

Spring 2018

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

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Office Hours: MWF 8:30-10:40am and noon -1pm; TTh 10:00am -noon

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: *A Writer's Reference*, Diana Hacker, Roanoke College Edition

New York Times on-line Health Section

Los Angeles Times on-line Health Section

Various magazines and newspapers available in Fintel Library

Health Datasets from STARS: Creation of Statistical Resources from Real Datasets website, and the WHO Website, among others

Minitab statistical software package (provided by the college)

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

Test Schedule Tests are closed book. Calculators are required.

	Block 9
Test 1	Thurs. Feb. 8
Test 2	Thurs. Mar. 1
Test 3	Thurs. Apr. 5
Final Exam	Fri. Apr. 27, 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.

Classroom policies The only electronic device that may be used on quizzes and tests is a calculator (cell phone calculators not allowed). Use of laptops and cellphones may be permitted occasionally, but only with my permission. If you leave the classroom during a test, you must leave your phone on my desk.

Special Assignments There should be about **seven** 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: - Students 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 other sources. You will also analyze additional health related datasets. From time to time you may have a quiz on the assignments. Quiz grades will be averaged with the daily homework. **I will accept NO daily homework after the key for it has been posted. You are expected to spend 12 hours per week working for this class (3 hours in class, 9+ hours outside of class).**

MCSP Lecture Requirement: The Math, Computer Science and Physics department offers a series of discussions that appeal to a broad range of interests related to these fields of study. These sessions will engage the community to think about ongoing research, novel applications and other issues that face our disciplines. Dates and times will be announced later and will appear on Inquire. **You must attend one of these lectures and fill out a response form. This form must be submitted within one week of the lecture.**

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, Writing 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. **This work must 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%	A 93-100	B- 80-82	D+ 67-69
Tests (15% each)	45%	A- 90-92	C+ 77-79	D 63-66
Special assignments average	25%	B+ 87-89	C 73-76	D- 60-62
Final Exam	20%	B 83-86	C- 70-72	F below 60

Course Averages:

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. I

Subject Tutoring is a CRLA Nationally Certified Program located on the lower-level of Fintel library in room 005. Subject Tutoring offers individual appointments in 30-minute intervals for Lab Sciences, Modern Languages, Math & CPSC, Social Sciences, Business & Economics. Hours are Sunday - Thursday 4 p.m. - 9 p.m. There is also walk-in tutoring available. For a list of tutorials or to make an appointment, go to www.roanoke.edu/tutoring.

The Writing Center @ Roanoke College, located in Room 15 on the Lower Level of Fintel Library, offers writing tutorials 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, and talk with trained peer writing 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. You can also Like our page on Facebook! **YOU ARE REQUIRED TO VISIT THE WRITING CENTER AT LEAST ONCE DURING THIS SEMESTER.**

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 Dr. Sue Brown, Director of Academic Services and Acting Coordinator of Accessible Education Services, at 540-375-2247 or by e-mail at sbrown@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 Dr. Brown at your earliest convenience to schedule an appointment.

Tentative Course Schedule Spring 2018

Question 1: How do we convey health information and data in an unbiased and informative way?	
Week 1	Jan 16 Chapter 1 Getting Started Jan 18 Chapter 2 Organizing Data
Week 2	Jan 23 Chapter 2 Organizing Data Question 2: Can we use data and statistical techniques to determine health trends and follow disease outbreaks? Jan 25 Chapter 9 Linear Correlation and Regression
Week 3	Jan 30 Chapter 3 Averages and Variation Feb 1
Week 4	Feb 6 Review Test 1 Thursday February 8
Question 3: How accurate is the reporting of health topics?	
Week 5	Feb 13 Chapter 4 Elementary Probability Theory Feb 15
Week 6	Feb 20 Chapter 5 The Binomial Probability Distribution Feb 22
Week 7	Feb 27 Review, Ch 6.1 Test 2 Thursday March 1
Spring Break	
Week 8	Mar 13 Chapter 6 Normal Curves and Sampling Distributions Mar 15
Week 9	Mar 20 Chapter 7 Estimation Mar 22 Chapter 7 Estimation
Week 10	Mar 27 Chapter 8 Hypothesis Testing Mar 29
Week 11	Apr 3 review Test 3 Thursday April 5
Week 12	Apr 10 Chapter 8 Hypothesis Testing Question 4: What health conditions are independent of others? Apr 12 Chapter 10 Chi-Squared and F distributions
Week 13	Apr 17 Chapter 10 Chi-Squared and F distributions Apr 19 Review for final
Fri. Apr. 27 Block 9 Final exam 8:30-11:30 Yes, it is comprehensive	