

BDS 509: Applied Game Theory



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Zoom link: <https://upenn.zoom.us/my/anomaly101>
M,W,F — 1:00-2:15pm — July 1 - Aug 6

Course description

This course covers basic concepts in game theory and applies these concepts to the social sciences. By the end of the course students will know how to identify Nash equilibria and Pareto optima, understand how to diagram simultaneous and sequential games, and be able to explain how different strategies apply to single play games and repeated games. Topics will include why conflict and cooperation occur among organisms with diverse goals and scarce resources, and how pro-social emotions and norms can alter human behavior in ways that facilitate cooperation.

Required Books

Thomas Schelling, *Micromotives and Macrobehavior*

Robert Frank, *Passions within Reason: The Strategic Role of the Emotions*

Grades are determined by one quiz that involves diagramming and analyzing some simple games, and two short exams that involve explaining concepts from the readings.

All articles will be posted on Canvas. You'll need to buy the books. The Encyclopedia entry on game theory is hyperlinked below, or you can find it with a quick internet search.

Reading Schedule

1. Basic Concepts

July 2: Class introduction, basics of game theory

July 5: No class

July 7, 9:

Don Ross, [Game Theory](#)

[§1](#) Philosophical Motivation (all), [§2](#) Basic Elements (end at 2.7: p. 48), [§6](#) Commitment (all)

Watch Game Theory PPE Videos ([click here](#))

Read game theory handouts and do practice problem set (posted with answers on Canvas)
Key concepts: be able to identify the five main games, be able to find Nash Equilibria and Pareto Optima, understand single play vs repeated games, diagram normal form vs extensive form games

July 12:

Quiz (in class)

Schelling, Chapter 3: Models

2. Emergent Orders

July 14:

Schelling, Chapter 4: Sorting and Mixing

Schelling, Chapter 6: Choosing our Children's Genes

July 16:

Gyngell and Douglas, "Stocking the Genetic Supermarket: reproductive choices and collective action problems"

Anomaly, Gyngell, and Savulescu, "Great Minds Think Different: preserving cognitive diversity in an age of gene editing"

3. Repeated Games

July 19:

Axelrod and Hamilton, "The Evolution of Cooperation"

Robert Trivers, "The Evolution of Reciprocal Altruism"

Robert Axelrod, "The Live-and-Let-Live System of Trench Warfare in WW1"

4. Commitment Devices: Incentives, Emotions, and Social Norms

July 21:

Wilson and Wilson, "Survival of the Selfless"

Robert Frank, *Passions within Reason: The Strategic Role of the Emotions*, chapter 1-2

*First exam emailed tonight

July 23: Exam review – open Q&A

July 25: First exam due at 11pm EST (send to anomaly@upenn.edu)

July 26: Frank, chapters 3-4

July 28: Frank, chapters 5-6

July 30: Frank, chapters 10-12

August 2:

Fehr and Gächter, "Altruistic Punishment in Humans"

Abbink, Thrasher, et al, "Peer Punishment Promotes Enforcement of Bad Social Norms"

5. Collective Action

August 4:

Mancur Olson, "The Logic of Collective Action"

Elinor Ostrom, "Collective Action and the Evolution of Social Norms"

*I'll email **final exam** today, **due August 8 (Sunday) at 11pm**

August 6:

Robert Frank et al, "Does Studying Economics Inhibit Cooperation?"

Exam review – open Q&A