

Updated: February 18, 2021

Econ 212: Game Theory

Instructor: John Lazarev (jlazarev@sas.upenn.edu)

PCPSE, Office 633

Zoom Office Hours: Tuesdays and Thursdays 7:00–8:00pm

Lectures: Tuesdays and Thursdays 1:30–3:00pm

Teaching Assistant: Pawel Bendarek (pbed@sas.upenn.edu)

Zoom Office Hours: by appointment

Midterm Exam: Tuesday, March 9

Final Exam: Wednesday, May 5

Course Description An introduction to game theory and its applications to economic analysis. The course will provide a theoretical overview of modern game theory, emphasizing common themes in the analysis of strategic behavior in different social science contexts. The economic applications will be drawn from different areas including trade, corporate strategy, and public policy.

Prerequisites: Econ 101 and Math 114/115.

Course Text: The required textbook for this course is *Strategy: An Introduction to Game Theory* by Watson, J. (3rd Edition) ISBN-13: 9780393918380. Moreover, I may post some additional lecture notes on Penn Canvas.

Lectures Lectures will be conducted on Zoom. Recordings will be posted. I expect you to complete the assigned readings and problems before the lectures. During the lectures, we will go over the key concepts and the assigned questions and problems. Come prepared. If you miss, watch the recordings only after you complete the required reading.

To optimize the recordings, I will share with you my whiteboard, turn off my and your video feed, mute your audio feed, and will be monitoring your questions posted on Zoom chat during the recordings. I will

try to leave extra time for questions at the end of each lecture.

The discussion module on Canvas is active. You can post there your follow-up questions after each lecture.

Course Requirements and Grading: The overall course grade is based *solely* on your performance on problem sets, class project, and the exams. No extra work can be given, or additional credit assigned, to improve your grade.

- **Problem Sets [12%]:** There will be twelve problem sets, assigned weekly during the semester. You will be both solving and grading your own problem sets. The grading part is as important as solving the problems. The grades you report will not be used to determine your course grade. You will receive full credit for problem sets as long as you submit your assignment on time. Each problem set is due by 11:59pm on the due day. If you are late (even 1 minute late), Penn Canvas may not accept it. No excuses for missed assignments/deadlines will be accepted.
- **Class Project [18%]:** Group project (3–6 students). Requirements to be announced in February.
- **Midterm Exam [30%]:** Four problems, 24-hour take home. The lowest problem score will be dropped.
- **Final Exam [40%]:** Five problems, comprehensive, 24-hour take home. The lowest problem score will be dropped.

Your scores on the various assignments will be aggregated at the end of the semester and converted into a letter grade based on a pre-announced scale. I will not assign letter grades to individual assignments. The grades will not be “curved.” Your letter grade will NOT depend on the performance of the rest of the class. I plan to announce the scale after Spring Break.

Missed Assignments: No excuses for missed assignments/deadlines will be accepted.

Departmental Course Policies: All course policies of the Economics Department apply to Econ 104 even if not explicitly listed on this syllabus. See: <https://economics.sas.upenn.edu/undergraduate/course-information/course-policies> for full details.

Approximate Course Outline and Schedule

Lecture	Topic
1/21	Introduction to Game Theory
1/26	The Extensive Form
1/28	Strategies and the Normal Form
2/2	Beliefs, Mixed Strategies, and Expected Payoffs
2/4	General Assumptions and Methodology
2/9	Dominance and Best Response
2/11	Rationalizability and Iterated Dominance
2/16	Applications: Location, Partnership, and Social Unrest
2/18	Nash Equilibrium
2/23	Applications: Oligopoly, Tariffs, Crime, and Voting
2/25	Mixed-strategy Nash Equilibrium
3/2	Strictly Competitive Games and Security Strategies
3/4	Review Session
3/9	Midterm Exam
3/11	Spring Break (No Class)
3/16	Details of the Extensive Form
3/18	Sequential Rationality and Subgame Perfection
3/23	Applications: IO
3/25	Bargaining Games
3/30	Engagement Day (No Class)
4/1	Repeated Games and Reputation
4/6	Applications: Collusion, Trade Agreements, and Goodwill
4/8	Random Events and Incomplete Information
4/13	Applications: Risk and Incentives in Contracting
4/15	Bayesian Nash Equilibrium and Rationalizability
4/20	Applications: Lemons, Auctions, and Information Aggregation
4/22	Perfect Bayesian Equilibrium
4/27	Applications: Job-Market Signaling and Reputation
4/29	Review Session
5/5	FINAL EXAM