Applied Data Analysis:
PSY 412, Winter 2005

Lecture: Tues/Thurs, 10:00-11:20, 311 ECS

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

Instructor	Office	E-mail	Phone	Office Hours
Jonathan Cook	329 Straub	jcook4@darkwing.uoregon.edu	346-4963	Wed 1-3
Jess Holbrook	325 Straub	jholbroo@darkwing.uoregon.edu	346-1980	Mon 1-3

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 will 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.

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. This is 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 a copy 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, one to refer to during class. *Your response will have two parts.* First, identify what you see as the three most important points in the chapter, and write a sentence explaining each point to the best of your ability. Second, identify two issues or points 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 Jess, 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 final exam must be submitted electronically to Jonathan by <u>noon on Wednesday March 16th</u>, and should be in Adobe Acrobat (.pdf) or Microsoft Word (.doc) format. The preferred format will be an Acrobat pdf file, as this ensures that any formatting will be consistent across operating systems/software configurations. However making pdf documents requires having access to the full version of Adobe Acrobat (not the free reader) and this software might not be available to you. If you can't use Acrobat, you might want to send Jonathan a sample Word file in advance to make sure that your files can be opened without any formatting loss.

Class point breakdown for grades (400 points possible)

Responses to readings: 75 pts
Homework sets: 100 pts
Quizzes: 100 pts
Final exam: 125 pts

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:** 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 Jess during each person's office hours

Course Schedule:

	Assigned Reading – read for class on Tuesday	Assignments & Activities:
Week 1 Jan 4th & 6th	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 Jan 11th & 13th	Chapter 7: 7.1 – 7.3; 7.5 – 7.6 Chapter 8: all Chapter 11: 11.1 – 11.5	Tu: One-way ANOVA *HW #1 due,* *Response to chapters 7, 8, & 11 due* Th: Effect Size & Power *Quiz #1*
Week 3 Jan 18th & 20th (JH teaching)	Chapter 12: 12.1 – 12.3 (top of 385); 12.5, 12.7, 12.13	Tu: Multiple Comparisons *HW #2 due,* *Response to chapter 12 due* Th: Multiple Comparisons *Quiz #2*
Week 4 Jan 25th & 27th	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 Feb 1st & 3rd	Chapter 16: 16.5 – 16.8 Supplemental Reading	Tu: ANCOVA *HW #4 due,* *Response to chapters 16 &* *supplemental reading due* Th: ANCOVA *Quiz #4*
Week 6 Feb 8th & 10th	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 Feb 15th & 17th	Chapter 9 : 9.1 – 9.9 ; 9.11 – 9.12 Chapter 15 : 15.1 – 15.6	Tu: Correlation & Regression *HW #6 due,* *Response to chapters 9 & 15 due* Th: Multiple Regression *Quiz #6*
Week 8 Feb 22nd & 24th	Chapter 15 : 15.7 – 15.14 Supplemental Reading	Tu: Multiple Regression *HW #7 due,* *Response to chapter 15 &* *Supplemental Reading due* Th: Logistic Regression *Quiz #7*
Week 9 March 1st & 3rd	Chapter 6: all	Tu: Categorical Data *HW #8 due,* *Response to chapter 6 due* Th: Categorical Data *Quiz #8*
Week 10 March 8th & 10th	Chapter 18: all	Tu: Bootstrapping *HW #9 due,* *Response to chapter 18 due* Th: Nonparametric Tests/Review *Quiz #9*
Finals Week: **Take-Home Final Exam:** Due by noon on Wednesday March 16th. ***Send electronically to Jonathan.***		