

# 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 11 am – 1 pm 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.**

<b>Test 1</b>	<b>Friday 1/31, in class</b>
<b>Test 2</b>	<b>Monday 2/24, in class</b>
<b>Test 3</b>	<b>Wednesday 3/25, in class</b>
<b>Test 4</b>	<b>Wednesday 4/15, in class</b>
<b>Final Exam (1:10 class)</b>	<b>Monday 4/27, 2 - 5 pm</b>
<b>Final Exam (2:20 class)</b>	<b>Tuesday 4/28, 2 - 5 pm</b>

## Course Grades

The final course grade is determined in the following way:

<b>Quizzes/Co-Curricular Activity</b>	<b>10%</b>
<b>Writing Assignments</b>	<b>18%</b>
<b>Final Project</b>	<b>12%</b>
<b>Tests (10% each)</b>	<b>40%</b>
<b>Final Exam</b>	<b>20%</b>

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 weekly quiz given at the beginning of class. No make-up quizzes will be offered, instead your lowest quiz grade will be dropped at the end of the semester.

**Co-Curricular Activity** The MCSP department and Roanoke College offer many opportunities to engage with mathematical ideas outside of classes. Members of this class are encouraged to attend many of these activities, however attending at least one is mandatory. Examples include MCSP Conversation Series talks and student research showcases - if you're unsure if a given activity makes sense for this purpose, please email me to ask. Within one week of attendance you must submit a brief response to the activity. Your response 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 one 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.

**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.

Day	Date	Topic	Assignments
M	J 13	Intro / Chapter 1	
W	J 15	Chapter 1: Picturing Distributions with Graphs	
F	J 17	Chapter 2: Describing Distributions with Numbers	
M	J 20	Chapter 2 / Chapter 3	<b>Writing 1 Assigned</b>
W	J 22	Chapter 3: Normal Distributions	
F	J 24	Chapter 4: Scatterplots and Correlation	
M	J 27	Chapter 4 / Chapter 5	<b>Writing 1 Due</b>
W	J 29	Chapter 5: Regression	
F	J 31	<b>Test 1</b>	

M	F 3	Chapter 7: Producing Data: Sampling	
W	F 5	Chapter 8: Producing Data: Experiments	<b>Writing 2 Assigned</b>
F	F 7	Chapter 9: Introducing Probability	
M	F 10	Chapter 9 / Chapter 11	
W	F 12	Chapter 11: General Rules of Probability	<b>Writing 2 Due</b>
F	F 14	Chapter 10: Sampling Distribution	
M	F 17	Chapter 10 / Chapter 12	
W	F 19	Chapter 12: Binomial Distributions	
F	F 21	Which probability tool to use?	
M	F 24	<b>Test 2</b>	
W	F 26	Chapter 13: Introduction to Inference	
F	F 28	Chapter 14: Thinking about Inference	
<b>Spring Break</b>			
M	M 9	Chapter 14 / Chapter 16	
W	M 11	Chapter 16: Inference about a Population Mean	
F	M 13	Chapter 17: Two-Sample Problems	<b>Writing 3 Assigned</b>
M	M 16	Chapter 17 / Chapter 18	
W	M 18	Chapter 18: Inference about a Population Proportion	
F	M 20	Chapter 19: Comparing Two Proportions	<b>Writing 3 Due</b>
M	M 23	Which test/tool to use?	
W	M 25	<b>Test 3</b>	
F	M 27	Chapter 21: Two Categorical Variables: the Chi-Square Test	<b>Final Project Assigned</b>
M	M 30	Chapter 21	<b>Final Project Topic Due</b>
W	A 1	Chapter 21	
F	A 3	Chapter 22: Inference for Regression	<b>Final Project Data Due</b>
M	A 6	Chapter 22 / Chapter 23	
W	A 8	Chapter 23: One-Way Analysis of Variance	
F	A 10	<b>Good Friday</b>	
M	A 13	Which test/tool to use?	
W	A 15	<b>Test 4</b>	
F	A 17	Review	
M	A 20	Project Summaries	
<b>Mon</b>	<b>A 27</b>	<b>1:10 class's Final Exam 2 - 5 pm</b>	
<b>Tues</b>	<b>A 28</b>	<b>2:20 class's Final Exam 2 - 5 pm</b>	

