

1. Course description and objectives

Game Theory is an amazing topic and powerful tool due to its wide applicability. Its concepts are used in economics, political science, computer science, biology. It can be treated as a language of the modern Microeconomics. This half course is designed to familiarize students with the game theoretical tools that are widespread in modeling economic processes. Our more ambitious goal is to help students in developing economic thinking, as an understanding of different life occasions in terms of players' strategic reasoning.

After the course students should have:

- Knowledge of fundamental concepts of non-cooperative game theory
- Ability to solve basic game theoretical models
- Ability to apply game theoretical tools to the analysis of real life situations

Course prerequisites:

- basics of calculus and probability theory (as it is covered in high school or other subjects of the program)

2. Teaching methods and assessment

- Course includes 5 lectures and 5 seminars
- The active participation during classes is appreciated and praised with the bonus points
- At the end of the course student will sit written exam

Grade is determined by the following formula:

$$GRADE = 0.7 \times Exam + 0.3 \times Bonus$$

Exam – grade for the final exam (from 0 to 100)

Bonus – sum of bonus points for activity during classes (from 0 out of 100)

3. Structure

1. Introduction. Strategic interactions.

Classification of games. Strategic interactions. Credible threat. Examples of different applications of game theory.

2. Simultaneous games with complete information.

Definition of static game. Dominant and dominated strategies. Pure strategies. Mixed Strategies. Nash Equilibrium. Iterated dominance.

3. Dynamic games with complete information.

Description of the dynamic game with complete information. Games in strategic form. Subgame perfect equilibrium. Backward and forward induction.

4. Oligopolies.

Bertrand model. Cournot model. Stackelberg model. Hotelling model. Strategic entry deterrence.

Nº	Topic	Description	Lecture	Class	Self – study
1	Introduction. Strategic interactions	Solving games in non-economic context.	1	1	2
2	Simultaneous games with complete information.	Solving games in normal form.	1	1	2
3	Dynamic games with complete information.	Solving games in extensive form.	1	1	2
4	Oligopolies.	Applications of game theory in economics	1	1	2
5	Problem solving session.	Solving different games	1	1	2
6	Exam			1	

4. Readings

Core material:

- Lecture slides (if provided)

Supplementary Readings:

- Osborne, M. J. (2004). *An introduction to game theory* (Vol. 3, No. 3). New York: Oxford university press.

5. Internet resources :

- <http://www.gametheory.net> –nice examples of the applications of game theoretic concepts, lecture notes
- <https://www.coursera.org/learn/game-theory-1> - introductory course from professors from Stanford and University of British Columbia
- <https://oyc.yale.edu/economics/econ-159#sessions> – materials from introductory course from Yale University

The lecturer has the freedom to change any part of the syllabus.