

Advanced Psychological Statistics
California State University, Fullerton
Tuesdays & Thursdays 8:30-9:45am in H-522

Instructor: Pi-Ju (Marian) Liu, MA

Email address: pliu@fullerton.edu

Office location: H-735K

Office hours: Tuesdays & Thursdays 7:30-8am, or by appointment

Office phone number: (657) 278-2602

Teaching assistant: Anna Sudit

TA office location: **Tuesdays 10:30-11:30am, or by appointment**
(between 10-1pm Wednesdays in Irvine campus)

TA office hours: **H-515**

How to reach us: I am most easily reached via email at pliu@fullerton.edu; nonetheless, please allow a minimum of 24 hours for a response. Anna Sudit is the teaching assistant for the course, and she can be reached at asudit75@csu.fullerton.edu.

Description and goals of the course: This is a 3-unit advanced statistics course covering analysis of variance, regression, categorical data analysis techniques and applications. Psychology 201, 202, and 300 are prerequisites for this class. Students who did not take those classes need to get permission from the instructor before enrollment. The course will cover both theoretical and applied aspects of statistics. One goal of the course is to gain an understanding of research design using techniques covered in class. In addition, through the class, students should be able to evaluate datasets, and apply appropriate data analysis techniques.

Course texts: The textbook for this course is “Cohen (2007). *Explaining Psychological Statistics* (3rd ed). Wiley”. Additional readings and handouts will be posted on TITANium (access from your student portal at <http://www.fullerton.edu/>). Please check that you can access the course site and contact helpdesk if you have problems.

Other references: For statistical concepts, read “Howell (2009). *Statistical Methods for Psychology* (7th ed). Wadsworth Publishing.” For SPSS assistance, read “Field (2009). *Discovering Statistics Using SPSS* (3rd ed). SAGE Publications Ltd.”

Required equipment: A calculator, and SPSS software (available on campus). Remember to bring your calculator to class, especially on exam days. Cell phone calculator is not allowed during exam.

Course requirements and grading: Attendance and completion of assignments are required, whether taking the course for credit or auditing. The course grade will be based on the following:

10%	Quizzes
30%	Assignments
20%	Exam 1
20%	Exam 2
20%	Final

Quizzes: To foster students’ learning process, quizzes will be administered at the beginning of each Tuesday. The instructor will announce the quizzes in class, and the quizzes will cover the content covered in previous lectures. Please bring blank papers for quizzes.

Assignments: There will be five assignments during the semester. Assignments will be posted on TITANium throughout the semester. Please see the schedule for tentative due dates. These assignments will be tied to lectures and course readings. Each student can choose to work with one study partner. You and your partner may turn in joint homework for the assignments, but each student should be fully involved with all of the problems, including computer analyses and interpretations. You can switch partner from assignment to assignment. Or you may turn in individual homework if you prefer. Remember that copying answers from each other is strictly prohibited and will result in zero score for the entire assignment. You need to turn in a hardcopy of your assignment at the beginning of class on the date when the assignment is due. If you need to miss class, you can email me a copy before the deadline. No late assignments will be accepted.

Exams: There will be two exams. Exam 1 will be in-class exams on **March 26** and **March 28**. Exam 2 will be on **May 14** and **May 16**. Part of the exams will be closed-book, and part of the exams will be open-book and open-note. However, laptops are not allowed. You have to be able to attend both exams on the scheduled dates to take this course. Exam 1 will cover all materials up to the exam. Exam 2 will be cumulative, but it will focus on materials not covered in the Exam 1. Students are expected to know important topics from before Exam 1, for example, though normal distribution will be covered at the beginning of the semester, they are the background knowledge students need to possess during Exam 2. Remember to bring your Titan card for admission to the exams. Students are not allowed to leave the exam room to use the bathroom or get drink during exam hours. [Notice: No make-up examination will be given except for reason of illness or other verified emergencies. The make-up exam will be offered at the instructor's convenience, and is likely to represent a longer and more difficult version of the exam.]

Final: Final consists of two parts, a paper (12%) and a presentation (8%). Students will search for datasets of their interests, form research hypothesis, conduct appropriate analysis, and report findings. The paper has to be written in APA style (see page 5 to 7), and is due at the beginning of the class on **May 23 (Thursday)**. Be sure to bring a hard copy to class for submission. Presentations will be held in the form of conference presentation on **May 23 from 9:30-11:20am**. Again, you have to be able to attend the final presentation to take this course. More details will be given later in class.

