Economics S159: Introduction to Game Theory

Summer 2025: Session B (June 30 – August 1, 2025)

* Syllabus subject to change. Check course webpage for up-to-date information *

This course is an introduction to game theory and strategic thinking. Ideas such as dominance, backward induction, Nash equilibrium, commitment, credibility, asymmetric information, and reputation are discussed and applied to games played in class and to examples drawn from economics, politics, movies, and life.

Meeting Location: WLH113.
Meeting Time: Monday, Wednesday 9:00 - 12:15.

Attendance Policy. Attendance is mandatory for all classes due to the condensed summer schedule, as outlined in the YSS policy. Falling behind is likely for students who do not attend every session.

Professor: Zvika Neeman
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Office hours: Monday and Wednesday after class (please let me know!), and also possibly at other times by appointment.
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Textbook: *The Art of Strategy* by A. Dixit and B. Nalebuff, Norton 2010.

Course Website: https://yale.instructure.com/courses/87882.
This website will contain an up-to-date syllabus, detailed lecture notes and assignments, and other materials as they become relevant.

Requirements: This course is an introduction to game theory. Introductory microeconomics (115 or equivalent) is not required but it is recommended. We will use calculus (mostly one variable) in this course. We will also refer to ideas like probability and expectation.

Grading:
Problem sets: 33%
Midterm examination: 33% (**Monday, July 14**)
Final examination: 34% (**Wednesday, July 30**)
The exam dates are fixed so please plan accordingly.

Grading policies: Problem set grades will be on a ✓, ✗, scale; any questions regarding the grading of a problem set must occur within two days of it being returned. Students may not submit joint problem sets. Although students are free to discuss the problem sets with each other, they are expected to solve these independently in order to best prepare for the exams, which will be similar to the problem sets. Late problem sets will be penalized proportionally to the lateness. Midterm and final exams will be graded on a 0-100 scale. The following procedure will be in place for addressing any concerns about the grading of an exam question (with the exception of simple errors in adding up the total score): within a window of time specified when the exam is returned, a student may submit their entire exam to be regraded, with the new score replacing the previous one. Errors in adding up the total score should be brought up with the professor directly. The final class grade, as determined from the formula above, will be mapped to a letter grade through cutoff points that will be determined after the final exam, based on overall class performance. Completion of the problem sets and the exams are requirements for passing the course.

<div align="center">**Tentative Class Schedule**</div>

<div align="center">** Check website for up-to-date information **</div>

Week 1-2: Simultaneous Games

1. Introduction (Art of Strategy, Ch. 1)

2. The Prisoners' Dilemma (Art of Strategy, Ch. 3)

3. Iterated Elimination (Art of Strategy, Ch. 3)

4. Nash Equilibrium (Art of Strategy, Ch. 4)

5. Mixed Strategies (Art of Strategy, Ch. 5)

6. Existence of Nash Equilibirum

Weeks 3-4: Sequential Games

1. Backwards Induction (Art of Strategy, Ch. 2)

2. Subgame Perfect Equilibrium (Art of Strategy, Ch. 6)

3. Alternating Offer Bargaining (Art of Strategy, Ch. 9)

4. Sequential Rationality (Art of Strategy, Ch. 7)

5. Repeated Games (Art of Strategy, Ch. 9)

Weeks 5: Games with Incomplete Information

1. Bayesian Games

2. Auctions (Art of Strategy, Ch. 10)

3. Reputation and Modeling Irrationality (Art of Strategy, Ch. 13)