Math 11 - Introduction to Statistics

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Course Name: Introduction to Statistics
Course #: 59071
Semester: Spring 2024
Class Dates and Time: MF-11:45-12:35
Units: 4
Office Hours: None

Welcome to Elementary Statistics

I look forward to spending the semester with you. Over the semester, you will experience a range of feelings, including success and failure; challenge and boredom; accomplishment and frustration. Please know that I will be here to help you through it. Having persistence, working hard, and putting in time and effort will help you succeed.
As your instructor, I will do what I can to give you the resources and support to help you succeed. Please reach out to me if I can help you.
There are many excellent resources available to you on the Reedley College campus. Other students in the class are a good resource, and I would encourage you to form small groups to study and do homework together. If you have an unanswered question, contact me. I am often available, so email me.

Prerequisites:

Math 103 or Math 211 or appropriate AB 705 placement.

Course Description:

This is an introduction to statistical methods and techniques for business, behavioral, and social science majors. 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.

Text and MyStatLab Access:

Text: Ron Larson, Elementary Statistics: Picturing the World, Pearson, 8th Edition, 2023.
You will have access to MyStatLab for free through Canvas. You can find an online version of your textbook, all the homework assignment, and exams there.

Required Course Materials:

* Notebook

* Stats Calculator (TI-84) or similar

* Computer/Laptops/tablet with reliable internet.

STEM Math Center

The STEM Math Study Center (MSC) is a free tutoring resource available to all Reedley College math students. The services available in the MSC are focused on increasing our students' ability to understand and enjoy mathematics. We hope to bridge the gap that keeps our students from pursuing majors and careers in math-related fields. The MSC has a study area in which students can receive services or study alone.

What services are available in the STEM Math Study Center?

The MSC offers drop-in tutoring facilitated by our faculty and well-qualified student tutors. The MSC has 20 computers and online access available to students with online math homework. The MSC offers bilingual tutoring to Spanish-speaking students.

This semester the Math Study Center will have BOTH in-person and online tutoring. Drop-in hours are M-W 9:00 AM to 4:00 PM, T-Th 9:00 AM to 8:00 PM, and Friday 9:00-1:00 PM.

Tutoring outside of these hours will be available online by appointment, which can be scheduled through the website: https://www.reedleycollege.edu/academics/tutoring-services/index.html. This link can also be found in your canvas courses under the "RC Tutoring Services" navigation link.

Contact Rebecca.reimer@reedleycollege.edu for more information

Academic Support Centers Video

Attendance:

Everyone can learn math, but don't do it alone! Watch each lecture online! Participating in class activities will help prepare you for exams and is truly an integral part of your learning process. Complications can arise during the semester that can impede participation in class. If you have trouble with anything in the notes or video, get help from the Math center, tutorial, and learning services center, the embedded tutor, your instructor, or a friend. It is important that you know the absence policy. Attendance in this class is MANDATORY and if you miss three classes, you may be dropped. You are expected to complete all assignments on time. If you decide to drop the course, it is your responsibility to make the drop official in the Administrations and Records office or else possibly receive a grade of F.

Note: The drop deadline is 3/8/24. After this date, you will get a grade in the class.

Online Homework:

After you read through notes, and view the additional resources on Canvas you can attempt the homework. You may work ahead if you like. Each assignment has a due date. Homework will be accepted late, but you will lose 10% credit every day you turn it in late. Your three lowest homework scores will be dropped to allow for any tech issues, emergencies, or missed assignments. If you do not successfully complete (70% or better) three homework assignments in a row you may be dropped. It is important to stay current to be successful in the course!

Note: When working on homework, you do not have to complete an entire assignment during one session. If you need to stop while in the middle of an assignment, you can submit your work and the program will save it for you. You can then come back to the assignment and continue from where you left off at another time as long as you do so before the deadline.

HOMEWORK WILL ALWAYS BE DUE ON SUNDAYS BY 11:59 PM. You cannot wait until the last minute to do the HW so make sure to aside days and times that you can devote to the class.

Timed Chapter Exams:

There will be 5 exams during the semester. It is recommended that you complete all of the chapter homework and the chapter review quiz before you attempt each exam. Everything for the unit is available to you now so please be careful when selecting/starting the exam. Once you start the chapter exam, it will count as an attempt and you only have one attempt for each exam and about 2 hours to complete it. You cannot start it and finish it at a later time like the homework. You will be booted out of the exam if you attempt to access any other resources within the site and will not be granted another attempt. All of the homework and the exam for the first unit will be available to you from the first day so please make sure you finish them by the set deadlines. You are not to receive any outside help. The UNIT REVIEW QUIZZES will be the best way to prepare for the exams.

Final Exam:

A final exam will be given at the end of the semester during finals week and will be similar to the chapter exams. IT WILL BECOME AVAILABLE FOR A ONE-DAY WINDOW ONLY on a date to be determined and you will have 2 hours to complete it once you start. You are to receive no assistance of any form during the exams including the internet to search for solutions, textbooks, or from another person. You will be booted out of the exam if you attempt to access any other resources within the site and will not be granted another attempt.

Grading:

The class grade is weighted as follows:

Assignment	Percent
Exams (5 @ 10% percent each)	50%
Final Exam	15%
Homework Assignments	20%
Quizzes	10%
Attendance	5%

- Online Homework and Quizzes will be worth 30% of your overall grade. I will drop two lowest scores including a 0 from your homework assignment group for any technical difficulties, missed deadlines, accidental attempts, unforeseen circumstances, or just a poor attempt.
- Exams will be worth 70% of your overall grade. I will drop your lowest score including a 0 for any technical difficulties, missed deadlines, accidental attempts, unforeseen circumstances, or just a poor attempt, and replace it with your score on the final exam.

