Intermediate Statistics
PSY 491P Spring 2015

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Prerequisites: 2.5 GPA; 15 PSY credits including PSY291 or 292 and 390 (or 204 and 316)

			Topics	Readings & Homework
Block #1 Hypothesis testing and t-tests				
Jan	13	Tu	Course Introduction	Review your own notes from Psy 204 review properties of Normal curve
	15	Th	Review descriptive statistics	Howell Chapters 2 & 3
	20	Tu	Descriptives/Normal curve/Inferential	**Hmwk #1** : www.ruf.rice.edu/~lane/rvls.html get handout (Due Jan 29)
	22	**Th**	**Test#1 part A (50 points)**	
	27	Tu	Chapter 7: *t-tests*, confidence limits and SPSS output	**Hmwk. #2**: Green Lessons 22, 23, 24 use SPSS (Due Feb 5)
	29	Th	Power and Effect Size	Howell Ch 8, p. 225-230 & sections 8.7 to 8.9
Feb	3	Tu	Continue Ch 8 and nQuery	
	5	Th	Green et al. Lessons 22 through 24 on t-tests	
	10	**Tu**	**Test#1 part B (50 points)**	
Block #2 Between groups ANOVA				
	12	Th	Go over test # 1, Start ANOVA	
	17	Tu	Simple Analysis of Variance	Ch 11 Howell skip 335-342 & sections 11.12 to 11.13 **Hmwk #3** Green Lesson 25 (Due Feb 26)
	19	Th	finish ch 11	Treat lesson 25 as significant & do follow-up tests
	24	Tu	Multiple Comparisons	Ch 12 Howell read 363-top 377 & read 12.10 **Hmwk # 4** Choose appropriate statistical test
	26	Th	Multiple Comparisons	see Blackboard (Due Mar 5)
Mar	3	Tu	Factorial Analysis of Variance	Ch 13 Howell read 413to middle of 426
	5	Th	Finish Ch 13	**Hmwk # 5** Green Lesson 26 (Due Mar 19)
	10 & 12		**Spring Break**	
	17	Tu	Finish 2-way and Simple Effects	
	19	Th	Continue simple effects and review for exam	
	24	**Tu**	**Test # 2 (100 points)**	

Block #3 Within group (Repeated Measures) ANOVA and Regression

	26	Th	Go over test#2, begin Chi square	**Hmwk #6** Green lessons 40 & 41 ex #1 (Due Apr 2)
Apr	31	Tu	Finish Chi Square	Ch 14 Howell read through 14.6 and also section 14.11
			Repeated Measure ANOVA	**Hmwk # 7** Green Lesson 29 (Due Apr 9)
	2	Th	Repeated Measures ANOVA	
	7	Tu	Repeated Measures ANOVA	
	9	Th	Multiple Regression	Ch 15 Howell p. 515-561 or up through 14.14
	14	Tu	Multiple Regression	**Hmwk # 8** Lesson 34 (Due Apr 23)
	16	Th	Partial correlation & Covariance	
	21	Tu	Dummy coding, ANCOVA & cross validation	**Hmwk # 9** see blackboard (Due May 1)
	23	Th	Review for final exam	

The Final Exam: (Thursday Apr 30, 11:00-1:30) (100 points)

TEXT: 1) Statistical Methods for Psychology (7th or 8th ed.), David Howell, Wadsworth Cengage, 2010, 2013

2) Using SPSS for Windows and Macintosh: Analyzing and Understanding Data (6th or 7th ed.) by Green and Salkind, Pearson Prentice Hall, 2011 or 2014

This course assumes a working knowledge of basic statistics. It is aimed at students who are good math students and who plan to seek graduate training that will involve research.

More about the Prerequisites for this course:

I have taught this course for many years, but this is the first time that I expect all students to actually be well prepared for an advanced course in statistics. All of you should have had PSY 291, 290 and 390. In the past students had only had the equivalent of PSY291 and moving on was difficult. I used to plead with students to review their notes from 291, but that did not work well for many. This time I hope that you will require less review, so I will give you an exam next Thursday on things you should already know. This will give all of us a better idea of where to begin.

Your responsibility:

This course will cover some difficult topics. If you become lost or confused and have done the reading and tried to answer your own question without success, please come to office hours and talk to me. During lecture if you become confused about what I just said, **ask a question right then!** This is your responsibility! I am not a mind reader! If you are confused you need to let me know somehow.

Consider forming a study group with fellow students. Such groups work very well in my graduate statistics course.

Begin to **learn actively** (as opposed to passively). Don't just read what you're told to read when you're told to read it. If the book is talking about power and you are lost, it's time to review power. If the book is talking about repeated measures designs and you haven't a clue, review that topic. If I try to cover everything this will just be Psy 291 all over again.

Finally, make an effort to participate in class. Overcome the by-stander-effect. Don't be afraid to give a wrong answer. You're probably not alone in your thinking and your bravery will undoubtedly help others. Likewise don't be afraid to be right. Your fellow students don't really hate smart people, they respect them and so do I.

Why learn Statistics?

Math is the most powerful tool ever invented by mankind. It helps us see through our own desires

and prejudices to help us uncover truth. All humans including scientists are biased in too many ways to count, but math and the scientific method, when applied correctly, can cut through this fog and help us see clearly.

In my experience, more people wash out of or give up on graduate school because of statistics than any other factor. A course like this will go a long way toward making graduate school more manageable. Trust me. So, keep your motivation up and work hard. What you get out of this course will be tied to what you put in.

Main Objectives of the course

1. You should learn to choose the correct statistical procedure for analyzing a set of scores.
2. You should understand effect size and power as they relate to any analysis.
3. You should learn to generate and interpret SPSS output for basic methods (t-tests, ANOVA, Chi Square and Regression).
4. You should learn to write up your findings in APA format.

Grades

Course grades will be based on three100 point exams and up to 100 points worth of quizzes, essays, attendance and/or homework. Class participation and attendance will be noted and may influence your grade. Students who appear motivated and who participate in class may benefit in their final grade. I recognize this is subjective. My intention is to reward serious effort when appropriate.

Homework

When I assign a homework lesson in Green et al., I want you to read the entire lesson carefully, follow the example worked out in the book, generating the same output using SPSS, and study the APA style conclusion. Then open the **first exercise data file** and generate an output **the way I have explained it in class**. (My approach may differ somewhat from the Green approach.) You do not need to answer the specific questions asked by Green for that exercise, just produce the relevant SPSS output and type a brief APA style conclusion. Attach the conclusion to the output and submit both with your name and homework number on it. Most students cut and paste the output and type their conclusions neatly. Each homework done correctly and turned in on time earns up to 10 points in this roughly 400 point course.

Green's conclusions are often lengthy. On exams and on the homework I expect you to be brief and to the point as in the following conclusion for a t-test.

> Men (M = 70.2 inches, SD = 5.13) were taller than Women (M = 65.3 inches, SD = 6.33), $t(39) = 4.81$, $p = .0013$, Cohen's $d = .85$ indicating a large effect.

The Green et al. book provides answers to exercise problems in the back of the book. Check those answers only after you have done your best. **Never copy an answer from the book.**