PSYC 5407 – Multivariate Data Analysis
Spring 2026

As the instructor for this course, I reserve the right to adjust this schedule
in any way that serves the educational needs of the students enrolled in this course.
–Jared B. Kenworthy

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Instructor Information

Instructor Name

Jared Kenworthy, Ph.D.

Graduate Teaching Assistants: Emily Gallegos: eag9622@mavs.uta.edu

(Thursdays, 9:30 – 10:30 am, LS 417)

Abu Jaed: abu.jaed@mavs.uta.edu

(Fridays, 10-11 AM, or by appointment, LS 416)

Office Location

Life Sciences 525

View Campus Map

Office Phone Number

817.272.0746 (Teams)

Kenworthy, Jared B
kenworthy@uta.edu

Email Address

kenworthy@uta.edu

Faculty Profile

https://www.uta.edu/academics/faculty/profile?user=kenworthy

Office Hours

Tuesdays, 10-11am, or by appointment (Teams or in person)

Communication Guidelines

My preferred communication method is via email or Teams.

I will respond to emails and voice messages within two business days.

Course Information

Section Information

PSYC 5407, section 001

Course Delivery Method

This course is designated ON-CAMPUS, which means that the majority of course instruction, exams and projects are delivered on-campus or at designated instructional sites, in-person.

For a full definition of the course modalities, please visit the Course Modalities page.

Time and Place of Class Meetings

Lectures →	Tuesdays and Thursdays:	8.00 – 9.20 AM, 336 COBA
Lab →	Fridays:	11.00 AM – 1.50 PM, 336 COBA

Time Zone

This course operates on Central Time. All times listed for class meeting times, exams, and assignment deadlines are in Central Time.

Description of Course Content

This course is a continuation of the graduate statistics sequence (PSYC 5405). You will learn some advanced data analysis skills and statistical techniques. We will start with correlation and simple linear regression, then move to multiple regression, and finally to techniques like factor analysis.

Although we will refer to the general linear model, we will focus more heavily on the conceptual and pragmatic aspects of statistics, rather than the computational formulae. However, we will always refer to the formulae to keep a grounding in the mathematics and logic of the statistics.

Another major part of the course will be learning how to implement various data analytic and visualization techniques in statistical programming software.

Prerequisites

PSYC 5405

Student Learning Outcomes (SLOs)

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

1. Analyze bivariate datasets
2. Analyze multivariate datasets
3. Build and test models
4. Write R code to perform statistical analyses
5. Write R code to transform and visualize data
6. Write R code to perform statistical tests on data

7. Interpret output of statistical tests
8. Generate reports of data patterns, statistical tests, and their interpretations

Textbooks and Other Course Materials

Required Textbooks and Materials
There is no required text for this course, and there will rarely be required reading. However, there are a few very useful texts that you can refer to if you want additional materials. I will recommend chapters from these books for specific analytic techniques. All material that you will be tested on will come from lecture and lab content. Readings will be for those who want to supplement course material with additional background.

Students: Additional materials for this course may range in cost depending on the project and or topic you choose to work on.

Recommended Course Materials
The textbooks and other materials listed below are optional but recommended.

Cohen J., Cohen P., West S. G., Aiken L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences (3rd Edition)*. Lawrence Erlbaum Associates.
^*This book is gold standard text for multivariate data analysis. It is computational in nature, but it gives a great mathematical and conceptual underpinning to multivariate statistics. It is also available in full text online at the UTA library:*
https://www-taylorfrancis-com.ezproxy.uta.edu/books/mono/10.4324/9780203774441/applied-multiple-regression-correlation-analysis-behavioral-sciences-jacob-cohen-patricia-cohen-stephen-west-leona-aiken

Einspruch, E. L. (2022). *An Introductory Guide to R.* Guilford Press.
^*This book is a hands-on walk through of some basic steps and analyses in R, many of which we will use in this class.*

Wickham, H., Cetinkaya-Rundel, M., & Grolemund, G. (2023). *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data.* O'Reilly Media.
^ *This book is a great resource by one of the key figures in the R universe. The book is available online for free: https://r4ds.hadley.nz/*

Ismay, C., & Kim, A. Y. (2021). *Statistical Inference via Data Science.* CRC Press.
^*This book also covers data management with the tidyverse, but gives more in-depth coverage of regression, hypothesis testing, sampling, bootstrapping, and inference. It is available for free online at https://moderndive.com/ and is also available in print for purchase.*

Descriptions of major assignments and examinations

Exams
The exams (midterm and final) will each be split into two parts. One will be a conceptual exam and will take place in class (see schedule below). The conceptual portion of the exam will include true/false, multiple choice, and short-answer questions regarding statistical concepts and interpretations. The other will be a more technical report completed in R. You will be given exercises to complete, and you will be graded on the appropriateness of your analysis, the

functionality of your code, and your interpretation of data patterns. The conceptual portions of the exam will be worth 60 points, and the technical portion will be worth 40 points.

