

Statistical Reasoning: Here's to Your Health!

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Office Hours: Monday & Wednesday 3:30-4:30
Tuesday & Thursday 3:00-5:00
otherwise by appointment

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, and statistical inferences

Specific Area of Inquiry: Students will apply the techniques of data analysis to data sets and statistical studies that deal with health related issues.

Course Objectives:

Students will become savvy consumers of statistical information presented in the media with a particular emphasis on health related claims. In order to evaluate the merit of published information, students will learn how data should be summarized numerically and graphically. Students will understand the power and, perhaps more importantly, the limitations of basing a health (or any type) claim on just a sample from the population of interest. Students will be prepared to analyze sample data sets and communicate appropriate conclusions as well as evaluate and critique published statistical findings.

Intended Learning Outcomes: By the end of this course, successful 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.
- ... articulate the importance and limitations of using data and statistical methods in decision making.
- ... write about course topics clearly and effectively

... interpret quantitative information related to course topic (health related issues)

Course Materials:

Primary Statistics Text:

The Practice of Statistics in the Life Sciences, by Baldi and Moore, W.H. Freeman publisher

Other Readings on Hand-outs/Postings

Subscription (free) to People's Pharmacy Newsletter

Writing Reference

A Writer's Reference, Diana Hacker RC Custom Edition

Minitab statistical software package (available on Roanoke College Remote Computing – RCRC)

Scientific/calculator

Inquire course management system available through MyRoanoke

Attendance Policies:

Full attendance is expected. As stated in the Academic Catalog, "Every student is accountable for all work missed because of class absence. Instructors, however, are under no obligation to make special arrangements for students who are absent." Also, anytime you come in late or leave during class you miss part of the course and you disrupt the educational experience for everyone else. Do this only in the case of emergency.

Overall Workload: In addition to the 3 hours of class time, you are expected to work outside of class for a minimum of 9 additional hours per week.

In-Class Assignments

There will be frequent in-class graded activities including quizzes, worksheets, group work, etc. There will be no make-ups, but the lowest grade in the In-Class category will be dropped.

There will be 6 tests on basic statistical techniques and readings. Make-up tests will be given only under *very* extenuating circumstances that prohibit you from physically appearing in the classroom.

Dates for tests and the comprehensive final exam are listed on the day by day schedule.

Outside of Class Assignments

Textbook Assignments: Practice problems will be assigned regularly so students can monitor their own progress. Most quizzes will be based on these practice problems. Selected problems requiring the use of Minitab will be collected.

Class Preparation: Includes reading ahead, internet research, and instructor videos as assigned

Writing: Writings will be based on health related articles and issues that involve statistics. Requirements may vary and will be detailed for each assignment.

Statistical Experiment & Report: Design and carry out a simple study related to a health issue and analyze the results.

Public Service Announcement: (Small Group Assignment) 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.

Inquire Policy

Students are required to be knowledgeable of all postings on Inquire. It is each student's responsibility to consistently monitor Inquire for course information. This means every day!

Any assignment that requires an Inquire upload will not be accepted in any other form. Also, to receive credit for uploads, the file must be immediately readable on the instructor's college computer. It is the student's responsibility to make successful submissions. It is the student's responsibility to resolve technology problems through the college's IT department.

Academic Integrity The college policy is fully supported. All tests and quizzes will be closed book and closed notes. Writings and reports must be in each student's own words. Collaboration is allowed on uncollected textbook work. Minitab assignments must be done individually.

And

Electronic Devices

The use of any electronic device during a quiz or exam is strictly prohibited. Exceptions may be made regarding the use of calculators. Use of calculators will be clarified on a case by case basis. **Any use of a non-approved device during a quiz or exam will be considered a breach of academic integrity.**

In-class use of laptops/iPads/tablet computers is not permitted unless official documentation of need is presented or the instructor makes a specific exception for a particular class activity.

Co-curricular 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 co-curricular sessions will engage the community to think about ongoing research, novel applications and other issues that face our disciplines. There is a link to the dates and times for these sessions on Inquire.

Members of this class are encouraged to attend all appropriate talks; however participation in at least one of these sessions is mandatory. A response form is available on Inquire. Within one week of attendance, students must upload this completed form on Inquire. The score for this form counts as a Quiz and is not eligible to drop.

Grading Policy

Course Averages:

Test Average	45%	A 93-100	B- 80-82	D+ 67-69
Quizzes/In-class work	10%	A- 90-92	C+ 77-79	D 63-66
Outside of Class Assignments	25%	B+ 87-89	C 73-76	D- 60-62
Final Exam	20%	B 83-86	C- 70-72	F below 60

IMPORTANT TO NOTE: The Inquire gradebook will be used for grade STORAGE only. Inquire will not be used to calculate your official course average. Any averages you might see in Inquire for this course should not be trusted.

Note: Material, content, and scheduling are subject to change if deemed appropriate or necessary by the instructor.

INQ 240 – Spring 2017 Block 6 Target Course Schedule

Dates	Text Coverage	
January 16- January 30	Introduction	
	Chapter 1	Picturing Distributions with Graphs
	Chapter 2	Describing Distributions with Numbers
	Chapter 3	Scatterplots and Correlation
	Chapter 4	Regression
Wednesday, February 1	TEST 1	
February 3 – February 15	Chapter 7	Samples and Observational Studies
	Chapter 8	Designing Experiments
	Chapter 9	Introducing Probability
	Chapter 10	General Rules of Probability
	Chapter 12	Discrete Probability Distributions
Friday, February 17	TEST 2	
February 20 – February 27	Chapter 11	Normal Distributions
	Chapter 13	Sampling Distributions
Wednesday, March 1	TEST 3	
Friday, March 3	Video Presentations	
SPRING BREAK March 13 – March 22	Chapter 14	Introduction to Inference
	Chapter 15	Inference in Practice
	Chapter 17	Inference about a Population Mean
March 24	TEST 4	
March 27 – April 5	Chapter 18	Comparing Two Means
	Chapter 19	Inference about a Population Proportion
	Chapter 20	Comparing Two Proportions
Friday, April 7	TEST 5	
April 10 – April 19	Chapter 21	Chi-Square Test for Goodness of Fit
	Chapter 22	Chi-Square Test for Two Way Tables
	Chapter 24	One Way Analysis of Variance
Friday, April 21	TEST 6	
Monday, April 24	Review for Final Exam	

Tuesday, May 2

FINAL EXAM 2:00-5:00