

Math 54: Elementary Statistics Spring 2018

Lecture: T, Th 7:15-9:20 p.m. in Bundy 221 (section 4295)

Instructor: Christopher Wayne Walker, Ph.D.

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Office Hours: Thursday, 6:10-7:10 p.m. in Bundy 2nd floor lounge

Website: www.cwwphd.com

Text: Elementary Statistics, 13th edition, or CA 3rd edition, by Mario F. Triola

First lecture: Tuesday, Feb. 13

Last lecture: Thursday, May 31

No lecture Tuesday, March 13 (Institutional Flex Day), April 10, 12 (Spring Break)

Grading Policy:

| Course Grading Method 1 | Percentage | Course Grading Method 2 | Percentage |
|-------------------------|------------|-------------------------|------------|
| 4 Exams | 60 % | Best 3 of 4 Exams | 50 % |
| Final | 30 % | Final | 40 % |
| Project | 5 % | Project | 5 % |
| Class Participation | 5 % | Class Participation | 5 % |
| Total | 100 % | Total | 100 % |

Exam Information:

Exam 1 is Thursday, March 8, 2018 (covers 1.1– 3.3).

Exam 2 is Thursday, April 5, 2018 (covers 4.1 – 6.1).

Exam 3 is Thursday, April 26, 2018 (covers 6.2 – 7.3).

Exam 4 is Thursday, May 24, 2018 (covers 8.1 – 9.4).

Final Exam is Tuesday, June 5, 2018 from 6:45-9:45 p.m. in Bundy 221. Covers the entire course.

Each of the 4 exams will be of 1 hour duration and will be given at the beginning of class.

Your overall average will be computed using the two methods shown above and you will receive the higher of the two scores. Letter grades are assigned as follows:

A: [85, 100] B: [70, 85) C: [60, 70) D: [50, 60) F: <50.

Regarding Method 2 Grading: You must take all 4 of the 1 hour exams unless excused (such as for a medical reason or some emergency) in order to drop the lowest exam using Method 2. If you are excused from an exam then that is the exam you drop. If you miss an exam without an approved excuse then you will receive a 0 for that exam and it will count toward your overall average (you cannot drop it). Any approval to miss an exam must be obtained from me either before the exam or within 2 weeks of the exam date in order not to receive a 0 for the missed exam. You must receive an email confirmation from me in order for your missed exam to be dropped so do not assume your missed exam has been approved unless you receive an email from me stating so. Under no circumstances will a student be excused from taking two or more exams. The final exam cannot be waived and you must take it at the scheduled time shown above.

There are no make-up exams (except for religious observances) so plan your schedule accordingly.

Calculators (but not computers) are allowed on exams. You should utilize a calculator that can do two-variable statistics such as the TI-84.

Use of cell phones is not allowed during exams (you cannot not even have them on your desk). You may not use a calculator feature of a cell phone on exams. You must use a self-contained calculator.

All of the exams including the final will be closed book and closed notes. You may use the formula sheet as instructed by the professor.

Homework Information: Homeworks will be assigned but not graded.

Attendance Policy: Attendance will be taken nightly and will count 5% of your grade. All absences must be approved either before or no later than 2 weeks after the absence to avoid the point deductions. You must receive an email confirmation from me in order for your absence to be approved so do not assume your absence has been approved unless you receive an email from me stating so.

Classroom Behavior: The lecture will begin promptly at 7:30 p.m. so I expect you to be in the classroom and seated at that time. We will take a 10 minute break during the lecture. When the break is over and before I start the lecture again I expect you to be in your seat and not talking. Classroom disruptions such as talking when I am lecturing will not be tolerated. If you show disrespect for the class by talking while I am lecturing I will deduct 2 points off of your overall average at the end of the semester. If this happens twice I will deduct 4 points from your average. If this happens three times I will drop you from the course.

Topics Covered

- Ch. 1 Introduction to Statistics**
Statistical and Critical Thinking, Types of Data, Collecting Sample Data
- Ch. 2 Exploring Data with Tables and Graphs**
Frequency Distributions for Organizing and Summarizing Data, Histograms, Graphs That Enlighten and Graphs That Deceive, Scatterplots, Correlation and Regression
- Ch. 3 Describing, Exploring, and Comparing Data**
Measures of Center, Measures of Variation, Measures of Relative Standing and Boxplots
- Ch. 4 Probability**
Basic Concepts of Probability, Addition Rule and Multiplication Rule
- Ch. 5 Discrete Probability Distributions**
Probability Distributions, Binomial Probability Distributions
- Ch. 6 Normal Probability Distributions**
The Standard Normal Distribution, Real Applications of Normal Distributions, Sampling Distributions and Estimators, The Central Limit Theorem
- Ch. 7 Estimating Parameters and Determining Sample Sizes**
Estimating a Population Proportion, Estimating a Population Mean, Estimating a Population Standard Deviation or Variance
- Ch. 8 Hypothesis Testing**
Basics of Hypothesis Testing, Testing a Claim About a Proportion, Testing a Claim About a Mean, Testing a Claim About a Standard Deviation or Variance
- Ch. 9 Inferences from Two Samples**
Two Proportions, Two Means: Independent Samples, Two Dependent Samples (Matched Pairs), Two Variances or Standard Deviations
- Ch. 10 Correlation and Regression**
Correlation, Regression, Prediction Intervals and Variation
- Ch. 11 Goodness-of-Fit and Contingency Tables**
Goodness-of-Fit, Contingency Tables
- Ch. 12 Analysis of Variance**
One-Way ANOVA