Grading: Regulations from the psychology department stipulate major and minor students to complete the class with a letter grade of "C" or higher; a "C-" is not sufficient to fulfill the major/minor requirements. Scores will be curved to help form a normal distribution for the grades.

A+ = 97-100%	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+ = 67-69%	D = 63-66%	D- = 60-62%
F = Below 60%		

***Extra credit policy:* For students who attended and turned in all quizzes on time (at 8:45am on Tuesdays), one extra credit will be given at the end of the semester. In addition, Psychology Day will be held on April 16 (Tuesday). More information will be given regarding earning extra credits on Psychology Day.**

Accommodating students with disabilities: For students requiring extra time or other accommodations related to disabilities, I am happy to help optimize the learning experience in this course. Please provide me with written documentation prior to the first exam so that we can arrange for a mutually agreeable alternative time for the exam, or other accommodations as needed.

Class policies: I expect students to behave professionally and value other students' right to learn. To limit distractions, please avoid coming late to class, have no food during class sessions, turn off cell phones and smart phones, and leave your laptop in your bag. All written products should be the student's own work. Students should not submit papers that have been written for prior or concurrent courses. In addition, all students should review university policies on plagiarism. Plagiarism is a serious offense, even if unintentional, and is subject to serious sanctions. It is also assumed that you will:

- Attend all classes and arrange to get what you need from others if absent.
- Raise relevant questions and appropriate observations on the topic.
- Participate through reflection on both your relevant professional experiences, as well as your completion of the reading assignments.
- Depend on each other as well as me, for learning.
- Learn and have fun with statistics!

Class attendance: All students are expected to attend all class sessions. Please be on-time to class. Late students should enter the classroom quietly and take an available empty seat closest to the entrance. If students need to leave the class prematurely, be sure to inform the instructor before class starts, take the seats closest to the exit, and leave quietly during class. Students are responsible for everything that is covered in the lecture, including announcements of assignments, due dates, and changes in the syllabus. You will need to take notes, but you are expected to use something other than a laptop or other electronic device to do so. If you are unable to come to class, please arrange to get lecture notes from fellow students.

Cell phone and other electronic device use: Cell-phones and smart-phones use are prohibited in the class. Please turn off any ringing or beeping electronic device before class starts. Students are expected to take notes without a laptop. During some class sessions, you might want to operate your laptop to follow instructor's SPSS demonstration. This is the only time when laptops are allowed in class. Nonetheless, if students are found checking emails or browsing websites unrelated to the class, they cannot use laptops during class anymore.

Disruptive behaviors: Since this is not a noon/evening class, eating is not allowed during class sessions. Drinks are fine. Please do not carry on a personal conversation during class. Chatting with other students is distracting, and highly disrespectful to fellow students' right to learn. According to the Student Responsibility Code of the Psychology Department, "a student responsible for continual disruptive behavior may be required to leave class pending discussion and resolution of the problem." (Please refer to Student Responsibility Code from page 8 to 10 for detailed responsibilities as a student.)

Academic honesty: Written work you submit must reflect your own work and completely indicate with citations material that came from another source. Any paper that fails to do so will receive a failing grade. "Plagiarism is a most serious offense in academia, subject to severe sanctions, including expulsion from school. Ignorance is no excuse, so it is important that you know what plagiarism is & how to avoid it. Plagiarism is presenting words or ideas of another without giving appropriate credit. Even if plagiarism is unintentional, it is still a serious breach of ethical standards in academia, and the plagiarist is subject to sanctions. The most obvious form of plagiarism is when exact words are taken from someone else's work and presented without a proper citation. Less obvious, but still plagiarism, is when ideas are taken and used without proper citation. Even if the work of another is paraphrased into your own words, you must cite the original source. Exact words must be enclosed in quotation marks and a citation given. If you draw material from a secondary

source, you must cite both the original writer and the author of the secondary source. See the *APA Publication Manual* for detailed examples of proper citation format.” (excerpt from <http://www.cgu.edu/pages/903.asp>) Please also visit the Dean of Students Office to read university policies on related judicial affairs (<http://www.fullerton.edu/deanofstudents/Judicial/>).

Tentative Schedule of Topics and Readings

1. January 29 & 31 – Course Introduction

Self-introduction on January 29.

