Course Description and Goals: The focus of this course is on the application of statistical techniques to analyze social science data, in particular survey data. Students will choose a data set and prepare a research paper based upon the data; the final product for the course will be an original research paper suitable for presentation at a profession conference or for publication in a scholarly journal. This is not a statistics course, per se, but rather a course in which statistical theories and techniques will be reviewed (and some new techniques introduced). The emphasis in this course will be on the appropriate use and interpretation of statistical techniques in the analysis of social science data. 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 through data analysis and presentation of findings.

Prerequisites: At least one graduate statistics course and a passing grade of 85% or higher on the diagnostic exam for this course. The course work assumes that students understand principles of statistical inference, including confidence intervals and hypothesis testing, measures of central tendency and variation, multiple linear regression, analysis of variance, logistic regression and bivariate and multivariate contingency tables (and associated statistical tests of association and relationship strength).
Learning Outcomes:
- Conduct statistical analysis appropriate to the research question of interest
- Gain familiarity with statistical techniques for a broad range of levels of measurement
- Understand and incorporate the appropriate statistical techniques, given the level of measurement of the independent and dependent variables of interest
- Interpret and communicate statistical output generated from Stata correctly
  Develop proficiency in the aural and written presentation of statistical analysis

It is expected that students will spend 9-15 hours per week completing tasks related to his course (outside of class attendance and lab attendance). As a general guide, students should expect to spend about 3-5 hours reading assigned course materials, about 3-5 hours completing assignments, and about 3-5 hours working on the semester long project and preparing for weekly quizzes and the final exam.

Required Texts: There are two required texts for this course. Additional reading material will be posted on the D2L site. The required texts are:


In addition, I have found the following text to be quite helpful for statistical computing using Stata:

Lawrence C. Hamilton (2012) *Statistics with Stata: Version 12*. Belmont, CA: Duxbury (an imprint of Thompson). This is a very expensive book—I have copies (earlier editions) in the Sociology Stat Lab for your use.

Computing
This course will make extensive use of statistical software for the analysis of complex survey data. The course will be taught using Stata. Many of the statistical tests and models we will be examining are not available in SPSS nor can one use the standard SPSS package for the analysis of complex survey data. Stata is available in the computer labs throughout campus. I have set up a Grad Plan package for you to purchase Stata for your personal computers. See the email from me for the link.
Grading. Grading for the course will be based on the following:

1. **Homework assignments (125 points).** There will be 5 homework assignments. The homework is intended to reinforce the lecture materials and readings and allow you the opportunity to apply your skills to real datasets. Each of the assignments will offer you the opportunity to further understand the dataset to be used for your final empirical paper. Late assignments will be downgraded by one letter grade per day that they are late. See schedule below.

2. **Final Exam (100 points).** An in-class cumulative exam will be given on Monday December 15th during the regular class period (4:30 p.m to 7:30 p.m). This will be an open-book, open note exam, focusing on application and interpretation.

3. **Empirical Research Paper (150 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 (theory or empirically based hypothesis), motivate the research with a literature review, complete the statistical analysis, and write up the results. The final paper is expected to be of the quality one would find in a leading social science peer-reviewed journal. This is a great opportunity to find the data for your MA or Ph.D. thesis and begin to conduct preliminary analysis! Students will peer-review and critique papers by fellow students. **Work on the final paper should begin the first week of class!**

4. **Empirical research paper: presentation (25 points).** In addition to writing a final paper, you will present a profession-level presentation to the class, 20-30 minutes of your findings. This presentation will be similar to a presentation you would present at a professional meeting. All students will grade and critique all of the presentations.

**Class website:** Lecture notes (to the extent there are any), exercises, and any supplemental readings not included in the texts can 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.

**Lecture and Lab format:** The course runs from 4:30 to 7:30 p.m. on Mondays; the course will be divided between lecture (4:30 to 6:15) and lab (6:30 to 7:30), depending upon the nature of the material to be covered. For example, during the weeks that we are focusing on statistical techniques, lab time will be spent applying (that is trying out) the various techniques. I encourage you to have a flash drive with you for all classes, so that you can save your work.

You are expected to have read the material prior to the lecture. The lectures only make sense when you have prepared adequately for the class. Since this is a small, Ph.D.-level course, all students will be expected to contribute to the discussion and
explication of material during the class. Attendance at both the lecture and lab are required. Office hours 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. If you wish to have any grade reconsidered (assignment, quiz, exam, final paper), all material must be submitted in writing. Note that review of any grade could result in additional points being deducted, added, or no change to the grade.

