National Taiwan University
Department of Economics
ECON 4037: Game Theory
Fall 2025

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Class Time and Location

Mondays at 2:20 PM – 5:20 PM
Room 506, College of Social Sciences

Office Hours

Mondays at 1:00 PM – 2:00 PM or by appointment

Course Description

This course provides a rigorous introduction to game theory, the mathematical study of strategic interaction. It is designed primarily for advanced undergraduate students in their third or fourth years.

Game theory is a standard framework for analyzing strategic interaction across several disciplines, including economics, political science, biology, and law. The course aims to provide students with a foundational understanding of game-theoretic concepts that are applicable to real-world situations. By the end of this course, students will be able to:

- Formulate strategic situations as non-cooperative games in normal or extensive form;
- Analyze classic games such as the prisoner's dilemma, models of oligopolistic competition, and job market signaling;
- Determine optimal strategies based on beliefs about others' behavior;
- Apply core solution concepts to predict strategic behavior, including (i) Iterated dominance, (ii) Nash equilibrium, (iii) Mixed-strategy Nash equilibrium, (iv) Subgame-perfect Nash equilibrium, (v) Bayesian Nash equilibrium, and (vi) Perfect Bayesian equilibrium

The prerequisites for this course are Microeconomics I and II (ECON 2018 and ECON 2019). Students are expected to be comfortable with calculus, probability, and statistics at the introductory level.

Course Requirements

Students are required to attend classes regularly, complete homework assignments, take the midterm exam, and take the final exam. Students may discuss homework problems with

classmates or use generative AI tools to explore how to solve them, but must write their own answers and ensure they fully understand their solutions.

Textbook

Watson, Joel. *Strategy: An Introduction to Game Theory*, 3rd ed., W. W. Norton & Company, 2013.

Grading

Homework: 20%
Midterm Exam (Monday, October 20): 40%
Final Exam (Monday, December 15): 40%

Academic Integrity

Cheating on exams is strictly prohibited. Cheating includes, but is not limited to:

- Bringing unauthorized notes, study aids, or texts into the exam room, or consulting them outside the room during the exam (e.g., in the bathroom);
- Using a cell phone or other electronic device to store or access information during the exam;
- Having another person take the exam on your behalf;
- Communicating with classmates, looking at their work, or allowing others to look at your work during the exam.

Course Schedule

The following is a tentative course schedule. Specific dates and topics are subject to adjustment.

Week	Date	Topic
Week 1	09/01	• Introduction (Ch. 1) • The Extensive Form (Ch. 2)
Week 2	09/08	• Strategies and the Normal Form (Ch. 3)
Week 3	09/15	• Beliefs, Mixed Strategies and Expected Payoffs (Ch. 4) • General Assumptions and Methodology (Ch. 5)
Week 4	09/22	• Dominance and Best Response (Ch. 6) • Rationalizability and Iterated Dominance (Ch. 7)
Week 5	09/29	• Location, Partnership, and Social Unrest (Ch. 8) • Nash Equilibrium (Ch. 9)
Week 6	10/06	**No class (Mid-Autumn Festival)**

Week 7	10/13	• Oligopoly, Tariffs, Crime, and Voting (Ch. 10)
Week 8	10/20	**Midterm**
Week 9	10/27	• Mixed-Strategy Nash Equilibrium (Ch. 11) • Details of the Extensive Form (Ch. 14)
Week 10	11/03	• Sequential Rationality and Subgame Perfection (Ch. 15)
Week 11	11/10	• Repeated Games and Reputation (Ch. 22)
Week 12	11/17	• Random Events and Incomplete Information (Ch. 24) • Bayesian Nash Equilibrium and Rationalizability (Ch. 26)
Week 13	11/24	• Lemons, Auctions, and Information Aggregation (Ch. 27)
Week 14	12/01	• Perfect Bayesian Equilibrium (Ch. 28)
Week 15	12/08	• Job Market Signaling and Reputation (Ch. 29)
Week 16	12/15	**Final Exam**