Homework Assignments (Quizzes)

The homework assignments will contain conceptual questions about course material. Usually, they will be due at 4:00 PM CST on Mondays. They will be posted after lectures (typically, but not always) on Thursdays. These assignments will be graded for accuracy.

Lab Assignments

In labs, you will learn technical skills in R, and how to perform various statistical tests. You will then complete exercises and answer questions based on R output. These assignments will be given in lab and worked through as a group. However, you will be responsible for completing the assignment and submitting it individually on Canvas. Lab assignments will be due at 4:00 PM CST on Mondays.

Attendance and Participation

One point toward the 40 points possible for attendance and participation will be assigned to students for being on time, attentive, and participatory for each session. Instructors (for lecture and lab) reserve the right to deduct any attendance/participation points for regular lateness, disruption, or failure to be "present" (e.g., watching movies, using social media, emailing, etc.).

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this 4 credit-hour course should expect to spend at least an additional 12 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Technology Requirements

We will be using R software in this course. You will need to install both R and R Studio. You can do via these links. R is available for Mac, Windows, and Linux systems. ***Please download and install both R and R Studio before the first class meeting so you can follow along.*** If you would like to follow along in R as we go through code in class, you can bring your computer to class (but this is not mandatory). However, ***bring your laptops to lab!!!***

[Downloading R for the first time](#)

[Downloading R Studio for the first time](#)

(Unless you know what you're doing, follow the default settings for installation. This will make things easier down the road).

I will also be sending certain class-related files via our Teams channel for this course.

Visit the [UTA Libraries Technology page](#) for a list of items that can be checked out or used at the library.

Recording of Classroom and Online Lectures

Faculty maintain the academic right to determine whether students are permitted to record classroom and online lectures. Recordings of classroom lectures, if permitted by the instructor or pursuant to an ADA accommodation, may only be used for academic purposes related to the specific course. They may not be used for commercial purposes or shared with non-course participants except in connection with a legal proceeding.

As the instructor of this course, I elect to prohibit recording of classroom or online lectures unless approved by SAR as part of a student's accommodations.

Grading Information

Graded Assignments & Values

Assignment Name	SLO #	Value (pts or %)
Quizzes 1-8	1-8	20 points each (160)
Lab assignments 1-14	1-6	20 points each (280)
Midterm	1-8	100 points
Final	1-8	100 points
Attendance / Participation	4-7	40 points
	Total	680 points

Students are expected to keep track of their performance throughout the semester which Canvas facilitates and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels; see "Student Support Services," below.

Final Grade Calculation

Range (pts or %)	Letter Grade
90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
Below 60%	F

I reserve the right to adjust exam grades upward (curve) based on the average grades of students on exams. I will never adjust grades downward. I will also round grades up to the nearest percentage point (e.g., 89.6% → 90%). However, do not ask me to round up beyond that (e.g., 88.7% → 90%). There are plenty of opportunities for you to maximize your semester point total and grade. Please take advantage of them.

Make-Up Exams & Late Work Policy

Missed exams will receive a score of zero until made up. Make-up exams will only be allowed with a university-approved excuse. If allowed, students have one week following the original exam deadline to take any missed exam.

Non-exam assignments to be turned in on Canvas will incur a 20% penalty per day following the original deadline. University-approved excuses for missing non-exam assignments must be presented within 3 calendar days of the original deadline to be exempted from the 20% per day penalty.

Updated Wednesday, January 7, 2026

Extra Credit Policy

No extra credit will be offered in this course.

Grades & Feedback Timeline

For all assignments, exams, etc., students may expect grades and feedback within one week of the posted deadline. Students will be notified of any deviation from that general expectation.

Grade Grievances

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current [University Catalog Grades and Grading Policies](#).

