

Soc. 651, Fall 2010  
Thurs. 7:00-9:30  
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Hours: TBD

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Hours: Weds. 10-12, Th. 4-6  
& by appointment

## **GRADUATE RESEARCH METHODS II: ANALYSIS OF QUANTITATIVE DATA**

The second half of the graduate research methods course focuses on the analysis of quantitative data on social processes. You will learn how to design and conduct data analyses, how to select and interpret statistics, how to use a computer, how to write research reports, and how to read and critique published research articles.

The course is organized in four units. The first unit introduces the logic of data analysis and basic computer procedures and reviews univariate descriptive statistics. The second unit concerns the fundamentals of tests of statistical inference and hypothesis-testing. A third unit focuses on bivariate analysis using both crosstabulation and correlation/regression as means for understanding relationships between variables and for clarifying the logic of data analysis. The fourth and last unit covers multiple regression analysis and related issues. Throughout the course, you will conduct your own data analyses using the techniques we are studying. By the end of the course, you will be familiar with the most essential approaches in data analysis and with the technical skills and theoretical reasoning required in quantitative work.

The specific course goals are:

- 1) To enhance understanding of social data analysis;
- 2) To increase proficiency with essential statistics;
- 3) To develop familiarity with computer usage;
- 4) To learn to write and critique a research report.

### **TEXTS**

Warner, Rebecca M. 2008. Applied Statistics: From Bivariate Through Multivariate Techniques. Los Angeles: SAGE Publications.

Schutt, Russell K. 2009. Investigating the Social World: The Process and Practice of Research, 6<sup>th</sup> ed. Thousand Oaks, CA: Pine Forge Press (an imprint of Sage). [*The text is an optional supplement, but we will use the text StudySite throughout the course. It is at <http://www.pineforge.com/isw6/>. Both Appendix F in the text and the statistics tutorials on that site are required reading.*] You can purchase the book directly from SAGE/Pine Forge at:  
[http://www.pineforge.com/textbooksProdDesc.nav?prodId=Book233148&utm\\_source=pine\\_homepage&utm\\_medium=bestselling\\_banner&utm\\_campaign=Book233148](http://www.pineforge.com/textbooksProdDesc.nav?prodId=Book233148&utm_source=pine_homepage&utm_medium=bestselling_banner&utm_campaign=Book233148),

Warner presents an overview of statistical basics and then very well-developed and careful explanations of the major statistical techniques used by applied social scientists, always with the goal of teaching you how to understand and apply rather than just how to calculate.

I expect you to be familiar with chapters 12 and 14 from my text, but you should also use earlier chapters to review basic methodological concepts. If you are unsure about such concepts as deductive and inductive research, the role of theory, variables and hypotheses, levels of measurement, measurement validity and reliability, probability sampling, or causality, please review chapters 1-6—understanding these topics is essential for mastering applied statistics! You can also use the Interactive Exercises on the Study Site for my text in order to review these key concepts. Other review resources available at <http://www.pineforge.com/isw6/> include an annotated list of useful web sites and a lesson on the best techniques for searching the web,

Be sure to keep up with the assigned reading. Assigned reading should be completed before you come to class in that week, but you should also review the text again as you work on the assignments. We will also use Warner's end-of-chapter Comprehension Questions as a focus of some class discussion. I will list questions to answer from Warner's Questions on our Blackboard each week. Please select a question and post both the text of the question and your answer to it. You must also post responses to another student's answer. Only one student per question/answer/response (which means, first come, first served). By the start of the 13<sup>th</sup> week, you must have posted 5 answers and 5 responses. You may post additional answers and responses if you do not receive a grade of A and would like to try to obtain a better grade.

We will use the statistics tutorials on the Study Site for my text to structure much of our time in class: <http://www.pineforge.com/isw6/interactives/engines/index.htm>. You will work through these tutorials in class and we will discuss the issues that emerge during this process. You should also prepare and review the tutorials outside of class in order to finish any sections that we do not complete in class and to improve your mastery of techniques.

Throughout the course, we will use the Statistical Package for the Social Sciences (SPSS) to analyze data. The statistics tutorials will help you to master the steps required to use SPSS, but you should also read sections of my Appendix F (on the Study Site) as they are assigned. Appendix F includes screen shots that will familiarize you with what you should expect to see as you perform basic programming actions.

If you expect to become a very heavy SPSS user, you should consider purchasing one or more of the SPSS manuals that are published by Prentice-Hall and/or SPSS ([www.spss.com](http://www.spss.com)). If you would like to purchase a copy of the SPSS program so that you can complete assignments on your own computer, you can obtain a lease for 6 months for just \$35 and download SPSS at <http://www.onthehub.com/spss/>.