Turn in student information card on January 29.

Initial assessment on January 31.

2. February 5 & 7 – Review of Basic Statistics (Cohen chapter 1 to 8, and 11)

3. February 12 & 14 – One-way ANOVA (Cohen chapter 12)

1st assignment due on February 14.

4. February 19 & 21 – A priori & Post-hoc Tests (Cohen chapter 13)

5. February 26 & 28 – A priori & Post-hoc Tests & Factorial ANOVA (Cohen chapter 13 & 14)

6. March 5 & March 7 – Factorial ANOVA (Cohen chapter 14)

March 5: Anna Sudit will take questions on assignment 2 & course-related materials.

*****2nd assignment due on March 7.*****

7. March 12 & 14 – Repeated Measures (Cohen chapter 15)

3rd assignment due on March 14.

8. March 19 & 21 – Correlation (Cohen chapter 9)

Mid-semester evaluation on March 21.

9. March 26 & 28 – Exam 1

Close-book in-class exam on March 26.

Open-book in-class exam on March 28.

10. April 2 & 4 – Spring Break

Class does not meet.

11. April 9 & 11 – Simple Regression & Multiple Regression (Cohen chapter 10 & 17)

12. April 16 & 18 – Hierarchical Regression

4th assignment due on April 18.

13. April 23 & 25 – Binary Logistic Regression

14. April 30 & May 2 – Nonparametric Tests (Cohen chapter 19, 20, 21)

5th assignment due on May 2.

15. May 7 & 9 – Nonparametric Tests (Cohen chapter 19, 20, 21)

16. May 14 & 16 – Exam 2

Close-book in-class exam on May 14.

Open-book in-class exam on May 16.

17. May 23 – Final

Final will be held from 9:30-11:20am on May 23 (Thursday).

The above schedule is subject to change in case of unforeseen events (e.g., natural disasters) or topic shifts (e.g., we decided to spend additional time on certain topics). Readings and due date for assignments may also vary given progress in the course. The instructor and the department reserve the right to revise this syllabus, verbally or in writing. Students are responsible for materials indicated above, whether explicitly discussed in class or not.

Reporting Experimental Results

In most scientific fields, experimental reports are written in a specific format. There are two very good reasons for this. First, the format makes it easier for the reader to know where to look for information on a particular point. It is not necessary to read the entire article to find it. Secondly, the standard format makes the report easier to write. The author is spared all problems dealing with the literary structure of the report. The format specifies in which section of the report one should place particular types of information about the experiment. Thus, while writing the report, the author can focus on each section without having to make decisions about what information does or does not belong there.

Here are the headings for the different sections that make up the experimental report given in their order of appearance. **The paper is double-spaced throughout.** Do not move to a new page at the end of a section to start the next section. The only exception is the abstract which appears on its own page and the reference section which starts on a new page.

1. **Cover sheet:** with title and author's name and affiliation. Include the names of any collaborators on the experiment, but underline your name so we know who wrote the report. The title should refer to the major variables or theoretical issues you have investigated.

2. **Abstract:** The abstract appears on the second page of the manuscript and is the only section on this page. It is typed as a single paragraph and should be between 100 and 175 words. The abstract is a brief summary of the content and purpose of the report. It should be self contained and fully intelligible without reference to the body of the paper. It should include succinct information about the experimental problem, method, results and conclusions. Variables or techniques which are important in the experiment should be specifically mentioned. One way to write an abstract is to write one or two sentences for each section of the report.

3. **Introduction:** The purpose of the introduction is to state the specific research problem under study and to explain its importance in a broader context. In other words, you should explain what you are doing in the experiment and why. The introduction should include: a brief review of

previous work in the area with a clear explanation of the relationship between this work and the problem under study; a brief discussion of relevant theories and how they are related to the problem; a preview of the particular methods used in the experiment with perhaps a statement of the independent and dependent variables; finally a statement of the experimental hypothesis.

