

Psychology 4301
Advanced Quantitative Methods in Psychology
June A Intersession (June 3-June 17)

Monday-Friday 1:00-5:00pm
Room: TBD

Instructor: Dr. Chrystyna Kouros
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Office Hours: By appointment

Course Overview

Statistics?!—but I’m a *psych* major! This course aims to breakdown the common misconception that psychology and statistics are two independent fields of study. In fact, research design and statistics are a necessary and critical component of psychology. From both a research and clinical perspective, an understanding of statistics will help you conduct, interpret, and evaluate your own research and help you interpret and evaluate research that you read. In this course, you will learn how to formulate research questions, how to operationalize psychological constructs, and common research designs used in psychological research. In addition, you will be building and adding to your “toolbox” of statistical skills. You will learn the purpose of each tool and when to use it. The goal of this course is not only to understand the *how* of statistics, but the *why* of it, as well. Finally, you will learn how to read and critically evaluate psychological research by reading empirical journal articles.

Required Materials

- Aron, A., Coups, E. J., & Aron, E. N. (2012). *Statistics for Psychology* (6th edition). Upper Saddle River, NJ: Prentice-Hall.
- Article readings are available on the course Canvas site.
- Access to SPSS software is needed for class labs. SPSS can be accessed from apps.smu.edu. Contact the OIT help desk to have SPSS added to your apps. Some computer labs on campus have SPSS installed on their machines. You may also contact Dr. Kouros about using one of the computers in her research lab to complete the lab assignments. You do not need to buy SPSS.
- You will need a hand calculator for working on the problems sets, activities, and exams. Do not use your cell phones as a calculator! You don’t need anything fancy; a simple calculator that adds, subtracts, divides, multiplies, and takes square roots is sufficient. Since you need to show your work on problem sets and exams, a calculator that also does statistical calculations will be of little help.

Course Prerequisites

PSYC1300, PSYC3301, and one additional psychology course

Course-specific Student Learning Objectives

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

1. Design a study to address a given psychological research question, and demonstrate knowledge of the advantages and limitations of various research designs and types of measurement.
2. Explain the purpose of various statistical tests covered, including what type of questions these tests answer, what type of data is needed, and the assumptions and robustness of each test.
3. Given a data set and research question, identify and apply the appropriate statistical technique.
4. Apply the techniques learned both by hand (for some, not all!) and using SPSS.
5. Interpret the output of results, translate statistical conclusions into substantive conclusions, and write-up a results section using APA guidelines.
6. Read and critically evaluate empirical research articles (e.g., understand the results section of most research articles and understand the design and statistical tests used by the researchers, why the researchers used those tests, and the results found.)

Course Requirements and Grading

Daily Warm-Up Problems

At the beginning of class (beginning June 4), student will be given 10-minutes to complete warm-up problems based on the material from the previous class. Students must be in class to complete the warm-up problems (i.e., if you show up late after the problems are turned in, you will receive a 0 for the problem that day). Warm-up problems are closed-notes, but you will be given the formulas needed for the problems. There are no warm-up problems on exam days (June 10 & June 17).

Problem Sets

There are **9 problem sets** assigned throughout the term; these include questions from the textbook or sometimes additional questions that I will give you. The problem sets are an opportunity to *practice* what you have learned. They are not busy work, but rather should help you process and understand the material. Students are encouraged to work together on these; however, each student should write up their own answers and turn in their own assignment. Please write neatly and show your calculations to receive full credit; showing only the final result is not sufficient. For Set I questions, the answers are in the back of the book: do not use the exact wording from the answers in the back of the book! The problem sets are graded for completion on a 0-2 scale.

Problem sets will be checked at the beginning of class after the warm-up problem. *Late assignments*: 0.5 points will be deducted from your score for each day the assignment is late. You are allowed, over the term, one late assignment without penalty, provided the problem set is completed/shown to Dr. Kouros before the start of the next class. Turning in a homework assignment at the end of class counts as being late.

