

PSY 507
Analysis of Psychological Data I
Fall, 2020

GENERAL INFORMATION

Lecture Time: Wednesdays 9:00am-11:00am
Lab Time: Fridays 12:15pm-1:05pm

Lecture Location: Zoomland
Lab Location: Zoomland

Instructor: James M. LeBreton
E-mail: james.lebreton@psu.edu

Office Location: Zoomland
Office Hours: By Appointment

TA Information

Assistant: Nathaniel Schermerhorn
E-mail: njs5478@psu.edu

Office Location: Zoomland
Office Hours: Mondays 1:00-2:00pm

Assistant: Samantha (Sam) Stevens
E-mail: sms8402@psu.edu

Office Location: Zoomland
Office Hours: Tuesdays 2:00-3:00pm

CLASS DESCRIPTION & OBJECTIVES

This is the first of a two-semester sequence designed to help you acquire the basic quantitative skills commensurate with a Ph.D. in Psychology. At the end of this sequence you should have (1) a solid conceptual understanding of the logic of hypothesis testing; (2) the ability to approach a wide variety of research questions, primarily using the general linear model; (3) the technical skills to analyze data and create publication-quality tables and figures; and (4) the ability to clearly interpret and communicate the results of statistical analyses. At the end of the sequence you will be well-positioned to study more advanced topics in the analysis of data.

The lecture portion of class will focus on concepts and theory through lecture, discussion, and occasional group activities. Conceptual material will be made less abstract through the analysis of data in weekly problem sets, with practical instruction in lab.

The course content is cumulative in the sense that later material builds directly on earlier material. This aspect of the course structure has important consequences for you. In particular, it's important that you keep up with the material. Missing class, falling behind on the readings, failing to complete weekly problem sets, and/or repeatedly showing up late to class will make it difficult to master the material.

The focus of this course is largely conceptual rather than mathematical. The goal is for you to become skilled and thoughtful data analysts rather than statisticians. To the extent that we focus on formulas, it will be to serve your conceptual understanding; the math will be basic.

COURSE MATERIALS

Canvas will be used for electronic access to course materials (<http://canvas.psu.edu>), including announcements, general course information, etc. It is your responsibility to monitor Canvas for new information and announcements. The course text book is...

Judd, C. M., McClelland, G. H., & Ryan, C. S. (2017). *Data Analysis: A Model Comparison Approach to Regression, ANOVA, and Beyond* (3rd edition). New York: Routledge.

You may also be given supplemental reading materials for certain topics.

COURSE REQUIREMENTS & ACTIVITIES

1. **Participation.** Participation starts with attending class; it will be more difficult to learn the material if you are absent frequently. If you do need to miss class, you are still responsible for the material and for turning in problem sets on time. During class, participation means asking questions and contributing to discussions. It is easier to learn the material and more helpful for everyone's understanding if you are actively engaged.
2. **Problem Sets.** Problem sets are designed to give you practice analyzing data and applying statistical concepts. They provide examples of realistic quantitative problems in order to illustrate points from each week's lecture and build your skills at presenting and explaining quantitative analyses. For full credit, show and explain all work, and annotate your computer printouts. Each answer should provide a thorough typed summary that explains the outcomes of all tests and their implications for the hypothesis or question of interest (you will receive plenty of examples of how to do this). All statistical notation and reporting should follow current APA guidelines. Problem set responses should be thought of as similar to the results and discussion sections of a journal article. Crunching numbers is of limited value without a clear presentation and interpretation of the results. Electronic copies of problem sets will be due at the *beginning* of class each Wednesday. Unless other arrangements are made in advance, problem sets will not be accepted after the start of class.
3. **Midterm.** We will have one "in-class" midterm that will occur during the normal Zoom lecture time. The midterm will involve conceptual questions and the interpretation of output. If you need to miss the midterm, please make arrangements with the instructor to take it before the scheduled midterm date. No makeup exams will be permitted after the scheduled midterm date and time.
4. **Final Exam.** The take-home final exam will include: (a) conceptual questions about different techniques (e.g., assumptions, associated problems), (b) "generate a plan" questions that ask you how you would analyze a data set, and (c) actual statistical analysis and interpretation of one or more data sets (following the format established by the problem sets).

GRADES

Participation	10%
Problem Sets (drop 2):	50%
Midterm:	20%
Final:	20%
Total:	100%

Course grades based on percentage of points earned.

