

MATH-11, Elementary Statistics
REEDLEY COLLEGE
FALL 2016

Instructor: Miguel-Angel Manrique

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Office hours: MTh 12:30-1:30pm, TW 10-10:30am, Th 4-5pm (by email), or by appointment

Meeting location: FEM-4

Meeting times: MTWTh 11-11:50am

Section number: 58540

Prerequisite: Math-103

Book: *Elementary Statistics: A Step by Step Approach*, 7th edition, by Allan Bluman.

1. COURSE DESCRIPTION

The main ideas we will look at in this course are

1. The Nature of Probability and Statistics
2. Frequency Distributions and Graphs
3. Data Description
4. Probability and Counting Rules
5. Discrete Probability Distributions
6. The Normal Distributions
7. Confidence Intervals and Sample Size
8. Hypothesis Testing
9. Testing the Difference Between Two Means, Two Proportions, and Two Variances
10. Correlation and Regression
11. Chi-Square and Analysis of Variance

Course Structure: You will have a chance to ask questions about homework problems at the beginning of each class period. The remainder of the session will be for thinking about (and discovering) mathematics. *You will be working on problem sets in every class meeting, with your peers and with me.*

Participation and attendance: Active participation in class is an essential ingredient in this course. Participation in your group and in whole class discussions is a significant part of your grade. You are expected to participate in problem solving, offer to present your individual thought process, your reasoning and your solutions to the whole class, and critically evaluate any reasoning presented in class.

For this reason, attendance is mandatory. Missing class, late arrival to class, or leaving in the middle of class will result in a lower grade.

Moreover, *cell phone use is prohibited during class*. Students using their cell phones during class may be asked to leave for the day. Do not use your phone as a calculator; do not have it out.

Homework: Homework will usually be due a couple of times each week in WeBWork. Access your homework sets here:

<http://www.reedleywebwork.online>

Your login is the same as your Reedley College email and your initial password is your ID number, without the leading zero. Homework problems will be close to the type and difficulty of material that you need to know for the exams.

Occasionally you will be given problem sets to work out on paper and/or with a computer. Many professional statisticians use the R software package to study data—we will do the same. You are encouraged to read about the R project and RStudio here

<http://www.r-project.org>

and here

<http://www.rstudio.com>

Many statistics software packages are available to us, but none match R's quality and price (*free*). R code will be periodically made available to you for use in your homework sets.

Exams and quizzes: There will be three midterm exams and one final exam. The final exam will be comprehensive over the entire semester. We will also have quizzes periodically throughout the semester.

No make-ups will be given for missed quizzes or work except in the event of a true, documented emergency where the instructor is notified **in advance**—if reasonable. In such a circumstance, it is the students responsibility to contact the instructor at the earliest possible time to make alternate arrangements.

2. GRADING

In order to pass this class, you must pass the final.

A	=	88%+
B	=	77 – 87%
C	=	66 – 76%
D	=	55 – 65%

I will use the following grading scheme:

WeBWorK:	15%
Traditional homework:	10%
Class participation:	5%
Quizzes:	10%
Exam 1:	10%
Exam 2:	10%
Exam 3:	10%
Final exam:	30%

3. IMPORTANT DATES

- Deadline to drop with a refund: August 26, 2016
- Deadline to add: September 2, 2016
- Deadline to drop to avoid a “W” on your transcript: September 2, 2016
- Deadline to drop with a “W”: October 14, 2016

4. STUDENT LEARNING OUTCOMES:

Upon completion of this course, students will be able to:

1. Organize, analyze, and utilize appropriate methods to draw conclusions based on sample data by using tables, graphs, measures of central tendency, and measures of dispersion
2. Apply concepts and terminology of statistics
3. Implement the rules of probability
4. Collect data, interpret and communicate the results using statistical analyses such as confidence intervals, hypothesis tests, and regression analysis.

5. COURSE OBJECTIVES:

In the process of completing this course, students will:

1. Distinguish among different scales of measurement and their implications;
2. Identify the standard methods of obtaining data and identify advantages and disadvantages of each;
3. Interpret data displayed in tables and graphically;
4. Calculate measures of central tendency and variation for a given data set;
5. Apply concepts of sample space and probability;
6. Calculate the mean and variance of a discrete distribution;
7. Calculate probabilities using normal and t-distributions;
8. Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem;
9. Construct and interpret confidence intervals;
10. Determine and interpret levels of statistical significance including p-values;
11. Interpret the output of a technology-based statistical analysis;
12. Identify the basic concept of hypothesis testing including Type I and II errors;
13. Formulate hypothesis tests involving samples from one and two populations;
14. Select the appropriate technique for testing a hypothesis and interpret the result;
15. Use linear regression and ANOVA analysis for estimation and inference, and interpret the associated statistics; and
16. Use appropriate statistical techniques to analyze and interpret applications based on data from disciplines including business, social sciences, psychology, life science, health science, and education.

6. HELP!

You are warmly invited to come and see me whenever you are faced with questions, confusion, insights, or concerns – or to share an exciting discovery. The listed office hours are times when I'm available specifically for you. Take advantage of this opportunity! In addition, whenever my office door is open throughout the week you are welcome to check in for help. If our schedules don't match well, email is a good way to get in touch: feel free to suggest a few times that would work for your schedule and we can make special arrangements to meet face-to-face.

Alternatively, personal help will be available in the Math Center. If math has been a struggle for you in the past, or if you wish to earn an "A" grade, then I strongly recommend regular Math Center participation. It has been very successful in helping students achieve their goals in mathematics.

7. ADVICE

Here are some suggestions for what you can do to succeed:

- Attend every class.
- Do the reading before coming to class. You may not understand all the fine details on first reading. Every time you get stuck reading, formulate a question on that material, and ask it when we discuss that topic on class. Try to identify the general ideas and concepts presented.
- Go through your notes very carefully. Be sure to understand all the ideas and examples discussed in class. Ideally, you should be able to solve the example problems discussed in class on your own, without looking at your notes. If you get stuck, consult your notes, and come to talk to me if you don't understand some of the steps. Don't memorize! Try to understand the reasoning.
- Start the homework assignments immediately and have them ready early.
- Do extra problems. I only assign a sampling of the problems from the text, but you are expected to know how to do most of the problems in the book, not just those that are assigned. Before an exam, it is excellent practice to work through problems that were not assigned in class and ask questions if you have difficulty with them. Also consult the Review sections at the end of the chapters.
- Take advantage of office hours. Office hours are time I set aside for you to come in with the questions you encountered trying to solve the problems. I can help you exactly where you are stuck. So do come with your questions!
- Use other available resources. If you have questions outside of class and office hours, you can come by and check whether my office door is open. I am also very accessible by e-mail, and you should feel free to send me a note at any time.
- Go through the review sheets carefully before the exams. A few days before an exam, I will hand out a detailed review sheet with the material you are expected to know. Use it as an outline for studying. Go through it carefully in advance, asking me questions about material you aren't sure how to do.
- Lastly, if you have a verified need for an academic accommodation or materials in alternate media (e.g. Braille, large print, electronic text, etc.) per the Americans with Disabilities Act or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Best wishes for a successful semester!