

PSYC 1303: STATISTICAL METHODS SYLLABUS

CRN: 20503

Spring 2024

Course time: MW 3:00 pm-4:20 pm

Classroom location: Education 115

Instructor: Liam Gleason, M.A. (ljgleason@miners.utep.edu).

Office Hours: Tuesday & Thursday 9:00 am-10:00 am or by appointment,

- **In Person:** PSYC Building Room 209.
- **Virtual:** Join [here](#), or find the link on Blackboard.

Teaching Assistant: TBD

COURSE DESCRIPTION

This course introduces statistics and shows how statistics is used by researchers in the behavioral and health sciences. Topics covered include Histograms and distributions; the mean, median, percentiles and the standard deviation; z-scores and the normal distribution; correlation, simple regression and scatterplots; polls and surveys; the sampling distribution; hypothesis-testing, and confidence intervals; the t-test, one-way ANOVA, and post-hoc tests.

COURSE OBJECTIVES

At the end of the course, students should be able to:

1. Create and interpret frequency and density histograms.
2. Explain the meaning of the mean and standard deviation, as well as estimate them from a histogram, and calculate them by hand.
3. Identify the main features of the normal curve; state the areas lying within 1, 2 and 3 standard deviations of the mean, as well as convert raw scores, z-scores and percentiles into each other.
4. Interpret correlation coefficients and calculate them by hand from raw scores.
5. Interpret scatter plots and explain their relationship to the correlation coefficient.
6. Interpret regression equations, calculate them by hand, and draw them (approximately) on scatter plots.
7. Explain the principle of least squares and its relationship to the regression line.
8. Explain and estimate the root mean square error of the regression line at a particular point.
9. State and explain basic concepts and terminology from probability theory.
10. Explain the meaning of sampling error and confidence intervals.

11. Explain how a sampling distribution is derived and how it differs from a sample distribution or population distribution.
12. Explain the expected value of the mean and the standard error of the mean, and estimate their value from the standard deviation of a sample.
13. Explain the expected value of the proportion and the standard error of the proportion and estimate their value from the standard deviation of a sample.
14. Construct a 95% confidence interval for the population mean based on information from a sample.
15. Construct a 95% confidence interval for the population proportion based on information from a sample.
16. Explain the purpose and main principles of hypothesis testing, including: the null and alternative hypotheses, Type I and Type II error, p values, and statistical power.
17. Explain the sampling distribution of the difference between two means, the expected value and standard error of this distribution, and use estimates of these parameters to perform a t-test.
18. Be able to interpret findings for one-way ANOVA and post-hoc tests.

REQUIRED TEXTBOOK (FREE)

J.M. Wood (2020). *Introductory Statistics for the Behavioral and Health Sciences*.

The textbook is posted on Blackboard in both pdf and Word format. It is available without cost to all students taking the course. The textbook includes all homework problems and their answers.

COURSE ASSIGNMENTS

There are **nine** types of **Assignments** for this course:

- (1) Readings
- (2) Homework Problems
- (3) Video-Recorded Lectures
- (4) Question and Answer Sessions
- (5) Quizzes
- (6) Exams
- (7) Review Packets for Exams
- (8) Review Sessions for Exams
- (9) Extra Credit Exercises

These **nine** types of **Assignments** are described in detail in the following paragraphs.

1. Readings (approximately one chapter per week).

Readings from the textbook are assigned on a regular basis (approximately one chapter per week) and must be completed by the dates listed in the course calendar.

2. Homework Problems.

Homework problems are assigned for each of the readings and are included in the textbook. It is highly important that students complete all homework problems for each reading. Problems should be completed **before** students take the quiz on a reading. **Answers for all homework problems are provided in the textbook.** *Students' homework problems are not collected or graded.*

Homework problems will **not** be handed in or graded, and will not be used in computing students' course grade. However, most questions for quizzes and exams are highly similar to the assigned homework problems. Students who do the homework problems will have little or no difficulty answering most quiz and exam questions. Students who are unable to perform a homework problem should attend the Question and Answer Sessions on Blackboard Collaborate and ask the instructor to explain how to solve the problem.

