

# SOCIOLOGY 542 – Analysis of Sociological Data II

## FALL 2008

**Lecture:**  
**Mondays, 9:50AM-12:30PM**  
**Lucy Stone Hall A256**

**Lab:**  
**Mondays, 12:30PM-1:30PM**  
**Sociology Computer Lab**

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<b>COURSE DESCRIPTION</b>
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This course is the second of a two-semester sequence (541 and 542) of graduate level statistics and data analysis. In this course, the focus is multivariate techniques of data analysis, particularly multiple linear regression. The course's main goal is for you to understand the mechanics of multiple linear regression in order to make your own rigorous analyses in the future. We will spend the majority of the semester on multiple linear regression and follow with an introduction to more advanced multivariate techniques like binary and multinomial logistic regression, event history analysis, hierarchical linear modeling, and structural equation modeling. In the final weeks of the semester, we will move to consider the application of quantitative techniques in actual research projects. The course seeks to promote an appreciation for multivariate statistical techniques as an approach that can enhance the research enterprise. By the end of the course you should be able:

- To understand the logics underlying multiple regression.
- To ensure that the assumptions of multiple regression analysis are met.
- To recognize when more sophisticated multivariate techniques should be used.
- To run your own multivariate analysis.
- To write about quantitative work.
- To evaluate quantitative work effectively.

## COURSE LOGISTICS

*Prerequisites:* Sociology 541 (Analysis of Sociological Data I) or its equivalent. You should be familiar with basic descriptive statistics, inferential statistics, bivariate quantitative analyses, and simple regression. You should also have some experience with SPSS or a statistical software package.

*Lecture:* Lectures take place on Mondays from 9:50am to 12:30pm. I encourage you to come to lecture with a critical eye and be prepared to raise questions. I will post lecture notes on the course Sakai site Monday mornings before class. You may wish to print the notes before coming to lecture.

*Lab:* The lab time, immediately following the course lecture from 12:30-1:30pm, will be led by Susan Bodnar-Deren. Although the lab is not a required portion of this course, I *highly encourage* you to attend. The lab time will be an occasion to review concepts from the lecture, ask questions, review homework assignments, practice using SPSS, and receive additional information that will help you in preparing the final project.

*Computing:* Modern quantitative analyses rely on a variety of statistical packages that facilitate data analyses with large data sets. In this course, we will use SPSS for Windows. Throughout the course, I will provide guidance on how to use SPSS for the specific topic we are tackling. You will also receive support in using SPSS from the course's TA and the Computer Lab TA. In addition, SPSS manuals are available in the computer lab and can also be purchased directly from SPSS Inc. If you intend to use a different statistical software package for completing your work in the course, please contact me.

*Sakai:* This course has a Sakai website where I will post announcements, articles, homework, and lecture notes. Please make sure that you check the course website before you come to class each week. I will also make available any handouts that we will discuss in class on the website. [www.sakai.edu](http://www.sakai.edu)

*Academic Integrity:* I expect outmost academic honesty and integrity in this course. Students should familiarize themselves with ethical conduct guidelines and Rutgers' policies on academic integrity (<http://academicintegrity.rutgers.edu/integrity.shtml>). Any type of academic dishonesty will be dealt with according to University policy. Because this class may involve group work, please let me clarify the application of the policy to joint work. Every student is expected to turn in their own work. Discussion of problems is okay *only* for the homeworks. However, you are expected to complete your own analyses and problems. Joint work is *not permitted for any work involved in completing the examination*.

## COURSE REQUIREMENTS & GRADING

Homeworks (35%): You will have to complete seven consecutive weekly assignments. These assignments will consist of problem sets, computer exercises, and exercises that apply the week's concepts. The assignments will be handed out at the end of each class and are due at the beginning of the next class. Each of the assignments will be worth 5% of your grade. Susan Bodnar-Deren will grade your homeworks.

Take-Home Examination (35%): There will be a take-home examination covering the materials covered in the course. The examination will be handed out at the end of class on November 10 and is due at the beginning of class on November 17. Please note that the exam takes place not at the middle of the term but towards the end of the term, so that we are able to get through the main components of the course before the exam. Susan Bodnar-Deren and I will grade your exam.

