

Fall 2015

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

Prof. Claire Staniunas

Office: 161-D Trexler Hall

Phone: 375- 2010

Email: staniuna@roanoke.edu

Office Hours: MWF 9:40 - 1pm; TTh 11:40 -1pm

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

Supplementary Reading: *News and Numbers- A Guide to reporting Statistical Claims and Controversies in Health and Other Fields*, Victor Cohn and Lewis Cope, any edition

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

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	Thurs. Sept 24	Thurs. Sept 24
Test 2	Thurs. Oct. 15	Thurs. Oct. 15
Test 3	Thurs. Nov. 19	Thurs. Nov. 19
Final Exam	Mon. Dec. 14, 8:30 am	Thurs. Dec 17, 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 Cell phones must be turned off and put away prior to entering the classroom. In the unlikely event that you need to turn on your cell phone during class, you must have permission of the instructor to do so. Otherwise, anyone using a cell phone for any reason during class will be asked by name to shut it off. The only electronic device that may be used in the classroom is a calculator (cell phone calculators not allowed). Use of laptops may be permitted occasionally, but only for specific assignments. Other electronic distractions are prohibited.

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: (Small Group Assignment) Groups will design and carry out a simple study related to a health issue.

- Write a “scientific” report of findings.
- Poster for in-class gallery walk

Public Service Announcement: (Small Group Assignment) Groups will produce a video in the style of a public service announcement regarding a health issue. The message of the announcement must be supported by solid statistical research. The research must be mentioned in the video and justified in written form.

Daily Homework: You will have practice problems from the primary text and assigned readings from supplementary text. You will also analyze additional health related datasets. From time to time you will have a quiz on the assignments and the reading. Quiz grades will be averaged with the daily homework. **Late daily homework MUST be submitted by the class period after the due date. You may use this grace period only twice. 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. If indulgence in alcohol causes you to miss more than one class, the number for AA is 343-6857.

The Office of Disability Support Services, located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library, provides reasonable accommodations to students with identified disabilities. Reasonable accommodations are provided based on the diagnosed disability and the recommendations of the professional evaluator. In order to be considered for disability services, students must identify themselves to the Office of Disability Support Services. Students are required to provide specific current documentation of their disabilities. Please contact Richard Robers, M.A. Ed., Coordinator of Disability Support Services, at 540-375-2247 or e-mail robers@roanoke.edu.

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.**

Tentative Course Schedule Fall 2015

Question 1: How do we convey health information and data in an unbiased and informative way?	
Thur	Sept 3 Chapter 1 Getting Started
Tue	Sept 8 Chapter 2 Organizing Data
Thur	Sept 10 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?	
Tue	Sept 15 Chapter 3 Averages and Variation
Thur	Sept 17 Chapter 3 Averages and Variation
Tue	Sept 22 Review
Thur	Sept 24 Test 1
Question 3: How accurate is the reporting of health topics?	
Tue	Sept 29 Chapter 4 Elementary Probability theory
Thur	Oct 1 Chapter 4 Elementary Probability Theory
Tue	Oct 6 Chapter 5 The Binomial Probability Distribution
Thur	Oct 8 Chapter 5 The Binomial Probability Distribution
Tue	Oct 13 Review, Ch 6.1
Thur	Oct 15 Test 2
Fall Break	
Tue	Oct 27 Chapter 6 Normal Curves and Sampling Distributions
Thur	Oct 29 Chapter 6 Normal Curves and Sampling Distributions
Tue	Nov 3 Chapter 6 Normal Curves and Sampling Distributions
Thur	Nov 5 Chapter 7 Estimation
Tue	Nov 10 Chapter 8 Hypothesis Testing
Thur	Nov 12 Chapter 8 Hypothesis Testing
Tue	Nov 17 review
Thur	Nov 19 Test 3
Tue	Nov 24 Chapter 9 Linear Correlation revisited, tests
Thur	Nov 26 Thanksgiving (Wise students will study for exams a little bit during this break)
Question 4: What health conditions are independent of others?	
Tue	Dec 1 Chapter 10 Chi-squared and F distributions
Thur	Dec 3 Chapter 10 Chi-Squared and F distributions
Tue	Dec. 10
Thur	Dec. 12 Review
Mon.	Dec. 14 Block 9 Final exam 8:30 -11:30 Yes, it is comprehensive
Thur.	Dec 17 Block 10 Final exam 8:30-11:30 Yes, it is comprehensive