

ECON4124  
Applied Game Theory  
Time: 10:30-11:50am Tue. & Thur.  
Location: Virtual

Instructor: Wooyoung Lim  
Office: LSK 6080  
Office Hours: by appointment  
Email: wooyoung@ust.hk

## 1 Course Objective

This course introduces the basic concepts of game theory. The emphasis is on the unifying perspective that game theory offers to questions in economics, other disciplines, and everyday life. It will enable students to view social interactions as strategic games, to use game theoretic concepts to predict behavior in these interactions and to conceive of ways in which altering the game affects social outcomes.

## 2 Teaching Assistant

- Run Li (rliaj@connect.ust.hk)
- Office Hours: TBD

## 3 Required Readings

1. Lecture Notes: course web at [Canvas.ust.hk](http://Canvas.ust.hk)

## 4 Recommended Readings Reserved in the Library

1. Martin J. Osborne (OB) “An introduction to Game Theory,” Oxford University Press.
2. Dixit, Avinash, Susan Skeath, and David H. Reiley Jr. (DSR) “Games of Strategy,” W. W. Norton & Company, Third Edition 2009.

## 5 Course Intended Learning Outcomes

1. Graduates will be critical and creative thinkers who make effective decisions supported by appropriate analytical techniques.

2. Graduates will have in-depth grasp of their business major.
3. Graduates will be effective in multi-cultural and international settings.

## 6 Course Requirement and Evaluation

- Evaluation will be based upon written assignments (20%), class participation (5%), a midterm (30%), and a final exam (45%).
- Weekly assignments (5-6 times) will be handed out. They are due at the beginning of class the following week. It will be collected via Canvas.ust.hk. Late submission is not accepted in any circumstances.
- Note that only simple answers for the assignments will be provided. Students are responsible to obtain the detailed solution by discussing with classmates, peers, teaching assistants, and me.
- The midterm exam contains all the materials covered before the exam, and is scheduled on **October 22, Thursday**, during the class time. The final exam contains all the materials covered throughout the semester. In the case of absence at an exam due to medical reasons, the student is required to submit medical certificate issued by a registered medical practitioner. Appropriate documentation will be required for absences due to other reasons. Announcements, lecture slides, and supplementary materials (if any) will be updated onto the course website at Canvas.ust.hk. If a student finds difficulties in the course and has any concern about the course, it is his/her benefit to contact me or the teaching assistant at the early stage.

## 7 Course Outline (tentative, subject to change.)

### Week1 (September 8 & 10)

- Lecture Note 1: Elements of a Game, Thinking Strategically, Sequential-move Games (OB Chapter 1, 5, 6 / DSR Chapters 1,2,3).
- [Classroom Experiment] Guessing Game, Centipede Game

### Week2 (September 15 & 17)

- Lecture Note 2: Simultaneous-move Games (OB Chapter 2, 3 / DSR Chapter 4)
- [Classroom Experiment] Pure-Coordination Game, Assurance Game

### Week3 (September 22 & 24)

- Lecture Note 3: Best-response Curve Analysis (OB Chapter 3 / DSR Chapter 5, 6)

- Lecture Note NE: Existence of Nash Equilibrium

**Week4 (September 29)**

- Lecture Note 4A&B: Mixed-strategy (OB Chapter 4 / DSR Chapter 7, 8)
- October 1: **No Class** (National Day)

**Week5 (October 6 & 8)**

- Lecture Note 5A&B: Games with Incomplete Information (OB Chapter 9 / DSR Chapter 9)  
[Classroom Experiment] Monty Hall Game.

**Week6 (October 13 &15)**

- Lecture Note 6: Equilibrium Refinement (OB Chapter 10 / DSR Chapter 9)

**Week7 (October 20: Review Session & October 22: Midterm)**

**Week8 (October 27 & 29)**

- Lecture Note 6: Equilibrium Refinement (OB Chapter 10 / DSR Chapter 9)

**Week9 (November 3 & 5)**

- Lecture Note 7: Signaling Game and Equilibrium Refinement (TBA)

**Week10 (November 10 & 12)**

- Lecture Note 8: Repeated Prisoners' Dilemma (OB Chapter 14 / DSR Chapter 11)

**Week11 (November 17 & 19)**

- Lecture Note 9: Auction & Mechanism Design (OB Chapter 9 / DSR Chapter 14, 17)  
[Classroom Experiment] Ascending auction / Common-value auction

**Week12 (November 24 & 26)**

- Lecture Note 10: Bargaining Theory (OB Chapter 16 / DSR Chapter 18)  
[Classroom Experiment] Ultimatum Bargaining

**Week13 (December 01 & 03)**

- Lecture Note 11: Rationality and Bounded-rationality (OB Chapter 12)
- A Lecture on Behavioral Economics  
[Classroom Experiment] 11-20 Money Request Game.

**Final Exam: TBD**

## **8 Learning Environment**

Matured conduct in classroom is the requirement for this course. Distractive behaviors such as use of cell phone, instant messaging and chatting are not tolerated. Violation of this rule will result in significant deduction of points from student's grade. Please refer to following website for the guideline for good learning environment:

[http://www.ust.hk/vpao/conduct/good\\_learning\\_experience.pps](http://www.ust.hk/vpao/conduct/good_learning_experience.pps).

## **9 Academic Integrity Policy**

Honesty and Integrity is central value in HKUST. Please be aware of the importance and maintain high standard of honesty in the problem sets and examinations in this course. Familiarize yourself to the university rules and the HKUST academic honor code by visiting following website:

<http://www.ust.hk/vpao/integrity/>.