Final Project (30%): You will be required to conduct your own multivariate analysis using a preferred secondary data set. There are three components to the project:

- 1) A one-page proposal of your topic. DUE **OCTOBER 6**
- 2) A brief oral report of the findings. DUE **DECEMBER 8**
- 3) A brief eight-ten page paper detailing the analysis. DUE **DECEMBER 15**

The purpose of the project is for you to practice applying the statistic techniques learned in the course and take first steps in writing up the methods and results of the analyses. You should leave the course with a sound quantitative multivariate analysis that you can augment and build a paper from. Therefore, I encourage you to find a data set that aligns with your substantive interests. However, keep in mind that there are some practical and time concerns that favor using a dataset like the NORC General Social Survey (GSS) that is easily accessible. We will provide some guidance on data sources and datasets that you may choose to use. I will provide more details on what should be included in each component of the project. I will grade all components of your project.

## COURSE READINGS

The required, supplementary, and recommended texts are available for purchase at the Livingston College Bookstore. They are also on reserve in Kilmer Library. There is a community copy of the Norusis SPSS reference in the Sociology computer lab.

### I. Required

Kahane, Leo H. 2008. *Regression Basics*. Thousand Oaks, CA: Sage Publications.

Readings from the Kahane text will be required each week. My general posture with regards to the assigned readings is that they are supplementary to the lecture. Therefore, they will not be adequate substitutes to lecture.

I will place any additional required articles on the website.

**II. Supplementary** [\*Portions of the Allison text will be required on November 3\*]

Allison, Paul D. 1999. *Multiple Regression: A Primer*. Thousand Oaks, CA: Pine Forge Press.

Kutner, Michael H., Christopher Nachtsheim, and John Neter. 2004. *Applied Linear Regression Models, Fourth Edition*. New York: McGraw Hill.

I have found that in learning statistics, different people with different preferences and backgrounds, need different explanations. As a result, every week I have listed readings from two additional texts, which you may choose to use as supplementary references. These texts cover the same material, albeit in different form, as the required Kahane text. The Allison text provides user friendly explanations of the concepts that I will cover slightly more in-depth in lecture. The Kutner et al. text is much more technical and provides more information for those inclined to gain a more theoretical and mathematical understanding of multiple regression. Use these additional texts as you deem necessary.

**III. Recommended** [\*Portions of the Miller text will be required November 24\*]

Miller, Jane E. 2005. *The Chicago Guide to Writing about Multivariate Analysis*. University of Chicago Press.

Hoffman, John P. 2004. *Generalized Linear Models*. Boston: Pearson.

The Miller text provides an orientation to how to apply and write about the techniques that we will learn in the course. I strongly recommend that you purchase the Miller book. You will find it useful as you prepare the final paper.

The Hoffman text is a good reference for the advanced models that will be briefly introduced towards the end of the semester. I recommend it for those that want a more in-depth understanding of Logistic and Multinomial Logistic Regressions, EHA, SEM, and HLM.

**IV. SPSS References**

Norusis, Marija J. 2005. *SPSS 13.0 Guide to Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Pallant, Julie. 2007. *SPSS Survival Manual*. Third Edition. McGraw-Hill.

Sweet, Stephen A. and Karen Grace-Martin. 2007. *Data Analysis with SPSS*. Third Edition. Pearson Education.



**Week 4:**      **September 29**      {HOMEWORK 2 DUE}

TOPICS:      Linearity  
                Dummy Variables  
                Interaction Effects

READINGS: I.      Kahane: Chapter 5  
  
                II.      Allison: Chapter 8 (pp. 153-174)  
                            Kutner et al.: Chapter 8 (pp. 294-342)  
  
                III.     Miller: Chapter 9 (pp. 213-218)

**Week 5:**      **October 6**      {HOMEWORK 3 DUE}      **PROJECT PROPOSAL DUE**

TOPICS:      Regression Diagnostics  
                Outliers and Influential Observations  
                Multicollinearity

READINGS: I.      Kahane: Chapter 7 (pp. 119-124)  
  
                II.      Allison: Chapter 4 (pp. 89-92); Chapter 7 (pp. 137-151)  
                            Kutner et al.: Chapter 10 (pp. 390-414)  
  
                III.     Miller: Chapter 12 (pp. 291-292)

**Week 6:**      **October 13**      {HOMEWORK 4 DUE}

TOPICS:      Multiple Regression Assumptions  
                Heteroskedasticity  
                Weighted Least Square (WLS)

