Course Description

This course is for students who understand the basic logic of the linear regression and logistic regression (those who took Soc 605 or equivalent). Based on such knowledge, we discuss some other techniques that may be considered more advanced but are used frequently by social scientists. The content includes:

- Review of Linear Regression and Logistic Regression Models: including
  Ordered logit, Multinomial logit (Case-specific or Choice specific)
- Poisson Regression (dealing with count outcomes)
- Survival Analysis (aka Event History Analysis)
- Introduction to Multilevel Analysis (aka Hierarchical Models, used for longitudinal data or other multi-level data)

The focus is heavily on the application of the techniques to social science research. We discuss which techniques are appropriate for certain types of research questions, how to perform the analysis using statistical package of STATA, and how to interpret the results.

Course evaluation will be based on individual research paper. Students are expected to have/find data sets appropriate for their research, but we can discuss together where and how to obtain data.

Required Text:


*We will read a few research papers from the current issues of sociological journals.

Reference books:

**Course Requirement**

**Attendance:** Attendance to all classes (including lab sessions) is required.

**Presentation:** Students are expected to actively participate in class discussions, and will make three types of presentations: (1) the textbook chapter of the week (2) individual research projects—proposal, analysis progress, and final paper, and (3) experiences with STATA and/or data analysis. Presentations will comprise 50% of the final grade.

**Research Proposal:** A research proposal—3 or more pages—is due by the end of the 6th week. The proposal should: (1) clarify research issues, (2) describe the data, and (3) discuss research design and methods as much as one can, although at this point they may be tentative. The proposal will comprise 10% of the final grade.

**Research Paper:** A research paper—about 15 pages—is due by the end of the semester. Important evaluation criteria include: (1) whether appropriate methods and models are chosen to answer the research questions, (2) whether the analysis of data is done thoroughly, and (3) whether the interpretation of results is appropriate. The paper will comprise 40% of the final grade.

**Course Schedule**

**READING the relevant materials BEFORE each class is essential!**

**Week**

1 Aug 26
   Overview
   Introduction to STATA
   Long Ch 1

2 Sep 2
   (class at computer LAB Saunders 342)
   STATA practice
   Review: Multiple regression
   Long Ch 2
   AF Ch 9-14

3 Sep 9
   (class at LAB Saunders 342)
   Models for Binary outcomes
   1 Statistics model
   2 Estimation using logit and probit
   3 Hypothesis testing
   4 Residuals
   5 Measuring fit
   6 Interpretation using predicted probabilities
   7 Interpretation using odds ratios
   8 Other commands for binary outcomes
   Long Ch 4
Week

4  Sep 16  (class at LAB Saunders 342)
    Estimation
    Models for ordinal outcomes  Long Ch 3

5  Sep 23  Models for nominal outcomes with case-specific data  Long Ch 6

6  Sep 30  **Proposal discussion**

    Models for nominal outcomes w/ alternative-specific data  Long Ch 7

7  Oct  7  Models for count outcomes  Long Ch 8

8  Oct 14  Other topics (Model specification issues)  Long Ch 9
    Life tables  RC 7, Bloss 1-2

9  Oct 21  Life tables  RC 7, Bloss 1-2
    Proportional hazard model  Bloss 4, RC 8

10 Oct 28  Proportional hazard model  Bloss 4, RC 8

11 Nov  4  Hazard models with time dependence  Bloss 7, RC 8-9
    Other hazard models  Bloss, RC 9

12 Nov 18  Multilevel modeling  Luke

**Research progress report**

13 Nov 25  Multi-level analysis II  RS
    (Random Intercept Model)

14 Dec  2  Multi-level analysis III  RS
    (Random Coefficient Model)

15 Dec  9  Paper presentations

*Paper is due Dec 16 (Wednesday noon)*