4. **Method:** The purpose of the method is to describe exactly what was done in the experiment. The information should be specific enough that the reader could perform precisely the same experiment and thus independently verify the results. The method is usually divided into the following subsections, which begin with their headings. **Participants.** This subsection gives information about how many people participated in the study and demographic information that is relevant, e.g., sex, age, and educational level. Other information should be included when it is relevant to the problem under study; for example, in experiments involving auditory perception it would be important to report whether participants had normal hearing. You should always state how participants were selected, e.g., through local schools, in dormitories, by answering an advertisement, etc. **Apparatus and materials.** This subsection describes the equipment and stimuli used in the experiment. There are experiments which use no equipment, for example a study of memory span for words in which words are presented on a card and the subject writes the response on a sheet of paper. In this case the subsection would be titled just "Materials," and would describe the words, i.e., how many syllables, parts of speech, and how they were selected. **Procedure.** This subsection would summarize each step in the execution of the experiment, as experienced by the participant, from beginning to end in chronological order. One way to organize the procedure subsection is to think about what was done to a subject from the beginning of the experiment to the end. It should also include information about the experimental design, e.g., were variables manipulated between or within participants; what was the order of presentation of the variable, e.g., were the different variables presented in "blocked" or "random" order? Instructions should be summarized.

5. **Results:** The results section presents a summary of the data collected in the experiment, usually by reporting mean number or percent. First, state the main finding of the experiment. You should be very careful to state only what the data show, not an interpretation of the data. There is usually data to be presented in tables and figures. You must verbally describe in the results section any tables or figures you wish to include. You should refer to data concerning the effects of all independent variables, even if they are counter to your hypothesis. If you know the proper statistical tests to perform on your data, by all means perform the tests and report the results. However, it is of no use to anyone for you to find a statistical test that you do not understand and apply it blindly in a "cookbook" fashion. The descriptive statistics (means, percentages) are what the reader wants to know, and they should be presented clearly and completely.

6. **Discussion:** In the discussion, you should first evaluate your results with respect to your original hypothesis. You might also give attention to the implications of the results for the theoretical issues raised in the introduction. You should note any differences between your results and the previous research reviewed in the introduction. You should state clearly and directly what conclusions can be drawn from the study.

7. **References:** The reference section begins on a separate page. In it you must list all references cited in the experimental report. It is assumed you have read all references cited. The references must be listed in the references section according to a specific format, the rules of which are given below. The rules are all exemplified in the illustration that follows. In the text, refer to an article by citing the last name of the author or authors, and put the date of the article in parentheses: "According to Burke (1990)". If there are two authors, cite thusly: "Hackl and Burke (2004)

showed that ...". If there are three or more, name them all in the first citation, but thereafter refer to the paper by mentioning only the first author, followed by "et al." and the date if appropriate.

In the references. For articles, the format is

Last name, I., Last name, J., & Last name, K. (Year), Title. Journal Name, vol. #, page to page.

For books the format is

Last name, I., Last name, J., & Last name, K. (year). Title. City: Publisher.

Examples of the reference section looks like this.

References

Beatty, W. R., Gray, T. J., & Nemo, C. (1990). Ingestion of flies by Venus' flytraps (*Dionaea muscipula*): A failure to replicate. *Journal of Plant Behavior*, *16*, 269- 275.

Bump, V. R. Y. Sand, grit, and other dirt. (2000). *Bulletin of the Atomic Botanist*, *82*, 596-604.

Ison, K. B., & Gray, T. J. Forgetting in plants and elephants. In T. M., Mason & J. K. Jarr (Eds.) (2004). *Learning is where you find it*. New York: Mediocre Press.

Kamano, M. *The neurophysiology of American plants*. (2001). Outlandish, N. J: Bench Press.

8. Tables and figures: Tables are placed after the reference section and they are followed by figures. Number all tables with Arabic numerals in the order in which they are first mentioned in text. Give every table a brief but clear explanatory title. All graphs, charts, and illustrations are called figures when mentioned in text. Number all figures consecutively with Arabic numerals. Each figure should have a caption that describes the contents of the figure in a brief sentence or phrase.

DEPARTMENT OF PSYCHOLOGY

Student Responsibility Code

The Department of Psychology is dedicated to providing you with the highest quality educational program. In order to maximize the benefits of our program, it is important that you meet your responsibilities as a student. Listed below are some of the responsibilities to be met.

Advisement – Please familiarize yourself with university and departmental policies and deadlines.

You should obtain and read pertinent sections of the University Catalog, Class Schedule booklet, and instructor course outlines. If you are a psychology major or minor, you should read the Psychology Student Handbook and meet with a psychology undergraduate advisor (Room H-830J) at least once a year to review your study plan and career goals. The Handbook is available to you at no charge from the Psychology Department Office (H-830M) or from the Psychology Undergraduate Advisement Office (H-830J). Please also consult <http://hss.fullerton.edu/psychology> for further information.