Use the following link to submit a grade grievance to the department: https://www.uta.edu/academics/schools-colleges/science/departments/psychology/degree-programs/undergraduate/undergraduate-resources/student-grievance-form

University & Course Policies

UTA students are encouraged to review the institutional policies and informational sections below and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](#) page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php), which includes the following policies, among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Attendance

Attending class sessions is a critical predictor and indicator of student success. The University of Texas at Arlington does not recognize a single attendance policy but encourages faculty to establish class-specific policies on attendance. As the instructor of this section, my attendance policy is this: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. **Attendance at lectures and labs is mandatory.** However, I understand there may be instances when you cannot come to class. It is your responsibility to complete any assignments you miss. As the instructor of this section, I and the GTAs will passively monitor attendance. If I notice you are not attending lectures and/or labs, I reserve the right to dock you points for attendance. *Coming to office hours should not serve as a replacement for coming to lectures and labs.*

The U.S. Department of Education requires that UT Arlington have a mechanism in place to verify Federal Student Aid recipients' attendance in courses. UT Arlington instructors are expected to report the last date of attendance when submitting students' final course grades; specifically, when a student earns a course grade of F, instructors must report the last date a student attended their class. For on-campus classes, last date of attendance can be based on attendance rosters or on academic engagements—a test, participation in a class project or

presentation, or Canvas-based activity. Online or distance education courses require regular and substantive online interaction and participation. Students must participate in online course activities in Canvas to demonstrate attendance; logging into an online class is not sufficient by itself to demonstrate attendance. The last date of attendance is reported to the U.S. Department of Education for federal financial aid recipients.

Generative AI Use in This Course

The use of Generative AI (GenAI) in course assignments and assessments must align with the guidelines established by the instructor. Unauthorized use of GenAI could result in breaches of academic integrity. Instructors bear the responsibility of clearly delineating the permissible uses of GenAI in their courses, underscoring the importance of responsible and ethical application of these tools.

The UTA Office of Community Standards articulates the university's stance on academic integrity and scholastic dishonesty. These standards extend to the use of GenAI. Unauthorized or unapproved use of GenAI in academic work falls within the scope of these policies and will be subject to the same disciplinary procedures.

As the instructor of this course, I have adopted the following policy on Student use of GenAI: **Prohibition of GenAI Use.** In this course, the focus is on the development of independent critical thinking and the mastery of subject-specific content. To ensure that all submitted work accurately reflects personal understanding and original thought, the use of Generative AI (GenAI) tools in completing assignments or assessments is strictly prohibited. This policy supports our commitment to academic integrity and the direct measurement of each student's learning against the course's Student Learning Outcomes (SLOs). Any work found to be generated by AI will be subject to academic review.

Academic & Wellness Resources

Academic Success Center

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring, and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: Academic Success Center (https://www.uta.edu/student-success/course-assistance). To request disability accommodations for tutoring, please complete this tutoring request form (https://www.uta.edu/student-success/course-assistance/tutoring/request).

The English Writing Center (411LIBR)

The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the Writing Center (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see Writing Center: OWL (http://www.uta.edu/owl) for detailed information on all our programs and services.

Academic Plaza

The Library's 2nd floor Academic Plaza (http://library.uta.edu/academic-plaza) offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer

UTA and various college/school advising hours. Services are available during the [library's hours](https://library.uta.edu/hours) (https://library.uta.edu/hours) of operation.

UTA CARE Team

UT Arlington is committed to the safety, success, and well-being of our students. To support our community, UTA has created a CARE Team, which is a dedicated group of campus professionals responsible for helping students who could benefit from academic, emotional, or psychological support, as well as those presenting risk to the health or safety of the community. If you know of someone experiencing challenges, appearing distressed, needing resources, or causing a significant disruption to the UTA community, please submit a [CARE Referral](#) by visiting the [Behavior Intervention Team](https://www.uta.edu/student-affairs/dos/behavior-it) (https://www.uta.edu/student-affairs/dos/behavior-it) page. You may also submit a referral for yourself if you would like additional support.

NOTE: If a person's behavior poses an immediate threat to you or someone else, contact UTA Police at 817-272-3303 or dial 911. If you or someone you know needs to speak with a crisis counselor, please reach out to the [MAVS TALK 24-hour Crisis Line](https://www.uta.edu/student-affairs/caps/crisis) (https://www.uta.edu/student-affairs/caps/crisis)at 817-272-8255 or the [National Suicide and Crisis Lifeline](https://988lifeline.org/) (https://988lifeline.org/) at 988.

Student Services

Everything you need to make the most of your time as a student (and beyond) is all on campus. Below are a few resources to get you started.

