Introduction to Statistics (Psyc 274)

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Office hours general availability: Mon. & Wed. – 12 pm to 1 pm; Tues. & Thur. – 9:30 am to 10:30 am; other times are available as well – students should always email and schedule time before dropping by office hours

Course Objectives

Psychology is a science. All fields of science rely on a simple directive: formulate hypotheses that can be tested with observable data. Statistics are a necessary component of this effort; they provide a valid means to summarize data, test hypotheses of interest, and interpret the results of those tests. In fact, analysts from any field of endeavor will use statistics to try to understand how real world events or variables may be related to each other. Statistics enable us to examine large, even overwhelming amounts of data to determine whether the data offers any meaningful, interpretable information or not.

Course Objectives

It is our goal in this course to begin to understand how and why statistics work. To realize this goal, Psyc 274 offers a series of introductory lectures, readings with representative statistical problems, and lab assignments; all of this is designed to help you become broadly familiar with *quantitative statistics* as they are calculated and interpreted in the social sciences. The important topics to be addressed will include such concepts as 1. scales of measurement and their central tendency, 2. variance, 3. hypothesis testing, 4. assumptions of analysis and ideas about distribution normality, 5. analysis of variance, 6. correlation, 7. regression, and 8. non-parametric tests. Our primary objective will be to understand these topics in a broad conceptual way while also learning how to execute specific statistical calculations. Our parallel objective will be to understand the purpose of the different statistical tests and the information that analysts hope to obtain when implementing such tests.

Recommended Preparation

"Introduction to Psychology" (Psyc 100) and "Foundations of Statistics" (Math 114) are recommended as coursework to prepare for Psyc 274.

Required Texts

Salkind and Frey. (2020). *Statistics for People Who (Think They) Hate Statistics*. Los Angeles: Sage Publications, Inc.

Evaluation Criteria

Grades for this course are based on five major components. Each of these will be assessed separately and posted in the Blackboard grade-book on the basis of 100 points. This approach to posting grades provides a form of scoring with which each student should be familiar. For example: a score of 100 is the best score possible; a score of 70 indicates 70% correct; and so on. However, the proportionally weighted importance of each in computing the final total course score is not the same for each separate component.

The weighted importance for each component on your final total course grade will be as follows:

Mid-term examination I	13 %
Mid-term examination II	13 %
Mid-term examination III	13 %
Final Examination (comprehensive)	20 %
Participation	10 %
Lab	16 %
Homework Problems	15 %

Cut-Points for Letter Grades

In percentages your letter grade will be assigned as follows:
A = 93.5 (and above), A- = 89.5 to 93.4,
B+ = 86.5 to 89.4, B = 82.5 to 86.4, B- = 79.5 to 82.4,
C+ = 76.5 to 79.4, C = 72.5 to 76.4, C- = 69.5 to 72.4
D = 60 to 69.4, F = below 60.

Examinations
There will be three examinations (see course schedule for dates). The examinations will test your understanding of the major concepts in the course and focus on both statistical calculations and the "big picture." All examinations are based on a combination of lecture material, class discussions, textbook information, assignments, and handouts. Each exam will be preceded by a review in lecture of the information that will be tested. In addition to this, assigned vocabulary and problems from the text book will serve as your study guides for the exams.

Homework in the text and Calculator
The Kiess and Green text book is essential for the course. Not only will the text book prepare you to better understand the lecture materials, it also contains the statistic problems and vocabulary that you are expected to turn in as homework. Homework will be evaluated on the basis of "genuine effort" rather than precisely correct answers. Thus, if your work manifests a true attempt to calculate a correct solution, you will be given full credit for the homework.

You MUST have a hand calculator that has a memory and takes square roots to execute the homework problems. Your calculator will be necessary for the exams as well. Bring your calculator to the exams.

Mandatory Attendance and Participation
Our understanding of statistics increases incrementally in a continuous step-wise fashion over time. You *must* come to lecture and take part in the discussions if you hope to realize this incremental growth. We cover a broad range of statistical concepts in Psyc 274. The content is not difficult to understand if you read the text and come to lecture prepared to take part in the discussions.

Participation points will be earned during lecture by writing down responses to impromptu questions. The responses do not need to be correct to obtain full participation points; they simply need to be appropriate responses. You should bring paper on which you can write down your responses; these participation sheets will be turned in at the end of lecture. Responses will not be accepted via email. To obtain full participation, your participation sheet must be turned in at the end of each respective lecture with your name and the date of the lecture on the participation sheet.