A	93-100	C	73-76.9
A-	90-92.9	C-	70-72.9
B+	87-89.9	D+	67-69.9
B	83-86.9	D	63-66.9
B-	80-82.9	D-	60-62.9
C+	77-79.9		

GETTING HELP

We have scheduled times available to you M, Tu, W, and F (including lecture, lab, and office hours) to help with any and all questions. Please call on us for whatever help you may need, at any point in the semester. Don't let yourself get behind! For quick clarification questions, email is fine but for anything more involved, please come see us in person (or rather via Zoom – we like talking with you!).

INDIVIDUAL AND GROUP WORK

You are strongly encouraged to consider working in groups for the problem sets so that you benefit from collaborative learning. However, you must submit your own individual solutions to each assignment. *Collaboration is not permitted on the exams.*

STATISTICAL SOFTWARE

1. **R & RStudio.** R and RStudio are free software packages that will serve as the primary software used in the course. If you are using a PSU computer from the CLA, you should be able to download and install a copy from the software center (Windows)/self service dock (Mac) if it is not already installed. If you are having trouble, you can contact the LA Helpdesk at techsupport@la.psu.edu. On personal computers, you can just download R (<https://www.r-project.org>) and RStudio (<https://www.rstudio.com>).
2. **SPSS.** SPSS is available in various student and research labs. Also, if the personal computer you use is owned by Penn State and part of the CLA, you should be able to download and install a copy from the software center (Windows)/self service dock (Mac) if it is not already installed. If you are having trouble, you can contact the LA Helpdesk at techsupport@la.psu.edu. If you are using a personal computer not owned by Penn State, SPSS can be downloaded onto two personal computers at no cost via PSU Student Software. Use the following link to download: <https://software.psu.edu>.

ZOOM

When using Zoom, keep in mind that this is a classroom environment and others should be treated with respect. Please keep your microphone muted unless you want to ask a question or interact with someone. If your microphone is not muted, the entire class will be able to hear what is going on in your environment. Also, as an instructor, I personally like to see people's faces. Also, as a participant, I am more involved when I have my camera on. I realize, however, that there are many reasons why you might not want to turn on your camera such as poor internet connection, joining via phone, or other privacy concerns. It is your choice as to whether you would like to have the camera on or not. If you have questions, please submit them to the TAs via the chat feature. They will either answer your question or wait until a good stopping point in the lecture so that I may try to answer your question.

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and only may be made available to all students presently enrolled in the class. For purposes where the recordings will be used in future class session/lectures, any type of identifying information will be adequately removed.

EXTENDED ABSENCES

During your enrollment at Penn State, unforeseen challenges may arise. If you ever need to miss an extended amount of class in such a circumstance, please notify your professor so you can determine the best course of action to make up missed work. If your situation rises to a level of difficulty you cannot manage on your own with faculty support, reach out to the Student Care & Advocacy office by phone at (814-863-2020) or email them at StudentCare@psu.edu. Office hours are Monday-Friday, 8 a.m. to 5 p.m.

ACADEMIC INTEGRITY

Penn State defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (Faculty Senate Policy 49-20). Sanctions for academic misconduct can include a grade of F for the course as well as other penalties.

Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported to the University's Judicial Affairs office for possible further disciplinary sanction.

The Department of Psychology views all acts of academic dishonesty including cheating and plagiarism as gross violations of academic integrity and supports the use of disciplinary actions in response to all acts of dishonesty. If you violate standards of academic integrity in this class, then you will be assigned a grade of F.

NON-DISCRIMINATION & REPORTING BIAS

The Pennsylvania State University is committed to equal access to programs, facilities, admission and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University's educational mission, and will not be tolerated.

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage (<http://equity.psu.edu/reportbias/>).

DISABILITY SERVICES

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides contact information for every Penn State campus (<http://equity.psu.edu/sdr/disability-coordinator>). For further information, please visit Student Disability Resources website (<http://equity.psu.edu/sdr/>).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: See documentation guidelines (<http://equity.psu.edu/sdr/guidelines>). If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

MANDATED REPORTING

Penn State's policies require me, as a faculty member, to share information about incidents of sex-based discrimination and harassment (discrimination, harassment, sexual harassment, sexual misconduct, dating violence, domestic violence, stalking, and retaliation) with Penn State's Title IX coordinator or deputy coordinators, regardless of whether the incidents are stated to me in person or shared by students as part of their coursework. For more information regarding the University's policies and procedures for responding to reports of sexual or gender-based harassment or misconduct, please visit <http://titleix.psu.edu>.