### **READING RESEARCH**

We will review as a class in the 2<sup>nd</sup> week examples of a descriptive research report, chosen from those available on my website at [http://www.faculty.umb.edu/russell\\_schutt/RESEARCH%20REPORTS.htm](http://www.faculty.umb.edu/russell_schutt/RESEARCH%20REPORTS.htm). We will compare a report to a published peer-reviewed article on my text study site. In your final paper you will review systematically several research articles, including at least one other that used the GSS dataset. A complete bibliography of research articles using the GSS can be found at the National Opinion Research Center (NORC) website, <http://www.norc.umd.edu/GSS+Website/>. The NORC conducts the General Social Survey and also provides more documentation on their site. You can find other articles as well as those using the GSS by searching SocioFile on the Healey Library web site (see the discussion in chapter 2 and appendix D of my text, on “Finding Information”). Of course, you must also locate an article that you can find in a journal available to you online through the Healey Library or on paper at Healey or some other library to which you have access. We’ll review procedures in class.

### **SUPPLEMENTARY READING**

The supplementary readings include some more-or-less classic articles as well as clear explanations of various techniques (see the bibliography at the end of the syllabus). They can help you to review and extend your knowledge of basic statistical techniques and to explore some of the advantages and disadvantages of quantitative approaches. The supplementary texts are in the library's collection but are not on reserve; most of the supplementary articles are available in the journals section of the library. Read them when you'd like to explore an issue in more depth. Even more supplementary readings are cited in my textbook. Refer to the relevant chapters and the corresponding citations.

If you plan on a research career, you may also want to purchase a copy of the complete SPSS User's Guide or the SPSS introductory statistics guide. These explain how to prepare data for analysis with SPSS and how to manage data using procedures that we will not have time to study in this course. You can purchase the User's Guide at the bookstore or order either volume on the web, from Prentice Hall or SPSS itself.

### **CLASS SESSIONS AND THE GENERAL SOCIAL SURVEY**

Several class sessions will be held in the White Lab on the 3<sup>rd</sup> floor of Healey Library, while others will be in our conference room, usually with laptops supplied in a “mobile classroom” setup. In most class sessions, I will guide you through hands-on analysis of research questions focused on the General Social Survey (see Schutt 2009, chapter 8, p. 257). We will also devote much class time to the logic behind statistical procedures and the challenges in interpretation of statistical results.

The General Social Survey is a periodic survey of a representative sample of the general population. Questions cover a range of issues about family, work, politics, health, and community involvement, with special modules on unique topics in some

years. The statistics tutorials that will be used in class are based on the 2006 GSS (which will be available in the UMB computer labs and on the laptops).

There is also information about the GSS at Web sites maintained by the Roper Center, the Interuniversity Consortium for Political and Social Research (ICPSR), and the University of California at Berkeley Sociology Department. You can link to these sites through the NORC site, <http://www.norc.org/GSS+Website/>. The UC Berkeley site allows you to conduct statistical analyses directly online with the GSS data.

### **ASSIGNMENTS AND GRADES**

Your course grade will be based on four assignments, one oral presentation, and a final paper. The four assignments together count for 60% of the course grade; the final paper is worth 30%; the oral presentations and class participation are together worth 10%. I encourage you to pick a research topic on which to focus throughout the term and to focus your work for each assignment on that topic. Assignments are listed in the syllabus in the week when they will be distributed; they will usually be due one week after that. In-class exercises (tutorials) are based on the 2006 General Social Survey, while assignments are to use the 2008 GSS. Your final paper can use one or more years from the cumulative GSS file (1972-2008), or just the 2008 GSS. You can obtain the cumulative file from the NORC site.

You will present findings from your last assignment (and/or some from your final paper) in one of the last two weeks of the course. You must display your steps and results with the instructor's PC and projector in the lab.

#### **Assignments**

1. Descriptive Statistics & Data Displays.
2. Cross-tabulation.
3. Mean Differences & Hypothesis-testing.
4. Correlation & Regression.

In your final paper, you will include some descriptive statistics as well as more advanced multivariate techniques that we will cover in the last weeks of the course. The paper will present an analysis of GSS data in a form that would be suitable for submission to a peer-reviewed journal.

### **COMPUTER USAGE**

Much of the instruction in basic statistical procedures with the computer will occur in the first weeks of the semester, but throughout the term our class sessions will help you to improve your computer mastery. Our class TA's first task during the course is to help you with computer procedures and SPSS questions, including obtaining data you need and properly running statistical procedures. She can also advise you on basic statistical procedures.

All assignments must be completed with a computer and statistical software--SPSS, unless you use the online analysis systems available at the NORC or Berkeley web sites (see above). There are several computers with SPSS that you can use in the Sociology Department (in the offices assigned to grad students). You can also use a computer in any of the computer labs identified below. The Graduate and Research Computing Lab on the 5<sup>th</sup> floor of Healey should always be open to you, as should the large computer lab in the back of Healey, UL. The Grad lab has top-notch equipment and software.