The key to success in this class is to do the assigned readings and homework problems in the textbook, in order to be fully prepared for the quizzes and examinations. The lectures are designed to help students understand the textbook and homework problems more clearly. But the real road to success is to do the readings and **all the homework questions.** Most students can complete the readings and the homework by working about 2 hours per day. The lectures usually add about 2-3 hours per day. So, the amount of time that students should devote to this course is about 4-5 hours per day, which includes the readings, homework and lectures.

3. Class Attendance

Attendance of all the lectures is rather essential part of this course because attending the lectures and taking notes will help with a conceptual understanding of the material. During lectures, the material that is covered will usually be on the quizzes and exams. As such, it is your responsibility to inform me of any extended absences, and to make the necessary arrangements. I do not drop students from the course; this is your responsibility. If, for any reason, you wish to drop the class, I will be happy to meet with you and discuss your options. (The Course Calendar can be found at the end of the course syllabus.)

4. Quizzes

Students are required to take 10 quizzes (approximately one quiz per week). The lowest 3 quiz grades will be dropped and the remaining 7 quizzes will be averaged to contribute 40% of students' course grade. The dates and topics of quizzes are listed in the course calendar. Quizzes cover the topics in the assigned readings and are intended to make sure that students do the readings each week. The drop proviso is there for emergency situations. Do not drop capriciously.

There are no make-ups of any kind for quizzes. Students who arrive late for a quiz will be permitted to take the quiz in the time allotted to the rest of the class. No time extensions will be given to accommodate students who are late to class. However, if a student arrives AFTER another classmate has already completed the quiz, the student will not be permitted to take the quiz (earning a 0 for that quiz).

Here is the secret of how to do well on the quizzes: Do the assigned readings and homework. Questions on the quizzes are usually very similar to the homework problems. A student who has done all the homework problems will usually have no trouble doing the problems on the quizzes. After all students in the class have completed a quiz, you will be able to view your quiz answers on Blackboard, along with the correct answers.

Your grade for each quiz will be calculated by the instructor (or TA), usually within one week of the exam, and will then be posted on “My Grades” in Blackboard.

More information on quizzes is provided in the following section of this syllabus entitled “Grading.”

5. Exams

Students are required to take three exams (Midterm 1, Midterm 2, and the Final Exam) during the semester. The dates of the exams are listed in the course calendar. Midterm 1 will cover all readings and lectures assigned until Midterm 1. Midterm 2 will cover all readings and lectures assigned between Midterm 1 and Midterm 2. The Final Exam will be "cumulative." That is, it will cover all readings and lectures for the entire course from its beginning to its end.

Students who arrive late for a test will be permitted to take the test in the time allotted to the rest of the class. No time extensions will be given to accommodate students who are late to a test. However, if a student arrives AFTER another classmate has already completed the exam, the student will not be permitted to take the exam (earning a 0 for that exam).

Here is the secret of how to do well on an exam: (1) Do the assigned readings and homework, (2) review the questions on the quizzes, and (3) Do the problems in the Review Packet for the exam (review packets are described later in this syllabus).

Exam questions are usually very similar to the homework problems, to problems that have already appeared on the quizzes and to problems in the Review Packets. A student who has done all the homework problems, reviewed the quiz questions, and practiced the problems in the Review Packet, will usually have no trouble answering the exam questions.

More information on exams is provided in the following section of this syllabus entitled “Grading.”

6. Review Packets for Exams (before each exam)

Approximately one week before each exam (the two midterm exams and the final exam) a packet of review problems will be posted on Blackboard. The review packets will include detailed answers for each problem in the packet.

The questions in a review packet will be similar to the questions that will appear on the exam. Students who want to do well on the exam should practice doing the problems in the review packet.

