Topics in Advanced Methodology  
Political Science 306  
Spring 2004

Class Time: Tuesday & Thursday 10:55-12:10  
Classroom: 143 Schaeffer  
Instructor: Fred Boehmke  
Office: 361 Schaeffer  
Office Hours: Tuesday 14:45-16:00 & Wednesday 15:00-16:00, or by appointment.  
Email: frederick-boehmke@uiowa.edu  
Phone: 335-2342  
Web Page: http://rubagalo.polisci.uiowa.edu/~fredb/Classes/polisci306  
Mailing List: polisci306@rubagalo.polisci.uiowa.edu  
AIM: ProfBoehmke

Course description

This class will introduce you to a variety of statistical techniques relevant to political science. The objective is for you to become familiar enough with them to understand how, when and why to use them. Emphasis will therefore be on empirical applications and a large portion of class time will be devoted to hands-on use of these methods in the computer lab. The class will require you to know or learn how to use Stata since almost all of our applications can be done using it and many of them essentially require it (unless you want to write your own code…). I will also assume familiarity with linear algebra, calculus and probability theory, but we will likely review these topics a bit as necessary.

The three main topics this semester are discrete choice analysis, models for event count data and duration analysis. Additional and related topics will be covered as necessary. The main tool through which you will familiarize yourself with these methods is Monte Carlo analysis, which will be presented in the first week. Many of your homework assignments and an in-class presentation will involve Monte Carlo analysis.

Grades will be based on four parts: class participation (15%), in-class presentations (probably two) (15% total), homework assignments (40%) and a poster presentation (30%) at the end of the semester.

Course Requirements

1. Class participation.  
   Class time will be divided between lectures, discussion and computer work - you will be assigned readings that explain and apply the methods we cover. You are expected to complete the reading before class and come prepared to discuss it. For substantive material, this implies the ability to answer the following questions: 1) What is the central research question? 2) What is the method used to test that hypothesis? and 3) What is the advantage of using that method? To help facilitate discussion and provide
a forum for methodological, empirical and computational topics related to
class, I have set up a mailing list that you will be required to join (I'll
explain how in class). I reserve the right to put these questions in quiz
format as necessary.

2. Homework.
The best way to learn the material is to use the models. I will assign
homework on a weekly to bi-weekly basis. Most of the assignments will
specify a model and ask you to run a Monte Carlo analysis that involves
generating data and then estimating the parameters using a few different
assumptions (both correct and incorrect). When you turn in the homework,
I want to receive an electronic copy of your Stata program file and an
appropriate graphical or tabular representation of the results. Late
homework will lose five points per day unless prior arrangements are
made.

3. Presentations.
Each student will complete two in-class presentations. The first
presentation will be a proposal for applying an advanced method to a
substantive research question. The second presentation will be an extended
Monte Carlo analysis of a specific methodological question. At a
minimum, you should compare the performance of at least two different
models under a variety of conditions (i.e., vary at least one component of
the model across a range of values). Your presentation must include an
appropriate graphical or tabular summary of the results and evaluate the
relative performance of the different models and you must circulate a copy
of the Stata program at least one day before your presentation.

4. Poster Presentation.
At the end of the semester (exact date TBA, but probably the Friday of the
penultimate week of classes), class members will present the result of their
research project to the department in poster format. Guidelines for poster
presentations are included on the Department’s Resources for Graduate
Students web page; additional materials may also be circulated. The focus
of the poster should involve either 1) the application of a suitable,
advanced method to a substantive research question; 2) the theoretical
development of a new method; or 3) a detailed investigation of existing
methods using Monte Carlo analysis, with a critique of current studies.

Posters must also meet the following criteria (adapted to the three options
as appropriate):

i. No fewer than 8 and no more than 12 panels (page equivalents).
ii. One page must explain why the primary method allows an
improvement over previous studies or how the primary method
permits appropriate testing of novel hypotheses.
iii. One page must present a graphical (or tabular, but only if
necessary) interpretation of the main result.
iv. One page must indicate the primary hypothesis being tested.
 v. One page must clearly indicate the data and/or methods employed.
You will submit a copy of your poster and Stata program files by the last day of classes.

**General Topics to be Covered**

I will pick out a few papers from the current topic each week and expect you to read them, but the ones I do not assign will also be useful if you are interested in that area or want to see some empirical applications.

1. Discrete Choice Analysis.
2. Count Models.
3. Duration Analysis.
4. Monte Carlo Analysis.

**Books**

There are two books assigned for the class, the first of which is available at *Iowa Book and Supply*. The second book is not yet published, but should be available by the time we reach duration analysis.


These books are also good to have around for reference and will be useful for topics covered in the class:


Introduction

Long, Chapter 1.


Discrete Choice Analysis: Logit and Probit

Long, Chapters 3-4.

Discrete Choice Analysis: Ordered Logit and Probit

Long, Chapter 5.


Discrete Choice Analysis: Multinomial Logit and Probit

Long, Chapter 6.


Bennett and Nordstrom, 2000, "Foreign Policy Substitutability and Internal Economic Problems in Enduring Rivalries" JCR, Feb


**Discrete Choice Analysis: Heteroskedastic Probit**


**Count Models: Poisson Regression**

Long, Chapter 8, Sections 1 and 2.


**Count Models: Negative Binomial Regression and the GEC Model**

Long, Chapter 8, Section 3.


**Count Models: Hurdle, Zero-Inflated and Seemingly Unrelated Count Models**

Long, Chapter 8, Sections 4-7.


**Duration Analysis: Introduction**

Long, Chapter 9, Section 4.


**Duration Analysis: Discrete Time Models**


**Duration Analysis: Duration Dependence in Discrete Time Models**


**Duration Analysis: Parametric Continuous Time Models**


**Duration Analysis: Duration Dependence in Parametric Continuous Time Models**


**Duration Analysis: The Cox Model**


**Duration Analysis: Repeated Events and Competing Risks**


**Duration Analysis: Additional Topics**


Box-Steppensmeier, Janet M.; Dan Reiter; and Christopher Zorn. 2003. “Nonproportional Hazards and Event History Analysis in International Relations.” Journal of Conflict Resolution.

**Other Information:**

Please visit the Political Science Department’s Website at [http://www.uiowa.edu/~polisci](http://www.uiowa.edu/~polisci). It is frequently updated regarding events and procedures in our department, changes in
the Schedule of Courses, plus TA and faculty hours when available. You may also find current information on pre-advising, and registration. Our Vernon Van Dyke Computing Facility (Political Science ITC) is located in Room 21 Schaeffer Hall. Available hours are listed at our website and also posted outside Room 21 Schaeffer.