

## ***Statistical Reasoning: Here's to Your Health!***

Prof. Jan Minton  
Office: 461 Trexler Hall  
Phone: 2488  
email: [jminton@roanoke.edu](mailto:jminton@roanoke.edu)  
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 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  
And  
Electronic Devices**

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.

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 – Block 6

## Target Course Schedule

Dates	Text Coverage
August 31 – September 14	Introduction Chapter 1 Picturing Distributions with Graphs Chapter 2 Describing Distributions with Numbers Chapter 3 Scatterplots and Correlation Chapter 4 Regression
Friday, September 16	TEST 1
September 19- September 28	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, September 30	TEST 2
October 3 – October 10	Chapter 11 Normal Distributions Chapter 13 Sampling Distributions
Wednesday, October 12	TEST 3
Friday, October 14	Video Presentations
FALL BREAK	
October 24 – November 2	Chapter 14 Introduction to Inference Chapter 15 Inference in Practice Chapter 17 Inference about a Population Mean
Friday, November 4	TEST 4
November 7 – November 16	Chapter 18 Comparing Two Means Chapter 19 Inference about a Population Proportion Chapter 20 Comparing Two Proportions
Friday, November 18	TEST 5
November 21 – December 5	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
Wednesday, December 7	TEST 6
Friday, December 9	Review for Final Exam
Tuesday, December 13	FINAL EXAM 2:00-5:00