

PSYC 274 - Statistics I

Course Syllabus

Section 52450R

Fall 2015

Lecture Meeting Time:	Tu & Th 3:30 - 4:50
Room:	Von KleinSmid Center (VKC), Room 203
Lab Meeting Times:	Wednesday 2:00 - 3:50 Friday 4:00 - 5:50
Room:	Seeley G. Mudd (SGM), Room 631
Instructor:	Christopher R. Beam, Ph.D.
Office:	Seeley G. Mudd (SGM), Room 523
Office Hours:	M & W 11:00 - 12:00 (or by appointment)
Teaching Assistant:	Zhiqin Chen
Office:	Seeley G. Mudd (SGM), Room 907
Office Hours:	F 1:30 - 3:30 (or by appointment)

Text: Howell, D.C. (2014). *Fundamental statistics for the behavioral sciences (8th Edition)*. Belmont, CA: Wadsworth, Cengage Learning.
ISBN-13: 978-1-285-07691-1

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 consists of both a lecture and a laboratory component. Lecture will meet in Von KleinSmid Center (VKC) 203 and the laboratory sessions will meet in SGM 231. In the laboratory sessions, you will learn to calculate statistics by hand and with the aid of R computer software (<https://www.r-project.org/>). Laboratory assignments will be graded and returned by the following laboratory session. The TA will review laboratory assignments from the previous week at the beginning of each session.

1.1 Attendance & Participation

1.1.1 Lecture

Lecture attendance is not mandatory. You are, however, responsible for knowing the material. Come to class prepared and ready to ask questions and contribute to the discussion. As in all mathematics courses, course content is introduced gradually and builds on previous sessions. The statistical and methodological concepts we will cover are easy to master as long as you attend every lecture and lab session, read the text, and earnestly complete the lab and homework problem sets. Please be on-time, as walking in late is disruptive to other students and instructors.

1.1.2 Laboratory Sessions

Laboratory session attendance is mandatory. Attendance will be taken each session by the TA. Failure to attend will result in 1% lower final grade *per missed laboratory session*. Obviously illness or emergencies will be excused with sufficient documentation (e.g., physician's note). Missing lab sessions because of athletic events or other extracurricular activities (e.g., clubs, band, service organizations) will not be excused. Schedule accordingly to make sure you attend each lab session.

1.2 Blackboard

Laboratory and homework assignments will be available via Blackboard. Assignments will be submitted for grading via Blackboard as well. Announcements and emails will be made via Blackboard, so please routinely check the course site. 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 Laptops, Tablets, & Phones

Recent research suggests that note-taking by writing, rather than by typing, improves conceptual learning (see Mueller & Oppenheimer, 2014, on Blackboard). Additionally, with laptops & tablets, some students distract others by viewing non-course material during class. **Therefore, use of laptops, tablets and phones is prohibited* during**

lecture and laboratory sessions. Put your phone away and have it either off or set to airplane mode (even simply vibrating is a distraction to you). You will be asked to leave the room if you are found using either in class or lab.

*If you think that your note-taking will suffer without such a device, you can apply to Dr. Beam for special permission and sit in a designated laptop-use-area at the front of the lecture hall. A permission form is available on the course Blackboard website.

2 Laboratory Sessions

Laboratory sessions are designed for you to apply the statistical concepts you learn in lecture to real and simulated data. Each session will consist of a R didactic wherein you will learn how to write R scripts to execute statistical procedures and interpret the results.

If you find yourself struggling with the assignments, do not wait until the end of the semester to meet with Dr. Beam or the lab instructor for additional help; sooner is better to target problems you are having early on.

2.1 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 may be 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/>. Plenty (if not all) R documentation is publicly available on Professor Revelle's website.

While R is a useful calculator in itself (and it's free), a hand calculator that has a memory and can take square roots is highly recommended (cost around \$10-15) for exam problems. Be sure to bring a calculator to the exams.

3 Student Evaluation

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

Assignment or Examination	Percentage Contribution
First Midterm Exam	25%
Second Midterm Exam	25%
Final Exam	30%
Laboratory Assignments	10%
Homework Problems	10%
Total Grade Basis	100%

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

A: $\geq 93\%$	A-: 90-92	
B+: 87-89	B: 83-86	B-: 80-82
C+: 77-79	C: 73-76	C-: 70-72
D+: 67-69	D: 63-66	D-: 60-62
F: $\leq 59\%$		

The rationale for the organization of the readings, lectures, homework assignments, lab assignments, and class quizzes is to encourage spaced learning. Research comparing spaced learning to "cramming" time and again supports the hypothesis that spaced learning improves retention of learned material. Two research articles on the benefits of spaced learning are available on Blackboard for further reading.

