ECON 513
Game Theory
Module 3, 2021-2022

Course Information

Instructor: Young Joon Park
Office: PHBS Building, Room 760
Phone: 86-755-2603-2019
Email: yjpark@phbs.pku.edu.cn
Office Hour: Monday 2:30pm - 4:30pm

Teaching Assistant: TBA
Email:
Office Hour:

Classes:
Lectures: Tuesday/Friday 10:30am – 12:20pm
Venue: PHBS Building, Room 313

Course Website:
https://cms.phbs.pku.edu.cn/claroline/course/index.php?cid=ECON513_004

1. Course Description

1.1 Context

Course overview:

We cover the 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. Furthermore, we will cover the development of behavioral game theory.

1.2 Textbooks and Reading Materials

The course is divided into three parts.
In the first 2 to 3 weeks, we will cover essential analytical tools in strategic situations and briefly overview the basics of game theory. Then, we will switch the gear and select a few specific topics of game theory and review the applications. We will extend these analytical tools to behavioral game theory during the remaining time, which applies recently proposed behavioral assumptions to the framework. The contents for the second and the third part can be chosen flexibly, and we will discuss which topics to select in class.
There is no assigned textbook for the class. Instead, I will handpick the topics I believe are attractive, practical, and insightful for business school students. For each topic, there are directly related references.

[1] Zhiyong Tu, Game Theory, Peking University Press, 2009.

[2] Joel Watson, Strategy: An Introduction to Game Theory, Norton, 2008.
[3] Jean-Jacques Laffont & David Martimort, The Theory of Incentives: The Principal-Agent Model, Princeton University Press, 2002.
[4] Colin F. Camerer, Behavioral Game Theory: Experiments in Strategic Interaction, Princeton, 2003.
[5] Nick Wilkinson & Mathias Klaes, "An Introduction to Behavioral Economics," Palgrave Macmillan, 2017.
[6] Daniel Friedman and Shyam Sunder, "Experimental Methods A Primer for Economists," Cambridge University Press, 1994.
[7] Colin F. Camerer, George Loewenstein, and Mattew Rabin, editors, Advances in Behavioral Economics, Princeton, NJ: Princeton University Press, 2003.
[8] John H. Kagel and Alvin E. Roth, The Handbook of Experimental Economics, Princeton, 1995
[9] Andreu Mas-Colell, Michael Whinston, and Jerry Green, Microeconomic Theory, Oxford University Press, 1995.
[10] Geoffrey A. Jehle and Phillip J. Reny, Advanced Microeconomic Theory, Prentice Hall, 2011.

For the first part, you may consult any game theory textbook (including [1] or [2]). I will consult [3] mostly on topics of asymmetric information. [4] is a good textbook that concentrates on behavioral game theory topics for the second part. [5] is an excellent general introductory textbook that broadly covers various behavioral issues. [6] is an excellent introductory book for Experimental methods, which will be helpful for some of our topics [7] and [8] are a collection of seminal papers in the field. You can also easily find game theory chapters in most graduate microeconomic textbooks like [9] or [10].

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 to produce business or research-oriented documents. However, these features will not be 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 apply leadership theories and related skills.	No
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	No

	program.	
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 a higher understanding of own and opponents' strategies and payoffs, which is a great tool and practice for critical thinking.)

2.2 Course specific objectives

The course's main objectives are to provide students with a foundation for the game theory that helps strategic and critical thinking and let them apply its intuition to solve real-world problems.

2.3 Assessment/Grading Details

Your grade will depend on two exams and other miscellaneous evaluations:

1) Midterm Exam (35%) – 10:30am to 12:20pm, Friday, March 25 (tentative)
2) Final Exam (50%) – 11:30am to 1:30pm, Tuesday, April 26,
3) Attendance and class participation (15%)

We will finalize the date of the midterm exam later.
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 a 3% deduction of your final score.
Several in-class experiments will also evaluate class participation.

I will give you several problem-sets that are not going to be graded.
Game theory can be complicated and abstract, and you will not understand the material by just coming to class. Game theory can only be learned through practice, so you must work through the examples and solve 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) to those in the problem sets.
You will also get the answer keys to check your understanding.

2.4 Academic Honesty and Plagiarism

It is essential for a student's effort and credit to be recognized through class assessment. Credits earned for a student's work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconduct, which includes 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 grades, honors, awards, or professional endorsement dishonestly; 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 an academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another faculty member, and/or communicating 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 purposes.

Where a violation is suspected, penalties will be implemented. The penalties for academic misconduct may include a deduction of honor 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 on 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

[2] Chapter 1-9, 11
[9] Chapter 7, 8 Sec. A-D

Week 2 Analysis of Dynamic Games and Equilibrium Refinement

[2] Chapter 14, 15, 18, 19, 22
[9] Chapter 9

- Ellison, G. (1994). Cooperation in the prisoner's dilemma with anonymous random matching. The Review of Economic Studies, 61(3), 567-588.
- Van Damme, E. (1989). Stable equilibria and forward induction. Journal of Economic Theory, 48(2), 476-496.

