

ECON 000

Game Theory

Module 1, 2020-2021

Course Information

Instructor: Young Joon Park

Office: PHBS Building, Room 760

Phone: 86-755-2603-2019

Email: yjpark@phbs.pku.edu.cn

Office Hour: TBA

Teaching Assistant: Mr. Hengxu Song

Email: hengxusong@pku.edu.cn

Office Hour: TBA

Classes:

Lectures: Monday/Thursday 1:30pm to 3:20pm

Venue: PHBS Building, Room TBA

Course Website:

https://cms.phbs.pku.edu.cn/claroline/course/index.php?cid=ECON000_001

1. Course Description

1.1 Context

Course overview:

We cover main ideas and techniques of game theoretic analysis. The course will help students build up further understandings of the basic intuition of game theory. Several more advanced topics and their applications are discussed as well.

Prerequisites for non-PhD students:

Students are expected to already have taken Adv. Micro 1 and 2 and to possess some basic knowledge of game theory. You may take this course if you have taken undergraduate level Microeconomics and Game Theory courses. Talk to me if you are concerned about your preparation.

1.2 Textbooks and Reading Materials

The course is divided into several parts. In the first part, I will introduce basic concepts and ideas of Game Theory. To those who have prior exposure to Game Theory, this part will be a brief review. Then, we will move on to more advanced topics of Game Theory. Specifically, we will discuss the cases of repeated games, incomplete information, and other ideas of equilibrium refinements. In the last part, we will discuss the applications of these theories into different areas of Economics.

There is no assigned textbook for the class. There are many good textbooks with some strengths and weaknesses. I do not plan to follow one specific textbook. However, I recommend you get access to at least one textbook for your reference. The following is an incomplete list of Game Theory textbook that you might find useful.

[1] Drew Fudenberg & Jean Tirole, *Game Theory*, The MIT Press, 1991.
 [2] Martin J. Osborne & Ariel Rubinstein, *A Course in Game Theory*, The MIT Press, 1994.
 [3] Michael Maschler, Eilon Solan, & Shmuel Zamir, *Game Theory*, Cambridge University Press, 2020.
 [4] Zhiyong Tu, *Game Theory*, Peking University Press, 2009.
 [5] Joel Watson, *Strategy: An Introduction to Game Theory*, Norton, 2013.
 [6] Roger B. Myerson, *Game Theory: Analysis of Conflicts*, Harvard University Press, 1991.
 [7] Jean-Jacques Laffont & David Martimort, *The Theory of Incentives: The Principal-Agent Model*, Princeton University Press, 2002.
 [8] Patrick Bolton & Mathias Dewatripont, *Contract Theory*, The MIT Press, 2004.
 [9] Colin F. Camerer, *Behavioral Game Theory: Experiments in Strategic Interaction*, Princeton, 2003.
 [10] Nick Wilkinson & Mathias Klaes, "An Introduction to Behavioral Economics", Palgrave Macmillan, 2017.
 [11] Daniel Friedman and Shyam Sunder, "Experimental Methods A Primer for Economists", Cambridge University Press, 1994.
 [12] Andreu Mas-Colell, Michael Whinston, and Jerry Green, *Microeconomic Theory*, Oxford University Press, 1995.
 [13] Geoffrey A. Jehle and Phillip J. Reny, *Advanced Microeconomic Theory*, Prentice Hall, 2011.

[1]-[3]: Commonly used text for graduate level
 [4]-[6]: Commonly used text for upper undergraduate level
 [7]-[8]: Text for topics on asymmetric information and contract theory
 [9]-[11]: Good references for Behavioral Game theory and Experimental Methods
 [12]-[13]: Microeconomics textbooks with limited coverage on Game Theory

2. Learning Outcomes

2.1 Intended Learning Outcomes

Learning Goals	Objectives	Assessment (YES with details or NO)
1. Our graduates will be effective communicators.	1.1. Our students will produce quality business and research-oriented documents.	No (There is a good chance that students can use the materials covered in this class in producing business or research-oriented documents. These features, however, will be not directly assessed in class.)
	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	No
2. Our graduates will be skilled in team work and leadership.	2.1. Students will be able to lead and participate in group for projects, discussion, and presentation.	No
	2.2. Students will be able to	No

	apply leadership theories and related skills.	
3. Our graduates will be trained in ethics.	3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it.	No
	3.2. Our students will practice ethics in the duration of the program.	No
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	No
5. Our graduates will be skilled in problem-solving and critical thinking.	5.1. Our students will have a good understanding of fundamental theories in their fields.	Yes (The course covers fundamental theories of Game Theory and the students will become familiar with them after taking the course.)
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Yes (Game Theory can be applied to many practical problems in strategic and competitive situations, which they will commonly encounter in business settings.)
	5.3. Our students will demonstrate competency in critical thinking.	Yes (Game Theory requires higher level of understanding of own and opponents' strategies and payoffs, which is a great tool and practice for critical thinking.)

2.2 Course specific objectives

The main objectives of the course are to provide students with a foundation to game theory that helps strategic and critical thinking and to let them apply its intuition to solve real world problems. The course will also help students either initiate research ideas in the field or apply the concept in other areas in Economics.

2.3 Assessment/Grading Details

Your grade will depend on two exams (90%) and class participation (10%):

The final exam is cumulative and covers all materials discussed in the course.

The weight of each exam is determined and not negotiable.

There is no make-up exam.

Attendance will be marked periodically.

Each absence without approval is worth 2% deduction of your final score.

Class participation may also be evaluated by several in-class experiments.

I will give you several problem sets that are not going to be graded.

Game theory can be complicated and abstract. You will not understand the material by just coming to class. Game theory can only be learned well through practice, so it is important that you work through the examples and spend time solving problems.

The purpose of the problem sets is to help you check your understanding of the materials. It will also be handy in preparing for the exams because some of the exam questions will be similar (or even identical) with those in the problem sets.

You will also get the answer keys to check your understanding.

2.4 Academic Honesty and Plagiarism

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honour points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

For more information of plagiarism, please refer to *PHBS Student Handbook*.

3. Topics, Teaching and Assessment Schedule

The schedule is tentative and due to changes.

The chapters and reading materials are provided for your reference.

Week 1 Introduction and Analysis of Static Games

Week 2-3 Analysis of Dynamic Games and Equilibrium Refinement

Week 4-5 Games with Incomplete Information and Asymmetric Information

Week 6-7 Signaling Games

Week 8-9 Applications of Game Theory

4. Miscellaneous