Labs

The labs will consist of simulations or demonstrations of statistical techniques we have learned and learning to run statistical tests using SPSS. Students may work in groups on these labs, but each person should write up their own answers and turn in their own lab. Labs will be posted on Canvas. You should be working on these labs as they are posted. Make sure you have a plan to access SPSS before the deadline—not being able to access SPSS is not an acceptable excuse for turning in your

assignment late. *Late assignments:* 5% of the total points for that lab will be deducted from your score for each day the lab is late. Turning in a lab at the end of class counts as being late.

Exams

There will be two exams. Exams may consist of multiple-choice, computational, or short-essay questions. Exams may cover material from the textbook, assigned readings, lectures, and class activities/discussion. Students are allowed a sheet of notes for the exams (specific details on what material is allowed will be provided for each exam).

Muddiest Point

After class, please take a minute to write down the following information and turn it in before leaving class. You do not need to put your name on it, but you can if you want.

1. Please list at least one concept that was clear during lecture (something you feel you grasped, understood, and feel good about). There may be some lectures that you won't have anything to write down—that's okay!
2. Please list at least one concept that wasn't clear (something you're having difficulty understanding or was confusing). If you're having trouble understanding a certain topic, it's likely others are as well. This will give me some insight into what material we may need to spend some more time on at the beginning of the next class, or whether I may need to take a different approach to teaching certain topics.

Grading

Grading is based on the mastery of key ideas and concepts covered in the course (and homework completion). For example, a grade of A represents that the student has mastered at least 90% of the course content. This course offers several ways for students to demonstrate mastery of concepts, including exams, writing assignments, class activities, and an oral presentation.

Grading for the course will be based on the following equation:

$$\text{Grade} = .20 (\text{Daily Warm-up Problems}) + .20(\text{Problem Set Completion}) + .20(\text{Labs}) + .40(\text{Exams})$$

Grade in Course					
A	100-93%	B-	80-82%	D+	67-69%
A-	90-92%	C+	77-79%	D	63-66%
B+	87-89%	C	73-76%	D-	60-62%
B	83-86%	C-	70-72%	F	≤ 59 %

NOTE 1. Grades are rounded up based on the third decimal place.

NOTE 2. I cannot accept extra credit that is not part of the course or make any special arrangements regarding grades, or adjust grades due to special circumstances of any kind. Please do NOT ask for any adjustments to your grade (other than for errors in grading).

Class Preparation & Attendance

Class attendance is strongly encouraged; a sign-in sheet will be provided during each class period. It is the student's responsibility to make sure he/she has signed in. Attendance is a critical component for learning in this course. Classes will consist of lectures, including material that is NOT in the textbook, group activities, discussions, demonstrations, and videos. It is very difficult to make up

the material missed from videos, class discussions, and group activities. *Note: Signing in a classmate who is not in class is a violation of the Honor Code* (see section on Academic Integrity).

Classroom Etiquette & Laptop Use

It is expected that each student is an active participant in class. This is demonstrated by paying attention, asking questions, participating in class discussions and activities, and completing assignments. Please turn off/silence and put away your cell phone while in class. Text messaging, checking email, FaceBook or other websites, completing work for another class, etc. are not acceptable during class time. *Cell phones must be turned off and put away during exams. If students use their cell phone during an exam, that will be considered cheating and a violation of the Honor Code* (see section on Academic Integrity).

You may use a laptop for note taking; however, this policy will be revisited if students are using their laptops for other purposes. I strongly recommend taking hand-written notes in this class. Students often struggle to keep up with class when taking notes on a laptop, since a lot of the notes include equations with symbols, diagrams, and drawings. Also, research shows students process and retain information better when taking hand-written notes. I recommend getting a large notebook and a folder/binder to organize class handouts.

Note on cell phones/smart watches: Cell phones must be turned off and put away during exams. If students use their cell phone during an exam, this will be considered cheating and a violation of the Honor Code (see section on Academic Integrity).

University Policies

Disability Accommodations: Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit <http://www.smu.edu/Provost/ALEC/DASS> to begin the process. Once registered, students should then schedule an appointment with the professor as early in the semester as possible, present a DASS Accommodation Letter, and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester (by February 6, 2018), and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

Academic Integrity and Plagiarism: Cheating and/or plagiarism will not be tolerated in this course and will be dealt with according to the University's Honor Code. As stated by the Honor Council, "Permitting others to prepare their work, using published or unpublished summaries as a

substitute for studying required materials, or giving or receiving unauthorized assistance in preparation of work to be submitted are directly contrary to the honest process of learning.” A violation of the Code will result in an F for the course. In addition, the student may also be taken before the Honor Council. If you are unclear about this please see the instructor immediately.

