This course surveys applications of natural science methods in the analysis of normatively significant political problems. Its unifying themes are the EITM (Empirical Implications of Theoretical Models) project of the National Science Foundation and the promise of policy relevant research on important topics like electoral law enforcement and conflict early warning. We begin with a study of mathematical reasoning in political science. We review models of unitary political decision making and of strategic choice in two person and n-person settings. Agent-based, computational modeling also is reviewed. We then turn to empirics. Measurement, randomized experimentation in observational and laboratory research, modeling of micro and macro political processes, and cross-level inference are studied in this third part. In the conclusion, efforts to join mathematical, statistical, and computational approaches are studied. Applications from the fields of American, Comparative, and International Politics are included in each week’s readings.

The weekly breakdown of topics is as follows:

*Part One: Motivation*

I. Introduction and organization  
II. The EITM project and the promise of policy relevant political analysis  

*Part Two: Political theorizing through mathematics*

III. Models of political decision making  
IV. Strategic decision making in “two person” settings  
V. Collective decision making part one: models of social choice  
VI. Collective decision making part two: agent based (computational) models  

*Part Three: Statistical testing of political arguments*

VII. Missing data and measurement  
VIII. Causal inference and research design, part one: observational studies  
IX. Causal inference and research design, part two: laboratory and survey experiments  
X. Analyzing micro political processes  
XI. Analyzing macro political processes  
XII. Cross level political inference  

*Part Four: Topics*

XIII. Models of political economy  
XIV. Bayesian approaches to political analysis

Students are required to complete all the required reading for the course and to write two papers. The first is a critical review of a selection of readings for one of the weeks in Parts Two (weeks III-VI) or Three (weeks VII-XII). The second paper is a research design for an application of a method studied in the course. If this method comes from Part Two, students are urged to write their first paper on readings from Part Three. If the
second paper is a design for an application of a method from Part Three, ideally, the first paper should be a critical evaluation of work in a week in Part Two.

In addition, all students also are required to present one reading in class and to write a final examination that covers the required reading for the entire course.

The final grade for the seminar will be weighted roughly as follows: class participation-15%, paper one--25%, paper two—25%, and final examination—35%.

NB. Many of the assigned readings and some of the recommended readings are available in a box in the computer lab on the 12th floor. All the assigned reading from books (denoted by +) are available in this box. Of course, most journal articles can be accessed (obtained) through the library or jstor.

Part One: Motivation

I. Introduction and organization
[Jan. 28]

II. The EITM project and the promise of policy relevant political analysis
[February 4]

Required


Required, read at least one of the following:


Recommended


Part Two: Political theorizing through mathematics

III. Models of political decision making (rational choice and decision theory) [February 11]

Required:


**Recommended**


**IV. Strategic decision making in “two person” settings**
[February 18]

**Required**

+Osborne, Martin J. (2004) An Introduction to Game Theory NY Oxford University Press: Chapters 1, 2, 4 (pps. 11-54, 99-152)

Recommended

McCarty, Nolan and Adam Meirowitz (2007) Political Game Theory
New York: Cambridge University Press.

Farrell, Joseph (1987) “Cheap Talk, Coordination, and Entry.” Rand Journal of
Economics 18: 34-39

Richards, Diana (2001) “Coordination in Shared Mental Models” American Journal
Of Political Science 45: 259-276.

Play in Repeated Coordination Games” Econometrica 58: 571-595.

Cooperation, Coordination and Communication.” In Modern Political Economy: 
Old Topics, New Directions J.S. Banks and E. Hanushek (eds) NY: Cambridge
University Press.

In Democratic Capitalist Societies” American Political Science Review 76: 215-238.

V. Collective decision making, part one
[February 25]

Required

Chapters 1 and 2


University Press, Chapters 2, 3, 5 (pps. 21-72; 90-114)

Riker, William (1980) “Implications from Disequilibrium of Majority Rule for 
The Study of Institutions” American Political Science Review 74: 432-446.

Shipan, Charles and Ferejohn, John and (1990) “Congressional Influence on 
Recommended


VI. Collective decision making, part two [computational approaches methods] [March 4]

**Required**


One of the following two articles:


**Recommended**


Part Three: Statistical testing of political arguments

VII. Missing data and measurement
[March 11]

Required

“Analyzing Incomplete Political Science Data: An Alternative Algorithm for
Multiple Imputation” American Political Science Review 95: 49-70.

