

# Applied Data Analysis:

## PSY 412, Winter 2006

CRN 24270, 4 credits

Lecture: Tues/Thurs, 10:00-11:20, 125 Chiles Center

Lab: Fri 9:00-9:50, 180 Straub

Instructor	Office	E-mail	Phone	Office Hours
Jonathan Cook	329 Straub	<a href="mailto:jcook4@uoregon.edu">jcook4@uoregon.edu</a>	346-4963	Wed 10:00-12:00
Chuck Tate	356 Straub	<a href="mailto:ctate1@uoregon.edu">ctate1@uoregon.edu</a>	346-1060	Mon 1:00-3:00

Class Blackboard site: <http://blackboard.uoregon.edu/>

### Course Goals:

This course is designed to sharpen your quantitative and analytical reasoning skills, and improve your ability to identify patterns in data, relate these patterns to substantive issues about the topic under investigation, and communicate your results and your interpretation in writing. By the end of the course you should be able to:

- generate a plan for data analysis that is appropriate to your research questions and the structure of the data
- execute your data analysis plan using SPSS
- understand and summarize the results of the statistical tests
- interpret the results in light of your research questions
- communicate your insights in writing

**Course Description:** We will cover the concepts and methods of descriptive and inferential statistics at an intermediate level. Topics will mainly focus on ANOVA, ANCOVA, and multiple regression. We may also spend some time on other techniques including chi square and non-parametric approaches. By the end of the course, you will have some understanding of each of these methods. Your understanding will vary across topics, and that is fine; statistical training is a lifelong process. We will treat you as colleagues in training and see our roles as guides, coaches, and fellow travelers. The course is designed to be difficult and rewarding. You will not understand everything, and that is okay! We are still learning, too.

**Learning Adjustments:** Contact Jonathan right away if you have been diagnosed with a learning disability (confirmed by the Academic Learning Center) or have some other special needs that may require adjustments for you to learn/understand the material. For more information about disability services, visit their web site: <http://ds.uoregon.edu/>.

## Class Requirements and Activities:

### 1. **Readings.** The primary text we will use for this course is...

Howell, D. C. (2002). *Statistical Methods for Psychology* (5<sup>th</sup> edition).

This is a good all-purpose statistics book and it is currently the text that is used in the first course of the graduate statistics sequence in psychology at the University of Oregon. Since much of the Howell text will cover the material in greater depth than we will go in this course, the assigned reading for each topic (on the last page of the syllabus) is selective. Howell provides a good reference book as you move forward in your exploration of data analysis and for this reason I encourage you to get a current copy and to keep it. If, however, you are unable to purchase a copy, there is one on reserve at the library.

You may also be given supplemental reading materials for certain topics. When this is the case, you will either be supplied with a photocopy of the reading or it will be made available online.

### 2. **Participation.** Attending class and lab are not required, but it will be difficult to learn the material if you skip class. *Turn responses and homework in on time if you are going to miss class!*

### 3. **Written responses to readings.** Every Tuesday, you will turn in a short ***\*typed\* response to the assigned reading.*** Bring two copies, one to hand in and one to refer to during class. *Your response will have two parts.* First, identify and describe the major analytic technique or topic that is being discussed in the reading and describe a circumstance in which you would use this technique (if the reading does not cover a specific statistical analysis, discuss when the topic would be applicable). Second, identify two issues or points from the chapter that you find confusing or hard to understand. Write a sentence for each, explaining what you find problematic. Responses that are turned in after class on Tuesday are considered late. ***Late responses that are turned in by Thursday earn half credit; responses will not be accepted after Thursday.***

### 4. **Homework.** Homework will be assigned every Tuesday and will be due at the ***\*beginning\**** of class on Tuesday. Homework will consist of conceptual questions and problem sets. For full credit, show and explain all work, and annotate your computer printouts. Each answer should fully explore any data you analyze and provide a thorough ***typed*** summary that explains the outcomes of all tests and their implications for the hypothesis or question of interest. All statistical notation and reporting should follow the APA guidelines from the 5<sup>th</sup> edition of the *Publication Manual*. Homework responses should be thought of as similar to the results and discussion sections of a journal article. Writing these summaries will help develop your skills at presenting and explaining analyses; crunching numbers is of limited use if you cannot present and interpret your results clearly. In order to provide timely guidance as you work on homework each week, we will post homework keys on Blackboard shortly after you turn them in. However, in order for us to be able to post the key, all homework will need to be turned in. Thus, ***unless other arrangements are made in advance with Chuck***, late homework that is turned in by Thursday will earn half credit.

Homework turned in by Friday at 4pm will earn one quarter credit. **Homework will not be accepted after Friday at 4pm.**

**Writing Skills:** Strunk & White's *The Elements of Style* can help you write concise, precise sentences to communicate scientific information. Review the eight elementary rules of usage and the ten elementary principles of composition at <http://www.bartleby.com/141/>

5. **Quizzes.** We will have short quizzes every Thursday on the material for that week. Quizzes provide you with feedback about what you do and do not yet understand. Material covered in quizzes that confused many students may make a re-appearance on the final, so study any questions you missed! The grading scheme for quizzes will be determined in class.
6. **Final.** The take-home final exam will include: (a) conceptual questions about different techniques (e.g., assumptions, associated problems), (b) "generate a plan" questions that ask you how you would analyze a data set, and (c) actual statistical analysis and interpretation of one or more data sets (following the format established by the homework).