Campus Carry Law: “In accordance with Texas Senate Bill 11, also known as the “campus carry” law, following consultation with entire University community SMU determined to remain a weapons-free campus. Specifically, SMU prohibits possession of weapons (either openly or in a concealed manner) on campus. For more information, please see: http://www.smu.edu/BusinessFinance/Police/Weapons_Policy.”

Articles Demonstrating Statistical Techniques for Review Papers (available on Canvas):

Independent t-tests

Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, 30, 510-517.

Factorial ANOVA

Meltzer, A. L., & McNulty, J. K. (2011). Contrast effects of stereotypes: “Nurturing” male professors are evaluated more positively than “nurturing” female professors. *Journal of Men’s Studies*, 19, 57-64.

Correlation and Regression

El-Sheikh, M., Buckhalt, J. A., Mize, J., & Acebo, C. (2006). Marital conflict and disruptions of children’s sleep. *Child Development*, 77, 31-43.

Course Schedule

*We may, and probably will, make adjustments to the schedule, but I will let you know. Students are responsible for changes made to the syllabus that are either announced in class or through email.

Date	Topic	Reading	Assignment Due
6/3	<ul style="list-style-type: none"> Welcome to PSY4301 and Why we need Statistics in Psychology Levels of Measurement Exploring and Graphing your Data 	Chapter 1 Chapter 14: 588-593 Chapter 15: 625-627	
6/4	<ul style="list-style-type: none"> Central Tendency & Variability Introduction to SPSS 	Chapter 2	Problem Set #1
6/5	<ul style="list-style-type: none"> Normal Curve, Z-scores, & Probability 	Chapter 3	Intro to SPSS Lab Problem Set #2
6/6	<ul style="list-style-type: none"> Sampling Distribution Hypothesis Testing with Means Errors, Effect Size, & Power 	Chapter 4 Chapter 5 Chapter 6	Problem Set #3
6/7	<ul style="list-style-type: none"> Is there a mean difference? Single, Dependent, Independent Means Is the t-test Robust? SPSS t-test Lab 	Chapters 7 & 8	Problem Set #4
6/10	<ul style="list-style-type: none"> Review & Exam 1 One-Way ANOVA 	Chapter 9	Problem Set #5 SPSS t-test lab
6/11	<ul style="list-style-type: none"> Where's the differences? Multiple Comparisons in One-Way ANOVA SPSS Lab on One-way ANOVA 	Chapter 9	
6/12	<ul style="list-style-type: none"> Two-Way ANOVA: Main Effects and Interactions SPSS Lab on Two-way ANOVA 	Chapter 10	Problem Set #6 SPSS One-way ANOVA Lab
6/13	<ul style="list-style-type: none"> Correlation Simple & Multiple Regression SPSS Lab on Correlation & Regression 	Chapter 11 Chapter 12 Chapter 15: 624-625	Problem Set #7 SPSS Two-way ANOVA Lab
6/14	<ul style="list-style-type: none"> Chi-square 	Chapter 13	Problem Set #8 SPSS Correlation & Regression Lab
6/17	<ul style="list-style-type: none"> Review & Exam 2 Advanced Topics 	OPTIONAL: Web Chapter 2 (on Canvas) Chapter 15: 618-623; 627-633; 636-648	Problem Set #9

Student Information Sheet & Contract

Please complete the following form and return to Dr. Kouros by **June 4**.

Name: _____

Year: _____

Major: _____

Minor (if applicable): _____

Please list any previous psychology and/or statistics courses you have taken.

What are your goals for the course?

Are you applying to graduate school? If yes, in what field?

Are you considering completing the Distinction program in Psychology?

Anything else you want me to know?

CONTRACT

By signing below, I acknowledge that I have read the syllabus and understand the class components and policies (e.g., policy regarding late assignments, attendance). It is my responsibility to refer to this syllabus and/or consult with Dr. Kouros with regard to any issues that may arise.

Signature

Date