Political Science (POLS) 601
Components of Political Inquiry
Fall 2019
Tuesday and Thursday 8:45 to 10:00 AM
Allen 1003

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September 16, 2019

1   Course Overview and Requirements

The purpose of this class is to introduce you to some core approaches to conducting research in political science. We will begin with math camp, followed by a discussion of the development of scientific knowledge in general. The remainder of the course will focus on game theory, which is the formal study of strategic (i.e., interdependent) decision-making and an important tool for developing theoretical arguments in political science.

There is no required text for this course, and I have posted my lecture notes on the course website given above. However, you should have at least one of the following three introductory graduate-level game theory texts:

- Tadelis, Steven. 2013. *Game Theory: An Introduction*. Princeton University Press. (Has lots of applications from political science. Has an especially excellent treatment of decision theory. Provides proofs of theorems, which is a slight advantage over the Osborne text.)

- Osborne, Martin J. 2004. *An Introduction to Game Theory*. Oxford University Press. (Has lots of applications from political science. Is perhaps a slightly gentler introduction than Tadelis, but is basically at the same level.)

- Gibbons, Robert. 1992. *Game Theory for Applied Economists*. Princeton University Press. (Has no applications from political science, but is a great book. Provides perhaps the most clear verbal explanations of solution concepts of all texts.)

All three are excellent. Many of the homework assignments will come from Tadelis, so if you choose not to get it, make sure you have access to someone's copy.

In addition to weekly homework assignments, there will be 2 in-class exams, one on **October 24** and the other on **December 3** (this will be our last class). The combined homework scores will account for one-third of your grade, and each exam will account for one-third of your grade.

The standard grading scale will be used: 90-100% is an A, 80-89% is a B, 70-79% is a C, 60-69% is a D, and below 60% is a failing grade.

2 Other Game Theory Texts

The following are some more advanced game theory texts, which you should consider acquiring if you plan to pursue game theory at an advanced level. (There may be some additional excellent texts that are not listed below simply because I am not as familiar with them.)

- Osborne, Martin J., and Ariel Rubinstein. 1994. *A Course in Game Theory*. MIT Press. (An excellent advanced-level text. If you want to pursue game theory at an advanced level, you should own this text, and work through it. Doesn't provide much verbal discussion, and is not for the faint of heart.)

- Fudenberg, Drew, and Jean Tirole. 1991. *Game Theory*. MIT Press. (Another advanced-level text. Is probably the most comprehensive out there; covers almost every topic under the sun. Therefore is very useful as a reference if you want to pursue game theory at an advanced level. Not for the faint of heart.)

- McCarty, Nolan, and Adam Meirowitz. 2007. *Political Game Theory: An Introduction*. Cambridge University Press. (This is an advanced-level text, and is written explicitly for political scientists. Therefore, contains many political science applications. Covers social choice theory, which is unique among the texts on this syllabus. Also provides a rigorous treatment of decision theory, which is also unique.)

The following two textbooks are entirely centered on applications of game theory to political science (rather than being textbooks on game theory in general), and so I recommend them if you plan to use game theory in your own research.

- Gehlbach, Scott. 2013. *Formal Models of Domestic Politics*. Cambridge University Press.

- Kydd, Andrew. 2015. *International Relations Theory: The Game-Theoretic Approach*. Cambridge University Press.

3 Course Schedule

Below is the order in which we plan to cover topics, and the associated reading with each (you can choose ONE of Tadelis, Osborne, or Gibbons, and don't have to read all three). I may add some applied readings to the game theory topics later. The readings for the Philosophy of Science section will be provided to you.

3.1 Math Camp

- Formal Logic, and Proof Strategies (William Clark)
- Calculus (Ahmer Tarar) (you have my lecture notes, which are also on the course website)
- Probability Theory (David Fortunato)

3.2 Philosophy of Science

1. What Is An Explanation?

    - Lave, Charles, and James March. 1993. *An Introduction to Models in the Social Sciences.* University Press of America. Chapters 1-3.
    - Elster, Jon. 1989. *Nuts and Bolts for the Social Sciences.* Cambridge University Press. Chapters 1-6 (the rest of book is "suggested reading").

2. Progress in Science

    - Kuhn, Thomas S. 1962. "Historical Structure of Scientific Discovery." *Science* 136 (3518): 760-764.
    - Lakatos, Imre. 1970. "Falsification and the Methodology of Scientific Research Programmes." (pages 170-196).
    - Magee, Bryan. 1985. *Philosophy and the Real World: An Introduction to Karl Popper.* New York: Open Court Press. Chapters 2-3.

3.3 Decision Theory (Single-Player Decision Making) (Expected Utility Maximization)

- Tadelis Chapters 1, 2
- Osborne Chapter 1
- APPLICATION: Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49(3):379-414. Focus on pp.386-390.
- APPLICATION: Harsanyi, John. 1975. "Can the Maximin Principle Serve as a Basis for Morality? A Critique of John Rawls's Theory." *American Political Science Review* 69(2):594-606.

3.4 Static (Simultaneous-Move) Games of Complete Information (Nash Equilibrium; NE)

- Tadelis Chapters 3, 4, 5, 6
- Osborne Chapter 2, 3, 4; Chapter 12 if you are highly interested in the topics of Tadelis Chapter 4
- Gibbons Chapter 1

3.5 Dynamic (Sequential-Move) Games of Complete Information (Subgame-Perfect Equilibrium; SPE)

- Tadelis Chapters 7, 8, also Tadelis section 2.4.1
- Osborne Chapters 5, 6, 7
- Gibbons Chapter 2

3.6 Static Games of Incomplete Information (Bayesian Nash Equilibrium; BNE)

- Tadelis Chapter 12
- Osborne Chapter 9
- Gibbons Chapter 3

3.7 Dynamic Games of Incomplete Information (Perfect Bayesian Equilibrium; PBE)

- Tadelis Chapters 15, 16
- Osborne Chapter 10
- Gibbons Chapter 4

3.8 Repeated Games (Time Permitting; Unlikely) (Subgame-Perfect Equilibrium; SPE)

- Tadelis Chapters 9, 10, also Tadelis section 2.4.2
- Osborne Chapters 14, 15
- Gibbons section 2.3