***The due date for the final exam is noon on Tuesday March 21<sup>st</sup>. All final exams must be submitted in hard copy to the psychology office by this time.***

## Class percentage breakdown for grades:

Responses to readings:	15 %
Homework sets:	25 %
Quizzes:	25 %
Final exam:	35 %

All assignments except final will be graded out of a maximum of 10 points.

Course grades based on percentage of points earned			
A+	97-100	C	73-76.9
A	93-96.9	C-	70-72.9
A-	90-92.9	D+	67-69.9
B+	87-89.9	D	63-66.9
B	83-86.9	D-	60-62.9
B-	80-82.9	N	< 70
C+	77-79.9	P	70

**Cheating**, if detected, will earn a **failing grade** in the course. The University may impose additional penalties in accordance with the student conduct code. Don't do it! Cheating = turning in the work of others as your own, copying other people's quiz answers, or copying from someone else's final exam. For the **final**, providing or asking for help from *other students* = cheating. See below for legitimate input on the final.

**What is NOT cheating? Collaborative learning;** that is, getting or providing help on the **homework**. Meeting to compare notes on homework (in person or on Blackboard) can help everyone do well. However, don't just copy what someone else has done—complete the homework yourself. For the **final**, no human collaborators are permitted (but use of books, the internet, etc. is permitted).

## Class Etiquette & Norms

Please try to come to class and lab on time, and stay for the whole class or lab

Treat your fellow students and your instructors with respect

Turn the ringer off on your cell phone during class

Ask questions and speak up during class

Stop by and see Jonathan and Chuck during each person's office hours

## Guidelines for Teaching and Learning

The Undergraduate Education Committee (UEC) of the psychology department has recently created guidelines for teaching and learning in psychology. These guidelines are available online at <http://psychweb.uoregon.edu/guidelines/index.htm>.

**Course Schedule:**

	<b>Assigned Reading – read for class on Tuesday</b>	<b>Assignments &amp; Activities:</b>
Week 1 Jan 10 <sup>th</sup> & 12 <sup>th</sup>	No assignment for first class, but review 302 material as necessary. Chapter 1: 1.1 – 1.3 Chapter 2: 2.1 – 2.5; 2.7 – 2.10, 2.13 Chapter 3: all Chapter 4: all	Tu: Intro, Diagnostic Test, EDA Th: Review normal distribution, hypothesis testing, z & t
Week 2 Jan 17 <sup>th</sup> & 19 <sup>th</sup>	Chapter 7: 7.1 – 7.3; 7.5 – 7.6 Chapter 8: all (just skim 8.3 – 8.5) Chapter 11: 11.1 – 11.4	Tu: One-way ANOVA <i>HW #1 due,</i> <i>Response to chapters 7, 8, &amp; 11 due</i> Th: Effect Size & Power <i>Quiz #1</i>
Week 3 Jan 24 <sup>th</sup> & 26 <sup>th</sup>	Chapter 12: 12.1 – 12.3 (top of 385); Read first paragraph on p. 291 for a definition of post hoc tests and then... 12.5, 12.7, 12.13	Tu: Multiple Comparisons <i>HW #2 due,</i> <i>Response to chapter 12 due</i> Th: Multiple Comparisons <i>Quiz #2</i>
Week 4 Jan 31 <sup>st</sup> & Feb 2 <sup>nd</sup>	Chapter 13: 13.1 – 13.6; 13.12 (ok to skim)	Tu: Factorial ANOVA <i>HW #3 due,</i> <i>Response to chapter 13 due</i> Th: Factorial ANOVA <i>Quiz #3</i>
Week 5 Feb 7 <sup>th</sup> & 9 <sup>th</sup>	Chapter 16: 16.5 – 16.8 Supplemental Reading	Tu: ANCOVA <i>HW #4 due,</i> <i>Response to chapters 16 &amp; supplemental reading due</i> Th: ANOVA issues <i>Quiz #4</i>
Week 6 Feb 14 <sup>th</sup> & 16 <sup>th</sup>	Chapter 7: 7.4 Chapter 14: 14.1 – 14.5	Tu: Repeated Measures ANOVA <i>HW #5 due,</i> <i>Response to chapters 7 &amp; 14 due</i> Th: Repeated Measures ANOVA <i>Quiz #5</i>

Week 7 Feb 21 <sup>st</sup> & 23 <sup>rd</sup>	Chapter 9 : 9.1 – 9.9 ; 9.11 – 9.12 Chapter 15 : 15.1 – 15.6	Tu: Correlation & Regression <i>HW #6 due, Response to chapters 9 &amp; 15 due</i> Th: Multiple Regression <i>Quiz #6</i>
Week 8 Feb 28 <sup>th</sup> & March 2 <sup>nd</sup>	Chapter 15 : 15.7 – 15.13 Supplemental Reading	Tu: Multiple Regression <i>HW #7 due, Response to chapter 15 &amp; Supplemental Reading due</i> Th: Multiple Regression Contd. <i>Quiz #7</i>
Week 9 March 7 <sup>th</sup> & 9 <sup>th</sup>	Chapter 15 : 15.14 Chapter 6: all	Tu: Logistic Regression <i>HW #8 due, Response to chapter 15 &amp; 6 due</i> Th: Categorical Data Analysis <i>Quiz #8</i>
Week 10 March 14 <sup>th</sup> & 16 <sup>th</sup>	Chapter 18: all	Tu: Nonparametric Tests <i>HW #9 due, Response to chapter 18 due</i> Th: Wrap Up <i>Quiz #9</i>
<p>Finals Week: <b>Take-Home Final Exam:</b> Due to the psychology office by noon on Tuesday March 21<sup>st</sup>.</p>		