

**Sabanci University**  
**Faculty of Arts and Social Sciences**

**POLS 434/534: Formal Modeling and Political Analysis**

We may have to revise the course plan according to the reassessment to be made country-wide, regarding higher education, at the beginning of April. The content to be delivered is certain but the method of course delivery, the number and dates of exams, and some other details are subject to change.

**INSTRUCTOR:**

Özge Kemahlıoğlu

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Meetings: Wednesdays, 13:40-16:30, FASS 1098

Zoom link:

<https://sabanciuniv.zoom.us/j/97841383718?pwd=WngraFJ4VWpuTHYxVHBkb2RtMWtydz09>

Password for first meeting: 305851

Office hours: Wednesdays, 16:40-17:30

**COURSE DESCRIPTION**

This course is a graduate level introduction to game theory for social sciences. Game theory consists of a coherent set of concepts and analytical tools to examine interactions between decision-makers, that is, situations where the well being of one decision-maker depends not only what she does but also on what others do. Game theory has become a widely used tool of analysis in a wide range of disciplines, including economics, political science, law, and international relations.

The course covers the standard group of essential concepts that are particularly important in game theory. It starts with an introduction to decision theory, also focusing on the plausibility of the rational choice assumption as a representation of real-life choices. It then discusses non-cooperative games, both with simultaneous and sequential moves. Time permitting, the course will finish with a discussion of incomplete information games.

Throughout the course, we will also cover applications of game theory to social sciences, particularly political science.

This course presupposes no knowledge of mathematics beyond simple arithmetic. It, however, requires students to think and reason in an analytically rigorous and systematic manner.

**TEXTBOOK**

The textbook for this course is

Martin Osborne, *An Introduction to Game Theory*, Oxford University Press 2004 (Os).

The following books will be useful for additional reading

Robert Gibbons, *Game Theory for Applied Economists*. Princeton, 1992

Avinash Dixit and Barry Nalebuff, *Thinking Strategically*, Norton, 1991

## **HOMEWORKS AND GRADING**

Problem sets will be handed out every three weeks.

Grading:

Problem sets	20%
Participation	10%
Midterm	25% (April 19)
Final exam	45% (TBA)

## COURSE OUTLINE

### 1. Rational Choice

a. Rationality assumption, preferences and utility

b. Reading assignment:

Tversky, Amos and Daniel Kahneman, 1981, "The Framing of Decisions and the Psychology of Choice", *Science*, New Series, Vol. 211, No. 4481, pp. 453-458.

Herbert A Simon, 1995, "Rationality in Political Behavior", *Political Psychology*, Vol. 16, No, 1, pp. 45-61.

Lichbach, Mark I., 2003, *Is Rational Choice Theory All of Social Science?* University of Michigan Press, Chapter 3, 28-40 (e-book)

### 2. Modeling

a. Constructing a normal form game

b. Well-known games

c. Application: Arce, Daniel and Todd Sandler, 2005, "Counterterrorism: A Game-Theoretic Analysis", *Journal of Conflict Resolution* 49(2): 183-200.

d. Application: Tsebelis, George, 1989, "The Abuse of Probability Analysis: The Robinson Crusoe Fallacy", *American Political Science Review*, Vol. 83, No.1, pp. 77-91.

e. Application: Mark Lichbach. 1990. "Will Rational People Rebel Against Inequality? Samson's Choice." *American Journal of Political Science*, Vol. 34, No. 4. (Nov., 1990), pp. 1049-1076.

### 3. Analysis in pure strategies

a. Domination,

b. Nash equilibrium

c. Application: Arce, Daniel and Todd Sandler. 2005. "Counterterrorism: A Game-Theoretic Analysis." *Journal of Conflict Resolution* 49(2): 183-200.

d. Application: Geddes, Barbara, 1991, "A Game Theoretic Model of Reform in Latin American Democracies", *American Political Science Review*, Vol. 85, No. 2, pp. 371-392.

### 4. Mixed strategies

a. Analysis on simple games

b. Application: Palfrey and Rosenthal (1985)'s model in McCarthy, Nolan and Adam Meirowitz, 2007, *Political Game Theory: An Introduction*, New York, NY: Cambridge University Press, pg 140

5. Continuum strategy sets
  - a. Best response analysis
  - b. Application: Hotelling model in McCarthy, Nolan and Adam Meirowitz, 2007, *Political Game Theory: An Introduction*, New York, NY: Cambridge University Press, pg 101-107

## **MIDTERM**

6. Extensive form games with perfect information
  - a. Extensive form
  - b. Sub-game Perfect Nash Equilibrium
  - c. Application: Przeworski, Adam. 1991. *Democracy and the Market: Political and Economic Reforms in Eastern Europe and Latin America*, New York, NY: Cambridge University Press, Chapter 2.
  - d. Application: Ulfelder, Jay, 2010, *Dilemmas of Democratic Consolidation: A Game-theory Approach*, First Forum Press, Chapter 2
7. Extensions
  - a. Combining sequential and simultaneous moves
  - b. Continuum of actions
  - c. Application: Weingast. Barry R. 1997. "The Political Foundations of Democracy and the Rule of Law." *American Political Science Review* 91(2): 245-263.
  - d. Application: Rubinstein, Ariel. 1982. "Perfect Equilibrium in a Bargaining Model." *Econometrica* 50: 97–110.