

# PSYC 274 - Statistics I

## Course Syllabus

### Spring 2022

Section 52495R (Lecture)  
52496R & 52497R (Lab)

Updated: 27 December 2021

<b>Lecture Meeting Time:</b>	Tu & Th 3:30p - 4:50p
<b>Room:</b>	Taper Hall (THH), Room 118
<b>Lab Meeting Times:</b>	Wednesday (section 52497R) 4:00p - 5:50a Thursday (section 52496R) 8:00a - 9:50a
<b>Room:</b>	Seeley G. Mudd (SGM), Room 631
<b>Instructor:</b>	Christopher R. Beam, Ph.D.
<b>Office:</b>	Seeley G. Mudd (SGM), Room 934
<b>Office Hours:</b>	Tues 1:30 - 2:30 (or by appointment)
<b>Email:</b>	beamc@usc.edu
<b>Teaching Assistant:</b>	Lynn Zhang
<b>Office:</b>	Seeley G. Mudd (SGM), Room 808
<b>Office Hours:</b>	Th 10:00a - 11:00a (or by appointment)
<b>Email:</b>	zhan306@usc.edu

## Required Materials

Howell, D.C. (2017). *Fundamental statistics for the behavioral sciences (9<sup>th</sup> Edition)*. Belmont, CA: Wadsworth, Cengage Learning. ISBN-13: 978-1-305-65297-2

Loftus, G. R. (1996). Psychology will be a much better science when we change the way we analyze data. *Current directions in psychological science*, 5(6), 161-171.

TBA

Additional readings might assigned but will be optional.

## **1 Course Description**

This course will teach you how to use statistics in the context of research. We will cover the basic concepts of statistics, scales of measurement, describing data (exploratory data analysis), the normal distribution and probability, inferential statistics, the logic of hypothesis testing, including the merits and limitations of classic and more modern approaches, elementary research methods, t-tests, analysis of variance, correlation, simple and multiple regression, effect size, confidence intervals, power and sample size, and nonparametric tests for categorical and ranked data.

Statistics I has both lecture and laboratory components. You will learn to use statistical procedures to answer scientific questions in a systematic and convincing manner. Lecture consists of instruction and practice problems. Lab consists of learning to explore and analyze data using R computer software (<https://www.r-project.org/>). Laboratory assignments will be graded and returned by the following laboratory session.

### **1.1 Attendance & Participation**

#### **1.1.1 Lecture**

Although attendance in lecture is not documented or graded, you are expected to attend. Come to class prepared and ready to ask questions. You are responsible for all material covered in the text, lecture, and lab. You are expected to participate in class. Course content is introduced gradually and builds on previous sessions. The course is designed to encourage spaced learning. (Two research articles on the benefits of spaced learning are available on Blackboard for further reading.) You can master the statistical and methodological concepts covered if you attend lecture and lab, keep up with the readings, and complete all lab and homework problem sets. Please be on-time - arriving late is disruptive to other students and instructors.

#### **1.1.2 Laboratory Sessions**

Lab session attendance is mandatory. Attendance will be taken each session by the TA instructor. Failure to attend will result in 1% lower final grade per missed laboratory session. Illnesses and emergencies will be excused with sufficient documentation (e.g., physician's note). Athletic events or other extracurricular activities (e.g., clubs, band, service organizations) do not qualify as an excused absence from lab. Schedule accordingly to make sure you attend each lab session.

Each session will consist of instruction on how to use R software execute statistical procedures and interpret results. The learning curve on R is steep at first, so if you find yourself struggling with the assignments, meet with Dr. Beam or your TA for additional help as soon as possible to target any issues.

## 1.2 Blackboard

All assignments will be posted on Blackboard. Announcements and emails are made via Blackboard in this course. Routinely check the course site for updates, as you are responsible for keeping track of all updates in this course. All grades will be posted on Blackboard. Grade discrepancies and corrections need to be made prior to the final exam. No grade changes will be made via Blackboard after the final exam.

## 1.3 Electronic Devices Policy

Graphing calculators and calculator apps on smartphones are prohibited from use on exams (simple calculators and basic scientific calculators only). Infractions on exams will incur a 2%-point reduction from your final grade plus immediate dismissal from the exam room without possibility of completing your exam.

## 1.4 Software

You will learn how to conduct descriptive and inferential statistical analyses using R (<https://www.r-project.org/>). R is a flexible platform for statistical computing that is free. While the initial learning curve for R typically is difficult, the long-term benefits consist of cultivating a more thoughtful approach to your research and statistical analyses. As an additional resource, please visit Professor Revelle's homepage: <http://www.personality-project.org/r/>, although you will find a great deal of R documentation publicly available online.

