# Applied Data Analysis: PSY 412, CRN 24517, Winter 2008

# Lecture:

Instructor: Adam D. I. Kramer, 346-4924, adik@uoregon.edu Time: Tues/Thurs, 4:00-5:20 Place: 189 PLC Office Hours: Monday and Wednesday 1:30-2:30 or by appointment

Lab: Instructor: Julia Oppenheimer, 346-4966, Straub 353, joppenh1@uoregon.edu Time: Fri 9:00-9:50 Place: 180 Straub Office Hours: Monday 12-1:30 or by appointment

#### Class website: <u>http://www.uoregon.edu/~adik/psy412/</u> BLACKBOARD IS NOT USED AS PART OF THIS CLASS.

#### **Course Goals:**

This course is called "Applied Data Analysis," and as such is designed to help you become able to analyze real data. The course will sharpen your quantitative and analytical reasoning skills, improve your ability to identify patterns in data, and relate these patterns to substantive issues about the topic under investigation, and communicate your results and interpretation in English. This course is designed for students who are planning to analyze their own data in a real-world situation, such as an analytic job or a scientific graduate program. By the end of the course you should be able to:

- Identify your research questions
- Understand the structure of your data (or design a good structure for data collection)
- Analyze the data you have to answer your questions (using software)
- Understand the results of the statistical tests
- Explain the results using natural written language
- Explain how these results address the research question

While data sets will be provided for class homework, we will be happy to help you with course concepts as applied to other data sets (for instance, your honors thesis data) during office hours.

#### **Course Description:**

We will cover concepts and methods of descriptive and inferential statistics at an intermediate level, focusing primarily on correlation and regression approaches. Most of the course will be spent learning and applying regression techniques to analyze data sets found commonly in the social sciences, for example ANOVA, ANCOVA, and regression designs. Categorical and multivariate techniques will be pursued as well if time permits.

This course is designed to help you to be able to analyze real data for real situations, and as such the course must be held to a certain standard and may be difficult. However, it is important to realize that statistics and the nature of summarizing numbers generated by people is not something one can develop in one term. We will treat you as colleagues-in-training, and will continue to learn ourselves.

## Learning Adjustments:

Contact Adam as soon as possible 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>. Evidence of a disability must be provided prior to requesting leniency.

## **Class Requirements, Activities, and Grading:**

## 1. Readings:

The primary text we will use for this course is Howell, D. C. (2007). *Statistical Methods for Psychology (6th edition)*. This is a good all-purpose statistics book and it is currently the text that is used in this department's graduate-level statistics course. 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) does not span the whole book, or proceed in order. 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. You may also be given supplemental reading materials for certain topics. When this is the case, you will be supplied with a PDF of the reading on the course website.

# 2. Participation and Attendance:

Attendance is not required, but is essential to learn the material. Missing class may leave you confused, and missing lab will make it VERY difficult to complete the homework correctly. Do not expect the instructors to repeat any material they already presented in class! PowerPoint slides from lectures and lab materials will be posted on the course website.

If you cannot attend class or lecture for any reason, it is your responsibility to learn the material presented. If you alert the instructor beforehand, the instructor may be able to help you out, but is not required to do so. Class will usually start on time; being late or leaving early is disruptive and often annoying, and as such is discouraged.

# 3. Homework

Homework is assigned every Thursday (including the first week, but not the last week), and is due the following Tuesday (including the last week, but not finals week), *in electronic format in MSWord, RTF, or PDF format only, one hour before class (3:00 PM), to Julia* on Tuesdays. All written work should conform to APA 5<sup>th</sup> Edition style; this style was covered in Psy 303 which is a prerequisite for this class. The UO server timestamps all incoming and outgoing email, so sending your assignment from your UO account is the best way to ensure that the submission time is correctly reflected.

Homework will generally consist of two parts: First, a reaction to the assigned reading, in which you provide a brief summary of what you believe are the "key points." If the assignment covers multiple chapters, you will still provide a single summary. This summary should be between 1/3 and 1/2 of a page. The purpose of the readings is to get you familiar with the concepts that we will be discussing in class each week and to help me identify concepts that require special attention. **This part must be written entirely on your own**, though you are free to discuss the reading with each other before writing your response. Second, there will be several questions addressing the material covered in lecture; this is the "problem set," and you may use a computer program to complete this section. You may work with other classmates currently enrolled in the class to complete the problem set, but **nobody else.** Further, the entire homework assignment must be *written and produced* by you; you may not copy any other student's words, tables, or statistical output. If you need further assistance, schedule an appointment with an instructor. Answer keys will not be provided, but common mistakes will be discussed in class.