7. Review Sessions for Exams (before each exam)

Before each exam (the two midterm exams and the final exam), the instructor will hold a live review session in class, as listed on the Course Calendar. Each review session will last the class period and will be one or two days before the exam. Students are urged to attend review sessions and ask any questions that they have about the questions in the review packets for the exam. In addition, students can ask about homework problems, quiz questions, or any other issues concerning the course. The review sessions will be recorded by the instructor and posted on Blackboard, so that students who are unable to attend the sessions can still view them.

8. Extra Credit Exercises

There are **5 optional extra credit exercises** available on Blackboard to improve your ability to use **Excel** for basic statistical tasks. These exercises are not required for the class. However, students can earn extra credit by performing the exercises correctly and submitting their work by the specified deadlines, as listed in the Course Calendar.

As an alternative the student will be allowed to complete **five hours of experimental research** credit through UTEP's **SONA** system (see Blackboard page for instructions). Or you could do some combination of extra credit assignments/experimental hours--- the total of which cannot be more than five. These exercises/research hours are not required for the class. Any research hours you choose to do must be finished by the week before the final week of regularly scheduled classes. **SONA Research participation must be finished by Friday, May 3rd.**

More information on the Extra Credit exercises is provided in the following section of this syllabus entitled "Grading" and on Blackboard.

GRADING

The course grade will be based primarily on the student's performance on quizzes and exams.

Quiz and exam scores will be weighted as follows:

Quizzes (best 7 of 10)	40%
Midterm Exam 1	20%
Midterm Exam 2	20%
<u>Final Exam</u>	<u>20%</u>
Total:	100%

The weighted average of exam and quiz grades will be translated into letter grades as follows:

90.0 – 100.0%	= A
80.0 – 89.5%	= B
70.0 – 79.5%	= C
60.0 – 69.5%	= D
59.5% and below	= F

Students may improve their grade in the course by completing the extra credit exercises described later in this syllabus.

Rules for quizzes and exams:

1. Students are expected to change seats if requested to do so by the instructor or proctor.
2. **Only simple calculators are allowed during quizzes or exams.** Use of any other electronic devices, including cell phones, smart watches, or calculators with memory or statistical functions, is forbidden. Students are asked to place all such devices in their backpacks or sufficiently far away from them to ensure that they cannot be used during the exam.
3. No **notes or references** of any kind are allowed.
 - a. One 3"x5" notecard will be allowed during the *exams*. Students must turn in the notecard with the exam.
4. **No communication of any form between students is allowed.**
5. Students who need to leave the testing room during a quiz or exam are asked to place their materials face down on their desk and leave all possessions inside the room.
6. Students who receive an audible call (including audible vibrations) during a quiz or exam are asked to inform the instructor or proctor that their phone has gone off and immediately silence their ringer. If the student deems the call to be an emergency, the student is asked to leave the room to ensure others are not disturbed.
7. A student is not permitted to begin a quiz or exam after another student has already completed the quiz or exam. If a student shows up after someone has already turned a quiz or exam in, they will not be permitted to take that quiz or exam and will earn a 0 for that assignment.

Curving

Quiz and exam grades will be curved according to the whole class' performance. The steps for this curve are:

1. Raw scores for a test are calculated by summing all the points students earned for correct responses.
2. Raw scores from approximately the top 10% of student grades for the test are averaged to yield a Top Ten Percent Average (TTPA).
3. All students' raw scores are then divided by the TTPA to yield their curved grade for that quiz or exam.

For example, suppose there are fifty students enrolled in the class. The TTPA will be based on the top five ($5/50 = 10\%$) raw scores in the class. Let's say the top five raw scores for Quiz 1 are 12, 13, 14, 12, and 14.

