Psy 412, Fall 2010

Applied Data Analysis

Instructor	Office	E-mail	Phone	Office Hours
Jordan Pennefather	326 Straub		346-5582	Tues 3:30-5:30
Amber Thalmayer	309 Straub	athalmay@uoregon.edu	346-4852	Thurs 3:30-4:30; Fri 10:00-11:00

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

Course Goals:

This course is designed to sharpen your quantitative and analytical reasoning skills. It should 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:

1. Generate a plan for data analysis that is appropriate to your research questions and the structure of the data
2. Execute your data analysis plan using statistical software
3. Understand and summarize the results of the statistical tests
4. Interpret the results in light of your research questions
5. Clearly communicate what you did, what you think the results mean, and why

Course Description: We will cover the concepts and methods of descriptive and inferential statistics at an intermediate level with a focus on correlation and regression as the underlying statistical machinery. Topics include Model development and testing, regression, ANOVA, and ANCOVA. By the end of the course, you will have some level of understanding of each of these methods. The level will vary across topics, which is fine; data analysis training is a lifelong process. This course will be both challenging and rewarding, and will begin you on the path to a theoretical understanding of data analysis and model building. You will likely not

understand every topic perfectly, but that is okay since this is a field which is constantly evolving and we are all still learning. Be sure to use all the resources that are presented, including your instructors, we are here to help you.

Learning Adjustments:
Contact Jordan 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. Disability Services web site: http://ds.uoregon.edu/.

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 book does a great job of organizing the topics of data analysis. Each chapter builds upon the previous chapters, thus we will follow the book sequentially. You will 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. 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 material they already presented in class or lab; office hours are best used for review and discussion of material after doing the reading and attending lecture, and for help with homework. Slides from lecture will be posted on Blackboard, but you may want to arrange to share notes with a classmate since much of the material will be presented on the whiteboard and may not be found on the slides.

3. Homework. Homework is assigned every Friday in lab (including the first week, but not the last week), and is due by the start of lab (Friday 9:00 AM) the following week. All work should be legible and where appropriate typed, with accompanying graphs and data output. There will be some work that is more appropriately written out by hand, including by-hand calculations, formulas, and model descriptions (this will be covered in more detail during lab**).** All written work should conform to APA 5th Edition style; this style was covered in PSY 303 which is a prerequisite for this class.
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 readings.

      • Second, there will be a "problem set," which will typically be a combination of hand calculations and analysis using a statistical analysis program. You will also be asked to

complete a discussion of the analyses in an APA-style results section. You may work with other classmates currently enrolled in the class to complete the problem set, but **nobody else.**

The entire homework assignment must be *written and produced* by you; you may not copy any other student's words, tables, or statistical output. You should generate your own analyses and write up the results yourself in APA style. 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. This allows our grading to remain completely objective. Homework and exams containing your name will **not be accepted until the name is removed**.

Lateness homework: Homework will be accepted up to 4 day late (the following Tuesday before 9:00 AM). There will be a 10% deduction per day late (your score multiplied by .9 if one day late, .8 if two days late, etc.)

4. Statistical software. Use of a statistical software package is necessary for completion of the homework assignments. You may use any software package (for instance, R, SAS, SPSS, Stat-A, Minitab, Excel, etc.) so long as your results are correct and clearly presented (must be able to provide SSE data for entire model). However, the lab for this class will show you how to conduct analyses in SPSS, and support will only be provided for SPSS. SPSS is available on all the computers in the Straub computer lab.

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 Tuesday of week 5 and be due via email the Tuesday of week 6; the final will be distributed on the last day of class and due one week thereafter, via email (during finals week).

6. Grading (approximate):
Homework assignments: 50% total (best of 8, all 9 must be turned in)
Midterm: 20%
Final: 30%

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, don't just copy what someone else has done—complete the homework yourself. Also, 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.
• Turn the ringer off on your cell phone during class.
• Ask questions and speak up during class.
• Stop by and see Jordan and Amber during office hours.
• Attendance is **not** required; **do not** attend class at all if you cannot meet these norms.

Tentative Course Schedule:

	Assigned Readings	Topics Covered
Week 1	**Preface, Chapter 1 due Thu**	Summary statistics, models and error
Week 2	**Chapters 2-3** **Judd 2000 (Thursday)**	Definitions of error and parameter estimates. Models of error and Sampling distributions
Week 3	**Chapter 4**	Inference, power, confidence intervals (one-sample t-test)
Week 4	**Chapter 5**	Simple regression (correlation/regression)
Week 5	**Chapter 6**	Multiple regression; midterm assigned
Week 6	**Chapter 7**	Moderated and Nonlinear regression
Week 7	**Chapter 8**	One-way ANOVA
Week 8	**Chapter 9**	Factorial ANOVA (two-way ANOVA)
Week 9	**Chapter 10**	ANCOVA (models with continuous and categorical predictors)
Week 10	**Chapter 11**	Repeated-Measures ANOVA (Nested design and dependent error)