- [Student Services Home](#)
- [Student Access and Resource (SAR) Center](#)
- [Military and Veteran Services](#)
- [Health Services](#)
- [Counseling and Psychological Services (CAPS)](#)
- [Activities and Organizations](#)
- [Recreation](#)

Librarian to Contact

Each academic unit has access to [Librarians by Academic Subject](https://libraries.uta.edu/research/librarians) (https://libraries.uta.edu/research/librarians) that can assist students with research projects, tutorials on plagiarism, and citation references, as well as support with databases and course reserves.

Safety Information & Resources

Face Covering Policy

Face coverings are not mandatory; all students and instructional staff are welcome to wear face coverings while they are on campus or in the classroom.

Emergency Exit Procedures

Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit, which is located out the classroom door and to the right or to the left. When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist

students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

MavAlert System

The MavAlert system sends information to cell phones or email accounts of subscribed users in case of an emergency. Anyone can subscribe to MavAlerts at [Emergency Communication System](https://www.uta.edu/uta/emergency.php) (https://www.uta.edu/uta/emergency.php).

Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381

Course Schedule

Session #	Week	Date	Topic	Readings	Homework / assignment
1	week 1	13-Jan	RStudio, scripts, variables, vectors	Syllabus, download R and R studio	
2		15-Jan	Packages, projects, importing data		
3		16-Jan	lab #1	Einspruch Chapter 2; Hadley et al. Introduction	lab #1
4	week 2	20-Jan	Mutate, filter, select		
5		22-Jan	Group and summarize	Einspruch Chapter 3	
6		23-Jan	lab #2		lab #2
7	week 3	27-Jan	Pivot wider/longer	Einspruch Chapter 3	
8		29-Jan	ggplot (plot types)	Einspruch Chapter 6	
9		30-Jan	lab #3		lab #3
10	week 4	3-Feb	ggplot (plot manipulation)	Einspruch Chapter 6	
11		5-Feb	R Markdown		
12		6-Feb	lab #4		lab #4
13	week 5	10-Feb	Univariate analysis (*t*-test)		
14		12-Feb	Univariate analysis (*t*-test)		
15		13-Feb	lab #5		lab #5
16	week 6	17-Feb	Univariate analysis (ANOVA)		Quiz #1
17		19-Feb	Bivariate correlations	Cohen et al. - ch. 2	
18		20-Feb	lab #6		lab #6
19	week 7	24-Feb	Simple linear regression		Quiz #2
20		26-Feb	Multiple regression	Cohen et al. - ch. 3	
21		27-Feb	lab #7		lab #7

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22	week 8	3-Mar	Multiple regression; review		
23		5-Mar	MIDTERM/EXAM 1 In class		
24		6-Mar	MIDTERM / EXAM 1 -- R portion		R portion due Friday, 06 March 2026, 7:00 pm
X	week 9	10-Mar	SPRING BREAK		
X		12-Mar	SPRING BREAK		
25	week 10	17-Mar	Statistical Interactions	Cohen et al. - ch. 7	
26		19-Mar	Statistical Interactions	Cohen et al. - ch. 8	Quiz #3
27		20-Mar	lab #8		lab #8
28	week 11	24-Mar	Logistic regression	Cohen et al. – ch. 13	
29		26-Mar	Logistic regression		Quiz #4
30		27-Mar	Lab #9		Lab #9
31	week 12	31-Mar	Exploratory Factor Analysis		
32		2-Apr	Structural Equation Modeling (SEM)	Cohen et al. – ch. 12	Quiz #5
33		3-Apr	Lab #10		Lab #10
34	week 13	7-Apr	Structural Equation Modeling (SEM)		
35		9-Apr	Structural Equation Modeling (SEM)		Quiz #6
36		10-Apr	Lab #11		Lab #11
37	week 14	14-Apr	Latent variable analysis	Cohen et al. - ch. 15	
38		16-Apr	Latent variable analysis		Quiz #7

39		17-Apr	Lab #12		Lab #12
40	week 15	21-Apr	Linear mixed effect modeling	Cohen et al. - ch. 14	
41		23-Apr	Longitudinal modeling		Quiz #8
42		24-Apr	Lab #13		Lab #13
43	week 16	28-Apr	lab #14; Review		lab #14 due Friday 01 May, 7:00 PM
X		5-May	FINAL / EXAM 2 in class 8 – 10:30 AM		R portion due Thursday 07 May 2026, 7:00 PM

Note: I reserve the right to alter this schedule as appropriate/needed.