Sociology 760: Advanced Statistical Methods in Sociology

Spring, 2006
Monday, 4:30 - 8:10 p.m.

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Course Description and Goals: This is a second course in statistics, covering selected inferential techniques used in sociology as well as other social science disciplines. Topics to be covered include: multiple linear regression, analysis of variance, logistic regression, and the analysis of categorical data, including multivariate categorical analysis. In the first two weeks of the course, we will review principles of statistical inference, including confidence intervals and hypothesis testing, measures of central tendency and variation. Practical data analysis will be a large part of the coursework, but conceptual material will also be tested.

Students completing this class should be able to analyze various types of data using the statistical package SPSS; understand and explain the reasoning underlying statistical procedures; choose models appropriate to particular analytic problems; and interpret computer output correctly. The material covered in this course will enable students to intelligently and critically read professional publications as well as prepare students to successfully complete the steps in the empirical research process, moving from a research idea to actual data analysis.

Prerequisites: An undergraduate statistics course (e.g., Sociology 261) and a passing grade of 85% or higher on the diagnostic exam for this course.

Required Texts: The text for this class is:

David Knoke, George Bohrnstedt, and Alisa Potter Mee (2002) *Statistics for Social Data Analysis*. Fourth Edition. F.E. Peacock Publishers

In addition to this required text, supplemental readings will be posted to the D2L website for the class. For those of you with little to no experience with the statistical software package, SPSS, I recommend that you purchase *Adventures in Social Research* (Babbie and Halley, 2000). This text is intended to serve as a tutorial for those of you who need to improve your SPSS skills.

Grading. Grading for the course will be based on the following:

1. **Weekly homework assignments (165 points)**. There will be 11 homework assignments throughout the semester. Each is worth 15 points. The schedule of assignments can be found in the attached schedule. The assignments will be given out during the lab, at which time you will have an opportunity to read the assignment and ask questions. Exercises will be turned in during lab.

   The assignments will typically require you to use a computer to complete the assignment. It is okay if you talk with each other about how to do your homework; in fact a little collaboration concerning statistical programming is encouraged. **However, you are required to write up your own answers to the homework, independent of other students. You are also required to produce and attach your own computer printout, whenever a printout is needed**. No photocopies or second printings of other students' printouts are allowed. Violations of this policy will result in serious penalties.

   Late assignments will be downgraded by 5 points per day that they are late.

2. **Weekly quizzes (100 points).** At the beginning of each class period (beginning with the second week), there will be a short quiz, covering the material from the previous week. Each quiz will be worth 10 points. If you miss a quiz because you are late or absent, you will get zero for that quiz. The two lowest quiz scores will be dropped from the calculation of your grade.

3. **Final Exam (75 points)**. A final exam will be given during the last class period, May 8th. The exam will consist of two parts; the first part will focus on lecture materials/readings (comprehensive) and the second part will focus on the interpretation of computer output for models covered during the semester. The exam will be based on material covered throughout the semester.

4. **Final project (60 points)**. The final project will require you to select a dataset of interest to you, draft a hypothesis or hypotheses you wish to examine using these data, and conduct analysis consisting of a minimum of four to six variables. Details of the final project will be handed out in early April, but you should begin to consider topics of interest to you and explore alternative data files that would allow you to address the

topic. (This is a great opportunity to find the data for your MA thesis or paper and begin to conduct preliminary analysis!).

Class website: Lecture notes (to the extent there are any), exercises, quiz solutions, and readings not included in the required text can all be found on the course website, using D2L. I encourage you to check the D2L website prior to class so that you can have copies of the material during the lecture.

Computer Programs. The data analysis exercises that require a statistical computer program are expected to be completed using SPSS (either version 11 or 12). SPSS is available in the computer labs throughout campus. You are welcome to acquire SPSS for use on your home computer; however, be careful if you purchase SPSS that you do NOT purchase the student software package, since this will only allow you to conduct analysis on datasets less than 1500 cases. You can purchase SPSS through the university by visiting this site: http://wiscsoftware.wisc.edu/wisc/39264.asp?institution=1029 . The cost is $93 for a limited term license (through August of 2006). Or you can visit the IMT web site: http://www3.uwm.edu/imt/software/forstudents.cfm for a list of other sites where you can purchase SPSS.

Lecture and Lab format: Lecture time will be spent on the administration of a short quiz, followed by a lecture covering material assigned for that week. **You are expected to have read the material prior to the lecture.** Lab time will be spent answering questions, assigning and returning homework exercises, and running SPSS programs. I encourage you to have a floppy dis, flash drive, or CD with you for all labs, so that you can save your work.

Attendance at both the lecture and lab are expected. Office hours for Leslie and myself are intended to be used for clarification of material and assistance with assignments, readings, and the final project and not to reiterate material that was covered in lecture and/or lab

Schedule of Topics

Date	Topic	Statistics for Social Data Analysis	Exercise Handed Out	Exercise Due
1.23	Review: describing variables	Chapters 1 & 2	#1	
1.30	Statistical Inference; hypothesis testing	Chapter 3	#2	#1
2.6	ANOVA; paired t-tests	Chapter 4	#3	#2
2.13	Lab Only: Finding Data for Final Project and Dealing with SPSS			
2.20	Bivariate Categorical Data Analysis; odds and odds ratios	Chapter 5	#4	#3
2.27	Bivariate regression and Correlation	Chapter 6	#5	#4
3.6	Multivariate Categorical Analysis: spurious relations	Chapter 7	#6	#5
3.13	Summary: Bivariate and Categorical Analysis			#6
3.20	Spring Break			
3.27	Multivariate Linear Regression	Chapter 8.1 - 8.5	#7	
4.3	Multivariate regression: Dummy variables	Chapter 8.6	#8	#7
4.10	Summary: multivariate linear regression		#9	#8
4.17	Nonlinear and Logistic Regression	Chapter 9.1- 9.5	#10	#9
4.24	Logistic Regression Continued		#11	#10
5.1	Review; Lab time for Final Papers			#11
5.8	Final Exam			
5.15	Final Paper Due			