

Fall 2016

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

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Office Hours: MWF 9:40 - 1pm; TTh 11:50 -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*, 11<sup>th</sup> 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 22	Thurs. Sept 22
Test 2	Thurs. Oct. 13	Thurs. Oct. 13
Test 3	Thurs. Nov. 17	Thurs. Nov. 17
Final Exam	Mon. Dec. 12, 8:30 am	Thurs. Dec 15, 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 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

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. 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).**

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, 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%	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 (DSS)**, is located in the Goode-Pasfield Center for Learning and Teaching in **Fintel Library**. DSS provides reasonable accommodations to students with documented disabilities. To register for Disability Support Services, students must self-identify to the Office of Disability Support Services, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact JoAnn Stephens-Forrest, MSW, Coordinator of Disability Support Services, at 540-375-2247 or e-mail her at: [stephens@roanoke.edu](mailto:stephens@roanoke.edu) to schedule an appointment. If you have registered with DSS in the past, and would like to receive academic accommodations for this semester, please contact Ms. Stephens-Forrest at your earliest convenience, to schedule an appointment.

**Subject Tutoring** is an Internationally Certified Tutoring Center through the College Reading and Learning Association (CRLA). Our highly trained staff offers individual tutoring appointments for the following subjects: Business, Economics, Mathematics, Modern Languages, Lab Sciences & Social Sciences. Subject Tutoring is located on the lower level of Fintel Library in room 05 from 4-9 p.m. Sunday – Thursday. Students can logon to make an appointment at [www.roanoke.edu/tutoring](http://www.roanoke.edu/tutoring) in 15, 30 or 45 minute intervals. For questions or concerns, please contact Shannon McNeal at 540-375-2247 or [mcneal@roanoke.edu](mailto:mcneal@roanoke.edu)

**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](http://www.roanoke.edu/writingcenter), where our schedule of writing workshops and creative writing playshops is also posted. Questions? Email [writingcenter@roanoke.edu](mailto: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 Fall 2016

<b>Question 1:</b> How do we convey health information and data in an unbiased and informative way?		
Thur	Sept 3	Chapter 1 Getting Started
Tue	Sept 6	Chapter 2 Organizing Data
Thur	Sept 8	Chapter 2 Organizing Data
		Chapter 9 Linear Correlation and Regression
<b>Question 2:</b> Can we use data and statistical techniques to determine health trends and follow disease outbreaks?		
Tue	Sept 13	Chapter 3 Averages and Variation
Thur	Sept 15	Chapter 3 Averages and Variation
Tue	Sept 20	Review
<b>Thur</b>	<b>Sept 22</b>	<b>Test 1</b>
<b>Question 3:</b> How accurate is the reporting of health topics?		
Tue	Sept 27	Chapter 4 Elementary Probability theory
Thur	Sept 29	Chapter 4 Elementary Probability Theory
Tue	Oct 4	Chapter 5 The Binomial Probability Distribution
Thur	Oct 6	Chapter 5 The Binomial Probability Distribution
Tue	Oct 11	Review, Ch 6.1
<b>Thur</b>	<b>Oct 13</b>	<b>Test 2</b>
<b>Fall Break</b>		
Tue	Oct 25	Chapter 6 Normal Curves and Sampling Distributions
Thur	Oct 27	Chapter 6 Normal Curves and Sampling Distributions
Tue	Nov 1	Chapter 6 Normal Curves and Sampling Distributions
Thur	Nov 3	Chapter 7 Estimation
Tue	Nov 8	Chapter 7 Estimation
Thur	Nov 10	Chapter 8 Hypothesis Testing 8.1, 8.3
Tue	Nov 15	review , Ch 8.2
<b>Thur</b>	<b>Nov 17</b>	<b>Test 3</b>
Tue	Nov 22	Ch 8.5
Thur	Nov 24	<b>Thanksgiving (Wise students will study for exams a little bit during this break)</b>
<b>Question 4:</b> What health conditions are independent of others?		
Tue	Nov 29	Chapter 9 Linear Correlation revisited
Thur	Dec 1	Chapter 10 Chi-Squared and F distributions
Tue	Dec. 6	Chapter 10 Chi-Squared and F distributions
Thur	Dec. 8	Review
Mon.	Dec. 12	<b>Block 9 Final exam 8:30 -11:30 Yes, it is comprehensive</b>
Thur.	Dec 15	<b>Block 10 Final exam 8:30-11:30 Yes, it is comprehensive</b>

