

MTH 3302: Probability and Statistics I

Sul Ross State University
Spring 2024

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Course Description MTH 3302 introduces the fundamental concepts of probability and statistics. Topics include probability laws, random variables, probability distributions, expectation, variance, sampling, hypothesis testing, estimation, confidence intervals, and basic data analysis techniques. The course emphasizes problem-solving and practical applications in various fields.

TEKS Information on the Texas Essential Knowledge and Skills can be found on the TEA website: <http://www.tea.state.tx.us>

Marketable Skills (1) Logical and analytical skills. (2) Statistical problem-solving using probabilistic methods. (3) Use of technology and statistical tools for data analysis and visualization. (4) Effective communication and interpretation of statistical results.

Class Meetings Mon, Wed: 1:45 – 3:00

Required Text Illowsky, Barbara, & Dean, Susan, Introductory Statistics, ISBN 1938168208.

Office Hours Monday-Thursday: 8:00am - 10:30am or by appointment.

Course Policies

Attendance Policy

Attendance is mandatory. Students are expected to attend class in person in their classroom of registration unless permission is given for extenuating circumstances. You will be held responsible for all material covered in class or the reading assignments. If you miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

Communication

I will post course documents, reminders, announcements, and assignments on the Blackboard system. You will also submit homework on Blackboard. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. You are welcome to e-mail, telephone, or text

me. However, if you choose to contact me, please make sure to state your name at the beginning of any message. I am here to help you! Ask questions in class, call me, e-mail me, text me, or come to my office. If you don't communicate with me, then I can't help you.

Grading Policy

Your grades will be weighted as follows:

Participation	10%
Mid-Term Exam	30%
Final Exam	40%
Homework/Report	20%

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

Participation

Your participation grade will be assigned depending on your class attendance and participation in class activities. Simply put, if you always come to class, seem like you're trying to pay attention, take notes, and take part in class activities, then you will get full credit.

Homework/Report

Homework will be assigned for each section that we cover in the text. You must complete each homework assignment before the next class period. This will allow you to make the most of our time together. If you have a question, ask about it. If you don't understand the homework, you are not ready to take the exam. To succeed in this course, you must do all the homework assignments on time! The amount of work for any college class is generally calculated as 3 hours of outside work for each hour in class. That means you should expect to spend as much as 9 hours each week on outside work on this course. We will always discuss the homework in class. You should come to class prepared: make sure to have your textbook and suitable writing materials with you. You may need to submit a report on a selected topic at the end of this semester (before the final exam).

Exams

There will be one midterm exam. The tentative date is the 4th Monday of February (February 24, 2025). This is subject to change. You will be notified of a change at least one week in advance. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved. The comprehensive final exam will take place at the time scheduled by the university, during the final exam period at the end of the semester. Official time and date to be announced once the university publishes the final exam schedule.

Subject Outline

I. SAMPLING AND DATA

1. Definitions of Statistics, Probability, and Key Terms.
2. Data, Sampling, and Variation in Data and Sampling.
3. Frequency, Frequency Tables, and Level of Measurement.
4. Experimental Design and Ethics.

II. DESCRIPTIVE STATISTICS

1. Stem-and-Leaf Graphs (Stemplots), Line Graphs, and Bar Graphs.
2. Histograms, Frequency Polygons, and Time Series Graphs.
3. Measures of the Location of the Data.
4. Box Plots.
5. Measures of the Center of the Data.
6. Skewness and the Mean, Median, and Mode
7. Measures of the Spread of the Data

III. PROBABILITY TOPICS

1. Terminology
2. Independent and Mutually Exclusive Events.
3. Two Basic Rules of Probability.
4. Contingency Tables.
5. Tree and Venn Diagrams

IV. DISCRETE RANDOM VARIABLES

1. Probability Distribution Function (PDF) for a Discrete Random Variable.
2. Mean or Expected Value and Standard Deviation.
3. Binomial Distribution.
4. Geometric Distribution.

V. CONTINUOUS RANDOM VARIABLES

1. Continuous Probability Functions.
2. Uniform Distribution.
3. Exponential Distribution
4. Normal Distribution

VI. THE CENTRAL LIMIT THEOREM

1. The Central Limit Theorem for Sample Means (Averages).
2. The Central Limit Theorem for Sums.
3. Applications of the Central Limit Theorem.

QEP Mapped Course

Course Design: Communication Infused

To be successful in college and beyond, many sources (e.g., Morrealle & Pearson, 2008) indicate that communication competencies are essential. Sul Ross recognizes that the current generation of undergraduate university students should receive training to navigate a global world as competent communicators in various contexts and channels of communication.

Through our Quality Enhancement Plan (QEP) called Compass, Sul Ross aims to equip you to navigate excellence in the 21st century by developing your communication skills across multiple courses. This mathematics course is designed to enhance your communication skills. Therefore, this course has the following QEP Student Learning Outcome:

QEP Student Learning Outcome

The student will create works that exhibit skill in prepared and purposeful communication (written, oral, or visual).

University Statements

Distance Education Statement: *Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.*

SRSU Disabilities Services: *Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. RGC students seeking accessibility services should contact Paulette Harris, Executive Assistant to the Vice President and Dean, at 830-279-3023 or email pharris@sulross.edu. Ms. Harris's office is at 2623 Garner Field Road, Uvalde, TX 78801 (this is the mailing address, too).*

University Libraries: *The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. SRSU RGC students may request InterLibrary Loans (ILLs) and book check outs from the Sul Ross Library to be picked up at the SWTJC library that is most convenient. Access requires your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123). The Southwest Texas Junior College (SWTJC) Library*

is also available on each campus for your physical use of the space or checking out books. Del Rio, Eagle Pass, and Uvalde students may use online resources available through SWTJC website, library.swtjc.edu These libraries serve as pickup locations for your ILL or Document Delivery or book requests; to do so, choose the appropriate pick-up location when requesting materials from the Alpine campus.