If you would like to use SPSS on your own PC at home (a good idea), you can purchase a copy of the SPSS Graduate Pack at the bookstore. This is an almost complete version of SPSS but at a substantial mark-down for graduate students. There is also a student version (intended for undergraduates) of SPSS that is almost free, but it limits you to datasets of no more than 50 variables, and a limited number of cases. This would be a problem for our coursework, but might be an option to discuss with me in special circumstances.

You may wish to attend a Computing Services workshop or take an online tutorial to learn more about e-mail, the Web, connecting to the UMB web site or other computer issues (including more instruction in SPSS itself and tools like Blackboard). Check their resources, including this semester's workshop schedule at: <http://www.umb.edu/training/>.

If you need help with computer procedures, lab staff can help with basics but they most often do not know much about SPSS. I expect you to first seek answers to SPSS questions from Sarah. I will respond to messages about course issues posted on our Blackboard site when Sarah has not been able to resolve them.

### **Blackboard**

The course is supplemented with materials available through Blackboard, an online course delivery system. You must log into our class Blackboard site regularly to ask questions of me and our Alexandra, and other students, and to check assignments and bulletins. I expect all course-related questions that arise outside of class to be asked through our Blackboard discussion site, so that all students can learn from this dialogue. We may schedule some online synchronous "chat" times through Blackboard, if the need arises for a "class outside of class."

## **COURSE OUTLINE**

### **UNIT I: THE LOGIC OF DATA ANALYSIS & COMPUTER TECHNIQUES**

INTRODUCTION TO DATA ANALYSIS, Week 1 (September 9)

Warner, Chapter 1: Review of Basic Concepts; Chapter 4 (125-135)

ADD/DROP period ends Monday, 9/13.

FREQUENCY DISTRIBUTIONS, GRAPHING & USING SPSS, Week 2 (Sep. 15)

Warner, Chapter 4: Preliminary Data Screening (135-157)  
Schutt, Chapter 14 (486-502); Appendix F (F1-F7)  
ISW6 Descriptive Statistics Tutorial

Assignment #1: Descriptive Statistics & Data Displays.  
Report & article review

DATA DEFINITION, UNIVARIATE STATISTICS, Week 3 (Sep. 23)

Warner, Chapter 2: Introduction to SPSS (41-59)  
Schutt, Chapter 12 (502-514); Appendix F (F7-F10)

### **UNIT 2: STATISTICAL SIGNIFICANCE**

STATISTICAL INFERENCE AND HYPOTHESIS TESTING, Week 4 (Sep. 30)

Warner, Chapter 2: Sampling Error, CIs (59-77);  
Chapter 3: Statistical Significance Testing (81-106)  
Schutt, Chapter 5 (177-183)  
ISW6 Inferential Statistics Tutorial

Assignment #2: Statistical Inference & Hypothesis-testing.

T-TEST AND ANOVA, Week 5 (Oct. 7)

Warner, Chapter 3 (115-123); Chapter 5: Comparing Group Means;  
Chapter 6: Analysis of Variance (215-234)

**UNIT 3:  
BIVARIATE ANALYSIS: CROSSTABULAR & CORRELATIONAL**

CROSSTABULATION & CHI-SQUARE, Week 6 (Oct. 14)

Warner, Chapter 4 (156-160)  
Schutt, Chapter 12 (514-525); Appendix F (F11-F12)  
ISW6 Crosstabulation Tutorial

Assignment #3: Crosstabulation & Chi--Square.

REGRESSION AND CORRELATION, Weeks 7, 8 (Oct. 21, 28)

Warner, Chapter 7: Pearson Correlation; Chapter 9: Bivariate Regression;  
Chapter 19 Reliability (826-848, 854-860)  
Schutt, Chapter 14 (531-533)  
ISW6 Regression Tutorial

Assignment #4: Correlation & Regression.

**UNIT 4:  
MULTIVARIATE ANALYSIS**

MULTIPLE REGRESSION, Weeks 9, 11 (Nov. 4, 18)

Warner, Chapter 10: Adding a Third Variable;  
Chapter 11: Multiple Regression;  
Chapter 12: Dummy Variables & Interaction Terms  
Multiple Regression Tutorial (in Blackboard)

HOLIDAY, Week 10, 12 (Nov. 11, 25)

ADVANCED REGRESSION, Week 13 (Dec. 2)

Warner, Chapter 14: Multiple Regression with More Predictors;  
Chapter 21: Logistic Regression

Begin final presentations

FINAL PRESENTATIONS, Week 14 (Dec. 9)

Schutt, Chapter 14 (546-561)

FINAL PAPERS: Due Thursday, December 16

**USEFUL REFERENCES**

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- Anderson, J. B. 1973. "Causal Models and Social Indicators: Toward the Development of Social Systems Models." American Sociological Review. 38:285-301.
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