INQ 240A, Fall 2017: Statistics and Food

Instructor	Maggie Rahmoeller *Phone:* (540) 375-2505 *Email:* rahmoeller@roanoke.edu *Office:* Trexler 270J
Class Meetings	INQ240-C MWF 2:20-3:20PM Trexler 362
Office Hours	Mon: 9:30AM-10:30AM Wed: 9:30AM-10:30AM Thurs: 10AM-12PM Or set up a different time by emailing me!
Course Description	Do you like food? Are you interested in issues concerning topics such as food industry, personal dietary choices, food marketing, and food shortages? In this course, you will learn how statistical methods are used to provide arguments for such issues and explanations for patterns that arise in the US today. And of course, food will be involved. You will read and reflect on articles involving food, use and create data sets concerning food, and even do a little bit of cooking! Materials needed for cooking and other projects will be included, free of charge.
Course Information	This is a course in learning how to obtain and interpret results obtained from sets of data by using techniques of statistics. This class will introduce to you the methods of collecting, organizing, and presenting data. You will also study various quantitative measures for data and will study how to draw conclusions and make inferences from that data. Some probability will also be discussed as a precursor to the "inferential" statistics.
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. In the critique students will recognize variability and its consequences, identify potential sources of bias and both proper and improper cause and effect inference, • articulate the importance and limitations of using data and statistical methods in decision making, • write about course topics clearly and effectively, and • interpret quantitative information related to the course topic.
Required Materials	**Textbook:** *Introductory Statistics*, by Barbara Illowsky, Susan Dean, etc; free, online text from OpenStax: https://cnx.org/contents/30189442-6998-4686-ac05-ed152b91b9de **Technology:** Minitab Express ($15, download 6-month rental from www.onthehub.com/minitab) **Reference Book:** *A Writer's Reference* by Diana Hacker, RC Edition OR *Easy Writer*, 6e, by Lunsford **Calculators:** Any scientific calculator to perform calculations **Other:** Other readings will be provided as needed

Course Grades

The following table lists the weights for the various forms of assessment for this class.

Activities & Homework	15%	Tests	30%
Projects	35%	Final Exam	20%

A grade scale will be determined after final grades are computed, but will be no worse than the scale given below:

		B+	87-89	C+	77-79	D+	67-69		
A	93-100	B	83-86	C	73-76	D	63-66	F	0-59
A-	90-92	B-	80-82	C-	70-72	D-	60-62		

Homework

Homework will be assigned on a daily basis, and graded partially on correctness and partially on completeness. Completeness includes using complete sentences, restating each problem in your answers, and explaining your answers.

Reading

Daily reading of assigned sections from our textbook is expected. You should come to class prepared to discuss the material that you have read. You can find an approximate schedule for the sections we will cover on the last page of this syllabus, but reading will also be announced in class and posted on Inquire. Readings from other sources will be assigned as appropriate.

Tests

There will be four tests; the tests will focus primarily on the statistics content of this course, but will emphasize critical thinking and writing! Homework and class notes are absolutely the best sources of review! The tests will not be designed to be cumulative, but as with any course involving mathematics, material from previous tests can be thought of as a prerequisite for future tests.

Other Assignments

There will be three major projects in this class that are designed to allow some freedom for you to explore the connection between statistics and food in the US.

The first of these assignments will be early in the semester. The form will be a paper (roughly 2-3 pages) focusing on critiquing the use of descriptive statistics in an assigned article and discussing potential bias and other issues in the described study.

The second of these assignments will take much of the semester. You will work in small groups to conduct a cooking experiment and use statistical methods to determine significant findings. For example, if your group has access to an oven, you could use statistics to determine whether the amount of a leavening agent in biscuit dough affects the height of the biscuit. If your group only has access to a microwave, you could instead use statistics to determine whether the flavor of microwave popcorn affects the number of unpopped kernels, for example. This project will culminate in a formal written report.

The third assignment will be done in class at the end of the semester. This assignment will be similar to the first in that you will reflect on how statistics from a study are used in an article; however, you will be in charge of finding an article relating to food and statistics that you find interesting.

Final Exam

The final exam will be comprehensive, and will be given during the scheduled time for Blcok 6, i.e. **Tuesday, Dec 12 from 2PM to 5PM**. As with the tests, it will also emphasize critical thinking and writing. The best way to review for the final is to review your performance on the four tests; focus on material that you did not master the first time around, and review the topics that you did master.

Attendance & Make-Up Work

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. **You will not be allowed to make up any work missed due to an unexcused absence.** This course expects you to spend **at least 12 hours** on work each week inside and outside of class.