In this example, the TTPAA Quiz 1 is calculated:

$$\frac{12+13+14+12+14}{5} = 13$$

Let's say Josephine's raw score for Quiz 1 is 11. Therefore, Josephine's curved grade for Quiz 1 is calculated by dividing her raw score (11) by the TTPA for Quiz 1 (13):

$$\text{Josephine's grade for Quiz 1} = \frac{11}{13} = .845 = \text{B.}$$

Extra credit

Students may improve their grade in the course by completing extra credit. Specifically, you can increase your course grade by 1% for each correctly performed Excel exercise/hour of SONA research that you submit by the specified deadline. As an example, let us say that Josephine's course grade based on quizzes and exams is 87%. If Josephine correctly performs all five Excel exercises and submits them on time, she can raise her course grade to 92% -- from B to A! Please note that there is a 5-point cap, even if you do all 5 Excel and 5 hours of SONA research participation, you will only be awarded 5 points. But **you can mix and match points (e.g., 4 Excel and 1 research hour or any combination)**.

More details about the Extra Credit exercises, including the deadlines for completing them, are posted on the Blackboard in the folder named "Extra Credit." You are responsible for reading the Extra Credit information on Blackboard and following the rules and deadlines described there. Assignments turned in after the deadline will not earn extra credit. Please contact the TA or instructor if you have any questions about the extra credit.

Except for the Excel exercises and SONA research participation, there are no other opportunities for extra credit in this class.

ATTENDANCE POLICY

Students should complete all assigned readings and homework problems and attend the lectures. The readings, homework problems and lectures provide the knowledge and skills necessary to perform well on quizzes and exams. However, students' completion of readings, homework and lectures is not monitored by the instructor or used to determine course grades.

The Review Sessions before exams are optional. However, many students report that these sessions are very helpful. Therefore, you are urged (but not required) to attend these sessions.

Taking quizzes and exams is required for the course. Students who miss (a) four or more quizzes or (b) either of the midterm exams should usually drop the course, in order to preserve their GPA. Under most circumstances, the instructor will *not* drop a student from the course unless the student has contacted the instructor and requested it.

TECHNOLOGY REQUIREMENTS

Course content is delivered via the Internet through the Blackboard learning management system (LMS). Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Mozilla Firefox and Google Chrome are the most supported browsers for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

OTHER POLICIES

Calculator

Students should purchase a simple calculator for use on homework, quizzes and exams. A simple calculator is one that (a) performs addition, subtraction, multiplication, division, square roots, and squares, but (b) does not have any memory or statistical functions. Simple calculators can be purchased for about a dollar at Dollar Tree and some other stores.

Blackboard

Be sure to visit Blackboard online regularly for this course. On Blackboard you can find:

- I. Free copies of the textbook for this course in pdf and Word. The textbook includes all readings and homework problems.
- II. PowerPoint for all lectures.
- III. Instructions for Extra Credit assignments.
- IV. Review packets for exams.
- V. Your grades for quizzes, exams and extra credit exercises

Excused Absences for University-Recognized Activities:

Students who will be absent while representing the University in officially recognized University activities (sports, band, professional conferences, etc.) must notify the Dean of Students not less than ten (10) days prior to the absence. The Dean of Students will provide the student with a letter of excuse for the instructor. It is the student's responsibility to give the letter to the instructor prior to the official recognized activity. Students following these procedures will be permitted to make up both assignments and examinations in consultation with faculty prior to the exam/quiz. Excused absences are not permitted unless the student is representing the University in officially recognized University activities. UTEP policies regarding excused absences are posted online at <http://catalog.utep.edu/undergrad/academic-regulations/curriculum-and-classroom-policies/>

Make-up work

There are no make-ups for quizzes. However, students' three lowest quiz scores will be dropped when course grades are calculated. Thus, if a student fails to take a quiz on the assigned day, the student will receive a score of 0 on that quiz and the quiz score will typically be one of the two grades that are dropped when the course grades are calculated at the end of the semester.

There are no make-up exams for midterms or the final **WITHOUT PRIOR** permission from the instructor, even for school sanctioned events. Instructors will generally not grant permission for make-up exams except under special circumstances with appropriate documentation provided by the student. The make-up for a midterm must be taken either before the scheduled date of the exam or during the day immediately after the exam. The make-up for a final exam must be taken during the two weeks before the scheduled date of the final. Students who fail to observe these time limits regarding missed exams and make-up exams will receive a failing grade for that exam.

