1 Course Overview

This course builds on POLS 601 (which is a prerequisite) and is a second course in game theory. The course is a combination of applied and advanced game theory. It is applied in that the primary focus will be to study and understand prominent game-theoretic models that have been used to study many important substantive topics in political science, in both domestic politics and international relations. It is advanced in that many of these models are quite technically sophisticated, and introduce game-theoretic concepts that we may not have fully encountered yet (additional equilibrium refinements, etc.). In addition,
the solution to these models can be quite technically challenging. A major goal will be for students to learn how to construct parsimonious models that capture the core strategic features of political phenomena of interest. This is well-learnt by studying many such models that others have constructed and analyzed, and thinking carefully about why these authors made the assumptions and modeling choices that they did. A second major goal will of course be to further develop your technical ability to solve such models and find their equilibria. A third goal is to develop a knack for identifying the substantive importance of features of those equilibria—being able to realize which results are interesting and worth emphasizing, and being able to convince readers why they should care about your formal analysis and why it should be published. Besides further developing your game-theoretic “toolkit”, the logical deductive reasoning you will be engaged in throughout the course should enhance your ability to develop coherent and convincing theoretical arguments regardless of whether these arguments are formalized or not.

2 Course Requirements

Your grade will be based on weekly homework assignments and two exams, a midterm and a final (either in-class or take-home; this will be decided later). The homework assignments will together account for 40% of your grade, and each exam will account for 30% of your grade.

3 Required Texts

- Kydd, Andrew. 2015. *International Relations Theory: The Game-Theoretic Approach*. Cambridge University Press. [This is actually recommended as a reference, and is not really required. The IR section of the course will mainly be based on a textbook that I am writing (which is quite a bit different from Kydd’s), although we may cover some topics from the Kydd text. Bottom line: buy it.]

4 Recommended Game Theory Texts

- Tadelis, Steven. 2013. *Game Theory: An Introduction*. Princeton University Press. (An excellent intermediate-level text, with lots of applications from political science. Has an especially excellent treatment of decision theory. Provides formal statements of propositions and proofs, which is a slight advantage over the Osborne text.)
• Osborne, Martin J. 2004. *An Introduction to Game Theory*. Oxford University Press. (Another excellent intermediate-level text, with 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. (Another excellent intermediate-level text. This has no applications from political science, but is an absolute gem. Provides perhaps the most clear verbal explanations of solution concepts of all the texts on this list.)

• 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 the most political science applications. Covers social choice theory, which is unique among the texts on this list. Also provides a rigorous treatment of decision theory, which is also unique.)

5 Some Other Game Theory Texts

• 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.)

• There are other game theory texts out there, which I don’t comment on simply because I am not as familiar with them. Some may be excellent.
6 Course Schedule

The following is the order in which we will cover topics. This is subject to minor changes and clarifications throughout the semester. For example, we won’t really be covering entire chapters from the Gehlbach text, but parts of them; specific page numbers will be given the week before. Similarly, we won’t be covering each chapter; the exact chapters we will cover will be clarified later. Similarly, I may be overestimating how many IR topics we will have time to cover: the following list is aspirational. Roughly speaking, the midterm will cover IR models and the final will cover domestic models. In the IR section, I have included some general game theory topics that we need to cover but that aren’t really IR, just game theory in general. The supplemental readings are optional and are meant to point you to important articles/books on topics that you are especially interested in; many important works are not included, so don’t take these lists as comprehensive. (Credit to Ian Turner for coming up with the supplemental readings in the domestic politics section.)

6.1 Formal Models of International Relations

6.1.1 Static Games of Incomplete Information With Two-Sided Uncertainty and a Continuum of Types (BNE Again)

- (We covered this with one-sided uncertainty and 2 types in POLS 601)
- Gibbons p.152-154 (“Mixed Strategies Revisited”)

Supplemental reading:

- Gibbons p.155-157 (“An Auction”)

6.1.2 Dynamic Games of Incomplete/Imperfect Information (Perfect Bayesian Equilibrium; PBE)

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

Supplemental reading:

6.1.3 Extended Deterrence: Uncertainty and Credible Signaling

- Lecture notes

Supplemental reading:

- Powell, Robert. 1990. *Nuclear Deterrence Theory: The Search for Credibility*. Cambridge, UK: Cambridge University Press. [or his various APSR articles on this topic]

6.1.4 Crisis Bargaining Under Complete Information

- Lecture notes (we largely covered this in POLS 601)

Supplemental reading:


6.1.5 Crisis Bargaining Under Incomplete Information

- Lecture notes

*Supplemental reading:*

6.1.6 Credible Signaling in Crisis Bargaining

- Lecture notes

Supplemental reading:


6.1.7 Shifting Power and Commitment Problems

- Lecture notes

Supplemental reading:


6.1.8 Intra-War Bargaining

- Lecture notes

Supplemental reading:


6.1.9 The Military *Fait Accompli*

- Lecture notes

*Supplemental reading:*


6.1.10 Repeated Games (SPE; The One-Stage Deviation Principle; The Folk Theorem)


- Tadelis Chapters 9-10 (sections 2.4.2, 2.5.2, and 8.3.4 may also be useful), or

- Osborne Chapters 14-15

*Supplemental reading:*


6.2  Formal Models of Domestic Politics

6.2.1  Electoral Competition Under Certainty

- Gehlbach Chapter 1

Supplemental reading:

- Selections from *An Economic Theory of Democracy* by Anthony Downs.

6.2.2  Electoral Competition Under Uncertainty

- Gehlbach Chapter 2

Supplemental reading:


6.2.3  Special Interest Politics

- Gehlbach Chapter 3

Supplemental reading:


### 6.2.4 Veto Players (and Agenda-Setting)

• Gehlbach Chapter 4

*Supplemental reading:*


### 6.2.5 Delegation

• Gehlbach Chapter 5

*Supplemental reading:*


### 6.2.6 Coalitions

• Gehlbach Chapter 6

*Supplemental reading:*


### 6.2.7 Political Agency

- Gehlbach Chapter 7

*Supplemental reading:*


6.2.8 Regime Change

- Gehlbach Chapter 8

Supplemental reading:


