Georgetown University
PPOL 737-20

Game Theory

Instructor:
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Class:
Wednesdays

Course Objectives
In the last few decades game theory has become one of the most powerful analytical tools in the study of political processes of decision-making. In this approach, human interactions are analyzed in situations in which individual decisions depend on expectations as to what others will do. Game theoretical models have been applied to the analysis of war, diplomacy, negotiations and conflict settlements, inter-institutional relations, collective action, leadership, voting and elections, and other relevant political dilemmas.
This module will:
1) provide a set of tools of the theory of games of strategy with analytical value,
2) develop some relevant applications in politics and decision-making.
Numerous examples, exercises and applications of the models to the analysis of relevant problems will be presented, required and promoted.

Course Requirements
☐ Weekly exercises (40%)
☐ Final paper or take-home exam (60%)

Paper projects must be discussed and approved by the instructor.
Grades: A>90; A->80; B+>70; B>60; B->50; C+>40; C>30; C->20; F>10.

Basic text
- Kenneth Williams, *Introduction to Game Theory*. Oxford University Press, 2013.

Syllabus

1. Introduction. What's game theory. Types of games.
Coordination games. Focal points.
Readings:
- Kenneth Williams, *Introduction to Game Theory*. Oxford University Press, 2013.
Chapter 1 + page 107.
- William Poundstone, *Prisoner's Dilemma. John von Neumann, game theory, and the puzzle of the bomb.* New York: Doubleday, 1993: chapters 1, 3.

2. Competition or Non-zero sum games. The Prisoner's Dilemma. Nash equilibrium.
Repeated games. The evolution of cooperation.
Readings:
- Williams, Chapter 5, Chapter 6 only sections A-B-C pages 95-101.
- Poundstone, chapters 6, 12.
- Robert Axelrod: 'An Evolutionary Approach to Norms', *American Political Science Review,* 1986.

3. Other competitive games: Stag Hunt. Chicken. Battle of sexes.
Readings:
- Williams, Chapter 6 only sections D-E-F pages 102-110.
- Poundstone, Chapters 10-11.

4. N-player games.
Readings:
- Thomas C. Schelling, 'Tipping Game', in *Micromotives and Macrobehavior*, 1978.
- by Josep Colomer, 'Leadership Games in Collective Action', *Rationality and Society*, 1995.

5. Conflict or Zero-sum games. Mixed strategies.
Readings:
- Williams, Chapter 7.

6. Extensive form games. Subgame perfect equilibrium.
Readings:
- Williams, Chapter 8, Chapter 9 only sections A-C pp. 142-150.

7. Incomplete information. Bayesian strategies. Evolutionary games.
Readings:
- Williams, Chapter 10 only sections A-B-C-D pages 160-173, Chapter 11.
- T. Schelling, 'Commitments, threats and promises', in *The Strategy of Conflict*.
- Robert Pool: 'Putting Game Theory to the Test', *Science*, 267, 1995.