Psychology 420: Advanced Statistical Methods
19201 12:30-1:45pm MW in SH 365
Lab 19202 2-2:50pm MW SH 363
Lab 19202 3-3:50pm MW SH 363

Information:

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Phone: 677-3898 **Office**: ST 302 **Office Hours**: 3:30-4:30pm M or by appointment
TAs
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Textbook:
Required:
Tabachnick, B. G., and Fidell, L. S. (2007). *Experimental Designs Using ANOVA*. Belmont, CA: Duxbury.

Recommended Supplemental Texts:
Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multipleregression/correlation analysis for the behavioral sciences* (3rd Ed.). Mahwah, NJ: Erlbaum.

Course Description
Univariate analysis of psychology research data using computational methods as well as packaged computer programs. Standard techniques with applications in psychology are covered. Choice of analytic technique is discussed, as are methods of screening data to assure appropriateness of techniques. Lab provides direct experience with computing facilities for conducting univariate analysis and computational methods extending statistical analysis provided by computer output.

Catalog
Explores the relationships between advanced statistical methods and psychological research methods. Advanced techniques of analysis of variance and regression analysis are emphasized. Lab considers problem-solving techniques and advanced computational methods needed to analyze data obtained in complex psychological experiments.

Exams:
Midterm examinations are scheduled for **Monday, October 10th and Wednesday, November 16th.** Each midterm examination will consist of 2 parts; one will be given during regular class and the other will be given during the lab time. Each part will consist of T/F, multiple-choice and short answer questions. Content for each midterm examination will be drawn from the assigned readings, the lecture material for the first part and the labs for the second part.

The final exam is scheduled for **TBA.** The final will consist of the same format as the 2 midterms and be approximately as long.

If any of these dates present a particular problem for you, please see me as soon as possible. Due to the rapid pace of the course and the large number of students enrolled, make-up exams are extremely difficult to arrange unless they are scheduled in advance. If you miss an exam without prior notice, please ensure that you have appropriate documentation to support your absence. I will deal with these situations on a case-by-case basis.

Grades
Class Grading:
Midterm 1   (Mon 10/10)   T/F, Multiple Choice, Short Answer questions
Midterm 2   (Wed11/16)   T/F, Multiple Choice, Short Answer questions
Final   (TBA)   T/F, Multiple Choice, Short Answer questions
Labs   9+ lab assignments throughout the semester

Your grade in the class will be based on three exams and labs.
Exams: There will be three exams worth 100 points each; a total of 300 points
Lab Assignments: There will be graded lab assignments worth a total of 100 points.

As you will learn in the course, the distribution of scores can be described in a standardized way. A **Z-score** is a standardized score which indicates how far a particular score is away from the mean (or average) score in terms of standard deviations (a measure of how wide a distribution is). Exam scores that are above the mean will have a positive Z-score, exam scores below the mean will have a negative Z-score.

Exam Grade Estimation
First convert your raw test score and convert it to a Z-score using the Z formula:

$$Z_{testscore} = \frac{X_{\text{raw test score}} - \overline{X}_{\text{test mean}}}{s_{\text{test standard deviation}}}$$

This formula is not something you should be familiar with right now, but before your first exam you should understand this formula, what it means and how to interpret you grade based on the Z-score you receive.
Using you raw score, the mean and standard deviation of the scores to calculate your Z-score you can then look up your Z-score on the table below to see your grade estimation

$$
\begin{array}{rcl}
.57 \text{ or above} & = & A \\
.43 & = & A- \\
.16 & = & B+ \\
-.16 & = & B \\
-.43 & = & B- \\
-.57 & = & C+ \\
-.84 & = & C \\
\text{Below } -.84 & = & C- \\
\end{array}
$$

You grade in the class will be determined by either your average z-score on the 3 exams and your homework or your z-score on your total score (i.e. adding the exams and homework together). I will calculate your grade both ways and you will receive the better of the 2 grades if there is a difference.

Lab Grading:
Your labs will be graded and you will receive a grade based on your scores on 9 laboratory assignments that will help your overall score in the class/lab. You will receive the same grade for all 4 units of the class/lab. These labs are intended to teach you how to analyze data using "by hand" methods as well as statistical programs available to you in the stats (and others) lab.

Exam difficulty
The exams are **DIFFICULT**. The scores are curved so this is really not a problem. In fact, hard exams are good because they allow the students who know more to distinguish themselves from those who don't know very much. An exam that is too easy does not allow for a wide enough spread in the distribution. Some of the exam questions will be similar to questions in the book or examples done in class. Some of the questions will require you to understand the concepts well enough to relate them to each other in a potentially novel way.