Athletes with games or students who miss a quiz or exam due to a school sanctioned events must email the instructor prior to missing a quiz or exam to schedule a makeup. Makeups will not be allowed, even if sanctioned, if there was not communication with the instructor beforehand.

Resolving grading disputes

A student who disagrees with their grade on a quiz, exam, or assignment should submit a written request for a grade change to the instructor via email. The request to the instructor must be submitted within 7 days following the quiz, exam or assignment and should provide a detailed explanation for why the grade should be changed. The instructor will review the request and make

a decision in a timely manner. Grade changes will not be made by the instructor unless the student has submitted their request within the time limits described here.

Academic honesty and conduct

Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct. <http://sa.utep.edu/osccr/academic-integrity/> <http://sa.utep.edu/osccr/student-conduct/student-conduct-process-appendix/>

Academic dishonesty is unacceptable. Academic dishonesty includes but is not limited to the following:

- * **Cheating** – use or attempted use of unauthorized materials, student aids or information in any academic exercise
- * **Fabrication** – falsifying or inventing information or data in an academic assignment
- * **Collusion** – aid or attempt to aid another student in committing academic misconduct

Students in this class are responsible for their own work. You may not receive or provide help from another person while taking a quiz or exam and you may not share information about a quiz or exam with anyone else until the quiz or exam has been graded and posted on “My Grades” on Blackboard. If you participate in the extra credit, you must do your own work. Evidence of academic dishonesty or any other violation of the Standards of Conduct **WILL BE REPORTED** to the Dean of Students. Students may be suspended or expelled and may have permanent notes included in their records.

Disabilities:

The Center for Accommodations and Support Services (CASS) provides students with accommodations, resources, advocacy, and outreach to enhance and support their pathway to academic and occupational success. As an outcome, students will be able to engage as active members of the campus community, and benefit from participation in an inclusive and supportive academic environment. If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

Information on this syllabus:

The instructor reserves the right to modify information on this syllabus and class schedule and will provide students with reasonable notification of such changes.

COURSE CALENDAR

Class	Date	Topic	Assignments due
0	Wednesday 01/17/2024		NO CLASS
1	Monday 01/22/2024	Course introduction. Variables and values.	Complete the following textbook chapters and their homework problems before today: Chapter 1. What are Statistics and Why Study Them?
2	Wednesday 01/24/2024	Histograms. The normal distribution. Symmetric & skewed distributions	Complete the following textbook chapters and their homework problems before today: Chapter 2. Variables and Histograms.
3	Monday 01/29/2024	Mean, median & percentiles. Distance from the mean and deviations.	Quiz #1 (in class) on Chapter 1 & 2.
4	Wednesday 01/31/2024	The Standard Deviation	Complete the following textbook chapter and its homework problems before today: Chapter 3. The Mean, Median and Standard Deviation.
Wednesday 01/31/2024 – Census Day, last day to register for class			
5	Monday 02/05/2024	z-scores. Calculating z-scores and raw scores from each other.	Quiz #2 (in class) on Chapter 3. Complete the following textbook chapter and its homework problems before today: Chapter 4. Z-Scores, Standardization, and Transformations.
6	Wednesday 02/07/2024	Transforming z-scores, raw scores & percentiles.	Quiz #3 (in class) on Chapter 4 Download and begin working on Review Packet for Midterm Exam 1 Last day to request Extra Credit 1 data on Blackboard.
7	Monday 02/12/2024	Review for Midterm Exam 1	Complete Review Packet for Midterm Exam 1 before today.