Assignment Schedule

<table>
<thead>
<tr>
<th>Handout Date</th>
<th>Assignment Topic</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>9.8.14</td>
<td>Proposed Research Topic and Data</td>
<td>9.22.14</td>
</tr>
<tr>
<td>9.22.14</td>
<td>Data Cleaning, Weighting and Imputation</td>
<td>10.6.14</td>
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<tr>
<td>10.6.14</td>
<td>Linear and Logistic Regression</td>
<td>10.27.14</td>
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<tr>
<td>10.27.14</td>
<td>Limited DV and Count Data</td>
<td>11.10.14</td>
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<tr>
<td>11.10.14</td>
<td>Outline of Analysis Plan</td>
<td>11.17.14</td>
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## Schedule of Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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| 9.8    | Introduction; Theory Based Data Analysis; Review of Levels of Measurement; Lab: Introduction to Stata | 1. Aneshensel *Theory-Based Data Analysis*, Chapters 1 & 2.  
2. Newton and Rudestam *Your Statistical Consultant*. Chapter 8  
3. Long and Freese, pp. 3-72  
4. Review your favorite stat text book—univariate through bivariate analyses |
2. Stapelton “Analysis of Data from Complex Surveys”  
3. Johnson and Elliot “Sampling Design Effects: Do They Affect the Analyses of Data from the National Survey of Families and Households?” |
| 9.22   | Preparing for the Analysis of Survey Data Lab: Descriptive Statistics | 1. Heeringa, Chapter 4  
2. Newton and Rudestam *Your Statistical Consultant*. Chapter 6  
3. Tabachnick and Fidell *Using Multivariate Statistics*. Chapter 4 |
| 9.29   | Treatment of Missing Data Lab: Identify and Replace Missing Data | 1. Heeringa Chapter 11  
3. Schafer and Graham “Missing Data: Our View of the State of the Art” |
| 10.6   | Analysis for Continuous Variables; Linear Regression Lab: Linear Regression | 1. Heeringa, Chapter 5 & 7  
2. Application: Klebanov, Brooks-Gunn, and Duncan “Does Neighborhood and Family Poverty Affect Mothers’ Parenting, Mental Health and Social Support” |
| 10.13  | Analysis for Categorical Variables; Logistic Regression Lab: Logistic Regression | 1. Heeringa, Chapters 6 & 8  
2. DeMaris “A Tutorial in Logistic Regression”  
3. Long and Freese, pp. 75-181 pp. 415-427  
4. Application: Sigelman, Tuch, and Martin “What’s In a Name?” |
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
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<tr>
<td></td>
<td>Lab: creating interaction terms</td>
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| 10.27 | Limited Dependent Variables: Ordinal and Multinomial Logit Models    | 1. Heeringa, Chapter 9 (pp. 265-285)  
2. Long and Freese, Chapter 5 &6  
|       | Lab: Multinomial logits                                              |                                                                                                                                          |
| 11.3  | Count Data                                                           | 1. Heeringa, Chapter 9 (pp. 286-298)  
2. Long and Freese, Chapter 8  
3. Application: Knudsen, Roman, Johnson and Ducharme “A Changed America? The Effects of September 11th on Depressive Symptoms and Alcohol Consumption” |
|       | Lab: Count Data; negative binomial and Poisson models                |                                                                                                                                          |
| 11.10 | Survival Analysis/Event History Analysis                            | 1. Heeringa, Chapter 10  
| 11.17 | Causal Pathways and Structural Equation Models [Guest Instructor Noelle Chesley] | 1. TBA  
| 11.24 | No Class ---work on final presentations                              |                                                                                                                                         |
| 12.1  | Presentations                                                        |                                                                                                                                         |
| 12.8  | Presentations                                                        |                                                                                                                                         |
| 12.15 | Final Exam                                                           |                                                                                                                                         |
UNIVERSITY AND SOCIOLOGY DEPARTMENT POLICIES

The Secretary of the University maintains a web page that contains university policies that affect the instructor and the students in this course, as well as essential information specific to conduct of the course. The link to that web page is: http://www4.uwm.edu/secu/SyllabusLinks.pdf

**Students with Disabilities.** Verification of disability, class standards, the policy on the use of alternate material and test accommodations can be found at the following: http://www.uwm.edu/Dept/DSAD/SAC/SACltr.pdf

**Religious Observances.** Policies regarding accommodations for absences due to religious observance are found at the following: http://www.uwm.edu/Secu/docs/other/S1.5.htm

**Students called to active Military Duty.** Accommodations for absences due to call-up of reserves to active military duty are found at the following: http://www4.uwm.edu/current_students/military_call_up.cfm

**Incompletes.** You may be given an incomplete if you have carried a course successfully until near the end of the semester but, because of illness or other unusual and substantiated cause beyond your control, have been unable to take or complete the final examination or to complete some limited amount of course work. An incomplete is not given unless you prove to the instructor that you were prevented from completing the course for just cause as indicated above. The conditions for awarding an incomplete to graduate and undergraduate students can be found at the following: http://www4.uwm.edu/secu/docs/other/S31.pdf

**Discriminatory Conduct** (such as sexual harassment). Discriminatory conduct will not be tolerated by the University. It poisons the work and learning environment of the University and threatens the careers, educational experience and well-being of students, faculty and staff. Policies regarding discriminatory conduct can be found at: http://www4.uwm.edu/secu/docs/other/S47.pdf

**Academic Misconduct.** Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Policies for addressing students cheating on exams or plagiarism can be found at the following: http://www4.uwm.edu/osl/dean/conduct.cfm

**Complaint Procedures.** Students may direct complaints to the Sociology Department Chair or the Associate Dean for Social Sciences in the College of Letters & Sciences. If the complaint allegedly violates a specific university policy, it may be directed to the Sociology Department Chair, the Associate Dean for Social Sciences in the College of Letters & Sciences, or to the appropriate university office responsible for enforcing the policy. Policies may be found at: http://www4.uwm.edu/secu/docs/other/S49.7.htm

**Grade Appeal Procedures.** A student may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow the established procedures adopted by the department, college, or school in which the course resides or in the case of graduate students, the Graduate School. These procedures are available in writing from the respective department chairperson or the Academic Dean of the College of Letters & Science. Procedures for undergraduate student grade appeal can be found at http://www4.uwm.edu/letsci/upload/grievance_procedure.pdf

Procedures for graduate student grade appeal can be found at http://www.graduateschool.uwm.edu/students/policies/
**Final Examination Policy.** Policies regarding final examinations can be found at the following:  
http://www4.uwm.edu/secu/docs/other/S22.htm

**Book Royalties.** In accord with Department of Sociology policy, the royalties from the sale of faculty-authored books to students in their classes are donated to a UWM Foundation/Sociology Account to support future awards and activities for UWM students in Sociology.

Update 06/2012