Course summary
This course covers statistical techniques used in sociology and other social sciences. Building on Sociology 6120, this course introduces students to current statistical methods beyond OLS regression. Topics we will cover include models for categorical data including binary, ordinal, and unordered dependent variables; frequency counts; and censored dependent variables. Additional topics will include event history analysis, models for panel data, and instrumental variables.

Prerequisite
FCS 6110, SOC 6120 or equivalent knowledge of OLS regression.

Course materials
Required, available at bookstore


Optional, available online


We will also make use of additional readings available online through JSTOR http://www.jstor.org (accessibile from University of Utah-based computers or via VPN), on reserve at the library, or other depositories.
We will be using version 11 of the statistical package Stata for this course. You have two options for obtaining access to Stata:

1) You can purchase Stata version 11 at a discounted price through a GradPlan for use on your own computer. This is probably the best option if you expect to use Stata on a regular basis for the rest of your career. Stata is available in 4 versions (Small, Intercooled, Stata/SE, and Stata/MP) which differ in the size of the datasets each can analyze and the number of cores or processors that Stata can use. Intercooled Stata is suitable for general use. Order online through http://www.stata.com/order/new/edu/gradplans/gp-campus.html or by phone 800-782-8272. If you order by phone be sure to say that you are ordering through the University of Utah GradPlan. Ordering an undiscounted copy is substantially more expensive.

2) You can use Stata for free on the PCs in the CSBS computer labs. Sociology graduate students may also use it in the 4th floor computer lab.

As for documentation, the online help available in Stata, Long & Freese, and your lecture notes should be sufficient for the purposes of Sociology 7130. If you expect to regularly use Stata in the future, you may order documentation through the sources listed above. There are also many online Stata resources linked via the course webpage.

Students desiring additional resources for learning Stata should consult:

UCLA Academic Technology Services Resources to help users learn and use Stata: http://www.ats.ucla.edu/stat/stata/default.htm

Richard Williams’ (Notre Dame Sociology) Stata Highlights: http://www.nd.edu/~rwilliam/stats/StataHighlights.html

Acock, Alan. 2006. A Gentle Introduction to Stata. College Station, Texas: Stata Press.


Course requirements and grading
Periodic problem sets will be assigned and students will be required to present their answers orally in class. Students may work on the homework in pairs and submit one assignment with the names of both students. There will also be two take-home midterms, a take-home final, and a term paper accompanied by a brief presentation. The final grade will be based on homework (20%), two midterms (35%), the final (25%), and the paper (20%).

The paper requirement is an empirical research paper that applies one of the methods covered in class to a substantive problem in social science. The paper (25 pages maximum including tables, figures, references, etc) should include problem formulation, linkage to substantive literature, analysis of suitable
data, and discussion of findings. Students are required to submit a two-page proposal outlining the problem, data, and empirical analyses. Deadlines are:

- **Proposal:** 1 March 2011
- **Final Draft:** 6 May 2011

### Americans with Disabilities Act (ADA)

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

### Supplementary readings

The following books are useful supplements to the required readings.


**Course outline and reading schedule**

Note that this outline is tentative. Discussion and exam dates may change.

**January**

11 Introduction to the course and to Stata  
Reading: Long & Freese Chapter 2

13 OLS Regression I: dummy variables, interactions  
Reading: Wooldridge Appendices D and E, Chs 2-5

18 OLS Regression II: hypothesis tests, relative importance  
Reading: Wooldridge Ch 4, 6.1

20 OLS Regression III: analysis of covariance, adjusted means, regression decomposition  
Reading: Wooldridge 7.1-7.4  
Jones & Kelley 1984  
Sweeney & Phillips 2004

25 OLS Regression IV: nonlinearity, missing data, measurement error, sampling weights  
Reading: Wooldridge 6.2, 9.3-9.4  
Winship & Radbill 1994  
Acock 2005

27 OLS Regression IV (continued)

**February**

1 OLS Regression IV (continued)

3 Maximum likelihood estimation, Binary dependent variables: logit and probit models  
Reading: Allison Chapters 2, 3, 4  
Wooldridge 17.1  
Long & Freese Chapters 3, 4  
Train Chapters 1-5 (advanced)

8 **TAKE-HOME MIDTERM 1 DISTRIBUTED**

Binary dependent variables (continued)  
Reading: Allison 1999

10 Binary dependent variables (continued)
15 **TAKE-HOME MIDTERM 1 DUE**  
Binary dependent variables (continued)

17 Binary dependent variables (continued)

22 Ordinal dependent variables  
   Reading: Allison Chapter 6  
            Long & Freese Chapter 5

24 Ordinal dependent variables (continued)

March 1 **PROPOSAL DUE DATE**  
Multinomial dependent variables and conditional logit models  
   Reading: Allison Chapter 5  
            Long & Freese Chapter 6

3 Multinomial dependent variables and conditional logit models (continued)

8 Censored and truncated variables: Tobit models, interval regression  
   Reading: Wooldridge 17.2, 17.4

10 **TAKE-HOME MIDTERM 2 DISTRIBUTED**  
Censored and truncated variables: sample selection bias  
   Reading: Wooldridge 17.5  
            Fu, Winship, & Mare 2004

15 Counted dependent variables: Poisson regression and its relatives  
   Reading: Allison Chapter 9  
            Wooldridge 17.3  
            Long & Freese Chapter 7

17 **TAKE-HOME MIDTERM 2 DUE**  
Loglinear models for multiway contingency tables  
   Reading: Allison Chapter 10

22 Spring break

24 Spring break

29 Loglinear models for multiway contingency tables (continued)

31 Event history analysis  
   Reading: Allison 1982  
            Willett & Singer 1991

April 5 Event history analysis (continued)  
   Reading: Vaupel & Yashin 1985

7 Panel and other types of clustered data  
   Reading: Long & Ervin 2000  
            Wooldridge Chs 13-14

12 Panel and other types of clustered data (continued)

14 Endogeneity and simultaneity: instrumental variables  
   Reading: Wooldridge Ch 15
19 Bayesian approaches
   Reading: Lynch Chapter 3
21 Paper presentations

26 Paper presentations

28 **Take-home final exam due 6 May 2011**
   Paper presentations