Homework documents should not contain your name in ANY format. Please use your STUDENT ID to mark an exam as yours. This allows our grading to remain completely objective. Homework and exams containing your name will **not be accepted and may be considered late.** 

Lateness coefficient: Your homework score will be multiplied by 1.0 if on time, .95 if it is less than 24 hours (one day) late, .85 if it is less than 2 days late, .7 for 3 days, .5 for 4 days, .3 for 5 days, and 0 for six days. This is to say, a homework that is more than 6 full days late is lost; stop working on it and spend your time working on the homework assignment due the next day!

#### **Statistical software:**

Use of a statistical software package is almost certainly necessary for completion of the homework assignments. You may use any software package (for instance, R, SAS, SPSS, Stata, Minitab, Excel, etc.) so long as your results are correct and clearly presented. However, the lab for this class will show you how to conduct analyses in SPSS. SPSS is available on all the computers in the Straub computer lab. The lab is open Monday through Thursday from 8am to 9pm and on Fridays from 8am to 5pm. Classes have first priority on access to these computers, so check the schedule on the doors or <u>check the online calendar</u> for availability.

If you are interested in purchasing your own copy of a statistical package, speak to the instructor if you would like advice.

# 5. Exams:

There will be a midterm and a final. The class will vote a week before the test on whether each test will be open-book with no electronics in class (easier, but more stressful and time-limited) or take-home (more time to work, but with more complicated questions and answers). The midterm exam will take place during class on February 12<sup>th</sup>, or be due at the end of class (5:20 PM); there will be no regular class that day. The final exam covers all course material and will be due or take place at 1 PM on Tuesday, March 18<sup>th</sup>. All parts of exams must be completed without any human assistance. Answer keys will not be provided, but common mistakes will be discussed.

# 6. Grading:

Homework assignments:	50% total (about 5.5% each)
Midterm:	20%
Final:	20%
Gestalt:	10%

Assignments and exams may be worth any number of "points," but it is the percentage correct that matters! The "gestalt" reflects the fact that the instructor may alter the grade by one letter if the instructor believes that, taken as a whole, a student has performed exceptionally well or poorly. Think of it this way: If the homework, midterm, and final can't really get at how well you understand the material, this percentage could be used to reflect any understanding you have shown in office hours, or in class/lab by asking questions, by up to one letter grade. For most students, the gestalt will not affect the overall grade earned, it's more of "emergency wiggle-room" which we want to be up front about, and allows our grading of your homework and exam to most accurately reflect your understanding.

#### 7. Cheating:

Cheating consists of copying any words, tables, or formulae not generated by yourself on a homework or exam, or discussing any component of an exam with any non-instructor (i.e., either providing or asking for help). If cheating is discovered, it will be discussed with the student, and may result in a failing grade in the course, a report to the university, and/or additional penalties in accordance with the student conduct code.

What is NOT cheating? Collaborative learning; that is, getting or providing help on the homework. Meeting to compare notes on homework (in person or online) can help everyone do well. Planning a time to sit in the Straub lab to complete and discuss the homework with friends is encouraged! 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, pre-existing websites, etc. is permitted).

#### 8. 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 and a degree of formality. Turn the ringer off on your cell phone during class. Ask questions and speak up during class. Stop by and see Adam and Julia during office hours.

# 9. 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.

# **Tentative Course Schedule:**

	Assigned Reading	Topic(s):
Week 1	Chapters 1-2	EDA, summary statistics, and
Jan 8, Jan 10		Distributions (z and t)
Week 2	Chapters 3-4	Covariance, Correlation
Jan 15, Jan 17		
Week 3	Chapters 9-10	Standardization; univariate
Jan 22, Jan 24		regression
Week 4	Chapter 15	Regression with multiple
Jan 29, Jan 31		continuous predictors
Week 5	Judd (2000)	Interactions and interpretations;
Feb 5, Feb 7		review
Week 6	Chapter 16	Feb 12, Midterm
Feb 12, Feb 14	-	Feb 14, Categories and dummy
		coding; ANOVA
Week 7	Chapter 12	Contrasts, contrast coding, and
Feb 19, Feb 21		interactions; ANCOVA
Week 8	Chapter 13	Continuous and Categorical
Feb 26, Feb 28		Interactions
Week 9	Chapter 17, TBA	Logistic regression, Multiple
Mar 4, Mar 6		DVs; PCA
Week 10	ТВА	MANOVA, Review
Mar 11, Mar 14		
FINAL EXAM	Re-read Judd	Cumulative!
Mar 18, 1 PM		