READINGS: I.      Kahane: Chapter 2 (pp. 31-35); Chapter 7 (pp. 124-141)  
  
                II.      Allison: Chapter 6 (pp. 125-128)  
                            Kutner et al.: Chapter 1 (pp. 26-27); Chapter 3 (pp. 132-134);  
                            Chapter 11 (pp. 421-431)

**Week 7:**      **October 20**      {HOMEWORK 5 DUE}

TOPICS:      Generalized Least Square

READINGS: I.      Kahane: Chapter 6 (pp. 103-118)

II. Kutner et al.: Chapter 12 (pp. 481-495)

**Week 8: October 27 {HOMEWORK 6 DUE}**

TOPICS: Logistic Regression  
Multinomial Logistic Regression  
Maximum Likelihood Estimation

READINGS: I. De Maris, Alfred. 1995. "A Tutorial in Logistic Regression." *Journal of Marriage and Family* 57:956-968. [Focus on pp. 965-968]  
  
Morgan, S. Philip and Jay D. Teachman. 1988. "Logistic Regression: Description, Examples, and Comparisons." *Journal of Marriage and Family* 50: 929-36.  
  
II. Hoffman: Chapter 3 (pp. 45- 64), Chapter 4 (pp. 65-82), Chapter 5 (pp. 83-100).  
Kutner et al.: Chapter 14 (pp. 555-567, 570-582, 586-589, 608-618)  
  
III. Miller: Chapter 9 (pp. 220-230)

**Week 9: November 3 {HOMEWORK 7 DUE}**

TOPICS: Overview of Advanced Methods: EHA, SEM, HLM  
REVIEW

READINGS: I. Kahane: Chapter 7 (pp. 138-141)  
\*Allison: Chapter 3 (pp. 49-70), Chapter 9 (pp. 177-187)\*  
  
III. EHA Hoffman: Chapter 7 (pp. 121-148)  
HLM Hoffman: Chapter 8 (pp. 160-162)  
SEM Hoffman: Chapter 8 (pp. 152-153)

**Week 10: November 10: EXAMINATION DISTRIBUTED AT END OF CLASS**

TOPIC: Q&A REVIEW

**Week 11: November 17: EXAMINATION DUE IN CLASS AT 10 AM**

TOPIC: Social Statistics in the Real World I  
Theory, Questions, and Hypotheses  
Data: Format, Types, and Management

READINGS: I. Kiecolt, K. Jill and Laura E. Nathan. 1985. *Secondary Analysis of Survey Data*. Newbury Park, CA: Sage Publications. (pp. 9-14, 47-76).

Kritzer, Herbert M. 1996. "The Data Puzzle: The Nature of Interpretation in Quantitative Research." *American Journal of Political Science* 40(1): 1-32.

III. Miller: Chapter 11, Chapter 12

Gross, Neil and Solon Simmons. 2002. "Intimacy as a Double-Edged Phenomenon? An Empirical Test of Giddens." *Social Forces* 81(2): 531-555.

**Week 12: November 24**

TOPICS: Individual Research Projects

READINGS: I. \*Miller: Chapter 14 (pp. 317-348), Chapter 15  
White, Lynn. 2005. "Writes of Passage: Writing an Empirical Journal Article." *Journal of Marriage and Family*. 67: 791-798.

**Week 13: December 1**

TOPICS: Social Statistics in the Real World II  
Critically Engaging Quantitative Work  
Writing and Presenting Quantitative Work

READINGS: I. Sanders, Jimmy M. and Victor Nee. 1987. "Limits of Ethnic Solidarity in the Enclave Economy." *American Sociological Review* 52(6): 745-773.

Portes, Alejandro and Lief Jensen. 1989. "The Enclave and the Entrants: Patterns of Ethnic Enterprise in Miami Before and After Mariel" *American Sociological Review* 54(6): 929-949.

III. Telles, Edward E. 1992. "Residential Segregation by Skin Color in Brazil." *American Sociological Review* 57(2): 186-197.

Telles, Edward E. 1995. "Structural Sources of Socioeconomic Segregation in Brazilian Metropolitan Areas" *The American Journal of Sociology* 100(5): 1199-1223.

**Week 14: December 8**

**PROJECT PRESENTATIONS**

**PROJECT PAPER DUE \*DECEMBER 15\* at 5pm in 235 Tillett Hall.**