Formula Sheets
You will be allowed a single sheet (1 side of an 8½ by 11 sheet) for the first exam, 2 sheets for the midterm and 3 for the final. You need to understand the concepts in the class and the formula sheets are only to assist in the application of formulas. It is imperative that you know the material well because the time allotted for the tests assumes you know the conceptual material, can analyze the data and can do it quickly. **Every student is required to put together their own formula sheet(s). No Xeroxing of formula sheets for distribution.**

Academic Dishonesty
       Cheating: Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
       There are five categories of cheating:
- Possession of unauthorized material,
- Misrepresentation of one person as another,
- Substantial editorial or compositional assistance,
- Resubmission of material already graded for credit, and
- False or fabricated claims, data or references.

       Fabrication: Intentional falsification or invention of any information or citation in an academic exercise.
       Facilitating academic dishonesty: Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.
       Plagiarism: Intentionally or knowingly representing the words, ideas, or work of another as one's own in any academic exercise.

Academic Dishonesty can result in three possible courses of action:
1. Assigning a lowered or failing grade on the assignment or the entire course WITHOUT notifying Assistant Vice President for Student Life and WITHOUT further disciplinary action (e.g., expelled, suspended, placed on probation or other lesser sanction)
2. Assigning a lowered or failing grade on the assignment or the entire course WITH a notification to Assistant Vice President for Student Life but WITHOUT further disciplinary action (e.g., expelled, suspended, placed on probation or other lesser sanction)
3. A request to the Assistant Vice President for Student Life for further disciplinary action (e.g., expelled, suspended, placed on probation or other lesser sanction)

Needless to say, everyone hates a cheater/plagiarizer. If you are caught at a minimum you will be assigned a Zero for that assignment(s) or exam(s) and we will notify the office of the Assistant Vice President for Student Life so that there is record of the cheating/plagiarism. Note: we have had a lot of experience at catching cheaters, so just don't do it, it really is not worth it. The time you spend creating some elaborate cheating scheme could be used to actually study; without the risk.

<u>Virtual Software Library</u>
To access the VSL please log into https://vsl.csun.edu with your username and password.
- Students will find (and should read) the **Quick Setup Guide** and **FAQ**. A YouTube video is also posted for those students less inclined to read the guide.
- **Supported browsers** - IE, Firefox, Safari (others may also work, however if issues occur, please fall back to the supported browsers). Also works on Ipads, Iphones, and Android mobile devices (by downloading the Citrix Receiver agent from Itunes or the Android Marketplace and connecting to mobilevsl.csun.edu). Instructions are included in the User Guide
- Students will need to **install the Citrix plug-in** (one-time only) and will be prompted to do so when logging in for the first time
- **Virtual storage is available - 'My Documents'' vslfiles.csun.edu** -- students have access to virtual storage for related coursework material (related to ArcMap, SPSS, CS5, Mathematica, etc.) when using the VSL this semester. To access from within an application such as SPSS, Mathematica, CS5, or ArcMap, simply 'file/open' or 'file/save' and find 'My Documents – vslfiles.csun.edu' in the list of options. Students can also save to their local computing device hard drive or flash drive.
- **For ANY questions or issues, students should contact the IT Help Center** via **online chat session** (http://www.csun.edu/it/helpdesk), **phone** (818.677.1400), or **email** (helpcenter@csun.edu).

Tentative Class Schedule

Week	Day	Date	Topic	Chapter	Lab
1	M	8/29	Intro and Review	1 & 2	#1
	W	8/31			
2	**M**	9/5	**Labor Day**		
	W	9/7	Basic ANOVA and GLM	3	#2
3	M	9/12			
	W	9/14	Fixed Effects ANOVA	4	#3
4	M	9/19			
	W	9/21			
5	M	9/26	Factorial FE ANOVA	5	#4
	W	9/28			
6	M	10/3			
	W	10/5	**Review**		
7	**M**	10/10	**Exam 1**	**Ch. 1-5**	
	W	10/12	Repeated Measures ANOVA	6	#5
8	M	10/17			
	W	10/19	Factorial RM ANOVA	7	#6
9	M	10/24			
	W	10/26			
10	M	10/31			
	W	11/2	Mixed ANOVA	8	#7
11	M	11/7			
	W	11/9			
12	**M**	11/14	**Review**		
	W	11/16	**Exam 2**	**Ch. 6-8**	
13	M	11/21	ANCOVA	9	#8
	W	11/23	**No Class**		
14	M	11/28	ANCOVA	9	#8
	W	11/30			
15	M	12/5	Random Effects ANOVA	10	#9
	W	12/7			
16	**TBA**		**Final**	**Ch. 9 & 10**	