Applied Data Analysis: PSY 412, Fall 2005

CRN 15401, 4 credits

Lecture: Tues/Thurs, 10:00-11:20, 360 Condon

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

Instructor	Office	E-mail	Phone	Office Hours
Jonathan Cook	329 Straub	jcook4@uoregon.edu	346-4963	Tues 1:30-3:30
Melissa Foynes	383 Straub	mfoynes@uoregon.edu	346-3936	Mon 1:30-3:30

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: <u>http://ds.uoregon.edu/</u>.

Class Requirements and Activities:

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

Howell, D. C. (2002). Statistical Methods for Psychology (5th 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!* It may be helpful to bring a calculator to class—it's handier than the computer for some calculations. A simple calculator is fine; if you have a fancier one, make sure you know how to use it.
- 3. Written responses to readings. Every Tuesday, you will turn in a short **typed* response to the assigned Howell chapter.* Bring two copies, one to hand in and one to refer to during class. *Your response will have two parts.* First, identify the major analytic technique that is being discussed in the chapter and describe a circumstance in which you would use this technique. 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. *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 5th 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 Melissa*, 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 <u>http://www.bartleby.com/141/</u>

- **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 Monday December 5th. 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	С	73-76.9		
Α	93-96.9	C-	70-72.9		
A-	90-92.9	D+	67-69.9		
B+	87-89.9	D	63-66.9		
В	83-86.9	D-	60-62.9		
B-	80-82.9	Ν	< 70		
C+	77-79.9	Р	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:** It is fine to have someone **outside the class** read a draft of your final to see if it is clearly written. When writing academic papers, scholars should get feedback from colleagues before submitting the final product to a journal.

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 Melissa 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 <u>http://psychweb.uoregon.edu/guidelines/index.htm</u>.

Course Schedule:

	Assigned Reading – read for class on Tuesday	Assignments & Activities:
Week 1 Sept 27 th & 29th	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 Chapter 3: all Chapter 4: all	Tu: Intro, Diagnostic Test, EDA Th: Review normal distribution, hypothesis testing, z & t
Week 2 Oct 4 th & 6 th	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, & 11 due</i> Th: Effect Size & Power <i>Quiz #1</i>
Week 3 Oct 11 th & 13 th	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 Oct 18 th & 20 th	Chapter 13: 13.1 – 13.6; 13.12 (ok to skim)	Tu: Factorial ANOVA HW #3 due, Response to chapter 13 due Th: Factorial ANOVA Quiz #3
Week 5 Oct 25 th & 27 th	Chapter 16: 16.5 – 16.8 Supplemental Reading	Tu: ANCOVA HW #4 due, Response to chapters 16 & supplemental reading due Th: ANOVA issues Quiz #4
Week 6 Nov 1 st & 3 rd	Chapter 7: 7.4 Chapter 14: 14.1 – 14.5	Tu: Repeated Measures ANOVA HW #5 due, Response to chapters 7 & 14 due Th: Repeated Measures ANOVA Quiz #5

Week 7 Nov 8 th & 10 th	Chapter 9 : 9.1 – 9.9 ; 9.11 – 9.12 Chapter 15 : 15.1 – 15.6	Tu: Correlation & Regression <i>HW</i> #6 due, <i>Response to chapters 9 & 15 due</i> Th: Multiple Regression <i>Quiz</i> #6		
Week 8 Nov 15 th & 17 th	Chapter 15 : 15.7 – 15.13 Supplemental Reading	Tu: Multiple Regression HW #7 due, Response to chapter 15 & Supplemental Reading due Th: Multiple Regression Contd. Quiz #7		
Week 9 Nov 22 nd No class on 24 th	Chapter 15 : 15.14	Tu: Logistic Regression HW #8 due, Response to chapter 15 due Th: No Class		
Week 10 Nov 29 th & Dec 1st	Chapter 6: all Chapter 18: all	Tu: Categorical Data Analysis <i>HW</i> #9 due, <i>Response to chapters 6 & 18 due</i> Th: Nonparametric Tests <i>Quiz</i> #8		
Finals Week: Take-Home Final Exam: Due to the psychology office by noon on Monday December 5th.				