Missed Participation, Assignments, and/or Examinations
Missed participation/class-exercises and examinations cannot be made up and will result in a grade of zero. Students who experience medical emergencies preventing them from attending class on days where class exercises, quizzes, or examinations are scheduled are required to provide original documentation from their physicians within one week explaining their absence. USC athletes should meet with Dr. Breland by the end of the second week of the semester regarding their scheduled athletic events that may conflict with course requirements. *Students honoring religious holy days are treated in a similar fashion*. Exams will be rescheduled for those whose absences are excused. Participation and class-exercises can be made up (when excused) by writing four-page papers on topics as assigned by Dr. Breland. You are responsible for submitting requests for these make-up assignments within one week of your absence.

Lab
The lab assignments have been designed to help you gain further experience with the statistical concepts that are discussed during lecture. The goals of the lab are: (1) to utilize a "hands-on" mode of learning, interacting with computer strategies, to reinforce basic statistical concepts; (2) to become knowledgeable about how to organize data and execute statistical analyses when using computer programs; and (3) to become multi-literate with respect to computer programs such as R, SPSS, and, to some extent, Excel.

Your LAB grade will be comprised of two parts: typical weekly "lab-assignments" and "lab-skills checkups".

(1) The typical weekly assignments are evaluated on the basis of "genuine effort." Students should be able to complete the lab assignments during the lab, but their work is not due until the following week's lab. If your work manifests a true attempt to correctly complete the lab work, you will be given full credit for the lab assignment regardless of the degree to which your work is precisely correct.

(2) There will be three short lab-skills checkups to determine the degree to which you actually have given "genuine effort" to your lab assignments. Each lab-skills checkup is scheduled to take place during the same week as the course's Mid-Term Exams. Each lab-skills checkup counts for 13% of your LAB grade. In other words, 39% of your LAB grade will result from the three lab-skills checkups and 61% of your LAB grade will result from turning in your typical weekly lab assignments, which demonstrate your full effort. You will be allowed to use your lab notes during the lab-skills checkup, but students are expected to know the software procedures well enough so that they do

not need to re-read the notes to complete the lab-skills checkups. Your lab notes can be used as a quick reference, but they should not require re-reading.

Tardy policy

There is a large amount of material to cover in this course. Tardy students (more than 5 minutes late) are disruptive to the class, and significantly retard the flow of information. If you are warned about recurring tardiness, then each time you late for class following that warning, you will lose your participation point for that particular lecture period.

Cell Phone and Electronic Device Policy

Cell phones should be turned off during class. Computers may be used for note taking purposes only. Any other usage (such as accessing Facebook, email, gaming, or working on assignments) is not permitted and will result in disciplinary action. ***Multiple infractions will result in being dropped from the course.***

Course Participation

You are expected to be prepared for class by completing the required readings BEFORE class, and should be prepared to discuss that information and respond appropriately to participation point questions.

Academic Dishonesty and DSP Arrangements

Students are held to the highest standards of ethical conduct. All the materials presented for this course in lecture, lab, discussion, sent via email, or posted on Blackboard are "all rights reserved" by the course instructor. Some of it may be copyrighted and distributed by a publishing corporation for in-class use only. You should be aware that it is a violation of student ethics to store, post, distribute, sell, or purchase any course materials with the intent of offering that material to or receive it from any student who is not presently enrolled in this course (applicable to commercial Internet sources).

You may not submit work for this class that you or anyone else has presented, even in part, for this or another class. You should be especially vigilant with regard to plagiarism (presenting someone else's ideas as your own, whether deliberately or accidentally – in whole or in part).

Students with disabilities and/or special needs should be registered through the University DSP and should meet with Dr. Breland regarding the arrangements approved through the DSP within the first week of entering the course. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. DSP is open Monday-Friday, 8:30-5:00, their phone number is (213) 740-0776.

Special Notes

1 This course is challenging and 100% attendance is expected of all students. It is clear that students who attend class regularly, stay up with the readings, complete the assignments with full effort, and who do not leave studying until the last moment typically find that they enjoy the course more and achieve at least a C or better in this course. As in any course, work of a significantly high caliber in each of the components of this course is considered to be B (good) or A (exceptional) work.

