Learning Objective

In this course we will study general and generalized linear models in detail, including both statistical theory and practical applications. Students will gain practical experience using statistics and statistical software to analyze survey data. By the end of this course they are expected to know how to use a variety of regression techniques, and understand when they work and why they may not work under various conditions.

Students will also learn the tools necessary to become a proficient researcher when working with survey data, and gain practical experience writing a research report. The lectures will cover the following topics: bivariate and multiple regression, regression diagnostics, path analysis, regression with limited dependent variables, and regression in matrix. We will also devote some time working through the logic of ordinary least squares (OLS) and maximum likelihood estimation (MLE), the statistical techniques most commonly used to obtain regression estimates for linear and generalized linear models. Students will confront issues that commonly arise when working with social surveys such as how to deal with missing data and large surveys involving complex sampling designs. This course will also keep students up-to-date with the latest developments in statistical programming for applied social science research.
The Research Project

From beginning to end, this class is designed to teach graduate students how to become proficient analysts of survey data. By the end of the course they are expected to be able to write a journal article quality research report on a topic of their choice. The project involves investigating the relevant literature to identify a research problem that can be addressed with datasets made available in the Data Resource Library on campus. Using the statistical techniques learned in class, students will review the relevant literature, analyze their data, report their results, discuss their findings, and generate some conclusions. The final paper will be approximately 25 and 30 pages, double spaced (including tables and appendices). Students who have taken this course in the past have used the final research project as preliminary research for their Master’s thesis or PhD dissertation. Many have presented their research from this class at national and international conferences, and others have also published their papers in peer-reviewed journals.

It is assumed that students enter this course with experience using regression analysis (SOAN 3120). This course does not require a strong background in mathematics; however, students are expected to perform simple matrix manipulations such as addition, subtraction, multiplication and division (i.e. calculating the inverse of a 2x2 matrix). The last in-class assignment involves calculating regression coefficients (by hand) in matrix form.

Attendance is extremely important as I address material in a slightly different way than it is covered in the text(s).

The primary statistical software package that will be used in this course is Stata. However, I will also provide some examples using SAS, SPSS and R.

Required Text: TBA
Supplemental Texts (on reserve in the library):


* A detailed week-by-week summary of readings will be provided in class

**Evaluation**

The midterm test is worth 40% and will cover all of the material presented up until the test. The final research paper is worth 50%, and is due at the end of the term. Various assignments/participation will make up the remaining 10%.  