# PSYC 5405: Advanced Statistics I

Fall 2021

## Instructor Information

### Instructor(s)

Dr. Amandeep Dhaliwal

### Office Number

LS 426

### Office Telephone Number

817-272-2281

### Email Address

[amandeep.dhaliwal@uta.edu](mailto:amandeep.dhaliwal@uta.edu)

All emails must be sent via canvas using UTA email address. Official communication from UTA to you will come only through your UTA e-mail box. UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at [OIT: Student MavMail](http://www.uta.edu/oit/cs/email/mavmail.php). Please access it regularly, or forward it to your current email address, as your success in college may depend on your ability to respond quickly.

### Faculty Profile

<https://mentis.uta.edu/explore/profile/amandeep-dhaliwal>

### Office Hours

Wednesday: 1PM – 3 PM or by appointment

**Teaching Assistant:** Adrian Abellanoza

[adrian.abellanoza@mavs.uta.edu](mailto:adrian.abellanoza@mavs.uta.edu)

**Office Hours:** Friday: Noon – 1pm or by appointment.

**Office:** LS 404

## Course Information

### Section Information

PSYC 5405-001

### Time and Place of Class Meetings

**Lectures:** Will be face-to-face in LS 318 every Tuesday and Thursday from 12:30 PM – 1:50 PM.

**Labs:** Will be face-to-face in COBA 339 every Friday from 9 AM – 11:50 AM.

**Note**: **ANY COVID-19 RELATED CHANGES TO IN-PERSON CLASSES WILL BE UPDATED ON CANVAS (Announcements) PRIOR TO AUGUST 24, 2021.**

### Description of Course Content

### This course offers an in-depth practical and conceptual approach to fundamental descriptive and inferential statistics used in psychological research. This course consists of learning a variety of procedures commonly used for testing hypotheses in psychological research, learning to examine and analyze the data accordingly, and learning to communicate the research results to the scientific community.

### Student Learning Outcomes

1. Students will be able to manipulate raw data by creating a database, properly coding & screening data, and presenting the results. These objectives will be accomplished by using SPSS, Excel, or another software package to create a database, manage data, conduct data screening procedures, and visualize the data. Additionally, students will write manuscript sections and create presentation slides to describe the data screening results.
2. Students will be able to determine and describe the strength of association and direction of relationships between two or more variables by identifying and computing (both by hand and with a statistical package) appropriate statistical tests (e.g., chi-square statistics, correlation coefficients, and linear regression models), by visualizing these relationships, and by writing Data Analysis and Results sections of manuscripts and creating presentation slides.
3. Students will be able to examine and present significant mean differences between and within groups by identifying and computing (both by hand and with a statistical package) appropriate statistical tests (e.g., *t*-tests and analysis of variance models), by visualizing these relationships, and by writing Data Analysis and/or Results sections of manuscripts and creating presentation slides.
4. Students will be able to write professional papers and create professional presentations by translating statistical procedures, analyses, and results into Data Analysis and Results sections of manuscripts and presentation slides using the knowledge gained about APA writing style and the content of these professional methods of communication.
5. Students will display communication skills, planning, problem-solving, and collaboration by regularly determining appropriate statistics and interpreting findings, working in teams, and through self-reflection and team evaluations.

### Required Textbooks and Other Course Materials

1. Lomax, R. G. & Hahs-Vaughn, D. (2020). *An introduction to statistical concepts* (4th ed.). New York, NY: Routledge. ISBN-13: 978-1138650558
2. Evergreen, S. D. H. (2020). *Effective Data Visualization: The right chart for the right data* (2nd ed.). Thousand Oaks, CA: Sage. ISBN-13: 978-1544350882
3. *Publication Manual of the American Psychological Association* (7th edition). Washington, D.C.: American Psychological Association. ISBN: 978-1-4338-3215-4
4. Additional required readings available on Canvas
5. A calculator with statistical functions
6. **Access to a computer with a webcam and SPSS statistical software.** Webcams will be used with Respondus Lockdown Browser. SPSS, the statistical software, is available for **free** for all students enrolled at the University of Texas at Arlington through OIT and compatible with PC and Mac operating systems. Additionally, computers are available in the OIT Labs, library computers, and on most Departmental desktops (see UTA.edu for hours of operation). SPSS will be used in the lecture and lab, but students can use another statistical software program if they choose.

