ECON 4100 – Game Theory
University of Pennsylvania
Spring 2025

Instructor

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Course Meeting: Monday and Wednesday, 3:30-5:00pm, Towne Building 315
Office Hours: Monday 2:00-3:00pm, PCPSE 502, or by appointment

Teaching assistant

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Review Sessions: To be scheduled before each exam
Office hours: Wednesday 1:30-2:30pm, PCPSE 500
                Thursday 9:00-10:00am, PCPSE 208

Recommended textbook

A substantial part of the course material will follow Joel Watson's "**Strategy: An Introduction to Game Theory**," third edition. The rest of the material will be provided in the form of detailed slides, which will be posted on Canvas.

Some of the examples in the slides are taken from "**Games, Strategies, and Decision Making**" by Joseph Harrington.

Prerequisites

Econ 2100 (formerly 101) and Math 1410/1510 (formerly114/115) in a previous semester.

Grades

Grades are determined by performance on homework assignments, and three midterms. The weight of the homework is 10% and the weight of each midterm is 30%.

Exams: The first midterm will take place tentatively on February 19th. The second midterm will take place tentatively on March 26th. The final midterm will take place on April 30th, the last day of class. **The grades of the two midterms can never lower your final grade.** The way this will work is that the numerical grade on each of the first two midterms will be compared to the numerical grade on the final midterm exam, and the higher grade will be used. The final midterm exam covers materials from the entire semester.

Assignments (problem sets): I will assign 6-8 homework assignments during this course. Assignments and other course documents will be posted on Canvas. The due date will be noted on the assignments. Homework assignments are designed to give you a hands-on perspective on the material as well as practice for exams. It is therefore best to attempt the assignments on your own first but collaborating with others when you are stuck is encouraged. Note, however, that each student must submit his or her own solution to every assignment. (Copying another student's work is a violation of academic integrity and does not qualify as one's "own solution.")

Grading: Careful explanations should be written out for your answers, unless a question explicitly states that an explanation is not required. You should show your work to an extent that convinces the grader you solved the question and not merely copied the solution. Exams will be graded for correctness of the reasoning and the answers. Problem sets will be graded based on both correctness and an assessment of the effort invested. The aggregate number of points obtained in all the problem sets together will determine 10% your final grade in the class. All problem sets will count toward the final grade.

Academic Integrity

See https://catalog.upenn.edu/pennbook/code-of-academic-integrity

Course Topics

The following is a *tentative* course plan. The corresponding book chapter number appears after every topic. On many topics the material in class will not be identical to the material in the corresponding text book chapter: some material in the book will not be covered, and other material not in the book will be covered. Problem sets and exams will be based on the material covered in class.

- Extensive-form games (2 and 14)
- Normal-form games (3)
- Beliefs and expected payoffs (4)
- Dominance and best response (5 and 6)
- Rationalizability and iterated dominance (5 and 7)
- Applications of rationalizability (8)
- Nash equilibrium (9 and 10)
- Nash equilibrium in mixed strategies (11)
- Subgame perfection (15)
- Applications to industrial organization (16)
- Parlor games (17)
- Uncertain outcomes and moral hazard (25)
- Games of incomplete information (24 and 26)