| Date | Text Material/Exams | Date | Text Material/Exams |
|-------------|----------------------------|-------------|----------------------------|
| 2/13/2018 | 1-1, 1-2 | 4/10/2018 | No Class |
| 2/15/2018 | 1-3, 2-1 | 4/12/2018 | No Class |
| 2/20/2018 | 2-2, 2-3 | 4/17/2018 | 7-3 |
| 2/22/2018 | 2-4 | 4/19/2018 | 8-1 |
| 2/27/2018 | 3-1, 3-2 | 4/24/2018 | 8-2 |
| 3/1/2018 | 3-3 | 4/26/2018 | Exam 3, 8-3 |
| 3/6/2018 | 4-1 | 5/1/2018 | 8-4 |
| 3/8/2018 | Exam 1, 4-2 | 5/3/2018 | 9-1 |
| 3/13/2018 | No Class | 5/8/2018 | 9-2 |
| 3/15/2018 | 5-1 | 5/10/2018 | 9-3 |
| 3/20/2018 | 5-2 | 5/15/2018 | 9-4, 10-1 |
| 3/22/2018 | 6-1 | 5/17/2018 | 10-2, 10-3 |
| 3/27/2018 | 6-2 | 5/22/2018 | 11-1 |
| 3/29/2018 | 6-3, 6-4 | 5/24/2018 | Exam 4, 11-2 |
| 4/3/2018 | 7-1 | 5/29/2018 | 12-1 |
| 4/5/2018 | Exam 2, 7-2 | 5/31/2018 | Project Due |
| | | 6/5/2018 | Final Exam |

Student Learning Outcome(s):

1. Given a data set, students will analyze the data set and design a presentation of the information using tables, graphs and statistical calculations.
2. Given sample data, students will decide on and use appropriate estimation strategies to make inferences about the important characteristics of population data, including the mean, proportion and variation.
3. Given sample data, students will decide on and use an appropriate test to reach conclusions about a hypothesis made about a population parameter.

Math 54
Fall 2018 Homework

| | | |
|-------------------|-------------|------------|
| Chapter 1 | 1-1 | 1-15 (odd) |
| | 1-2 | 1-29 (odd) |
| | 1-3 | 1-23 (odd) |
| Chapter 2 | 2-1 | 1-23 (odd) |
| | 2-2 | 1-11 (odd) |
| | 2-3 | 1-11 (odd) |
| | 2-4 | 1-11 (odd) |
| Chapter 3 | 3-1 | 1-23 (odd) |
| | 3-2 | 1-23 (odd) |
| | 3-3 | 1-29 (odd) |
| Chapter 4 | 4-1 | 1-37 (odd) |
| | 4-2 | 1-29 (odd) |
| Chapter 5 | 5-1 | 1-25 (odd) |
| | 5-2 | 1-35 (odd) |
| Chapter 6 | 6-1 | 1-47 (odd) |
| | 6-2 | 1-31 (odd) |
| | 6-3 | 1-15 (odd) |
| | 6-4 | 1-17 (odd) |
| Chapter 7 | 7-1 | 1-21 (odd) |
| | 7-2 | 1-21 (odd) |
| | 7-3 | 1-15 (odd) |
| Chapter 8 | 8-1 | 1-31 (odd) |
| | 8-2 | 1-31 (odd) |
| | 8-3 | 1-23 (odd) |
| | 8-4 | 1-15 (odd) |
| Chapter 9 | 9-1 | 1-21 (odd) |
| | 9-2 | 1-19 (odd) |
| | 9-3 | 1-15 (odd) |
| | 9-4 | 1-15 (odd) |
| Chapter 10 | 10-1 | 1-25 (odd) |
| | 10-2 | 1-25 (odd) |
| | 10-3 | 1-19 (odd) |
| Chapter 11 | 11-1 | 1-15 (odd) |
| | 11-2 | 1-15 (odd) |
| Chapter 12 | 12-1 | 1-15 (odd) |

Math 54: Project Fall 2018

Due Thursday, May 31, 2018 at 7:15 p.m. in the Classroom

This project will demonstrate that several student learning objectives have been met, including statistical calculations for a given data set consisting of samples and, for the given sample data, you will decide on and use an appropriate test to reach conclusions about a hypothesis made about a population parameter. You will be making inferences about the population proportion.

In this project you will utilize some of the statistical concepts we studied in class to analyze some data. The project will make use of a calculator with built-in statistical functions. You will be given a set of data to analyze. Your data consists of poll results for a two-candidate election. Your data consists of 1's and 0's. A 1 represents a yes vote for candidate A in the sample.

You should set up a hypothesis test to test the claim that candidate A will receive greater than 50% of the population vote (so $p > 0.50$). Your sample size is 100.

You should specify the null hypothesis and the alternate hypothesis. You should test the null hypothesis and compute the corresponding P-value using the traditional approach where you compute Z. The significance level is 0.05. Make sure your data meets any requirements necessary in order to use the normal approximation in computing Z.

Your report should consist of the following:

- A cover page where you include your name and assigned class number.
- An Introduction where you state the task your report addresses.
- An Analysis section where you show the hypothesis and formulas for the project and the results you obtain.
- A Conclusions section where you state your conclusions.
- An appendix where you include your raw data and detailed descriptions of the functions you used and how you used them including any parameters you had to input to the functions.

You must use built-in statistical functions on your calculator for your analysis. No credit will be given for answers obtained via plugging into formulas. However, you should show all formulas that would be required if you could not use technology for this project.

Note: This project is to be an individual effort. You are not to consult with other students or anyone else (except the professor) on any aspect of the project. You may ask your professor any questions you have. You should type your report (including equations) on single-sided white paper with a staple in the upper left-hand corner. Do not put your report in any kind of binder.