

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 whereas 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 K. Dixit and Skeath

All other readings will be available on the website.

## Course Outline <sup>1</sup>

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

## 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 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)