

San José State University
Department of Psychology
PSYC118, Advanced Research Methods

Spring 2023

Course and Contact Information

Instructor: Ryan Lundell-Creagh

Office Location: DMH232

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Office Hours: online M/W 4-5pm and by appointment

Class Days/Time, Location: Lecture: M/W 3:00-4:00pm, synchronous online

Lab: Asynchronous, lab help office hours M/W 4:00-6:00pm

Prerequisites: PSYC1, STAT95, PSYC100W

Course Description

From the course catalogue: Descriptive, correlational, quasi-experimental, and experimental approaches: design, methodology, and analysis. Experience designing, conducting, analyzing, and presenting research findings. Topics will include: hypothesis testing, validity, reliability, scales of measurement, questionnaire development, power, statistical significance, and effect size

This course provides an overview of experimental design and research in psychology. The course is split into three units. In the first unit we will focus on the fundamentals of research, covering topics such as formulating research questions, conducting literature reviews, and ethical considerations in research. The next unit focuses on research design, where we will learn about the different types of research that can be conducted, and how to select the best one to use. For the last unit of the course, we will delve deeper into the world of statistics, and take a closer look at what some of the most common statistical analyses run in psychology do, covering topics such as model selection, graphing, power, and effect size. Throughout the course, we will learn how to conduct these analyses in the R programming language.

The goal of this course is to provide students with a strong understanding of research methods and designs in psychology, and for them to be able to conduct their own research effectively, as well as critically evaluate the research being conducted by others. The course culminates with a final project, where students will work in groups to design a research study from scratch, including all data collection and analyses, and a final write-up in APA format.

Course Format

This course has two separate components: the lecture and the lab. The lectures are synchronous online sessions on M/W at 3pm. The lab is asynchronous, but I will be available for questions and to help with the lab assignments during our scheduled lab time and office hours.

Lecture: on Mondays there will be content based lectures. On Wednesdays, you will have the class time to meet with your group for the group project, as well as to complete the weekly lecture assignments. Any work that is not completed during the lecture time must be finished on your own time by Friday of that week (but

don't worry, the Wednesday lecture is often enough time to complete the assignments, so there will rarely be lecture homework!). I will be available for questions during this time office hours style.

Lab: The lab component of this course is entirely asynchronous. The lab is designed to teach you how to program in R. This is a VERY useful and marketable skill that you can add to your cv when you complete this class. There will be weekly lab assignments (with a few exceptions, when the assignments are longer you get two weeks to complete them) as well as guided videos on how to complete each of these assignments that you can watch on your own time at your convenience. I will be available for help and questions online during our scheduled lab time. You are welcome to come and work on the assignments with me at this time, but these sessions are optional for those who would prefer to work on their own.

Course Learning Outcomes (CLO)

CLO1: Conduct appropriate literature reviews and identify previously conducted research which is relevant to a particular psychological question (Course Unit: 1)

CLO2: Identify a research question and select the appropriate research design for testing this question (Course Unit: 1)

CLO3: Critically evaluate and critique various research designs, identifying strengths and limitations and suggesting improvements (Course Unit: 2)

CLO4: Identify and conduct appropriate statistical analyses for various research questions (Course Unit: 3)

CLO5: Conduct a study which tests a psychological question from start to finish, including write-up in APA format, and presentation of results (Course Units: 1,2,3)

CLO6: Learn to program and conduct statistical analyses using the R programming language (Course Unit: Lab)

Program Learning Outcomes (PLO)

1. Knowledge Base of Psychology

Students will be able to demonstrate familiarity with the major concepts, theoretical perspectives, empirical findings, and historical trends in psychology.

2. Research Methods in Psychology

Students will be able to design, implement, and communicate basic research methods in psychology, including research design, data analysis, and interpretations.

3. Critical Thinking Skills

Students will be able to use critical and creative thinking, skeptical inquiry, and a scientific approach to address issues related to behavior and mental processes.

4. Applications of Psychology

Students will be able to apply psychological principles to individual, interpersonal, group, and societal issues.

5. Values in Psychology

Students will value empirical evidence, tolerate ambiguity, act ethically, and recognize their role and responsibility as a member of society.

Recommended Texts/Readings

Textbook

Cozby, P. C., & Bates, S. C. (2020). *Methods in behavioral research (14th ed)*. McGraw Hill Publishing.

Note: this textbook is NOT required for the course but is recommended for those who learn well by reading and want some additional examples. All relevant parts of the textbook will be covered in the lecture notes.

Other Readings

Additional reading may be assigned as extra practice material, particularly in the section of the course on statistics. PDFs of these readings will be provided when this occurs.