There are 10 homework assignments. Most of the questions will be from Howell's textbook (the exercises at the end of each chapter) although other problem sets will be included at times. Each homework assignment is worth 10 points.

There are 10 lab assignments. These assignments are meant to expose you to R; deepen your knowledge of the statistical concepts covered in the course; and provide you with basic data analysis using the R statistical platform. Assignments are graded on a scale from 0-2 (2 = best score). **Lab assignments must be submitted via Blackboard by the beginning of the lab session in which they are due.** If you received a score less than 2 on any lab assignment, you are strongly encouraged to see Dr. Beam or Gin Chen during their office hours to troubleshoot areas causing you difficulty.

A quiz will be given at the end of each class about material covered in that class. All quizzes consist of 5 questions and are graded pass/fail. If you fail, you may correct the quiz at home and turn it in to receive a "pass" on it. **Quizzes cannot lower your grade, but they can improve it.** If you hand in all quizzes prior to each exam, you will receive a bonus point on that exam. Corrected quizzes must be handed in one class meeting prior to the exam meeting to be counted.

Late assignments will not be accepted apart from illness or emergency (with acceptable documentation). No exceptions.

Address all grade concerns early in the semester rather than later in the semester. Procrastination on your part **does not** constitute an emergency on our part.

4 Disability Services

Students requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. Please be sure the letter is delivered to me as early in the semester as possible. DSP is open Monday-Friday, 8:30-5:00, their phone number is (213) 740-0776.

5 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>.

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 by 11:59PM on the indicated due dates below. Lab assignments are due at the beginning of each laboratory session.

Week	Topics/Activities	Reading	Due Dates
Week 1 Tu (8/25) Th (8/27)	Course Overview Scales of Measurement No lab sessions	Syllabus Howell 1-2	
Week 2 Tu (9/01) Th (9/03)	Describing Data: Plots & Figures Describing Data: Central Tendency & Dispersion Lab 1: Introduction to R	Howell 3 Howell 4-5	HW 1 (8/31)
Week 3 Tu (9/08) Th (9/10)	The Normal Distribution Basics of Probability Lab 2: Descriptives & Plotting Data	Howell 6 Howell 7	HW 2 (9/7) Lab 1

Week 4 Tu (9/15) Th (9/17)	Sampling Distributions & NHST Null Hypothesis Significance Testing (cont.) Lab 3: Probability & Hypothesis Testing	Howell 8 Howell 8	HW 3 (9/14) Lab 2
Week 5 Tu (9/22) Th (9/24)	First Midterm Exam Correlation No lab sessions	Howell 9	
Week 6 Tu (9/29) Th (10/01)	Correlation (cont.) Correlation (cont.) & Regression Lab 4: Correlation & Regression	Howell 9 Howell 10	HW 4 (9/28) Lab 3
Week 7 Tu (10/06) Th (10/08)	Regression (cont.) Regression (cont.) Lab 5: Violations of Regression Assumptions	Howell 10 Cohen (1968)	HW 5 (10/5) Lab 4
Week 8 Tu (10/13) Th (10/15)	Multiple Regression Multiple Regression (cont.) Lab 6: Multiple Regression	Howell 11 Howell 11	HW 6 (10/12) Lab 5
Week 9 Tu (10/20) Th (10/22)	Multiple Regression Review Session Lab 7: Plotting Interactions	Howell 11	HW 7 (10/19) Lab 6
Week 10 Tu (10/27) Th (10/29)	Second Midterm Exam One sample & paired t -tests No lab sessions	Howell 12-13	
Week 11 Tu (11/03) Th (11/05)	Independent samples t -tests Power Lab 8: t-tests	Howell 14 Howell 15	Lab 7
Week 12 Tu (11/10) Th (11/12)	One way ANOVA One way ANOVA Lab 9: Effect sizes	Howell 16 Howell 16	HW 8 (11/9) Lab 8
Week 13 Tu (11/17) Th (11/19)	Factorial ANOVA Factorial ANOVA Lab 10: ANOVA	Howell 17 Howell 17	HW 9 (11/16) Lab 8
Week 14 Tu (11/24) Th (11/26)	Two-way ANOVA <i>Thanksgiving Holiday - No lecture</i> No lab sessions	Howell 18	

Week 15 Tu (12/01) Th (12/03)	Nonparametric tests - χ^2 test TBD Lab 11: χ^2 test	Howell 19	HW 10 (11/30) Lab 10
Week 16 Tu (12/08) Th (12/10)	Final Exam (Location & Time TBD)		