

University of Rochester Political Science
PSC 281
Formal Models in Political Science
SPRING 2014

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Office Hours: W 11:00-1:00, Harkness 109E

Overview

The purpose of this course is to introduce positive political theory, i.e., the use of mathematical modeling in the study of politics. This approach is usually labeled as formal modeling or rational choice methodology in the political science discipline. There are two main tool-boxes used: game theory and social choice theory. In general, the former provides models for interactions among strategic players where as the latter provides a theoretical framework for the normative analysis of aggregating individual preferences. We will survey a broad range of models which are applicable to many aspects of political science ranging from voting, electoral systems, institutions and institutional change, collective action to the strategic role of international organizations and the situations of international crisis bargaining. One common theme will be the individual level determinants of macro level patterns we observe in the political landscape.

Mathematics is a language. In fact, it is the most precise language we have. Although it has traditionally been associated with the physical sciences, it also provides us a rich set of tools to pursue our investigations within the social sciences. In this course, I would like to illustrate how the powerful language of mathematical model can help us reducing the complexities of the social world and communicate our findings.

There are no formal technical prerequisites for the course but some familiarity with mathematical reasoning is certainly helpful.

Course Requirements

Grading is as follows:

Weekly Problem Sets: %30

Midterm Exam: %30

Final Exam: %40

Required Texts

- Analyzing Politics, by Ken Shepsle and Mark Bonchek
- Games of Strategy, by Avinash Dixit and Susan Skeath

All other readings will be available on the website.

Course Outline¹

Topic 0: Mathematical Models in Social Sciences

Topic 1: Rationality and Rational Choice

Shepsle & Bonchek, Chapter 1-2

Topic 2: Preference Aggregation and Arrow's Theorem

Shepsle & Bonchek, Chapter 3-4

Topic 3: Majority Rule and May's Theorem

Shepsle & Bonchek, Chapter 4

May, Kenneth O. "A set of independent necessary and sufficient conditions for simple majority decision." *Econometrica* (1952): 680-684.

Topic 4: Positive Democratic Theory

List, Christin, and Robert E. Goodin. Epistemic democracy: generalizing the Condorcet jury theorem. *Journal of political philosophy* 9.3 (2001): 277-306.

Topic 5: Spatial Models of Voting

Shepsle & Bonchek, Chapter 5

Duncan Black, "On the Rationale of Group Decision-making," *Journal of Political Economy*, Vol. 56, No. 1. (Feb., 1948),

Topic 6: Strategic Form Games: Theory

Dixit & Skeath, Chapters 4, 5, 7, 8

¹This schedule may change as the semester unfolds

Topic 7: Strategic Form Games: Applications

Barbara Geddes, "A Game Theoretic Model of Reform in Latin American Democracies," American Political Science Review, Vol. 85, No. 2. (Jun., 1991), pp. 371-392

Topic 8: Extensive Form Games

Dixit & Skeath, Chapters 1-3

Topic 9: Bargaining

Muthoo, Abhinay. 2000. "A Non-Technical Introduction to Bargaining Theory." World Economics 1(2)

Baron, David P. and John A. Ferejohn. 1989. "Bargaining in Legislatures." American Political Science Review 83(4)

Topic 10: Repeated Games and Cooperation

Dixit & Skeath, Chapter 11

Shepsle & Bonchek, Chapter 8

Topic 11: Collective Action and Public Goods

Shepsle & Bonchek, Chapter 9, 10

Topic 12: Institutions and Institutional Change

Shepsle & Bonchek, Chapter 11

Greif, Avner, and David D. Laitin. "A theory of endogenous institutional change." American Political Science Review 98.4 (2004): 633-652.

Topic 13: Delegation and Bureaucracy

Shepsle & Bonchek, Chapter 13

Topic 14: Models of Courts and Judge

Shepsle & Bonchek, Chapter 15

Topic 15: Games, Information and War

Dixit & Skeath, Chapter 9

James D. Fearon, "Rationalist Explanations for War", *International Organization*, Vol. 49, No. 3 1995: 379-414.

Topic 16: Experimental Political Science

Morton, Rebecca B., and Kenneth C. Williams. *Experimental political science and the study of causality: From nature to the lab*. Cambridge University Press, 2010. (pp 3-24, 31-58)