

INQ 240 Statistics & Sports Industry Fall 2018 Section D2 (T-TH)

Instructor: Roger Reakes

Office: 161B Trexler Hall

Phone: 375-2450

Email: reakes@roanoke.edu

Office Hours:

Monday and Wednesday 1:00 pm to 3:00 pm

Tuesday and Thursday 8:30 am to 10:00 am

All office hours are by appointment. To make an appointment, please use the link:

<https://rreakes24.youcanbook.me>

If these hours do not work with your schedule, please call or email me to set up an appointment.

Text: *Elementary Statistics: Picturing the World, (6th edition),*

by Ron Larson and Betsy Farber

Required Materials: All students will need a graphing calculator, preferably a TI-83 or TI-84.

Recommended Materials: All students should use a notebook which contains graph paper.

Note: Students who have completed Stat 202 may not take this course for credit. Students must receive a C or better in this course or Math 111 to declare a major in Business Administration. You may wish to discuss grade requirements with your advisor with regards to your major.

Academic Integrity: You are expected to be familiar with the Academic Integrity Code outlined in the booklet,

[Academic Integrity at Roanoke College.](#)

https://www.roanoke.edu/inside/a-z_index/academic_affairs/academic_integrity

- 1) The use of any electronic device other than a calculator during a quiz or exam is strictly prohibited. Any use of such devices during a quiz or exam will be considered a breach of academic integrity. You will not be allowed to share a calculator.
- 2) Cell phones must be turned off prior to entering the classroom. You are not to either send or receive text messages during class!
- 3) You are expected to do all work graded for accuracy independently. This includes tests, quizzes, and graded practice problems. You are allowed to work alone, with a partner or a group on the daily independent practice problems which will only be checked for completion.

Course Objective: Students will gain an understanding of how decision making is accomplished using modern statistical techniques. Topics include descriptive statistics, graphical techniques, elementary probability, estimation, inferential statistics, linear correlation, and regression. Quantitative reasoning will also be emphasized.

Course Outcomes: By the end of this course, successful students will be able to:

- 1) use the methodologies of statistics to investigate a topic of interest and make decisions based on the results,
- 2) use the methodologies of statistics to design and carry out a simple statistical experiment,
- 3) 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,
- 4) articulate the importance and limitations of using data and statistical methods in decision making,
- 5) write about course topics clearly and effectively, and
- 6) interpret quantitative information related to the course topic.

Policy on expected number of hours of work per week: Per the Academic Catalog, “For each one-unit course, students are expected to complete 12 hours of work inside and outside of class each week.” Realistically, this may vary due to the strength of the background of each individual student with respect to course content.

Grading:

Accuracy of Graded Practice Problems:	5%
Completion of Independent Practice Problems:	5%
Where is the Data Project:	5%
Sports Article using Data Analysis Project:	15%
Tests:	70%

Grades will be assigned using the scale below:

A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	Below 60

Testing Policy:

We will use Mastery-Based Testing rather than Points-Based Testing. Mastery-based testing is very different from what you are used to - do not hesitate to ask me questions! You will only receive credit for answers that demonstrate you completely understand (have mastered) a topic. But you will get MANY chances to display mastery throughout the semester with NO PENALTY for earlier attempts.

- The course has been summarized by 16 topics.
- Your mastery of questions on these topics is assessed through the working of problems each week and during the final exam period.
- Each problem submitted is graded as either “Mastered” or “Not Mastered”. A grade of Mastery indicates that you have demonstrated full understanding of the concept being tested and further work on the topic is unnecessary.
- Once you have mastered a topic, you need not attempt it again.
- There is no penalty for multiple attempts taken to achieve mastery.
- Mastery does not mean perfect! It means you understand and can demonstrate all fundamentals of the topic and are proficient at the level desired for the course you do not need to study the topic further.

Your overall test grade is determined by the number of topics you have mastered:

# Mastered	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Mastery Grade	100	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25

Where’s the Data Come From Project: You must find articles about sports you are interested in that uses data analysis to make or prove a point. In the article you must find the data set or a description of the data set used to support the authors claim and what sampling technique was used to collect the data. You may share as many articles as you like, but are required to share at least one with the class. You must also select one of the articles and submit a written report fully describing the author’s data collecting techniques using the vocabulary of a statistician.

Sports Article using Data Analysis Project: After reading article yourself and listening to your classmates examples of articles using data analysis to support an author’s claim, you will become the author. Your task will be to use proper

techniques to collect, organize, visualize, analyse and interpret data. You will use these results to write an interesting sports article which uses your results of your statistical study to prove or disprove a claim.

Late Work Policy: Independent practice problems will be collected the day they are due and checked for completion. This work will only be accepted on the day it is due. No late papers will be accepted without arrangements approved prior to absence OR without written documentation from a college official. Graded practice problems will be checked for accuracy and may be submitted until solved correctly. They will not be accepted after the last day our class meets prior to the final exam. Projects will only be accepted on the day it is due. No late papers will be accepted without arrangements approved prior to absence OR without written documentation from a college official.

Attendance: Attendance is critical to the understanding of the material in the course; it is both required and expected. Any absence that is not discussed with the instructor prior to the missed class is considered unexcused. When absent, excused or unexcused, you are responsible for all material covered in class. Work missed due to either an unexcused or excused absence can only be made up when arrangements are made in advance of the absence OR with written documentation from a college official.