Class	Date	Topic	Assignments due
8	Wednesday 02/14/2024	FIRST MIDTERM EXAMINATION	
Friday 02/16/2024 – Last day to submit Extra Credit 1 on Blackboard.			
9	Monday 02/19/2024	Plotting points on scatterplots. Scatterplots of z-scores. The point of averages	Complete the following textbook chapter and its homework problems before today: Chapter 5. Scatterplots. Last day to request Extra Credit 2 data on Blackboard.
10	Wednesday 02/21/2024	Scatterplots of z-scores. Hybrid scatterplots. The Point of Averages.	Quiz #4 (in class) on Chapter 5.
11	Monday 02/26/2024	Positive and negative correlations. The strength of correlations	Complete the following textbook chapter and its homework problems before today: Chapter 6. Correlation.
12	Wednesday 02/28/2024	Calculating the correlation coefficient.	Quiz #5 (in class) on Chapter 6.
Friday 03/01/2024 – Last day to submit Extra Credit 2 on Blackboard.			
13	Monday 03/04/2024	Predictions using the group mean, conditional means, and regression line	Complete the following textbook chapter and its homework problems before today: Chapter 7. Regression. Sections 1-6 only. Last day to request Extra Credit 3 data on Blackboard.

Class	Date	Topic	Assignments due
14	Wednesday 03/06/2024	The standardized equation of the regression line. Using this equation to predict raw scores and percentiles.	Quiz #6 (in class) on Chapter 7.
NO CLASS Spring Break: 03/11/2024 – 03/15/2024			
15	Monday 03/18/2024	Finding the unstandardized equation of the regression line. The R.M.S. error of the prediction.	No Quiz Complete the following textbook chapter and its homework problems before today: Chapter 7. Regression. Sections 7-12.
16	Wednesday 03/20/2024	Find the regression equation for (a) a scatterplot or (b) raw data	Download and begin working on Review Packet for Midterm Exam 2.
Friday 03/22/2024 – Last day to submit Extra Credit 3 on Blackboard.			
17	Monday 03/25/2024	Review for Midterm 2	Complete the Review Packet for Midterm Exam 2 before today. Last day to request Extra Credit 4 data on Blackboard.
18	Wednesday 03/27/2023	SECOND MIDTERM EXAMINATION	
Thursday 03/28/2024 – Spring Drop/Withdrawal Deadline			

Class	Date	Topic	Assignments due
19	Monday 04/01/2024	Introduction to Probability	Complete the following textbook chapter and its homework problems before today: Chapter 8. Introduction to Probability.
20	Wednesday 04/03/2023	Surveys and polls: Populations, samples, and the sampling distribution	Quiz #7 (in class) on Chapter 8
Friday 04/05/2024 – Last day to submit Extra Credit 4 on Blackboard.			
21	Monday 04/08/2024	Surveys and polls: The expected value and the standard error	Complete the following textbook chapter and its homework problems before today: Chapter 9. Sampling, Surveys and Political Polls. Last day to request Extra Credit 5 data on Blackboard.
22	Wednesday 04/10/2024	Confidence intervals: Part 1	Quiz #8 on Chapter 9.
23	Monday 04/15/2024	Confidence intervals: Part 2	Complete the following textbook chapter and its homework problems before today: Chapter 10. Confidence Intervals.
24	Wednesday 04/17/2024	Null hypothesis significance testing & t-test. Part 1.	Quiz #9 on Chapter 10.
Friday 04/19/2024 – Last day to submit Extra Credit 5 on Blackboard.			

Class	Date	Topic	Assignments due
25	Monday 04/22/2024	Null hypothesis significance testing & t-test. Part 2.	Complete the following textbook chapter and its homework problems before today: Chapter 11. Null Hypothesis Significance Testing and the t-Test. Guest lecturer.
26	Wednesday 04/24/2024	Type I & II error. Statistical power	Quiz #10 on Chapter 11. Complete the following textbook chapter and its homework problems before today: Chapter 12. Type II Error and Statistical Power. Guest lecturer.
27	Monday 04/29/2024	ANOVA	No Quiz Complete the following textbook chapter and its homework problems before today: Chapter 13. Introduction to ANOVA. Download and begin working on Review Packet for Final Exam
28	Wednesday 05/01/2024	Review for final exam	Complete the Review Packet for Final Exam by today.
30	Monday 05/06/2024	FINAL EXAMINATION FROM 1:00 PM – 3:45 PM IN REGULAR MEETING ROOM.	