Fall 2022
GOVT 7073: Game Theory I

Instructor: Dr. Alexandra Cirone, aec287@cornell.edu
Office hours: Thursdays 10-12pm; sign up on calendly.com/cirone [Zoom OR in person]

Game theory provides a scientific approach to the study of social, political, and economic interactions that focuses on the strategic aspects of decision-making between two or more individuals or groups. This course introduces students to the fundamentals of formal theory, as well as how to solve basic games frequently used in political science research. The first part of the course will focus on strategic coordination, games in normal and in extensive form, and Nash Equilibria. The second part of the course will cover repeated games and games where informational uncertainty plays a role. Each week will also focus on applications to political science and economics, which includes topics of legislative bargaining and veto players, elections and candidate selection, clientelism, as well as deterrence and international relations. The course will conclude by focusing on experimental games, covering both lab games and "lab-in-the-field games."

Students will be expected to complete weekly problem sets, participate in class games and simulations, and complete an independent final project.

Required Textbooks:

1. Tadelis. Game Theory: An Introduction. 2013, Princeton University Press.
2. Shepsle and Bonchek. Analyzing Politics. 2010, W.W. Norton and Company.

There are a number of other useful textbooks, including ones that take a more technical approach to game theory. These are not required purchases, but might be helpful:

Political Game Theory: An Introduction, by Nolan McCarty and Adam Meirowitz
Formal Models of Domestic Politics, by Scott Gehlbach
A Course in Game Theory, by Martin J. Osborne and Ariel Rubinstein

Political Games, by Macartan Humphreys
Game Theory for Applied Economists, by Robert Gibbons
Game Theory, by D. Fudenberg and J. Tirole

Game theory is a mathematical discipline. The course will review basic mathematical concepts, however, it may help students to refresh their math skills before taking the course. Students should consult *Schaum's Outlines* (in Calculus I, Basic Math, and/or Probability), or *A Mathematics Course for Political and Social Research* by David A. Siegel and Will H. Moore.

Requirements

The requirements for this course are designed to further your understanding of the material presented. There are two components:

60%   **Problem Sets**
40%   **Final Project**

There will be a number of problem sets throughout the course. Problem sets will be distributed once the relevant topic is concluded, and due two weeks later. Late problem sets (without permission by instructor) will lose points for each additional day late. Note that problem sets are an important part of the class, and essential to learn the material. You may work in groups; however, you need to first attempt the exercises by yourself. Further, all group work should be acknowledged within the problem set – for example, "Brunhilda provided the first proposition." Finally, even if the solution was ultimately collective, *problem sets must be handed in individually, and written in your own words.*

You will be required to write paper presenting a draft model or an experimental research design. This will be due by 11:59pm on the assigned date. We will discuss expectations for the these projects in class.

The class prioritizes comprehension over strict scheduling; each bold topic heading represents roughly one class, and we will follow the order of the syllabus. To aid in planning, the schedule will be be set each week, during lecture.

	Topic	Assignments
Th	Preferences, Choices, Utilities	
Th	Normal Form Games	**PSET 1 Distributed**
Th	Expected Utility and Risk	**PSET 2 Distributed**
Th	Extensive Form	
Th	Multistage	**PSET 3 Distributed**
Th	Repeated Games	
Th	Incomplete Information	**PSET 4 Distributed**
Th	Signaling Games	**PSET 5 Distributed**
Th	Lab Games	
Th	Behavioral GT I	**PSET 6 Distributed**
Th	**NO CLASS (Thanksgiving Break)**	
Th	Behavioral GT II	
Th	Experiments Workshop	
TBD		**Research Design Due**

Preferences, Choices, Utilities
1. Tadelis, Chapter 1
2. Shepsle and Bonchek, Analyzing Politics, Ch 1 - 4

Normal Form Games
1. Tadelis Chapters 3, 4, and 5

*** PSET 1 DISTRIBUTED

Expected Utility and Risk
1. Tadelis Chapter 2
2. Tadelis Chapter 6.1-6.2
3. *Optional:* McCarty N., and A. Meirowitz. 2007. Political Game Theory, CUP, Ch 3.1-3.2

*** PSET 2 DISTRIBUTED

Extensive Form Games
1. Tadelis, Chapter 7
2. Tadelis, Chapter 8.1-8.2

Multi-stage Games
1. Tadelis, Chapter 9

*** PSET 3 DISTRIBUTED

Repeated Games
1. Tadelis, Chapter 10.1-10.5
2. Tadelis, Chapter 10.6

Incomplete Information
1. Tadelis Chapter 12.1

Incomplete Information
1. Tadelis, Chapter 12.2-12.4 and Chapter 15
2. Osborne Ch 10

*** PSET 4 DISTRIBUTED

Signaling Games
1. Tadelis, Chapter 16 and Chapter 18

Signaling Games
1. No readings

*** PSET 5 DISTRIBUTED

Behavioral GT I
1. Ashworth, Berry, and Bueno de Mesquita. All Else Equal in Theory and Data (Big or Small). doi:10.1017/S1049096514001802
2. Damien Bol. (2018). "Putting Politics in the Lab: A Review of Lab Experiments in Political Science." *Government and Opposition,* July.
3. Daniel M. Hausman (2005). 'Testing' game theory, *Journal of Economic Methodology,* 12:2, 211-223, DOI: 10.1080/13501780500086065

*** PSET 6 DISTRIBUTED

Behavioral GT II

1. Belot, M., Duch, R. and Miller, L. (2015.) 'A Comprehensive Comparison of Students and Non-students in Classic Experimental Games', *Journal of Economic Behavior and Organisation,* 113(1): 26–33.
2. Coppock, A. and Green, D.P. (2015.) 'Assessing the Correspondence between Experimental Results Obtained in the Lab and Field: A Review of Recent Social Science Research', *Political Science Research and Methods,* 3(1): 113–31.
3. Daniel M. Hausman (2005). 'Testing' game theory, *Journal of Economic Methodology,* 12:2, 211-223, DOI: 10.1080/13501780500086065

Resources for Final Project

1. Writing a Model

 Clarke, Kevin A., and David M. Primo. 2007. "Modernizing Political Science: A Model Based Approach." *Perspectives on Politics* 5, 4:741–753.

 Fiorina, M. 1975. "Formal models in political science", *AJPS.*

 Little, Andrew and Thomas Pepinsky. 2016. "Simple and Formal Models in Comparative Politics," Chinese Political Science Review. Vol 1, No 3, 425–447

 Exit, Voice, Loyalty Model (see Canvass)

 Varian: "How to Build an Economic Model in Your Spare Time"

 Halmos: http://www.mat.uc.pt/~pedro/lectivos/LaTeX/how-to-write-mathematics.pdf

2. Doing an Experimental Research Design

https://declaredesign.org

Pre-Analysis Plans: https://economics.mit.edu/files/10654

Example of a PAP: http://emiguel.econ.berkeley.edu/assets/miguel_research/101/ Heat_Labs_PAP-2020-11-25.pdf

https://gametheorylab.org

https://www.ztree.uzh.ch/en.html