for each section, including solutions, will be available on the class website. More Practice questions are optional and will not be graded. Students should prepare for class by reading sections of the book before they are presented in class. **If necessary, due to illness of the instructor, or an outbreak of a highly infectious illness, class will be conducted on Teams.**

Expected Student Work Policy: It is highly recommended that students work through More Practice questions until you are confident you know the material, including how to use the calculator to solve the question. Notes presented in class will be available on the class website on Inquire. Students are expected to spend at least 6 – 9 hours of work each week inside and outside of class, 3 hours in class, and 3 - 6 hours outside of class. This time should be spent reviewing the notes presented in class, studying the questions done together in class, working More Practice questions, and reading the chapter sections to be studied in the week ahead.

Grading Policy: The final course grade will be determined by a weighted average with the following values:

Assignments	24%
4 Writing Assignments	16%
3 Unit Tests and the Final Exam	45%
Final Exam	15%

Grading Scale

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

Questions Done in Class/Out of Class Assignments : Practice is essential to learning new skills. Questions Done in Class, a few out of class assignments and the optional More Practice questions will help you practice what you are learning. Due dates for Questions Done in Class, Out of Class Assignments and dates the Writing Assignments will be done in class are included in the tentative schedule presented on pages 5 and 6. For you to keep up with the coursework assignments should be done on time. Late Assignments will be accepted until the Unit Test on the material included in the assignment. If several students are turning assignments in late, the acceptance of late assignments will be ended.

Almost all of the graded assignments will be done in class. Students are expected to print each assignment from the class website, and bring it to class to work on in class the week before it is due. All work should be done on the printed assignments.

If you prefer to write assignments on your own paper, questions must be written in order, the work must be legible, with a blank space between each questions and with answers circled. Assignments written on paper torn from a spiral notebook will not be accepted with ragged edges.

To receive credit for In Class/Homework, the statistics given in the question, the calculator entry, and your answer must be written legibly in your own hand.

Writing Assignments: There will be four writing assignments on various topics. These assignments will be done in class. You may discuss the questions on the writing assignments with your classmates at your table and then write your responses. If time permits, you may ask classmates at your table to read your work and provide feedback on whether your writing is clear, or if they see grammatical errors. Everyone's writing is improved by such feedback. However, the written assignments should be your own work. Using AI, or having someone write a paper for you, or copying the work of someone else is a violation of the Academic Integrity policies of the college.

Tests: You may make up one Unit Test missed due to illness if you notify me of your absence before the test, and if the test is made up within one week of the original test date. The Final Exam may not be made up. If your Unit Test average is 90% or better, taking the Final Exam is optional and your Unit Test average will be your Final Exam score. If your Final Exam score is higher than a previous test score, it will replace that test score. If you miss a test, the grade on that test will be zero and your Final Exam will replace that test score.

Students should make every effort to take care of personal needs before a test begins so they don't need to leave the classroom during a test. Athletes who will miss a test due to an out of town game or meet must make arrangements to take the test before the test day.

You may not use your own books, notes, scratch paper or other aids during Unit Tests or the Final Exam. The instructor may provide formulas for the Unit Tests and the Final Exam. Approved calculators may be used but not shared between students. Also, please note that arrangements for extended time or testing in a distraction-reduced environment must be made at least one week *before every test*.

One extra credit point may be earned for each unit test by volunteering to read in class at least once a week every week we are studying that unit.

Attendance: Attendance will be taken during every class. Your attendance in all class sessions is **essential** for your success in this course. It is your responsibility to read the text, study the notes provided, and complete assignments for any class you miss. You are responsible for the material covered as well as all announcements or changes in the schedule made in your absence.

Classroom Policies: Open and mutually respectful communication of varied opinions, beliefs, and perspectives during classroom or online discussion encourages the free exchange of ideas that is essential to higher learning and to the ability to learn from each other. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

Cell phones should be turned off prior to entering the classroom. Laptops should not be used during class sessions. The use of laptops or any other electronic device during an exam is not allowed. Any use of such devices during a quiz or exam will be considered a breach of academic integrity.

Academic Integrity is a foundational value of Roanoke College and students are expected to behave as responsible members of the college community and to be honest and ethical in their academic work. Guidelines for academic integrity, as well as forms of academic dishonesty are 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.

Additional Information: Each student is responsible for being aware of the information contained in the [Roanoke College Catalog](#), the [Student Handbook](#), and the [Academic Calendar](#). All information may be viewed on the [Roanoke College website](#).

