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Formal Political Theory I
Fall 2017

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Game theory is widely used in political science to analyze strategic interactions in different settings. Each subfield—to a varying degree—has seen game-theoretic concepts enter its vocabulary, and students entering the profession need to grasp the potential and limits of game theory. This course is the first in a two-course sequence in game theory. Students will learn the basic concepts of game-theoretic modeling and how to solve most types of games used in applied work in political science or related disciplines. The main aim is to prepare students to be good “consumers” of game-theoretic work in the substantive areas they work on, with the secondary goal of preparing them to think about writing their own models. In particular, students will leave the course with a working knowledge of games of complete information, to the point where they can write down a (simple) model, solve it, and state some of the model’s empirical implications. Students will also have an introductory knowledge of games of incomplete information. The second course of the sequence—taught in the Spring— will cover more advanced topics with more of a focus on producing original game-theoretic work.

Because an important component of game theory in political science and political economy is the analysis of substantive political phenomena, we will cover illustrative examples in combination with the basic methodological toolkit. The political and economic phenomena that we will examine include electoral competition, legislative bargaining, nuclear deterrence, and imperfect markets. The purpose of these examples is not to offer a complete review of the literature. Rather, the examples are employed to provide students with the ability to analyze strategic situations and evaluate existing models in the field.

Game theory is a mathematical discipline. However, this is not a math class, and we will spend much more time going through concrete examples of how game theory has been applied to political science than proving general theorems. We will only assume knowledge of algebra, and any calculus and probability theory used will be reviewed as we go along.

Reading Materials¹

The main textbook for the course is:

- Ⓜ Osborne, Martin J. (2003), *An Introduction to Game Theory*, Oxford University Press. [We'll cover chapters 1 through 7, plus some parts of chapters 9, 10, 12, 14, and 15.]

A nice and not-so-technical overview of the main concepts we will cover can be found in:

- Ⓜ Gibbons, Robert (1997), "An Introduction to Applicable Game Theory," *Journal of Economic Perspectives*, 11(1), pages 127-149.

Although Osborne (2003) will be the main textbook, it may be useful for you to consult more than one source (besides the lecture slides), even if for specific topics only. Another great book at a similar level (but more economics focused) is:

- Ⓝ Gibbons, Robert (1992), *Game Theory for Applied Economists*, Princeton University Press.

An equally nice (and more political science focused) book is:

- Ⓝ McCarty, Nolan and Adam Meirowitz (2007), *Political Game Theory. An Introduction*, Cambridge University Press.

A more technical (but comprehensive for non-cooperative game theory) book is:

- Ⓝ Fudenberg, Drew and Jean Tirole (1998), *Game Theory*, MIT Press.

In class, we will discuss some of these papers too:

- Ⓝ Camerer, Colin F. (1997), "Progress in Behavioral Game Theory," *Journal of Economic Perspectives*, 11(4), pages 167-188.
- Ⓝ Clarke, Kevin A. and David M. Primo (2007), "Modernizing Political Science: A Model-Based Approach," *Perspectives on Politics*, 5(4), pages 741-753.
- Ⓝ Myerson, Roger B. (1999), "Theoretical Comparisons of Electoral Systems," *European Economic Review*, 43, pages 671-697.
- Ⓝ Dal Bo, Pedro and Guillaume R. Frechette (2011), "The Evolution of Cooperation in Infinitely Repeated Games: Experimental Evidence," *American Economic Review*, 101, pages 411-429.
- Ⓝ Banerjee, Abhijit, Lakshmi Iyer, and Rohini Somanathan (2008), "Public Action for Public Goods," in: *Handbook of Development Economics*, Elsevier, pages 3117-3154.

Requirements

- (1) *Problem sets*. There will be 8 problem sets. They are worth 40% of your grade. While we encourage you to work in groups, you have to state whom you collaborate with, and you cannot collaborate with the same person (directly or indirectly) more than 50% of the times. Problem sets will be set on Thursdays and due in the following week.
- (2) *Final exam*. There will be a comprehensive final exam during finals week at the end of the semester. The final will be an in-class exam. And it is worth 40% of your grade.
- (3) *Paper*. There will be a paper due at the end of the semester. You have to pick a qualitative or empirical paper, or some idea you want to explore, and the assignment consists on modeling its core argument. The paper cannot exceed 1,000 words (plus, eventually, tables or figures to represent the structure of the game). And it is worth 20% of your grade.

¹ Readings denoted by the icon Ⓜ are compulsory; readings denoted by the icon Ⓝ are optional.

*Weekly Outline*²

Week 1 (August 31)

General overview. Basic definitions. Introduction to static games of complete information.

Week 2 (September 7)

Static games of complete information: Solution concepts and textbook examples.

Week 3 (September 14)

Static games of complete information: Electoral competition and other applications.

Week 4 (September 21)

Static games of complete information: Collective action and other applications.

Week 5 (September 28)

Dynamic games of complete information: Solution concepts and textbook examples.

Week 6 (October 5)

Dynamic games of complete information: Democratization, trade wars, and other applications.

Week 7 (October 12)

Introduction to finitely and infinitely repeated games.

Week 8 (October 19)

Repeated games: Cooperation, legislative bargaining, and other applications.

Week 9 (October 26)

Static games of incomplete information: Solution concepts and textbook examples.

Week 10 (November 2)

Dynamic games of incomplete information: Solution concepts and signaling games.

Week 11 (November 9)

Dynamic games of incomplete information: Cheap talk, informational role of committees.

Week 12 (November 16)

Dynamic games of incomplete information: Reputation, deterrence, and other applications.

Week 13 (November 30)

Tales from the Lab: Recent findings in behavioral game theory.

² Well, this is pretty approximate, but a couple of days before each class you will find the lecture slides online.