# 2 Student Evaluation

Course grades will be assigned based on the following assignments and examinations:

Assignment or Examination	Percentage Contribution
First Midterm Exam	20%
Second Midterm Exam	20%
Final Exam	25%
Laboratory Assignments	20%
Homework Problems	15%
<b>Total Grade Basis</b>	<b>100%</b>

Letter grades will be assigned based on the percentage of points earned (traditional rounding rules apply):

A:  $\geq 93\%$       A-: 90-92.99  
B+: 87-89.99    B: 83-86.99      B-: 80-82.99  
C+: 77-79.99    C: 73-76.99      C-: 70-72.99  
D+: 67-69.99    D: 63-66.99      D-: 60-62.99  
F:  $\leq 59.99\%$

Course grades are based on the ratio of the number of points you achieve and the total number of points offered. Dr. Beam does not normalize or recenter grade distributions (i.e., grade on a curve).

**Address all grade concerns early in the semester rather than later in the semester.**

## **2.1 Homework & Lab Assignments**

Each homework assignment is worth 10 points and due in person at the beginning of lecture. Alternative submission requirements will be made for the first two weeks of class when the course is remote and/or if the course continues to be remote beyond 24 January 2022. Assignments may be hand written or typed.

Lab assignments are graded on a scale from 0-2 (2 = best score). Lab assignments follow a specific format using R markdown (.Rmd). Both the R markdown file and the pdf file must be turned in via Blackboard. Lab assignments must be submitted before the beginning of your next lab session.

Late assignments will not be accepted apart from illness, emergency, or university-sponsored athletic events. Acceptable documentation must be provided to and approved by Dr. Beam. Late assignments that meet one of the above criteria must be turned in by a date and time approved by Dr. Beam.

## **2.2 Exams**

Exams include conceptual and calculation problems. A hand calculator that has a memory and can take square roots is needed for exam problems. Be sure to bring a calculator to class and to exams. Calculators may not be shared during exams. Graphing calculators and calculator apps on smartphones are prohibited from use during exams. All exams are closed book. Exams must be turned in by the official class end time (no exceptions).

# **3 COVID-19 Related Policies**

## **3.1 Zoom & Zoom Etiquette**

While the course is remote, synchronous sessions will be recorded and provided to all students asynchronously via Blackboard. Please mindful of practicing "internet etiquette", which includes making sure you your microphone is muted during lecture unless you are asking or responding to a question. Please also turn your video on if you are in a place in which it can be turned on. If you are unable to keep your camera on during the synchronous Zoom session, please contact Dr. Beam prior to the class session to discuss expectations and accommodations needed. Instructing via Zoom to a matrix of blackboxes can be quite difficult, as it prevents instructors from receiving nonverbal feedback regarding learning and comprehension that is already made difficult via Zoom. If you have questions about these policies, please contact Dr. Beam.

As a policy of USC, sharing of course materials outside of the learning environment is prohibited (see USC Student Handbook Section 11.12(B)). Additionally distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy). Violation of this policy is a violation of academic integrity and will be handled as such (see below).

### **3.2 Exam Makeup Policy**

I recognize that airborne pathogens create conditions that may cause absences, including extended absences, for a variety of reasons. Students who are required to quarantine or seek medical treatment due to a direct diagnosis should contact Dr. Beam as soon as possible so a suitable equivalent makeup arrangement can be provided. Students should also provide documentation to the Dean of Students Office when possible. The Dean's Office will notify me of the general circumstances of your absence without compromising your privacy with respect to the specific issue. Students directly exposed to someone who has tested positive for an airborne pathogen may also need to quarantine themselves. Anyone within 6 feet for >15 minutes (mask or no mask) is considered exposed. In this event, students should contact me as soon as possible to discuss makeup arrangements. Absences due to care obligations arising from airborne pathogens should be discussed with me as soon as possible to determine the appropriate course of action. Prompt communication with me is critical and expected in each of these situations.

## **4 Academic Integrity**

All students are expected to complete their own work, including homework problems, lab assignments, and exams. You are encouraged to ask one another for help in the laboratory sessions, but every student is expected to do his or her own assignments in this class. That includes homework assignments, lab assignments, quizzes, and examinations. The classroom is crowded and it is important that you make sure you keep your eyes on your own exam. For more information on Academic Integrity consult the Trojan Integrity Guide at <http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf>.

If you are caught cheating (regardless of level of involvement), you will automatically fail the course and a report will be filed with USC's Office of Student Judicial Affairs and Community Standards.

## **5 Statement on Academic Conduct and Support Systems**

### **5.1 Academic Conduct**

Plagiarism - presenting someone else's ideas as your own, either verbatim or recast in your own words - is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on Research and Scholarship Misconduct.

