

Spring 2020

INQ 240 Statistical Reasoning : Here's to Your Health!

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Office Hours: MWF 9:30am – 12pm; TTh 11:45am -12:30pm

Note: Students who have completed Stat 202 may not take this course. Students must receive a C or better in this course or Math 111 to declare a major in Business Administration.

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

Primary Statistics Text: *Understandable Statistics Concepts and Methods*, 11th edition, Brase and Brase

Writing Handbook: *Easy Writer*, by Andrea Lunsford or some other writer's guide

Various magazines and newspapers available in Fintel Library or online

Health Datasets the CDC website, and the WHO Website, among others

Minitab statistical software package, available on campus

Scientific/graphing calculator, preferably a TI-83 or TI-84

Test Schedule Tests are closed book. Calculators are required.

	Block 9	Block 10
Test 1	Tue. Feb 4	Tue. Feb. 4
Test 2	Thurs. Feb. 27	Thurs. Feb. 27
Test 3	Thurs. Apr. 2	Thurs. Apr. 2
Final Exam	Fri. Apr. 24, 8:30 am	Thurs. Apr. 23, 8:30 am

Please do not ask me to reschedule your exam just because you want to leave school early.

If illness or family emergency causes you to miss a test, notify me promptly. You'll be expected to take the test as soon as possible, preferably within 48 hours. Also, please note that arrangements for extended time on testing in a distraction-reduced environment must be made at least one week *before every test*.

Classroom policies In my class your phone is a tool, not a toy. I will ask you to use it to look up information. Please refrain from perusing social media or playing games while in class. Such behavior will not help you understand the course topics. Please bring your calculator to class as it is more useful for computing statistics than your phone is. Use of laptops may be permitted occasionally, but only for specific assignments.

Special Assignments There should be about **six** of these including:

Writing Assignments: There will be two or three assignments concerning the use of health statistics in the news. These are aimed at developing a healthy skepticism about what is reported in health articles and the skills to find the underlying information. Another writing assignment will be a project based upon an analysis of health data using Minitab.

Minitab assignments: There will be three or four assignments in which the students will use Minitab to display statistics, simulate processes, and perform tests upon data sets. The students will write an interpretation of their results as part of the assignment.

Statistical Study: Individuals or Groups will design and carry out a simple study related to a health issue.

- Write a “scientific” report of findings.

Daily Homework: You will have practice problems from the primary text and assigned readings from various sources. You will also analyze additional health related datasets. From time to time you will have a quiz on the assignments. Quiz grades will be averaged with the daily homework. **Late daily homework MUST be submitted by the class period after the due date. Homework submitted after the keys have been posted will receive a grade of 0.** You are expected to spend 12 hours per week working for this class (3 hours in class, 9+ hours outside of class). You may gain extra credit by attending one of the MCSP colloquia and completing a response form about what you learned. A link to the schedule will be posted on the top pane of our Inquire page.

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.

Tests, Quizzes, and Minitab assignments: All work that a student submits for a grade must be *solely* the work of that student unless I have given explicit permission for students to work together. **Writing Assignments:** You may seek help from the writing Center. Tests, quizzes, Minitab, and writing assignments should be pledged.

Daily homework: In the case of daily assignments taken from the textbook, I encourage you to work together. Please note that this is the **EXCEPTION** to the rule of not collaborating with each other.

Grading Policy

Homework /Quizzes average	10%	Course Averages:		
Tests (15% each)	45%	A 93-100	B- 80-82	D+ 67-69
Special assignments average	25%	A- 90-92	C+ 77-79	D 63-66
Final Exam	20%	B+ 87-89	C 73-76	D- 60-62
		B 83-86	C- 70-72	F below 60

Attendance Policy If you miss **THREE** classes after you add this course, you may be dropped from it OR have 1.5 points deducted from your final grade for every subsequent class missed. Be aware that a DF on your transcript counts as an F and lowers your GPA. If you miss a week of class I must report your absence to the Registrar’s office.

Subject Tutoring, located on the lower level of Fintel Library (Room 5), is open 4 pm – 9 pm, Sunday – Thursday. We are a Level II Internationally Certified Training Center through the College Reading and Learning Association (CRLA). Subject Tutors are highly trained Roanoke College students who offer one-on-one tutorials in a variety of general education and major courses. Tutoring sessions are available in 15, 30, or 45-minute appointments. Feel free to drop by for a quick question or make an appointment at www.roanoke.edu/tutoring for a longer one-on-one appointment. For questions or concerns, contact us at 540-375-2590 or subject_tutoring@roanoke.edu.

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 Laura Leonard, 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 Laura Leonard at your earliest convenience to schedule an appointment.

The Writing Center @ Roanoke College, located on the Lower Level of Fintel Library, offers writing tutorials focused on written and oral communication for students working on writing assignments/projects in any field. Writers at all levels of competence may visit the Writing Center at any point in their process, from brainstorming to drafting to editing, 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 by going to www.roanoke.edu/writingcenter, where our schedule of writing workshops and creative writing playshops is also posted. Questions? Email writingcenter@roanoke.edu or call 375-4949. Like our Facebook page for updates!

YOU ARE REQUIRED TO VISIT THE WRITING CENTER AT LEAST ONCE DURING THIS SEMESTER.

Tentative Course Schedule Spring 2020

Question 1: How do we convey health information and data in an unbiased and informative way?	
Week 1	Jan 14 Chapter 1 Getting Started Jan 16 Chapter 2 Organizing Data
Week 2	Jan 21 Chapter 2 Organizing Data Chapter 9 Linear Correlation and Regression
Question 2: Can we use data and statistical techniques to determine health trends and follow disease outbreaks?	
Week 3	Jan 23 Chapter 3 Averages and variation
Week 3	Jan 28 Chapter 3 Averages and Variation Jan 30 Review
Week 4	Test 1 Tuesday February 4 Feb 6 Chapter 4 Elementary Probability Theory
Question 3: How accurate is the reporting of health topics?	
Week 5	Feb 11 Chapter 4 Elementary Probability Theory Feb 13 Chapter 5 The Binomial Probability Distribution
Week 6	Feb 18 Chapter 5 The Binomial Probability Distribution Feb 20 Chapter 6 Normal curves and sampling distributions
Week 7	Feb 25 Review Test 2 Thursday Feb 27
Spring Break	
Week 8	Mar 10 Chapter 6 Normal Curves and Sampling Distributions Mar 12
Week 9	Mar 17 Chapter 7 Estimation Mar 19 Chapter 7 Estimation
Week 10	Mar 24 Chapter 8 Hypothesis Testing Mar 26
Week 11	Mar 31 review Test 3 Thursday April 2
Week 12	Apr 7 Chapter 8 Hypothesis Testing
Question 4: What health conditions are independent of others?	
Week 13	Apr 9 Chapter 10 Chi-Squared and F distributions
Week 13	Apr 14 Chapter 10 Chi-Squared and F distributions Apr 16 Review for final
Thur. Apr. 23	Block 10 Final exam 8:30-11:30 Yes, it is comprehensive
Fri. Apr. 24	Block 9 Final exam 8:30-11:30 Yes, it is comprehensive