

**Psychological Statistics, Research Methods and Design (Draft 8/23/07)**  
**PSY 631T Fall 2007**

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**Topics**

**Readings & Homework**

**Block #1 Hypothesis testing and t-tests**

Aug 23 Th Variability, Hypothesis testing,  
Normal distribution, GLM

Howell Chapters 1- 4  
Underlying Model p. 299-300

28 Tu z-test, t-tests, F test  
Sampling distribution of the mean  
Central Limits Theorem

Howell Chapter 7

30 Th Power and effect size

Howell Chapter 8

Sep 4 Tu Writing up t-tests APA style

HmWk: Green et al. lessons 21, 22, 23

**6 Th Test # 1 (20% of grade)**

**Block #2 Independent Groups ANOVA**

11 Tu Simple 1-way ANOVA

Howell Chapter 11

HmWk: Green et al. lesson 24

13 Th Continue 1-way ANOVA

18 Tu Multiple Comparisons

Howell Chapter 12

20 Th Post hoc and planned comparisons

25 Tu Factorial ANOVA

Howell Chapter 13

HmWk: Green et al. lesson 25

27 Th Continue factorial ANOVA

Oct 2 Tu Simple effects testing

4 Th Review for exam

**9 Tu Test # 2 (30% of grade)**

**Block #3 Within group (Repeated Measures) ANOVA**

11 Th Repeated Measure ANOVA

Chapter 14

16 Tu Repeated Measures ANOVA

18 Th Repeated Measures ANOVA

23 Tu Mixed (split-plot designs) Chapter 14

25 Th Finish mixed designs

30 Tu Regression/ Multiple regression Chapter 15

Nov 1 Th

6 Tu Analysis of Covariance and the GLM Chapter 16

8 Th

13 Tu

15 Th

20 Tu

22 Th **Thanksgiving**

27 Tu

29 Th

**The Final Exam: (up to 50% of grade) (Tuesday December 11 5:00 to 7:30)**

**TEXT:** 1) Statistical Methods for Psychology (6th ed.) by David Howell, Thompson Wadsworth, 2007  
2) Using SPSS for Windows: Analyzing and Understanding Data (4th ed.)  
by Green and Salkind, Pearson Prentice Hall, 2005

1. Although I have been teaching at UM for 30 years this semester, this is the first time I've taught this course. I don't yet know what to expect from you, I have my well-established teaching and assessment methods, but you are an unknown. The syllabus reflects my uncertainty. The first half of the semester will influence what we can accomplish during the second half. I plan to revise the syllabus one or two times during the semester. I will also be adding a few homework assignments and possibly a few quizzes. I think you should know that I have a very high opinion of our graduate students. I expect you all to be highly motivated and highly capable. So I expect you to be the best group of students I've ever taught. Is that too much to ask?

1. I hope that you are a self-motivated learner who learns 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 review everything, this will just be undergraduate Introduction to Statistics all over again.

### **Why learn Statistics?**

Math is the most powerful tool ever invented by mankind. It helps us to see through our own desires and prejudices and helps us uncover the 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 more clearly.

More importantly, you are on your way to becoming a professional Psychologist and the methods of this course are the methods of your discipline. I'm sure you chose psychology because you want to work with people, but I hope you know enough now to understand that working effectively with people requires working with numbers, math probability and statistics. Human abilities, characteristics,

interests etc. must be quantified and analyzed if we ever hope to positively affect those things. So statistics and research methods are not necessary evils, they are the very tools that enable progress in our field. Embrace the methods that will enable you to read, comprehend and engage in the science of Psychology.

More practically, a good understanding of statistics and methods will make you more employable upon graduation.

### **Main Objectives of the course**

1. You should learn to choose the correct statistical procedure for analyzing a set of scores.
2. You should learn about all the various uses of ANOVA
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)
4. You should learn to write up your findings in APA format.

### **Grades**

Course grades will be based on three 100 point exams. In addition there may be some quizzes, essays, and/or homework. Class participation and attendance will be noted and may positively influence grading. In other words 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.