Class Attendance – Please remember that you are responsible for attending all classes and laboratory meetings, and for being on time. The benefit you derive from your education is often lost if you are lost too!

The Learning Environment – Please be mindful of your fellow students and the instructors.

Behavior that persistently interferes with classroom activities may be subject to disciplinary action. Such behavior may include, but is not limited to, cell phones or beepers ringing, entering the class late, leaving the class prematurely, eating in class or chatting with other students during class. A student responsible for continual disruptive behavior may be required to leave class pending discussion and resolution of the problem.

Workload – Please be realistic in adjusting your outside responsibilities (work, family, social obligations, etc.) in order to allow sufficient time for your education.

In order to receive a quality education, you must not overload yourself. As a general rule, you should allow two to three hours of study outside of class, for each hour spent in class. Additional information on this topic is discussed in the Psychology Student Handbook.

Academic Integrity – The world of academia is completely dependent on straightforward honesty and integrity, and it protects these values in many ways. Your ability to think of yourself as an educated person depends on these same values. For these reasons the University imposes serious penalties for breaches of academic honesty and cases of suspected breaches of honesty may be reported. Please familiarize yourself with the academic integrity guidelines found in the current student handbook.

- o Work produced through academic misconduct (e.g., cheating on exams, plagiarism) will be dealt with according to the policies of the academic integrity guidelines. Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. Since dishonesty in any form harms the individual, other students and the University, policies on academic integrity are of great concern to us all.
- o Your exams, homework, research reports, and term papers should reflect your own work, unless your instructor directs you otherwise.
- o Proper methods of referencing outside sources of information should be used at all times. Additional information on this requirement may be obtained by reading the University Catalog section on Academic Dishonesty.

Special Needs – If you need special assistance in the classroom, please inform the instructor in order to facilitate contact with Dr. Paul Miller at the office of Disabled Student Services located at UH-101, (657) 278-3117.

*If you have any questions concerning the above responsibilities,
please contact your psychology instructor or the Psychology
Department Chair. Rev. 8-07*

**Emergency Procedures Notice to Students (from
<http://www.fullerton.edu/emergencypreparedness/>)**

The safety of all students attending California State University Fullerton is of paramount importance. During an emergency it is necessary for students to have a basic understanding of their personal responsibilities and the University's emergency response procedures. In the event of an emergency, please adhere to the following guidelines.

Before an emergency occurs-

1. Know the safe evacuation routes for your specific building and floor.
2. Know the evacuation assembly areas for your building.

When an emergency occurs-

1. Keep calm and do not run or panic. Your best chance of emerging from an emergency is with a clear head.
2. Evacuation is not always the safest course of action. If directed to evacuate, take all of your belongings and proceed safely to the nearest evacuation route.
3. Do not leave the area. Remember that faculty and other staff members need to be able to account for your whereabouts.
4. Do not re-enter building until informed it is safe by a building marshal or other campus authority.
5. If directed to evacuate the campus, please follow the evacuation routes established by either parking or police officers.

After an emergency occurs-

1. If an emergency disrupts normal campus operations or causes the University to close for a prolonged period of time (more than three days), students are expected to complete the course assignments listed on the syllabus as soon as it is reasonably possible to do so.
2. Students can determine the University's operational status by checking the University's web site at <http://www.fullerton.edu>, calling the University's hotline number at 657-278-4444, or tuning into area radio and television stations. Students should assume that classes will be held unless they hear or read an official closure announcement.

MY GRADING POLICY IF CAMPUS IS SHUT DOWN
If the campus is shut down for the rest
Of the semester and I am required to
post course grades anyway, then your
grade may be based only on the work you
submitted prior to the shutdown (eg.,
papers, exams). There may be no further
exams or assignments. Therefore, you
should do your best on every exam and
assignment because they may end up being
the total basis for your course grade.
IN CASE OF A SHUTDOWN, CHECK YOUR CSUF
EMAIL FOR FURTHER INSTRUCTIONS REGARDING
THIS COURSE.

EMERGENCY CALLS**DIAL 9-1-1**

All campus phones and cell phones on
campus reach the University Police
Department

Non-emergency line: (657) 278-2515

24-hour recorded emergency
information line:
(657) 278-4444