

## Game Theory

**Instructor:** UrmambetovBakytMoldogazievich.

**Office Hours:** M,W,F: 11-12.40 am, or by appointment.

**Prerequisites:** Mathematics, Microeconomics, Mathematical Statistics.

### Course Content

Our primary goal is to study the scope and methods of game theory. We mainly focus on games arising in economics and business, although general games will be considered with applications to other fields.

Game theory is about the strategies adopted by agents (e.g. consumers, firms or governments) when there are competing interests or ends and the outcomes depend on the actions chosen by all of the participants. Our time together is designed to develop a view of the concepts and problems studied by game theorists. You should also learn a set of analytical skills reflecting game theory's main themes.

The course is modular in structure. There are 7 modules in all

Week 1-2. An Introduction to Games and their theory. One-Person games. (Chapter 1), {chapters 1-2}.

Week 3-4. Two-Person Games. Constant-Sum Games. One card Stud Poker. Winning at Blackjack (chapter 2-3), [Chapters 2-4]

Week 5-7. Mixed Strategies and Mixed Strategy Equilibrium. Mixed Strategies and Bluffing: Liar's Poker. Mixing when one player has three or more pure strategies. (Chapters 2 and 3), [Chapters 2-4], {Chapter 5}

Week 9-10. The Origins of Cooperation. Cournot's theory of duopoly and its relationship to Prisoner's Dilemma. Bertrand Competition. Market games with differentiated products. (Chapters 5 and 7), [Chapter 3]

Week 11-12. Nature games. Threats and Negotiations. Credibility. (Chapter 6) [Chapters 5 and 7]

Week 13-14. Two-Player Signaling Games. Sequential Equilibrium. (Chapter 9), [Chapters 6, 13, 14].

Week 15. Bargaining games. Nash Bargaining solution. Kalai-Smorodinsky solution/ (Chapter 12), [Chapters 11-12]

### Textbooks

(1) Roy Gardner, Games for Business and Economics, John Wiley and Sons, 1994.

[2] John McMillan, Games, Strategies and Managers, Oxford University Press, 1992

{3} Avinash K. Dixit and Susan Skeath, Games of Strategy, W.W. Norton & Company, 1999.

### Organization

Course Grades:

- Midterm Exam 40%
- Final Exam 50%
- Homework 5%
- Class participation 5%
- Midterm exam date: Tentatively set for Tuesday, October 20.
- Final exam date: Saturday or Sunday, December 12 or 13.
- Homework: At the conclusion of each module is homework assignment. You may work in small groups of up to 3 students on the homework exercises.
- Participation: This includes participation in class experiments and collaborative learning exercises.

Grading Scale:

$0 \leq F \leq 49 < D \leq 55 < C- \leq 60 < C \leq 65 < C+ \leq 70 < B- \leq 75 < B \leq 80 < B+ \leq 85 < A- \leq 90 < A \leq 100$ .