Syllabus

This course is an introduction to the use of mathematical models in the study of politics. We will survey a broad range of models that are applicable to many aspects of political science. The types of models that we will consider are all parts of “positive political theory,” which can be further subdivided into social choice theory and game theory. The course rests on the premise that positive political theory (also known as formal theory, rational choice, or the economic approach to politics) can offer insights to those who want to better understand why and how political actors behave the way they do. We will use both strategic and nonstrategic models to further our understanding of political events.

I have set two goals in teaching this course. First, I want to introduce students to the tools of positive political theory using a number of classic political situations ranging from voting, legislative politics, and political campaigns to the comparison of electoral systems, collective action and political participation, and international relations. Second, and as important, I want to show students how positive political theory allows us to sharpen our intuitions and provides us with new ways of looking at familiar topics. In short, this course will try to offer those interested in politics a new way of thinking about political institutions and political behavior, and show those interested in positive political theory a broad and fertile area in which its tools have many applications.

While there are no formal mathematical prerequisites for the course, some familiarity with mathematical reasoning and logic is helpful.

Course Meetings: Lectures for the course will be twice weekly, Tuesdays and Thursdays at 2:00 in Meliora 219.

Course Work: Student performance will be evaluated on the following activities:
1. A 1-2 page paper on each of the ten readings below marked with **. These short papers should summarize what the main question is that the reading asks, how the reading answers this question, and how effective the argument of the reading is. These short papers are due at the beginning of class. Late work will not be accepted, but I will drop the lowest score from the papers over the course of the semester. (40%)

2. An in-class midterm on a date to be announced. (30%)

3. An 10-15 page paper due at the end of the semester that demonstrates an ability to develop and apply formal modeling skills. This can be an original model, a modification of an existing model or a new application of an existing model. (30%)

**Course Readings:** The two required texts for the course are available at the campus bookstore. Additional readings will be distributed during the semester. The two required texts are *Analyzing Politics*, by Ken Shepsle and Mark Bonchek, and *Games of Strategy*, by Avinash Dixit and Susan Skeath.

Below are the scheduled readings for the course. Naturally, this schedule may change as the semester unfolds.

**Topic 0** Logistics

**Topic 1** Rationality and Rational Choice

- Shepsle & Bonchek, Chapter 1 (pp. 5–14)
- McCubbins and Thies, “Rationality and the Foundations of Positive Political Theory” (link)

**Topic 2** Information Aggregation and Democratic Theory

- selections from Surowiecki, *The Wisdom of Crowds*

**Topic 3** Individual Preference and Voting Rules

- Shepsle & Bonchek, Chapter 2, pp. 15–31, Chapter 3 (pp. 39–48) and Chapter 7 (pp. 166–191)
Topic 4: Cyclical Majorities, Agenda Control, and Voting Paradoxes and Applications to Political Development

- Shepsle & Bonchek, Chapter 4, pp. 49–62
- selections from Aldrich, Why Parties?

Topic 5: Thinking Abstractly about Voting: Arrow and May

- Shepsle & Bonchek, Chapter 4, pp. 63–81

Topic 6: The Spatial Model of Voting

- Shepsle & Bonchek, Chapter 5


- Shepsle & Bonchek, Chapter 5, pp. 115–136

Topic 8: Measuring Voting Power

- Steven Brams, Game Theory and Politics, Ch. 5

Topic 9: Models of Diversity

Topic 10: Utility Theory and Applications to Voting, Cheating, and Surprise

- Shepsle & Bonchek, Chapter 2, pp. 31–35


**Topic 11** Extensive Form Games, Backward Induction, and Applications to Environmental Management and Economic Development

• Dixit & Skeath, Chapters 1-3


**Topic 12** Strategic Form Games, Nash Equilibrium, and Applications to Political Reform and Terrorism

• Dixit & Skeath, Chapters 4 & 5


• ** Todd Sandler, “Collective Versus Unilateral Responses to Terrorism,” *Public Choice*, Jul 2005, Vol. 124, pg. 75 (link)

**Topic 13** Mixed Strategies

• Dixit & Skeath, Chapters 7 & 8


**Topic 14** Cooperation and Repeated Games

• Dixit & Skeath, Chapter 11

• Shepsle & Bonchek, Chapter 8 (pp. 197–219)

**Topic 15** Commitment, Credibility, and Coordination

• Dixit & Skeath, Chapter 10

**Topic 16** Collective Action and Public Goods

• Shepsle & Bonchek, Chapter 9 (pp. 220–259) and Chapter 10 (pp. 260–296)
• Dixit & Skeath, Chapter 11, pp. 356-392
• Michael Laver, *Private Desires, Political Action*, Ch. 3

**Topic 17** Tipping Models


**Topic 18** Models of Bureaucracy and Delegation

• Shepsle & Bonchek, Chapter 13 (pp. 345–379)

**Topic 19** Models of Leadership and Authority

• Shepsle & Bonchek, Chapter 14 (pp. 380–404)

**Topic 20** Models of Courts and Judges

• Shepsle & Bonchek, Chapter 13 (pp. 405–431)

**Topic 21** Models of Coalitions and Cabinet Government
• Shepsle & Bonchek, Chapter 16 (pp. 432–456)
• Michael Laver, *Private Desires, Political Action*, Ch. 7

**Topic 22** Games and Information and Applications to Voting and War

• Dixit & Skeath, Chapter 9
• **James D. Fearon, “Rationalist Explanations for War”, International Organization, Vol. 49, No. 3 (Summer), 1995: 379414. [JSTOR]**