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


Required, available online


We will also make use of additional readings available online through JSTOR http://www.jstor.org (accessible from University of Utah-based computers or via VPN), on reserve at the library, or other depositories.

Computing
We will be using version 9 of the statistical package Stata for this course, although the most current is version 10. You have two options for obtaining access to Stata:
1) You can purchase Stata version 10 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/ep-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/stats1/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: Tuesday, 24 February 2009
Final Draft: Monday, 4 May 2009
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.

<table>
<thead>
<tr>
<th>January</th>
<th>Reading</th>
<th>Reading</th>
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<tbody>
<tr>
<td>13 Introduction to the course and to Stata</td>
<td>Long &amp; Freese Chapter 2</td>
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<tr>
<td>15 OLS Regression I: review, matrix approach to regression</td>
<td>Powers &amp; Xie Appendix A, Chapter 2</td>
<td>Wooldridge Appendices D and E, Chapters 2-5</td>
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<tr>
<td>20 OLS Regression II: hypothesis tests and “relative importance”</td>
<td>Wooldridge Chapter 4, 6.1</td>
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<td>22 OLS Regression III: analysis of covariance, adjusted means, regression decomposition</td>
<td>Wooldridge 7.1-7.4</td>
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<tr>
<td>27 OLS Regression IV: nonlinearity, missing data, measurement error, sampling weights</td>
<td>Wooldridge 6.2, 9.3-9.4</td>
<td>Winship &amp; Radbill 1994</td>
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<td>29 OLS Regression IV (continued)</td>
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<tr>
<th>February</th>
<th>Reading</th>
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<tr>
<td>3 Maximum likelihood estimation, Binary dependent variables: logit and probit models</td>
<td>Powers &amp; Xie Chapters 1, 3, Appendix B</td>
<td>Wooldridge 17.1</td>
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<td></td>
<td>Long &amp; Freese Chapters 3, 4</td>
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<td>Train Chapters 1-5 (advanced)</td>
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<tr>
<td>5 TAKE-HOME MIDTERM 1 DISTRIBUTED</td>
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<tr>
<td>10 Binary dependent variables (continued)</td>
<td>Allison 1999</td>
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<tr>
<td>12 Binary dependent variables (continued)</td>
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<tr>
<td>17 Ordinal dependent variables</td>
<td>Powers &amp; Xie Chapter 6</td>
<td>Long &amp; Freese Chapter 5</td>
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<tr>
<td>19 Ordinal dependent variables (continued)</td>
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<td>24 PROPOSAL DUE DATE</td>
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<tr>
<td>26 Multinomial dependent variables and conditional logit models</td>
<td>Powers &amp; Xie Chapter 7</td>
<td>Long &amp; Freese Chapter 6</td>
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<tr>
<td></td>
<td>Multinomial dependent variables and conditional logit models (continued)</td>
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March

3 Censored and truncated variables: Tobit models, interval regression
   Reading: Wooldridge 17.2, 17.4
5 Censored and truncated variables: sample selection bias
   Reading: Wooldridge 17.5
   Fu, Winship, & Mare 2004

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

12 TAKE-HOME MIDTERM 2 DISTRIBUTED
   Loglinear models for multiway contingency tables
   Reading: Powers & Xie Chapter 4

17 Spring break
19 Spring break

24 TAKE-HOME MIDTERM 2 DUE
   Loglinear models for multiway contingency tables (continued)

26 Event history analysis
   Reading: Powers & Xie Chapter 5
   Allison 1982
   Willett & Singer 1991

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

April

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

7 Panel and other types of clustered data (continued)
9 Endogeneity and simultaneity: instrumental variables
   Reading: Wooldridge Chapter 15

14 Bayesian approaches
   Reading: Lynch Chapter 3
16 Bayesian approaches (continued)

21 Wrap-up/catch-up
23 Paper presentations

28 TAKE-HOME FINAL EXAM SCHEDULING TO BE ANNOUNCED
   Paper presentations