### **5.2 Students and Disability Accommodations**

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](http://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

### **5.3 Support Systems**

#### **Counseling and Mental Health - (213) 740-9355 - 24/7 on call**

[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

#### **National Suicide Prevention Lifeline - 1 (800) 273-8255 - 24/7 on call**

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

#### **Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours - 24/7 on call**

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

#### **Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086**

[eeotix.usc.edu](http://eeotix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

**Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298**

[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

**The Office of Student Accessibility Services (OSAS) - (213) 740-0776**

[osas.usc.edu](http://osas.usc.edu)

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

**USC Campus Support and Intervention - (213) 821-4710**

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**Diversity, Equity and Inclusion - (213) 740-2101**

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

**USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 - 24/7 on call**

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

**USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 - 24/7 on call**

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.

**Office of the Ombuds - (213) 821-9556 (UPC) / (323) 442-0382 (HSC)**

[ombuds.usc.edu](http://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

**Occupational Therapy Faculty Practice - (323) 442-3340 or [offp@med.usc.edu](mailto:offp@med.usc.edu)**

[chan.usc.edu/offp](http://chan.usc.edu/offp)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

## 6 Course Schedule

A schedule of dates, topics and readings are shown below. Laboratory assignments and homework assignment due dates also are given below. Homework assignments are due at the beginning of class. Lab assignments are due at the beginning of each laboratory session.

Week	Topics/Activities	Reading	Due Dates
Week 1 Tu (1/11) Th (1/13)	<i>Sessions via Zoom</i> Syllabus & Scales of Measurement Frequency Distributions & Plotting Data <b>No lab</b>	Howell 1-2 Howell 3	
Week 2 Tu (1/18) Th (1/20)	<i>Sessions via Zoom</i> Describing Data: Central Tendency & Dispersion Dispersion <b>Lab 1: Introduction to R</b>	Howell 4-5 Howell 5	HW 1
Week 3 Tu (1/25) Th (1/27)	<i>Sessions resume in-person in TTH 118</i> The Normal Distribution Probability <b>Lab 2: Descriptive Statistics</b>	Howell 6 Howell 7	HW 2 Lab 1
Week 4 Tu (2/01) Th (2/03)	Sampling Distributions Sampling Distributions & NHST <b>Lab 3: Normal Distribution</b>	Howell 8 Howell 8	HW 3 Lab 2
Week 5 Tu (2/08) Th (2/10)	NHST An alternative to NHST <b>Lab 4: Sampling Distributions &amp; NHST</b>	Loftus (1996) TBA	HW 4 Lab 3
Week 6 Tu (2/15) Th (2/17)	Midterm I Correlation & Regression <b>No Lab</b>	Howell 9-10	
Week 7 Tu (2/22) Th (2/24)	Correlation & Regression Correlation & Regression <b>Lab 5: Correlation</b>	Howell 9-10 Howell 9-10	HW 5 Lab 4
Week 8 Tu (3/01) Th (3/03)	Multiple Regression Multiple Regression <b>Lab 6: Regression</b>	Howell 11 Howell 11	HW 6 Lab 5
Week 9 Tu (03/08) Th (03/10)	Chi-Square Review Session <b>Lab 7: Chi-square tests</b>	Howell 19	HW 7 Lab 6



Tu (03/15) Th (03/17)	Spring Recess Spring Recess		
Week 10 Tu (03/22) Th (03/24)	One sample $t$ -tests <b>Second Midterm Exam</b> <b>No Lab</b>	Howell 12	
Week 11 Tu (03/29) Th (03/31)	Paired $t$ -tests Independent samples $t$ -tests <b>Lab 8: <math>t</math>-tests</b>	Howell 13 Howell 14	HW 8 Lab 7
Week 12 Tu (04/05) Th (04/07)	Power Power & ANOVA <b>Lab 9: Effect size &amp; Power</b>	Howell 15	HW 9 Lab 8
Week 13 Tu (04/12) Th (04/14)	One-way ANOVA One-way ANOVA <b>Lab 10: One-way ANOVA</b>	Howell 16 Howell 16	HW 10 Lab 9
Week 14 Tu (04/19) Th (04/21)	Factorial ANOVA Factorial & Repeated-Measures ANOVA <b>Lab 11: factorial ANOVA</b>	Howell 17 Howell 17-18	HW 11 Lab 10
Week 15 Tu (04/26) Th (04/28)	Factorial & Repeated-Measures ANOVA Repeated-Measures ANOVA <b>Lab 12: ANOVA as a special case of regression (assignment due last of the semester)</b>	Howell 17-18 Howell 18	HW 12 Lab 11
Week 16 Tu (5/10)	<b>Final Exam (2:00-4:00PM in THH 118)</b> <b>Note change in meeting time</b>		