INQ 240 : Statistical Reasoning - Here's To Your Health

Dr. Hannah Robbins Trexler 270H, x4906, robbins@roanoke.edu (email is the best way to reach me)

Office Hours Monday, Wednesday, Friday noon – 1 pm and Thursday 10 am – noon or by appointment.

Course Description This course is an introduction to statistical reasoning and basic statistics techniques focusing on the examples and data sets dealing with health related issues. You will learn how to collect, organize and present data and study quantitative measures which will allow you to draw conclusions and make inferences from the data. Some probability will be discussed as a precursor to the "inferential" statistics.

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
- express themselves clearly and effectively in writing using the concepts and language of statistics
- articulate the importance of the methodologies of statistics for understanding health related issues

Course Materials Textbooks: *Essential Statistics* Moore, Technology: Calculator (should be capable of taking square roots, cannot be a cell phone or computer), Minitab statistical software package

Important Dates We will have four in-class tests and a final exam. Each test will focus on the material learned since the last test, but will (necessarily) contain previous material. The final will be comprehensive.
If you have a conflict with one of these dates please email me ASAP.

Test 1	**Monday 9/17, in class**
Test 2	**Monday 10/8, in class**
Test 3	**Friday 11/9, in class**
Test 4	**Monday 12/3, in class**
Final Exam (9:40 class)	**Wednesday 12/12, 8:30 – 11:30 am**
Final Exam (10:50 class)	**Tuesday 12/11, 8:30 – 11:30 am**

Course Grades The final course grade is determined in the following way:

Quizzes/MCSP Conversations	**10%**
Writing Assignments	**15%**
Final Project	**10%**
Public Service Announcement	**5%**
Tests (10% each)	**40%**
Final Exam	**20%**

A grade scale will be determined after final grades are computed, but will be no worse than the scale given below. Attendance and class participation will be considered when determining marginal grades.

		B+	88-89	C+	78-79	D+	68-69		
A	92-100	B	82-87	C	72-77	D	62-67	F	0-59
A-	90-91	B-	80-81	C-	70-71	D-	60-61		

Quizzes We will have a short quiz almost every Wednesday at the beginning of class. No make-up quizzes will be given, instead your lowest quiz grade will be dropped at the end of the semester.

MCSP Conversations The MCSP department offers a series of talks designed to appeal to a broad audience. Members of this class are encouraged to attend many of these meetings, however attending at least one session is mandatory. Within one week of attendance you must submit a response to the talk. This will count as one quiz grade.

Writing Assignments There will be three writing assignments on health-related statistical topics. More specific instructions will be given for each piece when it is assigned.

Final Project In small groups you will perform your own statistical study: ask a health-related question, gather and analyze data to answer it, and form conclusions based on your analysis. More specific instructions will be given when the project is assigned.

Public Service Announcement In small groups you will produce a short video public service announcement about a health-related issue based on some statistical research. More specific instructions will be given when the video is assigned.

Daily Problems After each section I will assign some problems from the book for practice. These will not be collected (the answers are in the back of the book), and they are your chance to make sure you understand the material and to get help if you realize you need it.

Attendance Policy Class attendance is expected. If you do have to miss class, you are responsible for learning all material covered that day. If you have not discussed your absence with me beforehand, you will be unable to make up any work missed.

Expected Work Policy This course expects you to spend at least 12 hours of work each week inside and outside of class.

Electronic Devices You can use **only** your calculator during class. (This means no cell phones - please set them on silent and leave them in your bag.)

Extra Resources To get extra help with writing issues, take advantage of the writing center in Fintel Library. Subject tutoring is also available.

Special Needs If you have a disability that may require an accommodation in this course, please provide me with your documentation within the first 2 weeks of the semester. I must have your documentation at least 48 hours prior to any accommodation made. (Check with the Center for Learning and Teaching for their scheduling guidelines.)

Academic Integrity I expect all of you to follow the Academic Integrity policies of Roanoke College. All graded work should be your own work! If you ever have questions about how these policies apply to our class please contact me. Any violations of our AI policies will automatically be turned over to the Academic Integrity Council.

Course Schedule

The following schedule is approximate and subject to change except for the test dates. It should give you an idea of the timing of the topics covered and assignments.

Week	Dates	Topics	Assignments
1	A 29 - 31	Chapter 1: Picturing Distributions with Graphs	
2	S 3 - 7	Chapter 2: Describing Distributions with Numbers	
		Chapter 3: Normal Distributions	W: **Writing 1 Assigned**
3	S 10 - 14	Chapter 4: Scatterplots and Correlation	
		Chapter 5: Regression	W: **Writing 1 Due**
4	S 17 - 21	Chapter 7: Producing Data: Sampling	M: **Test 1**
		Chapter 8: Producing Data: Experiments	F: **Writing 2 Assigned**
5	S 24 - 28	Chapter 9: Introducing Probability	
		Chapter 10: Sampling Distribution	F: **Writing 2 Due, PSA Assigned**
6	O 1 - 5	Chapter 11: General Rules of Probability	M: **PSA Group/Topic Due**
		Chapter 12: Binomial Distributions	W: **PSA Test Video Due**
7	O 8 - 12	Chapter 13: Introduction to Inference	M: **Test 2**
			W: **PSA Due**
		Fall Break	
8	O 22 - 26	Chapter 14: Thinking about Inference	
		Chapter 16: Inference about a Population Mean	F: **Writing 3 Assigned**
9	O 29 - N 2	Chapter 17: Two-Sample Problems	
		Chapter 18: Inference about a Population Proportion	F: **Writing 3 Due**
10	N 5 - 9	Chapter 19: Comparing Two Proportions	
		Which test/tool to use?	F: **Test 3**
11	N 12 - 16	Chapter 21: Two Categorical Variables: the Chi-Square Test	M: **Final Project Assigned**
			W: **Final Project Group/Topic Due**
12	N 19, 26 - 30	Chapter 22: Inference for Regression	M: **Final Project Data Due**
		Chapter 23: One-Way Analysis of Variance	
13	D 3 - 7	Review and Project Summaries	M: **Test 4**
			F: **Final Project Due**
Tues	D 11	**10:50 class's Final Exam 8:30 - 11:30 am**	
Wed	D 12	**9:40 class's Final Exam 8:30 - 11:30 am**	