MCSP Conversation Series: The Department of Mathematics, Computer Science and Physics 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 discipline. Members of this class are invited to be involved with all of these meetings; however participation in at least one of these sessions is mandatory. After attending, students will submit a one page paper within a week reflecting on the discussion. This should not simply be a regurgitation of the content, but rather a personal contemplation of the experience. This does not have to be a formal paper. This reflection paper will be counted as a graded practice assignment.

Subject Tutoring: Subject Tutoring is a CRLA Nationally Certified Program located on the lower level of Fintel Library in room 005. Subject Tutoring offers individual appointments in 30-minute intervals for Lab Sciences, Modern Languages, Math and CPSC, Social Sciences, Business and Economics. Hours are Sunday - Thursday 4 p.m. - 9 p.m. For a list of tutorials or to make an appointment, go to www.roanoke.edu/tutoring.

Tentative Course Schedule:

Day	Date	Topic	Sections(s)	Topic(s)	Assignment
Thur	8/30	1	1.1 & 1.2	Introduction to Course and Statistics Vocabulary, Types and Levels of Data	pgs 6-7 11-19 odd, 25-33 odd; pgs 13-14 7-19 odd
Tues	9/4	1 & 2	1.3 & 2.1	Data Collection, Statistical Study, Frequency Distributions, Histograms	pgs 25-26 19-29 odd
Thur	9/6	2	2.1 to 2.2	Frequency Distributions, Histograms, Bar Graphs, Line Graphs, Circle Graphs, Stem & Leaf Plots	pgs 49-51 11,13,15,19,25, View 29 & 31 on TI84 pgs 62-65 5-9 all, 9,11,13-16 17,19 & View 31 on TI84
Tues	9/11	3	2.3 2.5	Mean, Median, Mode, Quartiles and Box-and-Whisker Plots,	pgs 75-77 17-21 odd, 31,33 pgs 109-110 11a, 13a,15,25,27
Thur	9/13	3	2.4	Mean, Variance and Standard Deviation of a Data Set and a Distribution Mastery Opportunity for Topics 1 - 3	Pgs 93-95 13-23 odd
Tues	9/18	4	9.1 to 9.2 3.1	Scatter Plots, Correlation, Regression and Predictions Intro to Probability	Pgs 482-483 9-18 all 21-25 odd Pgs 491 17-21 odd Pgs 140-145 15,17,29,31,33, 37-49 odd, 61-67 odd,71,73,76
Thur	9/20	5		Introduction to "Where's the Data Come From Project" (Mrs Piper Cumbo?) & Mastery Opportunity for Topics 1 - 4	
Tues	9/25	5	3.3 3.4 3.2	The Addition Rule for Probability, Finding the Number of Outcomes & The Multiplication Rule for Probability	Pgs 162-165 9-12 all, 13-17 odd, 23,25
Thur	9/27	5	3.2	The Multiplication Rule for Probability cont... & Mastery Opportunity for Topics 1 - 5	
Tues	10/2	6	4.1 & 4.2	Probability Distributions & Binomial Probability Distributions	
Thur	10/4	7	5.1	Identifying and the Properties of the Normal Distribution & Mastery Opportunity for Topics 1 - 6	
Tues	10/9	7	5.2 to 5.3	Identifying the Properties of the Normal Distribution & Applying the Properties of the Normal Distribution	
Thur	10/11		5.4	Mastery Opportunity for Topics 1 - 7	
Tues	10/16			Fall Break	
Thur	10/18			Fall Break	
Tues	10/23	8		Normal Distribution and the Central Limit Theorem & Normal Binomial Distributions	
Thur	10/25	8		Normal Binomial Distributions cont... & Mastery Opportunity for Topics 1 - 8	
Tues	10/30	9	6.1 & 6.3	Confidence Interval for a Mean & Confidence Interval for a Proportion	
Thur	11/1	9	6.3	Confidence Interval for a Proportion cont... & Mastery Opportunity for Topics 1 - 9	

Tues	11/6	10	7.2	Hypothesis Test for One Mean	
Thur	11/8	11	7.4	Hypothesis Test for One Proportion & Mastery Opportunity for Topics 1 - 10	
Tues	11/13	12	8.1	Hypothesis Test for Two Means	
Thur	11/15	13	8.4	Hypothesis Test for Two Proportions & Mastery Opportunity for Topics 1 - 12	
Tues	11/20			Project Introduction & Mastery Opportunity for Topics 1 - 13	
Thur	11/22			Thanksgiving Break	
Tues	11/27	14	10.1 & 10.2	Chi Square Test for Good Fit & Chi Square Test of Independence	
Thur	11/29	15	7.1 to 10.2	Choosing an Appropriate Hypothesis Test & Mastery Opportunity for Topics 1 - 14	
Tues	12/4	15 & 16	10.4	Choosing an Appropriate Hypothesis Test cont... & ANOVA	
Thur	12/6	16		ANOVA cont... & Mastery Opportunity for Topics 1 - 16	
Thur	12/13			Mastery Opportunity for Topics 1 - 16 (Block 10 at 8:30 to 11:30)	