Also required: read two of the following

In the Social Sciences” Political Analysis 28(3): 588-616

Markov Chain Monte Carlo for the U.S. Supreme Court, 1953-1999”
Political Analysis 10(2):134-153.

American Journal of Political Science 52(1) 201-217.

Answering Questions Versus Revealed Preferences” American Journal of Political
Science 36: 579-616.

Recommended

Bagozzi, Benjamin and Bumba Mukherjee (2012) “A Mixture Model for Middle
Category Inflation in Ordered Survey Responses,” Political Analysis 20:369-386.

Political Science 43(4): 1209-1230.

Ideal Point Estimates via the Parametric Bootstrap” Political Analysis 17(3): 261-275

Coppedge, Michael (2012) Democratization and Research Methods NY:
Cambridge University Press.

Freeman, John R. (1989) “Systematic Sampling, Temporal Aggregation and the
Study of Political Relationships,” Political Analysis vol 1, Ann Arbor, University
Of Michigan Press, pps. 61-98.
Hollyer, James et al (2012), "Measuring Transparency"
hp://www.tc.umn.edu/~jhollyer/HRV_indexpaperSSRNversion.pdf


Spring Break (no class March 18)
VIII. Causal Inference and Research Design Part One: Observational Studies [March 25]

Required


If time permits read also,


Recommended


Gingerich, Daniel W. 2009 “Corruption and Political Decay: Evidence from Bolivia” Political Analysis 4: 1-34.


Political Analysis Special Issue (2012), 20(2). Review essay by Freeman and Jackson; Articles by Bednar et al (“Revised Path Dependence”), Franzese et al “Modeling History Dependence in Network-Behavior Coevolution”, and Jackson and Kollman “Modeling, Measuring, and Distinguishing Path Dependence, Outcome Dependence, And Outcome Independence.”


IX Causal Inference and Research Design Part Two: Laboratory and Survey Experiments
[April 1]

Required


If time permits, read also


Recommended


X. Analyzing micropolitical processes
[April 8]

Required


Recommended


Analysis 11(Fall): 345-367.


XI. Analyzing macropolitical processes
[April 15]

Required


Required also: Either


Or, the following pair of articles


Recommended

Erikson, Robert, Michael MacKuen and James Stimon (2002) *The Macropolity*
NY Cambridge University Press.


XII. Cross-level and multi-level inference
[April 22]

Required


Recommended


M. Herron and K. Schotts “Using Ecological Inference Point Estimates as Dependent Variables in Second Stage Regressions”

C. Adolph and G. King, “Comment on Herron and Schotts”

M. Herron and K. Schotts “Cross-contamination in EI-R: A Reply”
C. Adolph and G. King with M. Herron and K. Schotts, “A Consensus Second Stage Analyses in Ecological Inference Models”


A Symposium on Multilevel Modeling for Large Clusters. Special Issue of Political Analysis 13(4). Articles by Kedar and Shively, Bowers and Drake, Jusko and Shively, Lewis and Linzer, Huber et al, Duch and Siverson, Kedar, Franzese, and Achen with Comments by Beck and Gelman.

Part Four: Topics

XIII. Political economy
[April 29]

Required


Required also: Either


Or,

Recommended


XIV. Bayesian approaches to political analysis
[May 6]

Required


Recommended


XV. Retrospectives and Review
[Optional class during finals week (May 11)]

**Required**

Review EITM, Clark and Primo, and other readings from week II (February 4)

**Recommended**

An exchange in the Autumn 2007 issue of *Political Analysis* 15(4)


Carrubba et al. (2007) “Reply to Signorino” pps. 502-504

Topics in Part Three deserving (more than) a week’s reading but (only mentioned) not covered here:

Break Point Analysis
Count Models
Event history (duration) analysis
Graphics and visual display of data and of statistical results
Hierarchical linear models
Neural network modeling of politics
Network analysis
Panel methods
Path dependency
Political forecasting
Spatial analysis
Survey research
Markov Switching and other kinds of nonlinear models
Text analysis