Disability Support Services

The Office of Disability Support Services, located in the Goode-Pasfield Center for Learn ing and Teaching in Fintel Library, provides reasonable accommodations to students with identified disabilities. Reasonable accommodations are provided based on the diagnosed disability and the recommendations of the professional evaluator. Please contact JoAnn Stephens-Forrest, MSW, Coordinator of Disability Support Services, at 540-375-2247 or email her (stephens@roanoke.edu) to schedule an appointment. If you have registered with DSS in the past, and would like to receive academic accommodations for this semester, please contact Ms. Stephens-Forrest at your earliest convenience, to schedule an appointment. Also, please note that arrangements for extended time on exams, testing, and quizzes in a distraction-reduced environment must be made at least 48 hours before every exam.

Academic Integrity

Students are expected to adhere to the Academic Integrity policies of Roanoke College. All work submitted for a grade is to be your own work! Note that any electronic devices used during exams must be first okayed by your instructor (me), and used only in an appropriate manner, which is decided by your instructor (me).

Writing Center

Roanoke College's Writing Center is located on the Lower Level of Fintel Library and offers writing tutorials focused on written and oral communication for students working on writing assignments/projects in any field. Writers at all levels of competence may visit the Writing Center at any point in their process, from brainstorming to drafting to editing, to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 pm. Simply stop in, or schedule an appointment by going to www.roanoke.edu/writingcenter, where our schedule of writing workshops and creative writing playshops is also posted. Questions? Email writingcenter@roanoke.edu or call 375-4949. Like our Facebook page for updates!

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.

Course Schedule

The following schedule is approximate and subject to change.

Wed	Aug 30	Ch 1	Experimental vs Observational Studies
Fri	Sept 1	Ch 1	Experimental Design **Project 1 assigned**
Mon	Sept 4	Ch 1	Data Collection

Wed	Sept 6	Ch 2	Visual Statistics
Fri	Sept 8	Ch 2	Visual & Descriptive Statistics
Mon	Sept 11	Ch 2	Descriptive Statistics **Project 1 due**
Wed	Sept 13	Ch 3	Intro to Probabiilty
Fri	Sept 15	Ch 3	Probability cont.
Mon	Sept 18	Ch 3	Probability cont.
Wed	Sept 20		**Review**
Fri	Sept 22		**Test 1** (Chapters 1, 2, 3)
Mon	Sep 25	Ch 4 & 5	Random Variables **Project 2 assigned**
Wed	Sep 27	Ch 6	Random Variables cont.
Fri	Sept 29	Ch 6	Normal Distribution cont.
Mon	Oct 2	Ch 2 & 7	Sampling Distribution
Wed	Oct 4	Ch 2 & 7	Sampling Distribution cont. **Groups and Topics due**
Fri	Oct 6	Ch 2 & 7	CLT & Law of Large Numbers
Mon	Oct 9	Ch 2 & 7	Binomial Distribution Approximation **Research Question due**
Wed	Oct 11		**Review**
Fri	Oct 13		**Test 2** (Ch 2, 4, 5, 6, 7)
			Fall Break
Mon	Oct 23	Ch 8	Intro to Inference **Intro of paper and Hypotheses due**
Wed	Oct 25	Ch 8 & 9	Intro to Hypothesis Testing
Fri	Oct 27	Ch 9	1-Sample Tests **Experimental Design and Supply List due**
Mon	Oct 30	Ch 9	1-Sample Tests cont.
Wed	Nov 1	Ch 10	2-Sample Tests
Fri	Nov 3	Ch 9 & 10	Hypothesis Testing cont.
Mon	Nov 6		**Review**
Wed	Nov 8		**Test 3** (Ch 8, 9, 10)
Fri	Nov 10	Ch 11	Chi-Square
Mon	Nov 13	Ch 11	Chi-Square cont.
Wed	Nov 15	Ch 13	ANOVA
Fri	Nov 17		**No Class!!**
Mon	Nov 20	Ch 13	ANOVA cont. **Project 2 due** **Project 3 assigned**
			Thanksgiving Break
Mon	Nov 27	Ch 12	Scatterplots

Wed	Nov 29	Ch 12	Regression
Fri	Dec 1	Ch 12	Regression
Mon	Dec 4		**Review**
Wed	Dec 6		**Test 4** (Ch 11, 12, 13)
Fri	Dec 8		Review **Project 3 due**
Tues	**Dec 12**		**Final Exam: 2-5PM**