2 All lab assignments in this course are expected to be word-processed and graphs/tables should be computer-generated. Homework may be handwritten in pen or pencil.

4 All students are expected to have access to the student computer network. It is your responsibility to ensure that your access is up-to-date during the semester.

5 Tutors may be available for this course through the Center for Academic Support (213-740-0076). If you should find that you are not doing as well in this course as you would like, please see me immediately. The longer you delay, the more you will disadvantage your ability to do well.

Weekly Homework Assignments Will Be Provided Across the Semester as Relevant to Each Exam

Psyc 274 Course Schedule

Wk #	Date	Lectures	Labs	Assigned Readings
1	1/13	Introduction to class Foundational Concepts	No Lab during first week of semester	Reference: *Text* *Chptr. 1, 2*
2	1/20	***Monday – University Holiday – MLK B-Day*** Descriptive Statistics of Sample Data Distributions, Measures of Central Tendency	Lab 1 Expect: Introduction to the Lab and Lab computer software	Reference: *Text* *TBA*
3	1/27	Measures of Variability, Normal Distributions, Probability, and Standard Scores	Lab 2 Expect: Scales, Distributions, and Graphs	Reference: *Text* *TBA*
4	2/3	Use of Statistics for Inference and Estimation	Lab 3 Expect: Measures of Central Tendency and Dispersion	Reference: *Text* *TBA*
5	2/10	**** Mid-Term Exam during 2nd lecture*** Review of Relevant Chapters	***1st 30 minutes of Lab:*** ***Lab Skills Checkup*** Lab 4 Expect: Characteristics of Normal Distributions	Review Readings for Exam
6	2/17	***Monday – University Holiday – President's Day*** Return of Exams and Discussion Testing Hypotheses of Population Means (z-tests vs. one sample t-tests)	Lab 5 Expect: Hypothesis Testing	Reference: *Text* *TBA*
7	2/24	Overview of Research Methodology Two group comparisons; Independent vs Paired-Samples t-tests	Lab 6 Expect: Independent Samples vs. Paired- Sample t-tests	Reference: *Text* *TBA*
8	3/2	One Factor, Between Subject Analysis of Variance Designs	Lab 7 Expect: One-factor Between Subjects Analysis of Variance	Reference: *Text* *TBA*

Wk #	Date	Lectures	Labs	Assigned Readings
9	3/2	**** Mid-Term Exam during 2nd lecture*** Review of Relevant Chapters	***1st 30 minutes of Lab:*** ***Lab Skills Checkup***	Review Readings for Exam
10	3/9	Return of Exams and Discussion Two-Factor Between Subjects ANOVA	Lab 8 Expect: Two-way Analysis of Variance	Reference: *Text* *TBA*
11	3/16	***SPRING BREAK***	***SPRING BREAK***	***SPRING BREAK***
12	3/23	Factorial ANOVA (Recap) Chi-square: Analysis of Frequency Data	Lab 9 Expect: Chi-square tests of independence vs. goodness-of-fit	Reference: *Text* *TBA*
13	3/30	Correlations Pearson's r vs. Spearman's Rho	Lab 10 Expect: Correlation, Tests of variable relationships	Reference: *Text* *TBA*
14	4/6	Regression, prediction, and linear equations Intro to Multiple Regression	Lab 11 Expect: Regressions, Equations of Prediction	Reference: *Text* *TBA*
15	4/13	**** Mid-Term Exam during 2nd lecture*** Conclude Multiple Regression Review of Relevant Chapters	***1st 30 minutes of Lab:*** ***Lab Skills Checkup*** Lab 12 Expect: Multiple Regression	Review Readings for Exam
16	4/20	Return of Exams and Discussion Review of the Course	Lab 13 Expect: Lab Wrap-up	Reference: *Text* *ALL Previous Assigned Chptrs from the Course*

Wk #	Date	FINAL EXAM	Labs	Assigned Readings
Final Exam	→	**Lecture Section 52455 (TTh 11:00 am)** ***Exam on Tuesday 5/12 11 am – 1 pm*** **Lecture Section 52475 (TTh 12:30 pm)** ***Exam on Wednesday 5/13 2 pm – 4 pm***	**< NO LAB FINAL EXAM >**	Cumulative Exam

Weekly Homework Assignments Will Be Provided Across the Semester as Relevant to Each Exam