Applied Data Analysis:
PSY 412, CRN 15129, Fall 2009

Statistics is what makes psychology a science.

Lecture:
Instructor: Adam D. I. Kramer, 346-4924, adik@uoregon.edu
Time: Tues/Thurs, 2:00-3:20
Place: 125 CHI
Office Hours: Monday 2-4 PM or by appointment

Lab:
Instructor: Nate Ashby, ???-????, Straub ???, nashby@uoregon.edu
Time: Fri 9:00-9:50
Place: 180 Straub
Office Hours: Monday 12-1:30 or by appointment

Class website:
http://www.uoregon.edu/~adik/psy412/
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, broadly called "linear models." 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.

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: http://ds.uoregon.edu/. 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 Judd, C. M., McClelland, G. H., and Ryan, C. S. (2009). Data Analysis: A Model Comparison Approach (second edition). This is a good, concise, and straightforward all-purpose statistics book…it's also cheaper than the popular alternatives. Lecture will largely follow the structure of the book, because the book largely follows the structure of the lectures I've written—that's a good thing. However, departures from the book will indeed occur, and you are responsible for the readings assigned as well as that which is discussed in class. 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—feel free to screw yourself if you like. 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, but may not make sense without the lecture, and there is no guarantee that the slides will contain everything that appears on the homework/exams.

If you cannot or do not attend lab 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 Nathan*** on Tuesdays. All written work should conform to APA 5th 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 three 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 readings.
- Second, there will be a "problem set," and you may use a computer program to complete this section unless otherwise noted. You may work with other classmates currently enrolled in the class to complete the problem set, but **nobody else.**
- Third, you will summarize part 2 in a single-page APA results section.

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 assignment as yours, and name the file you submit via email by the name of the assignment. This allows our grading to remain completely objective. Homework and exams containing your name will **not be accepted until the name is removed**.

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 more than 5 days. This is to say, **a homework that is more than 5 days late is lost; stop working on it and spend your last two days working on the next assignment!**

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 R, and support will only be provided for R. R is available on all the computers in the Straub computer lab, and can be downloaded for free from http://cran.cnr.berkeley.edu .

R is a pain in the ass to learn, but as easy to use as SPSS once you know it. Nate and Adam agree that it is actually easier to learn R in the long run. Persevere!

5. Exams:
There will be a midterm and a final, both of which are take-home. Yes, there is homework due the week the midterm is due, but the midterm will not include material from that week's homework. The midterm exam will be distributed via email the Wednesday of week 5 and be due via email the Wednesday of week 6; the final will be distributed on the last day of class and due one week thereafter, via email (during finals week). **Adam** grades the exams, not Nate! All parts of exams must be completed without assistance from any human besides Nate or Adam. So internet searches are OK, internet conversations are not. Answer keys will not be provided, but common mistakes will be discussed.

6. Grading (approximate):

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

Assignments and exams will receive grades of A if and only if they are judged to contain **excellent** work. Work that is **good** but not excellent will be graded a B, work that is **adequate** but not good will be graded a C, work which is **inadequate** but still contains **rudimentary understanding** will be graded a D, and work lacking in rudimentary understanding will be graded an F. This same metric is used to determine your course grade. We will do our best to write homework assignments and exams that reflect the "usual" cutoffs (90% and above is an A, etc), but for some assignments the cutoff for "excellent" may be a bit above or below 90%.

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 will almost certainly 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, do not read or share actually documents that will be turned in! 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:

- Arrive on time and stay for the entire class.
- 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.
- Attendance is **not** required; **do not** attend class at all if you cannot meet these norms.

- **Tentative Course Schedule:**

	Assigned Reading	Topic(s):
Week 1	**Preface, Chapter 1 due Thu**	Summary statistics, models and error
Week 2	**Chapters 2-3**	Modeling error: Distributions (z and t)
Week 3	**Chapters 4-5**	Inference, covariance, correlation, single regression
Week 4	**Chapters 6 & 13**	Regression with multiple continuous predictors
Week 5	**Chapter 7**	More multiple regression; midterm assigned
Week 6	**Chapters 8 and 9**	Regression with categorical preds (ANOVA); midterm due
Week 7	**Chapter 10**	Mixing predictor types (ANCOVA)
Week 8	**Pgs. 247-252 (stop at "How do we handle?")**	Nests and dependent error; fixed vs. random effects
Week 9 (Thanksgiving!)	**Chapter 12**	Multi-level (e.g., within-subjects) regression
Week 10	**TBA**	Other topics if time; review; final assigned
FINAL EXAM	**Judd (2000)**	Final due December 10, 5PM, via email to adik@uoregon.edu