Course Withdrawal: The last day to submit a Pass/Fail or Audit form is Tuesday, January 21, 2025. The last day to drop a course before a "W" will be recorded on your transcript is Monday, January 2, 2025. The last day to drop a course unless withdrawing from the college is Tuesday, April 8, 2025. A course is considered officially dropped only if the DROP form is accepted by the Registrar's office.

Syllabus Changes: Occasionally, changes to the syllabus may be necessary. Students will be notified of any changes to the syllabus in writing. The Grading Policy will not be changed.

College Services:

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!

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 Dustin Persinger, 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 Dustin Persinger at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Student Health & Counseling Services supports students through in-person health appointments, in-person counseling, 24/7 telehealth (TimelyCare), Therapy Assistance Online, as well as resources related to general wellness, LGBTQ+, sexual assault, substance abuse, and suicide prevention. Unmet health needs can negatively impact your performance in this course. Student Health & Counseling Services can help. Please see <https://www.roanoke.edu/shcs> for more information and to access services.

Tentative Schedule INQ 240 – C4 Statistical Reasoning : To Your Health

Week	Dates	Unit and Chapter Sections to be Studied
<i>Unit 1 Data Collection and Organizing and Summarizing Data</i>		
1	January 12 - 16	Course Syllabus, Class Website 1.1 Introduction to Statistics 1.2 Observational vs Experimental Design 1.3 Simple Random Sampling Assignments 1 and 2 due Wednesday, Jan 21.
2	January 19 - 23	Martin Luther King Day No Class 1.4 Other Sampling Methods 1.5 Bias in Sampling 1.6 The Design of Experiments Assignments 3 and 4 due Monday, Jan 26.
3	January 26 -30	Writing Assignment 1 2.1 Organizing Qualitative Data 2.2 Organizing Quantitative Data 2.3 Additional Displays of Quantitative Data 2.4 Graphical Misrepresentations of Data Assignment 5 due Monday, February 2.
4	February 2 – 6	3.1 Measures of Central Tendency 3.2 Measures of Dispersion 3.3 Measure of Central Tendency and Dispersion from Grouped Data 3.4 Measures of Position and Outliers Assignment 6 due Monday, February 9.
5	February 9 - 13	3.5 The Five-Number Summary and Boxplots 4.1 Scatter Diagrams and Correlation 4.2 Least-Squares Regression 4.4 Contingency Tables and Association Writing Assignment 2 Assignments 7 and 8 due Mon, Feb 16.
6	February 16 - 20	Test on Unit 1 <i>Unit 2 Probability and Probability Distributions</i> 5.1 Probability Rules 5.2 The Addition Rule and Complements 5.3 Independent of Events and the Multiplication Rule Assignment 9 due Monday, February 23
7	February 23 - 27	5.4 Conditional Probability and the General Multiplication Rule 6.1 Discrete Random Variables 6.2 The Binomial Probability Distribution Writing Assignment 3 Assignment 10 due Monday, March 9

Week	Dates	Unit and Chapter Sections to be Studied
8	March 2 - 6	Spring Break
9	March 9 – 13	7.1 Properties of the Uniform and Normal Distributions 7.2 Applications of the Normal Distribution 8.1 Distribution of the Sample Mean Assignment 11 due on Monday, March 16.
10	March 16 - 20	7.3 Assessing Normality 7.4 Normal Approximation for the Binomial Review of Unit 2 Assignments 12 and 13 due on Monday, March 23
11	March 23 - 27	Test on Unit 2 <i>Unit 3 Inference: From Samples to Population</i> 9.1 Estimating a Population Proportion 9.2 Estimating a Population Mean 9.3 Estimating a Population Standard Deviation Assignment 14 due on Monday, March 30
12	March 30 – April 3	10.1 The Language of Hypothesis Testing 10.2 Hypothesis Test for a Population Proportion 10.3 Hypothesis Test for a Population Mean 10.4 Hypothesis Test for a Population Standard Deviation Assignment 15 due Monday, April 6
13	April 6 - 10	11.1 Inference about Two Population Proportions 11.2 Inference about Two Means: Dependent Samples 11.3 Inference about Two Means: Independent Samples Assignment 16 due Monday, April 13
14	April 13 - 17	Review of Unit 3 Test on Unit 3 Writing Assignment 4 Assignment 17, Review of Unit 3 due Wednesday, April 15
15	April 20	Review for the Final Exam Assignment 18, Review for the Final Exam due Tuesday, April 2
16	Thursday, April 23 – Tuesday, April 29	Final Exam Week

Final Exam for INQ 240 C4 Block 3 – Final Exam, Friday, April 24, 2026, 8:30 – 11:30 am