

Course Syllabus: MATH 11 – Elementary Statistics

MATH 11-55553

100% Online

Instructor: Mr. Steven Zook

Phone: (559) 638-3641 ext. 3279

Office Hours: TTh 10am-12pm, W 9-10am

Reedley College

Spring 2021

Email: steven.zook@reedleycollege.edu

Office: FEM 4A

[Virtual Office](#)

Meeting Days:

Monday, Wednesday 10:00 – 11:50 am, Zoom (links in Canvas)

Course Description:

This course is an introduction to statistical methods and techniques with applications in the fields of business, behavioral and social science, as well as in science, technology, engineering, and mathematics. Topics include descriptive measures of central tendency and variability, probability, binomial and normal distributions, random variables, sampling, estimating, hypothesis testing (parametric and nonparametric), correlation and regression.

Course Prerequisites: MATH 103

Course Advisories: Eligibility for English 1A

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.

Student Learning Outcomes are statements about what the discipline faculty hope you will be able to do at the end of the course. This is NOT a guarantee: the ultimate responsibility for whether you will be able to do these things lies with you, the student. In addition, the assessment of Student Learning Outcomes is done by the department in order to evaluate the program as a whole, and not to evaluate individual faculty performance.

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.
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

Required Text:

Openstax, [Introductory Statistics](#), 2020. This text is required for reading; however, you do not have to purchase a hard copy of the text since it is available for free online:

[Introductory Statistics Textbook](#)

Required Course Material:

All required course material is available and integrated in Canvas. We will be using Google Sheets (web-based spreadsheet application that is similar to Excel). This will require you to create a google account, if you do not already have one.

Office Hours:

I will be holding regular virtual office hours. I want to be available to you if you need assistance outside of class. Please visit me during the scheduled times for drop-in questions. You may come unannounced during those times. If the scheduled office hours do not suit your schedule, you may arrange a time to meet with me by sending me an email. Please don't hesitate to take advantage of these since I want you to succeed – it's what I am here for.

This semester all my office hours are virtual at the following link: [Virtual Office](#)

Communication:

There are a variety of ways to reach me. I will do my best to respond to messages and emails that are received Monday-Friday between 9am and 5pm as soon as possible, but no later than 24 hours. If you don't hear back from me in 24 hours, assume I did not receive your message/email and please resend it. On weekends, please give me additional time - I will respond to messages/emails received over the weekend (after Friday 5pm) on Monday mornings. Please identify yourself in the email with your full name and course number (e.g. Steven Zook, MATH 11-55014).

Preferred:

1. Message me using the "Inbox" feature in Canvas.
2. Email me directly: steven.zook@reedleycollege.edu
3. Drop by my virtual office (zoom) during my scheduled office hour: [Virtual Office](#)

4. Consider posting a general course question in the Q&A discussion thread on Canvas.

Other:

5. Visit me in my office: FEM 4A (on hold until it is safe to be in my office and have visitors)
6. Call me on my office phone: 559.638.3641 extension 3279. If leaving a message, please let me know your full name and the course you are taking along with a call-back number.

Attendance and Drop Policy:

The primary way that you "attend" class is by participating in class discussions and completing assignments (homework, quizzes, and exams). It is important that students regularly and consistently participate in the course from the very beginning. For this reason I have the following guidelines for when I may drop students from the course. If I intend to drop you, I will always message you a warning before I do, so don't be anxious about being dropped "out of the blue". If you do have missing assignments, I encourage you to reach out to me, so we can make a plan to get you on track - the sooner the better!

1. Introduce yourself to me and to your classmates by participating in the **Introduction discussion** during the first week. Otherwise, I may drop you as a "no-show".
2. Start strong! Complete **all assignments** during the first two weeks of class. If you miss an assignment during the first two weeks, I may drop you from the course.
3. If you miss **more than eight (8) assignments** (discussion, quiz, homework, exam, etc.) during the first 9 weeks of the semester, I may drop you from the course for poor attendance.

Drop Deadline: Friday, March 12

Assignments:

1. Homework assignments can be worked on any time before they are due. I will accept late homework; however, I automatically deduct 10% for each day after the due date that the assignment is late. So, an assignment that is 10 or more days late will not receive credit ($10 \times 10\% = 100\%$ penalty).
2. Discussions will not be accepted late. Your classmates depend on your thoughtful, consistent, and timely participation.
3. Quizzes will be accepted late with a 50% penalty. A quiz that is more than one week late will not receive credit.
4. Exams cannot be made up late for any reason. However, to safeguard against any unavoidable and unforeseen circumstances, I drop the lowest exam score. I do allow you to take an exam early, if it is prearranged.
5. The final exam is cumulative and will not be dropped.

Assignment Categories and Weighting:

| <i>Assignment</i> | <i>Weighting</i> |
|-------------------------|------------------|
| Homework | 10% |
| Discussions | 10% |
| Quizzes | 5% |
| Projects | 10% |
| Exams | 50% |
| Final Exam (cumulative) | 15% |

Final Grades:

| <i>Letter Grade</i> | <i>Percent</i> |
|---------------------|----------------|
| A | 90 – 100 |
| B | 80 – 89 |
| C | 70 – 79 |
| D | 60 – 69 |
| F | 0 – 59 |

Special Needs Requests:

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Plagiarism and Academic Honesty:

Please refer to the policies in the Reedley College catalog, pages 47, 48. Academic honesty is of utmost importance and the college policies will be followed.

Course Outline and Schedule:

- Week 1: Course Introduction/Sampling and Data (Chapter 1)
- Week 2: Summarizing Data Graphically and Numerically (Chapter 2)
- Week 3: Descriptive Statistics (Chapter 2)
Exam 1, (Chapters 1 and 2)
- Week 4: Probability (Chapter 3)
- Week 5: Discrete Random Variables (Chapter 4)
Exam 2 (Chapters 3 and 4)
- Week 6: Continuous Random Variables (Chapter 5)
- Week 7: The Normal Distribution (Chapter 6)
- Week 8: The Central Limit Theorem (Chapter 7)
Exam 3 (Chapters 5, 6, and 7)
- Week 9: Confidence Intervals (Chapter 8)
- Week 10: Hypothesis Testing with One Sample, Part 1 (Chapter 9)
- Week 11: Hypothesis Testing with One Sample, Part 2 (Chapter 9)

Exam 4 (Chapters 8 and 9)

----- Spring Break -----

Week 12: Hypothesis Testing with Two Samples, Part 1 (Chapter 10)

Week 13: Hypothesis Testing with Two Samples, Part 2 (Chapter 10)

Week 14: The Chi-Square Distribution (Chapter 11)

Exam 5 (Chapters 10 and 11)

Week 15: Linear Regression and Correlation, Part 1 (Chapter 12)

Week 16: Linear Regression and Correlation, Part 2 (Chapter 12)

Exam 6 (Chapter 12)

Week 17: F Distribution and One-Way ANOVA (Chapter 13)

Week 18: Final Exam