## Recommended (Optional) Resources:

* Field, A. (2018). *Discovering statistics using SPSS* (5th ed.). Thousand Oaks, CA: Sage. ISBN: 978- 1526436566
* **APA Formatting:** www.apastyle.org

### Descriptions of major assignments and examinations

Exams (2, 100 pts each): There will be two examinations, a midterm and final exam, that will each be given in two parts. For Part I, you will be given questions that assess your conceptual knowledge of the concepts that were covered in the class and lab. Part I of the exam will be a combination of multiple-choice and short answer questions given through Respondus LockDown Browser with Monitor and will focus on data screening, selection of statistical analyses, variable characteristics, and analyses. For Part II, you will be provided with data sets and required to analyze and interpret the data. You will be required to write up your answers in APA style. Only work and materials uploaded before the submission deadline will be graded. Work submitted after the deadline will not be graded.

In-Lab Assignments (ILAs; 12, 100 pts each): Lab attendance is mandatory. You are expected to be in lab for the entirety of the class period. Lab is an experiential, hands-on experience (i.e., flipped classroom).You are expected to come to the lab prepared, having read lab assignments, reviewed lecture notes, and completed the necessary readings. Students have been assigned to a lab group of 3-4 students prior to the semester beginning. During each weekly lab, you and your teammates will be assigned a role within the group and together, you will complete the in-lab assignments (ILAs). Laboratory assignments are designed to be completed during each lab and must be submitted to Canvas at the end of the lab. Beyond University excused absences (see **Make-Up Work** policy), there are no make-up opportunities for missed in-lab assignments. If you are not present for the lab assignment, you will receive a grade of a zero, even if your group completes the assignment without you.

Homework (12, 100 pts each): In addition to In-Lab Assignments, each week you will be responsible for individual homework. Each homework assignment will be completed by the following week in which it is assigned. All homework assignments will be submitted via Canvas by 11:59PM on the date that it is due. No late homework will be accepted.

Quizzes (12, 100 pts each): All students are responsible for reading the assigned materials *prior* to class and coming to class and lab prepared to discuss the materials. As such, you will have weekly quizzes over the readings, lab, and/or class lectures. Some of the questions on the quizzes may even be taken straight from homework questions. Quiz days are indicated on the **Course Schedule**. Beyond University excused absences (see **Make-Up Work** policy), there are no make-up opportunities for missed quizzes.

## Attendance/Participation (100 pts): Participation in lecture and lab is expected and will be determined by your instructor and teaching assistants. You will be evaluated on your attendance, participation in class discussions, responses to polling questions, and your teammate assessment.

### Technology Requirements

This course will be computer/internet intensive. You will need a personal device (desktop, laptop, smartphone, tablet, etc.) or access to a UT Arlington computer lab so you can access Canvas and Microsoft Teams regularly and participate in class effectively. If you do not own a computer, please make arrangements to rent one through the UTA library or to access and use the computers available to you on campus during lab and lecture times.

## Grading Information

### Grading

You will receive one course grade for your combined performance in the lecture and laboratory. All exams, in-lab and homework assignments, and quizzes in this course will be graded on a 100-point scale, scored based on percentage correct, averaged together, and then weighted accordingly (see table below).

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| --- | --- |
| **Assignment** | **Percentage of Final Grade** |
| Exams (2) | 45% |
| In-Lab Assignments (12) | 25% |
| Quizzes (12) | 15% |
| Homework (12) | 10% |
| Attendance/Participation | 5% |
| **Total:** | **100%** |

Final Grades: Final grades will be assigned based on the following:

|  |  |
| --- | --- |
| **Percentage** | **Letter Grade** |
| 100 – 90.0% | A |
| 80.0 – 89.9% | B |
| 70.0– 79.9% | C |
| 60.0– 69.9% | D |
| < 59.9% | F |

### Expectations for Out-of-Class Study

A general rule of thumb is this: for every credit hour earned, an undergraduate student should spend 3 hours per week working outside of class during a regular 15-week semester. Hence, a 4-credit course might have a minimum expectation of 12 hours of reading, study, etc. *each week* for a 15-week semester. Beyond the time required to attend each class meeting, students enrolled in this 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, taking exams, doing out-of-class assignments, etc.

### 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.

## Institutional Information

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

## Additional Information

### Face Covering Policy

*While the use of face coverings on campus is no longer mandatory, all students and instructional staff are strongly encouraged to wear face coverings while they are on campus. This is particularly true inside buildings and within classrooms and labs where social distancing is not possible due to limited space. If a student needs accommodations to ensure social distancing in the classroom due to being at high risk they are encouraged to work directly with the Student Access and Resource Center to assist in these accommodations.* *If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center’s front desk or in their department.*

### Attendance

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. As the instructor of this section, lecture attendance is required, and lab attendance is mandatory and counts toward the participation grade. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

### 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. 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.

### 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 [form](https://forms.office.com/Pages/ResponsePage.aspx?id=Q1vcXL7XqkyBc3KeOwpi2ccSjcIXpSJAqJFuDEhczLlUMVVHRVRIVlJJWDZJWlVYOUgxNjRPODdLVS4u).

