STAT 5428/ STAT 6428: Intro to Statistical Analysis

Spring 2026

Instructor:	Rene Gutierrez Marquez	**Time:**	M-W 09:00 – 11:20
Email:	rgutierrezmar@utep.edu	**Place:**	Bell Hall 130

CRN: 22144/25739.

Prerequisites: STAT 2480

Office Hours: Monday and Wednesday 13:30-14:30, Bell Hall 228.

Final Exam: Wednesday, May 13th 10:00 am – 12:45 pm

Textbook: (Optional) An Introduction to Statistical Methods and Data Analysis by R. Lyman Ott, Michael T. Longnecker (7th Edition) **Textbook:** (Optional) Introduction to Probability and Statistics Using R by G. Jay Kerns First Edition

Course Description: Introduction to Statistical Analysis is a graduate-level course that provides a comprehensive foundation in statistical methods for analyzing and interpreting data. The course begins with descriptive statistical techniques for summarizing and visualizing data, including numerical and graphical methods that describe patterns, variability, and distributions. Building on this foundation, students are introduced to basic probability concepts and the role of randomness in statistical reasoning. The course then focuses on statistical inference, including estimation and hypothesis testing for means and variances, as well as methods for comparing multiple groups through analysis of variance and covariance. Regression methods—including least squares and logistic regression—are introduced as tools for modeling relationships between variables. Additional topics include categorical data analysis, nonparametric methods, and principles of experimental design. Throughout the course, emphasis is placed on checking the validity of modeling assumptions, interpreting results in context, and selecting appropriate alternatives when assumptions are not met. Computer simulations are used to build intuition for key concepts such as sampling distributions, confidence levels, and statistical power. Statistical software (R) is used extensively for hands-on analysis of biological and other real-world datasets, enabling students to translate theoretical concepts into practical data-analytic skills. The course is open to graduate students from all disciplines and does not require prior advanced coursework in statistics.

Course Objectives: By the end of this course, students will be able to:

- **Summarize and Explore Data:** Use descriptive statistical measures and graphical techniques to effectively summarize, visualize, and communicate key features of datasets.
- **Apply Probability and Statistical Reasoning:** Understand and apply basic probability concepts to reason about uncertainty and variability in data.
- **Perform Statistical Inference:** Conduct and interpret confidence intervals and hypothesis tests for means, variances, and model parameters.
- **Analyze Group Differences and Study Designs:** Apply analysis of variance and covariance methods to compare multiple groups and evaluate experimental and observational studies.
- **Develop and Interpret Statistical Models:** Formulate and interpret least squares and logistic regression models, including models with categorical predictors.

- **Assess Model Assumptions and Robustness:** Diagnose assumptions underlying statistical models, evaluate model adequacy, and implement appropriate remedial measures or nonparametric alternatives when necessary.
- **Use Statistical Software Effectively:** Employ statistical software (`R`) to perform data analysis, conduct simulations, interpret output, and clearly communicate statistical findings.

Grading: There will be one midterm exam and one final exam, one bonus pre-requisites exam as well as projects throughout the semester. The exams will be based on lecture notes. The final will be noncumulative, focusing on material covered since the midterm, however tools learned during the semester will be necessary for the final exam.

For the exams, students are permitted to bring handwritten notes. For the midterm, you may bring one 8.5" x 11" sheet of notes, written on both sides. For the final exam, you are allowed to bring two 8.5" x 11" sheets of handwritten notes. Exam dates will be announced in class or posted on Blackboard.

Grading:

Projects	60%
Midterm	20%
Final	20%
Bonus	10%

Make-up Policy: No late work will be accepted if the reason is not considered excusable. No make-up exam will be given unless there is a documented emergency.

Grading Scale:

90%-100% = A
80%-89% = B
70%-79% = C
60%-69% = D
0%-59% = F

Accommodations Policy: The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

Excused Absences and/or course drop policy: According to UTEP Catalog, "At the discretion of the instructor, a student can be dropped from a course because of excessive absences or lack of effort. A grade of "W" will be assigned before the course drop deadline and a grade of "F" after the course drop deadline." See Policies and Regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email.

Or

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the Registrar's Office to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

Academic Integrity: Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) forpossible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline.

Guidance on Artificial intelligence: The use of generative AI tools such as Chat GPT is permitted in this course.

Students must cite any borrowed content sources to comply with all applicable citation guidelines, copyright law, and avoid plagiarism. Instances that violate these guidelines will be referred to the Office of Student Conduct and Conflict Resolution.

Course Resources: Where you can go for assistance:

Technology Resources

- Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- UTEP Library: Access a wide range of resources including online, full-text access to thousands of journals and eBooks, plus reference service and librarian assistance for enrolled students.
- University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help, and explore other writing resources.
- Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.
- History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor, and explore other history resources.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial, Fact Sheet, and Quick-Start Guide.
- The Miner Learning Center: Join peer-led study sessions in person or online to review content and discover study strategies in core curriculum courses.
- UTEP Edge: UTEP's cross-campus framework for student success and empowerment – develops students' assets through high-impact experiences made possible by the expertise and dedication of faculty, staff, alumni, and community partners.

Individual Resources

- Student Success Help Desk (SSHD): Students experiencing challenges or obstacles to academic success including registration, financial, food, housing, and transposition resources may submit a ticket request for assistance to studentsuccess@utep.edu.
- Military Student Success Center: Assists personnel in any branch of service to reach their educational goals.

- Center for Accommodations and Support Services: Assists students with ADA-related accommodations for coursework, housing, and internships.
- Counseling and Psychological Services: Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.
- UTEP Food Pantry: Non-perishable food items are available to students who are currently enrolled in classes. Bring a Miner Gold Card to Memorial Gym, Room 105, Monday through Friday, 10 a.m. to 2 p.m.