Percent of Total Points	Grade
90-100	A
80-89	B
70-79	C
59-69	D
0-58	F

Where to Find Your Grade:

- Canvas - Grades. (Not in MyMathLab)

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.

Student Learning Outcomes

Calculate and interpret measures of central tendency and dispersion
Calculate basic probabilities
Calculate, interpret, and analyze probability distributions and confidence intervals.
Calculate, interpret, and analyze hypothesis testing
Calculate, interpret, and analyze correlation, regression, and analysis of variance

Important Dates for Spring 2024

DATE	DAY	EVENT / DEADLINE
January 8	(M)	Start of Spring 2024 semester
January 15	(M)	Martin Luther King Day
February 16-19	(F-M)	President's Day
March 8	(F)	Last day to drop and not receive a grade
March 25-29	(M, F)	Spring Recess
May 13-17	(M-F)	Final Week
May 17	(F)	End of Semester

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, you are encouraged to provide me with your notification of authorized services form from DSP&S and consult with me immediately so that arrangements can be made.

Academic Integrity

You are expected to be honest. In this course, that primarily means you should never submit work that is not your own. This does not mean that you are not allowed to work with other students. I encourage you to collaborate on homework problems! It is often more fruitful and enjoyable to work with other people when trying to figure something out. They can give you a fresh insight or different perspective on the problem. Conversely, explaining your idea to another person forces you to clarify your thoughts and can help to highlight flaws you may have previously overlooked. However, if you work with others to come up with a solution, afterward you should write up your work on your own. You should not base your homework on another's student's homework, and never put your name on something you do not understand.

Below is the official School policy on academic dishonesty, cheating, and plagiarism.

Academic Dishonesty

Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to put an entirely honest effort into all academic activities. Academic dishonesty in any form is a very serious offense and will incur serious consequences.

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights.
Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

Course Objectives

1. Distinguish among different scales of measurement and their implications.
2. Identify the standard methods of obtaining data and identify the 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;
17. Use just-in-time support to accomplish the objectives of the course; and
18. Identify and use appropriate study skills to show competence in basic statistics.

COURSE CONTENT OUTLINE:

A. Introduction to Statistics
    1. Summarizing data graphically and numerically
        a. Frequency distributions
        b. Graphs
    2. Descriptive statistics:
        a. measures of central tendency: mean, median, mode
        b. measures of variation: variance, standard deviation, quartiles, range
        c. relative position
        d. levels/scales of measurement
B. Probability
    1. Sample spaces and probability
    2. Random variables and expected value
    3. Sampling and sampling distributions
    4. Discrete distributions – Binomial
    5. Continuous distributions – Normal
C. Sampling Theory
    1. Simple random sample
    2. Central Limit Theorem
D. Estimating Population Parameters
    1. Estimation and confidence intervals from a small or large sample.
    2. Sample size.
E. Hypothesis Testing (Parametric/Nonparametric)
    1. One population, one and two-sided tests.
        a. z-test for means and proportions
        b. t-test for means (independent and dependent samples)
    2. Two populations, sampling distributions
    3. Chi-square (Goodness of Fit and Contingency Tables)
F. Correlation and Simple Linear Regression
    1. Correlation coefficient
    2. Regression coefficient
    3. Test of hypothesis about the value of correlation/regression coefficient.
    4. Analysis of variance (ANOVA)

G. Applications/Technology
    1. Applications using data from disciplines including business, social sciences, psychology, life science, health science, and education
    2. Statistical analysis using techniques such as SPSS, EXCEL, Minitab, or graphing calculators

Course Tentative Schedule:

Assignments	**Due Date**
Homework sections: 1.1, 1.2, 1.3, Chapter 1 Quiz, Chapter 1 Skills Review	1/14/2024
Homework sections: 2.1, 2.2, 2.3, Chapter 2 Skills Review	1/21/2024
Homework sections: 2.4, 2.5, Chapter 2 Quiz	1/28/2024
Exam 1, Homework sections: 3.1, 3.2, Chapter 3 Skills Review	2/4/2024
Homework sections: 3.3, 3.4, Chapter 3 Quiz	2/11/2024
Homework sections: 4.1, 4.2, 4.3, Chapter 4 Skills Review, Chapter 4 Quiz	2/18/2024
Exam 2, Homework sections: 5.1, 5.2, Chapter 5 Skills Review	2/25/2024
Homework sections: 5.3, 5.4, 5.5, Chapter 5 Quiz	3/3/2024
Homework sections: 6.1, 6.2, 6.3, Chapter 6 Skills Review	3/10/2024
Homework sections: 6.4, 7.1, Chapter 6 Quiz	3/17/2024
Exam 3, Homework sections: 7.2, 7.3, Chapter 7 Skills Review	3/24/2024
Spring Break	3/25-3/29
Homework sections: 7.4, 7.5, Chapter 7 Quiz	4/7/2024
Homework sections:8.1, 8.2, Chapter 8 Skills Review	4/14/2024
Homework section 8.3, 8.4, Chapter 8 Quiz	4/21/2024
Exam 4, Homework section: 9.1, 9.2, Chapter 9 Quiz	4/28/2024
Homework sections: 10.1, 10.2, 10.3	5/5/2024
Exam 5, Homework sections: 10.4, Chapter 10 Quiz	5/12/2024
Final Exam	5/17/2024