**The** [**IDEAS Center**](https://www.uta.edu/ideas/) (https://www.uta.edu/ideas/) **(**2nd Floor of Central Library) offers **FREE** [tutoring](https://www.uta.edu/ideas/services/tutoring/index.php) and [mentoring](https://www.uta.edu/ideas/services/mentoring/index.php) to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

### 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/) (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.

The Library’s 2nd floor [Academic Plaza](http://library.uta.edu/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) of operation.

### Librarian to Contact

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

## 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

Quiz dates are indicated by \* next to the date.

*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. –Amandeep Dhaliwal, PhD*

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| **Lecture** | | | | | **Lab** | | | |
| **Week** | **Date** | **Lecture Topic** | **Readings** | **Date** | | **Lab Exercises/Assignments** | **Assignment**  **Due** |
| **1** | 8/26 | Course Overview & Data Coding | APA Ch. 2 & 7  Evergreen Ch. 8 | 8/27 | | **No Lab Meeting** |  |
| **2** | 8/31 | Data Screening: Data Coding, Entry, & Descriptive Statistics | L&H Ch. 1-4  Evergreen Ch 1, 2, 5, 6  T&F Ch. 4 (Canvas) | 9/3 | | SPSS: Codebook, Database Construction, Data Entry, Checking Data | HW 1  ILA 1 |
| \*9/2 |
| **3** | 9/7 | Data Screening: Distributions & Scoring |  | 9/10 | | SPSS: Screening & Descriptive Statistics | HW 2  ILA 2 |
| \*9/9 | Probability & Sample Statistics | L&H Ch. 5 |
| **4** | 9/14 | Sampling Distributions & Hypothesis Testing | L&H Ch. 6  Evergreen Ch. 4 | 9/17 | | Probability | HW 3  ILA 3 |
| \*9/16 | Hypothesis Testing: *z* test |
| **5** | 9/21 | Measures of Association: Chi-Square | L&H Ch. 8  Evergreen Ch. 3 | 9/24 | | *z*-test and Chi-square | HW 4  ILA 4 |
| \*9/23 |
| **6** | 9/28 | Correlation & Prediction | L&H Ch. 10  Evergreen Ch. 7 | 10/1 | | Correlations | HW 5  ILA 5 |
| \*9/30 |
| **7** | 10/5 | Introduction to Linear Regression | L&H Ch. 17 | 10/8 | | Simple Linear Regression | HW 6  ILA 6 |
| \*10/7 | *t*-tests | L&H Ch. 6  Evergreen Ch. 3, 4 |
| **8** | 10/12 | *t*-tests | L&H Ch. 7 | 10/15 | | *t-*tests | HW 7  ILA 7 |
| \*10/14 | One-way ANOVA | L&H Ch. 11 |
| **9** | 10/19 | One-way ANOVA | L&H Ch. 11 | 10/22 | | **Midterm Exam** | |
| \*10/21 | Multiple Comparisons | L&H Ch. 12 |
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| **Lecture** | | | | | **Lab** | | | |
| **Week** | **Date** | **Lecture Topic** | **Readings** | **Date** | | **Lab Exercises/Assignments** | **Assignment**  **Due** |
| **10** | 10/26 | Multiple Comparisons | L&H Ch. 12 | 10/29 | | One-way ANOVA & Post-hocs | HW 8  ILA 8 |
| \*10/28 | Trends & the Linear Model | L&H Ch. 12 |
| **11** | 11/2 | Factorial Design  Factorial ANOVA | L&H Ch. 13 | 11/5 | | Comparisons and Contrasts | HW 9  ILA 9 |
| \*11/4 |
| **12** | 11/9 | Factorial ANOVA | L&H Ch. 13 | 11/12 | | GLM Factorial ANOVA | HW 10  ILA 10 |
| \*11/11 |
| **13** | 11/16 | Repeated Measures ANOVA | L&H Ch. 15, pp. 700-708; 723-731 Evergreen Ch. 9 | 11/19 | | GLM RM ANOVA | HW 11  ILA 11 |
| 11/18\* |
| **14** | 11/23 | Multivariate Approaches to Repeated Measures | T&F Ch. 8 (Canvas) | 11/26 | | **Thanksgiving Holiday—No Lab** | |
| 11/25 | Thanksgiving Holiday—No class | |
| **15** | 11/30 | Mixed ANOVA | L&H Ch. 15, pp. 708-716; 734- 747 | 12/3 | | GLM Mixed ANOVA | HW 12  ILA 12 |
| \*12/2 | Hypothesis Generation |  |
| **16** |  |  | | 12/7 | | Final Lab | HW 13  ILA 13 |
| **Finals** | 12/14 | **11-1:30PM Final Exam** | | | | | |