Week 3-4 Games with Incomplete Information and Asymmetric Information

[2] Chapter 24-29
[3] Chapter 2-4
[9] Chapter 8 Sec. E, 13, 14,

- Bikhchandani, S., Hirshleifer, D., and Welch, I., 1992, "A theory of fads, fashion, custom, and cultural change as informational cascades," Journal of Political Economy, 100, 992–1026.

Week 4-5 Signaling Games

[9] Chapter 13

- Spence, M. (1978). Job market signaling. In Uncertainty in economics (pp. 281-306). Academic Press.
- Crawford, V., and J. Sobel (1982): "Strategic Information Transmission," Econometrica, 52(6), 1431–1451.
- Milgrom P. (2008): "What the Seller Won't Tell You: Persuasion and Disclosure in Markets," Journal of Economic Perspectives, 22, 115–132.

- Kamenica, E., and M. Gentzkow (2011): "Bayesian Persuasion," American Economic Review, 101, 2590–2615.

Week 6 Introduction to Behavioral Game Theory (optional)

[4] Chapter 1, "Introduction"; Appendix 1.1, "Basic Game Theory"; and Appendix 1.2, "Experimental Design"
[6] Chapter 13, Colin F. Camerer, "Behavioral Game Theory: Predicting Human Behavior in Strategic Situations"

- Richard H. Thaler, "From Homo Economicus to Homo Sapiens," Journal of Economic Perspectives, 2000, vol. 14.
- Matthew Rabin, "Psychology and Economics," Section 2, Journal of Economic Literature, March 1998.
- Stefano DellaVigna, "Psychology and Economics: Evidence from the Field," Section 2.3 Journal of Economic Literature, June 2009.

Week 7 Survey of experiments in Game Theory (optional)

[4] Chapter 2, Dictator, Ultimatum and Trust game

- James Andreoni, Marco Castillo, and Ragan Petrie, "What do Bargainers' Preferences Look Like? Exploring a Convex Ultimatum Game." *American Economic Review,* 93(3), June 2003, 672-685.

Week 8 Social Preference (optional)

[6] Chapter 9, Ernst Fehr and Klaus M. Schmidt, "A Theory of Fairness, Competition, and Cooperation"
[6] Chapter 10 Matthew Rabin, "Incorporating Fairness into Game Theory and Economics"

- Alvin Roth, Vesna Prasnikar, Masahiro Okuno-Fujiwara, and Shmuel Zamir, "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study," *American Economic Review* 81 (1991), 1068-1095.
- Joel Sobel, "Interdependent Preferences and Reciprocity" Journal of Economic Literature, June 2005
- Ernst Fehr and Klaus M. Schmidt, "The Economics of Fairness, Reciprocity and Altruism – Experimental Evidence and New Theories," in Handbook of the Economics of Giving, Altruism and Reciprocity, Edited by S. Kolm and J.M. Ythier. July 2006, North Holland
- Geanakoplos, John, David Pearce, and Ennio Stacchetti. 1989. "Psychological Games and Sequential Rationality." Games and Economic Behavior 1: 60-80.
- Pierpaolo Battigalli & Martin Dufwenberg. 2019. "Psychological Game Theory"

Week 9 Mental Models of Others (optional)

[4] Section 4.1, Unstructured Bargaining; 4.2, Structured Bargaining; Chapter 5, Dominance-Solvable Games; and Chapter 7, Coordination
[6] Chapter 12, Vincent P. Crawford, "Theory and Experiment in the Analysis of Strategic Interaction"
- Rosemarie Nagel, "Unraveling in Guessing Games: An Experimental Study," *American Economic Review* 85 (1995), 1313-1326
- Miguel Costa-Gomes and Vincent Crawford, "Cognition and Behavior in Two-Person Guessing Games: An Experimental Study," *American Economic Review* 96 (December 2006), 1737-1768
- Camerer, Colin, Ho, Teck-Hua and Chong, Juin Kuan, "A Cognitive Hierarchy Model of Games," *Quarterly Journal of Economics* 119 (2004), 861-898;
- Vincent Crawford and Nagore Iriberri, "Fatal Attraction: Focality, Naivete, and Sophistication in Experimental Hide-and-Seek Games," American Economic Review, 97 (2007),
- Judith Mehta, Chris Starmer, and Robert Sugden, "The Nature of Salience: An Experimental Investigation of Pure Coordination Games," *American Economic Review* 84 (1994), 658- 674.

- Vincent Crawford, Uri Gneezy, and Yuval Rottenstreich, "The Power of Focal Points is Limited: Even Minute Payoff Asymmetry May Yield Large Coordination Failures," American Economic Review, 98 (2008)
- Vincent Crawford "Adaptive Dynamics in Coordination Games," *Econometrica* 63 (January 1995), 103-143: Section 2, pp. 106-109
- Carlsson, H., & Van Damme, E. (1993). Global games and equilibrium selection. Econometrica: Journal of the Econometric Society, 989-1018.
- Morris, S., & Shin, H. S. (1998). Unique equilibrium in a model of self-fulfilling currency attacks. American Economic Review, 587-597.
- Morris, S., & Shin, H. S. (2001). Global games: Theory and applications.

4. Miscellaneous