

Syllabus
Econ 4100-001: Game Theory
University of Pennsylvania
January 9, 2023

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Description. The object of game theory is to understand situations in which a person's behavior affects the optimal behavior of others. In this course we study the theory and some of its applications to economics, political science, and law. The goal is to give you a solid grasp of both the methods and the basic models used in game theory.

Prerequisites. Econ 101 and Math 114/115, in a previous semester.

Teaching Methodology. Lecture slides and notes will be posted on Canvas to be read before they are discussed in class. Accompanying videos, made when the entire course was online, will also be made available – any changes in the material will be flagged. This is a problem-oriented course, and we will spend some time in class doing problems in addition to the almost weekly problem sets.

Class Time and Place. MW 1:45-3:14 pm, TOWNE 311.

Office Hours.

- Professor: Thursdays, 3-4:15pm. And by appointment.
- TA: TBA.

Textbook. *Strategy: An Introduction to Game Theory*, 3rd edition, by Joel Watson.

Assessment. 15% for the six problem sets,¹ 25% for each of two in-class midterms, 35% for the final exam. Midterm 2 covers the material introduced between the two midterm dates. The final exam covers the entire semester. All three exams are closed book, notes, and electronics.

If you are unable to take a midterm for an excused reason,² the other three instruments will be scaled up proportionately: 20% for the problem sets, 33. $\bar{3}$ % for the midterm taken, 46. $\bar{6}$ % for the final exam.

Upload Policy. You will upload to Canvas your solutions to the problem sets – as a pdf file. Your work can be handwritten, but scanned to create a *single* pdf file.

¹One of your problem sets that has your worst score will be dropped.

²The definition of an excused absence, departmental regrade policies, and so on can be found at <https://economics.sas.upenn.edu/undergraduate/course-information/course-policies>.

Important Dates

First Class	Wednesday 1/11
No Class	Monday 1/16 (MLK)
PS 1 due	Friday 1/27 at 11:45pm
PS 2 due	Friday 2/10 at 11:45pm
Midterm 1	Wednesday 2/15, in class
Drop Day	Monday, 2/20
PS 3 due	Friday 3/3 at 11:45pm
Spring Break	3/4 – 3/12
PS 4 due	Friday 3/24 at 11:45pm
Midterm 2	Wednesday 3/29, in class
PS 5 due	Friday 4/14 at 11:45pm
PS 6 due	Wed 4/26 at 11:45pm (Last Class)
Final Exam	TBA (in week of 5/1-9)

Tentative Course Outline

Topic	Watson Chapter
Representing Games	
Extensive form, strategies	1 – 3
Normal form, beliefs/mixed strategies	4, 5
Static Games	
Best response, rationalizability, applications	6 – 8
Equilibrium, applications	9, 10
Mixed strategy equilibrium	11
Strictly competitive games	12
Contract and law	13
Dynamic Games	
Extensive forms and subgame perfection	14, 15
Applications: IO and parlor games	16, 17
Bargaining games	19
Repeated games and applications	22, 23
Incomplete Information Games	
Random events and incomplete information	24, App A
Bayesian-Nash equilibrium, applications	26, 27
PBE, signaling, reputation	28, 29
Risk and Incentives (Moral Hazard)	25