This course is an introduction to formal models in political science and to a field of research that is at various times called political economy, positive political theory, formal theory, and public choice. While formal theory is a diverse and rich field of research, the purpose of this class will be to introduce students to some of the basic models that form the foundation of the field.

There are no prerequisites to this course. But as you will discover, formal theory often relies on mathematical models. It is axiomatic and requires logical rigor and abstract thinking. The models and styles of thinking emphasized in this class will help you organize your thoughts and uncover the relevant variables in much of political research, regardless of whether you seek to use formal models in your own work.

The course is divided into three classes of models: individual choice, game theory, and social choice. We will start with a survey of theories of individual choice and decision-making, where we will first encounter the assumption of rational choice and what it means. There are several ways to model individual choices and decisions. We will briefly survey the most prominent models before examining an application of those models to the decision of whether or not to vote. Game theory is the second component of the course. Game theory is a form of individual choice where the outcome of any action depends on choices made by other people. Since all social sciences study human interaction, game theory is perhaps the most basic theory in the social sciences. Social choice theory is the third broad section of the course. Social choice theory describes the mechanisms by which individual choices are aggregated into collective choices. Political institutions such as voting rules, legislatures, parties, and hierarchy are central concerns in this literature. We will focus on alternative voting methods and political institutions. Then we also examine how societies solve some practical distributive problems.

**Required Readings**

The following books are required readings and are available in the bookstore.

- Robert Axelrod, *The Evolution of Cooperation*
- Avinash Dixit & Barry Nalebuff, *Thinking Strategically*
- David Kreps, *Game Theory and Economic Modelling*
- H. Peyton Young, *Equity*
Grades:

Class participation  20% of grade
Homeworks and Quizzes  40% of grade
Final Paper  40% of grade

TOPICS

A. Preferences and Utility Theory

1. Foundation of Individual Choice Theory
   • Binmore, Fun and Game, 2.1-2.3, 3, 5.2
   • Arrow, class handout
   • Aldrich, “Rational Choice and Turnout.” AJPS 37 (February 1993)

B. Game Theory

2. The Basics of Non-Cooperative Games: Normal-Form and Extensive-Form Games and Solution Concepts
   • David Kreps, Microeconomic Theory, Chapter 11, class handout
   • Dixit & Nalebuff, Chs. 1-3, Epilogue to Part I
   • Kreps, Chs. 1-3

3. Mixed Strategies in Non-Cooperative Games
   • Dixit & Nalebuff, Ch. 7

4. Variations in Non-Cooperative Games: Sequence, Information, Commitments
   • Dixit & Nalebuff, Chs. 5,6,8,9
   • Kreps, Ch. 4-6

5. Prisoners' Dilemma Game and the Collective-Action Problem
   • Axelrod, entire
   • D & N, 4
• Niou and Tan, “External Threat and Collective Action.”

**C. Social Choice and Theory of Voting**

6. Introduction to Voting Methods
   • Ramon Lull, *Blanquerna*, chapter 24, ca. 1283.
   • Lewis Carroll, "A Discussion of the Various Methods of Procedure in Conducting Elections,” 1873.
   • H. P. Young, “Condorcet’s Theory of Voting,” *APSR*, 1988, pp.1231-44 (recommended)

7. Majority will, Paradox of voting, Arrow's Theorem
   • Schwartz, "Votes, strategies, and institutions: an introduction to the theory of collective choice."
   • D & N, Chapter 10, "The Strategy of Voting"
   • Nicholas Miller, “Pluralism and Social Choice,” APSR 1983 [jstor]

8. Spatial Models of Voting: Median Voter Theorem and Extensions

9. Special Topics
   • Cyrus Chu and Emerson Niou, “The Strategy of Ambiguity in Electoral Competition”
   • Kong-pin Chen and Emerson Niou, “Term-Limits, Incumbency Advantage and Democratic Representation”

10. Philosophical Approaches to Equity
    • Young, Chapter 1 of *Equity in Theory and Practice*
11. Indivisible Goods and Equity
   • Young, Chapters 2&3

12. Divisible Goods and Equity
   • Young, Chapters 4&5

Class Dates

1/7 1/9 1/12 1/14 1/21 1/26 1/28
2/2 2/4 2/9 2/11 2/16 2/18 2/23 2/25
4/5 4/7 4/12 4/14