Other technology requirements / equipment / material

Students will be required to conduct lab assignments using the R open-source programming software. It is strongly recommended to have access to a personal computer, with both R and R studio installed on it.

If you do not have access to your own personal computer, it is possible to borrow one from the IT department. Follow this link to learn more: <https://www.sjsu.edu/learnanywhere/equipment/index.php>

Course Requirements and Assignments

Exams:

- This course has NO EXAMS!

Weekly Activity (30%) (CLO1,2,3)

- After each week of lecture, there will be a weekly assignment. These assignments will look slightly different from week to week, but they are all designed to be low stakes (i.e., ways of engaging with lecture material that are not stressful and have no time pressure). Some weeks this may involve a quiz (in which you can have as many attempts as you like), others may involve interpretation of code outputs, or others may ask some more opinion-based discussion questions. Weekly assignments are due each week Friday night. Students may use a portion of the Wednesday lecture class to work on these assignments. The first 10 assignments are mandatory. The final 5 are optional and can be used to replace a lower grade. Each weekly assignment you complete that is counted is worth 3% of your final grade.

Final Paper (25%) (CLO5)

- Throughout the Wednesday lectures and the lab, you will work with a group to design and conduct a research study from scratch. You will write up the results in APA format and turn them in as your final paper.

Course Labs (20%) (CLO4, CLO6)

- There will be 10 labs worth 2% each. These labs are designed to teach you how to program in R

Code Debugging Assignment (10%) (CLO4)

- You will be provided with some lines of code that intentionally have errors and asked to fix the errors to make the code run. More details during the semester.

Programming Final Assignment (15%) (CLO4)

- This course does not have a formal final exam. The final is replaced by a take home programming assignment (essentially Lab 11) which tests the programming knowledge that you have gained throughout the semester
- WARNING: This assignment is LONG! DO NOT leave it until the last minute!! You will be provided with the questions at the beginning of the semester, and thus have all semester to complete it.
 - This assignment has two submission dates. The first submission is OPTIONAL. However, if you submit the assignment by the first submission date, I will return it to you ungraded with the

questions that you have wrong flagged. You can then fix these questions to earn more points, and resubmit by the second submission date

Late Assignment Policy

Late assignments will be penalized 10% per day late. Late assignments will not be accepted after the answer key for that lab has been posted.

Final Examination Time

This course does not have a formal final exam. The take home programming final will be assigned on the last day of classes and is due ten days later.

Grading Information

Your final course grade will be rounded to the nearest whole number (ex: 89.5 rounds to 90, 89.49 rounds to 89)
This course is graded using the following inclusive cut-offs:

A+: 97 and above

A: 93-96

A-: 90-92

B+: 87-89

B: 83-86

B-: 80-82

C+: 77-79

C: 73-76

C-: 70-72

D+: 67-68

D: 63-66

D-: 60-62

F: below 60

University Policies

Per [University Policy S16-9](#), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on [Syllabus Information web page](#) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>). Make sure to visit this page to review and be aware of these university policies and resources.

(COURSE SCHEDULE ON NEXT PAGE. This schedule may be subjected to change throughout the semester)

Psych 118: Preliminary Schedule of Lectures and Assignments

Module	Start Date	Lecture Topic	Assignments
0	01/25	Syllabus Review and Lab Installation	NA
1	01/30	The Research Process	Class Work 1 Lab 2
2	02/06	Research Questions, Journal Articles, APA Format	Class Work 2 Lab 3 Project Idea
3	02/13	Reliability and Validity	Class Work 3 Lab 4 Project Intro
4	02/20	Variables, Operationalization, and Scales of Measurement	Class Work 4 Lab 5
5	02/27	Survey Design and Creation	Class Work 5 Project Proposal
6	03/06	Selecting a Model	Class Work 6
7	03/13	Interpreting Interactions	Class Work 7 IRB
8	03/20	Graphing	Class Work 8 Lab 6
NA	03/27	SPRING BREAK---NO CLASS	
9	04/03	Coding Day 1	Class Work 9 Analysis Plan
10	04/10	Descriptive Statistics, Inferential Statistics, Power	Class Work 10 Data Collection
11	04/17	T and F tests	Class Work 11 Lab 7
12	04/24	Simple Regression	Class Work 12
13	05/01	Multiple Regression and Moderation	Class Work 13 Lab 8
14	05/08	Mediation and Logistic Regression	Class Work 14 Lab 9 Final Write Up

15

05/15

Coding Day 2

Class Work 15

Lab 10

Deadlines

All class work is due by Friday at 11:59pm of the assigned week

All labs are due by Monday at 11:59pm of the week following the assigned week

All group work is due by Wednesday at the start of class (due dates specified when assigned)