There will be no review of basic statistics or research design issues in this course. It is assumed that you now have a solid background in these basics. If not, you will have to see me during office hours or after class to get advice on how to proceed.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Readings &amp; Homework</th>
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<tr>
<td>Aug 26</td>
<td>Introduction to the course</td>
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<tr>
<td>Sep 2</td>
<td>Normal distribution, GLM Central Limits Theorem</td>
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<td>4</td>
<td>z-test, t-tests and ANOVA</td>
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<td>9</td>
<td>Run three t-tests and discuss APA style write up</td>
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<td>11</td>
<td>1-way ANOVA</td>
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<td>16</td>
<td>Finish 1-way ANOVA</td>
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<td>18</td>
<td>Multiple Comparisons</td>
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<td>23</td>
<td>Post hoc and planned comparisons</td>
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<td>25</td>
<td>Review for exam</td>
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<td>Test # 2</td>
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<td>Oct 2</td>
<td>Factorial ANOVA</td>
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<td>Simple effects testing</td>
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<td>9</td>
<td>Finish ANOVA, Three and four-way</td>
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<td>Expected Mean Squares</td>
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<td>16</td>
<td>Fall Recess (Oct 16 to 19) No Class</td>
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<td>21</td>
<td>Nested designs</td>
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<td>23</td>
<td>Transforming data</td>
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28  Tu  Test #3

30  Th  One-Way Repeated Measures ANOVA  Chapter 14

   HmWk # 4 Green lesson 29.
   Due Nov 6

Nov 4  Tu  Mixed (split-plot designs)  HmWk #5: on SPSS run Howell Data sets
   Due Nov 18

6   Th  More on mixed designs
11  Tu  Finish mixed designs, start regression

13  Th  Regression/ Multiple regression  Chapter 15
   HmWk #6 Stepwise and venn diagrams
   see blackboard assignment. Due Dec 4

18  Tu  Running regression on SPSS

20  Th  Partial and semi-partial correlations, stepwise regression

Thanksgiving Recess (Nov 22 to Nov 30) No Class

Dec  2  Tu  Finish Regression: Dummy coding, mediation, moderation and cross validation

4   Th  Chi Square (other non-parametric tests)  Chapter 6
9   Tu  review for exam  HmWK #7 Green lessons 40 and 41
   Due Dec 11

The Final Exam: (25% of grade) (Thursday Dec. 11th, 5:00 to 7:30)

   2)  Using SPSS for Windows and Mac: Analyzing and Understanding Data (6th ed, but any edition
   should work) by Green and Salkind, Pearson Prentice Hall

1.  I see this course as an important first step in a three or four course statistics sequence that most
    Psychology Graduate students will move through during the next 2 or 3 years. There is no substitute
    for getting a strong understanding of the basics that underlie the General Linear Model and the very
    notion of significance testing.

2.  I know that you all “want to learn”, but I also know that some students avoid doing the necessary
    reading and class preparation until days before exams. This does not work very well in statistics.
    Students who do this will often fault me for going too fast or not being clear in lecture, but lecture
    presupposes that you have done the assigned reading. 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
    with some variation in math ability. I just caution you to avoid the procrastination trap. I expect you
    to be among the best groups of students I’ve ever taught. Please come to my office hours as soon as
    you develop questions or confusions. The time to remediate is before, not after, exams. Also form
    study groups. There is no need to struggle on your own.

3.  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.

4.  Again, study groups seem to work very well! Consider forming a study group. You will probably
**Why learn Statistics?**

Math is the most powerful tool ever invented by mankind. When coupled with scientific methodologies, math 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 (and virtually any other field of study).

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

**Main Objectives of the course**

1. You should learn to conceptualize various data sets in terms of the research design that was employed and be able to articulate what was done using appropriate language.
2. This should enable you to choose the correct statistical procedure for analyzing a set of scores to answer a particular question.
3. You should learn or relearn many of the research methods and design terms needed for professional discussions.
4. You should learn much about the various issues surrounding ANOVA
5. You should understand effect size and power as they relate to any analysis
6. You should learn to generate and interpret SPSS output for basic methods (t-tests, ANOVA, Chi-Square)
7. You will come to understand the General Linear Model (GLM), which underlies all of this.
8. You will get a very basic (advanced undergraduate level) introduction to Multiple Regression
9. You should learn to write up your findings in APA format.

**Grades**

Course grades will be based on three 100-point exams, each worth about 25 % of the course grade. In addition there will be some homework that collectively adds to the remaining 25 % of the grade. Class participation and attendance will be noted and may 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.

**Course readings beyond our textbooks**

In addition to assigned readings in the Howell book and in Green and Salkind there will be 4 or 5 assigned articles on statistical topics related to the course. These will be posted on the Blackboard website under the section on Course Assignments. The first of these is entitled "The New Statistics: Why and How"