Additionally, I am required to make a report on any reasonable suspicion of child abuse in accordance with the Pennsylvania Child Protective Services Law (<https://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM>).

COUNSELING & PSYCHOLOGICAL SERVICES

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Counseling and Psychological Services at University Park (CAPS)
(<http://studentaffairs.psu.edu/counseling/>): 814-863-0395

Counseling and Psychological Services at Commonwealth Campuses
(<http://senate.psu.edu/faculty/counseling-services-at-commonwealth-campuses/>)

Penn State Crisis Line (24 hours/7 days/week): 877-229-6400
Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

ADDITIONAL SERVICES

Penn State students are also welcome to contact other units for assistance with personal concerns that interfere with academic progress, including: Counseling and Psychological Services (CAPS; <http://studentaffairs.psu.edu/counseling/>), the Office of Student Affairs (<http://studentaffairs.psu.edu/>), Career Services (<http://studentaffairs.psu.edu/career/>), the Gender Equity Center (<https://studentaffairs.psu.edu/genderequity>), the LGBTQA Student Resource Center (<http://studentaffairs.psu.edu/lgbtqa/>), the Office of Sexual Misconduct Prevention and Response (<http://titleix.psu.edu/>), Penn State Educational Equity (<http://equity.psu.edu/>), the Multicultural Resource Center (<http://equity.psu.edu/mrc>), and University Health Services (<http://studentaffairs.psu.edu/health/>).

NATURAL OR UNNATURAL DISASTERS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances.

TENTATIVE COURSE SCHEDULE

WEEK	DATE		TOPICS, READINGS, & ACTIVITIES	TIMELINE
1	08/26/20	TOPIC	Introduction & Course Overview	9am to 11am
		TOPIC	Model Building, Statistical Notation, Error	9am to 11am
2	09/02/20	READING	Preface, Chapters 1 & 2	9am
		ASSIGNMENT	Problem Set 1	due by 9am
		TOPIC	Estimation and Sampling Distribution	9am to 11am
3	09/09/20	READING	Chapter 3	9am
		ASSIGNMENT	Problem Set 2	due by 9am
		TOPIC	Hypothesis Testing, One-Sample t	9am to 11am
4	09/16/20	READING	Chapter 4	9am
		ASSIGNMENT	Problem Set 3	due by 9am
		TOPIC	Confidence Intervals and Power	9am to 11am
5	09/23/20	READING	Chapter 4	9am
		ASSIGNMENT	Problem Set 4	due by 9am
		TOPIC	Regression with 1 Continuous Predictor	9am to 11am
6	09/30/20	READING	Chapter 5	9am
		ASSIGNMENT	Problem Set 5	due by 9am
7	10/07/20	TOPIC	Regression with 1 Continuous Predictor	9am to 11am
		READING	Chapter 5	9am

		ASSIGNMENT	Problem Set 6	due by 9am
8	10/14/20	MIDTERM EXAM		9am to 11am
9	10/21/20	TOPIC	Regression with a Dichotomous Categorical Predictor	9am to 11am
		READING	Chapter 8 (through dichotomous predictors)	9am
10	10/28/20	TOPIC	Regression with Multiple Continuous Predictors	9am to 11am
		READING	Chapter 6	9am
		ASSIGNMENT	Problem Set 7	due by 9am
11	11/04/20	TOPIC	Regression with Multiple Continuous Predictors	9am to 11am
		READING	Chapter 6	9am
		ASSIGNMENT	Problem Set 8	due by 9am
12	11/11/20	TOPIC	Regression with Multiple Continuous Predictors	9am to 11am
		READING	Chapter 6	9am
		ASSIGNMENT	Problem Set 9	due by 9am
13	11/18/20	TOPIC	Regression Diagnostics & Categorical Predictors	9am to 11am
		READING	Chapter 13, Chapter 8	9am
		ASSIGNMENT	Problem Set 10	due by 9am
14	11/25/20	NO CLASS!		9am to 11am
15	12/02/20	TOPIC	Wrap-Up, Summary, Overview of Next Term	9am to 11am
		ASSIGNMENT	Problem Set 11	due by 9am
16	12/09/20	NO CLASS! STUDY FOR FINAL!		