

ECON4999J

Applied Game Theory

Time: 4:30am-5:50pm Tue. & Thur.

Location: LTK

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 Required Readings

1. Lecture Notes: course web at [Canvas.ust.hk](http://Canvas.ust.hk)
2. Dixit, Avinash, Susan Skeath, and David H. Reiley Jr. (DSR) “Games of Strategy,” W. W. Norton & Company, Third Edition 2009.

## 3 Recommended Readings Reserved in the Library

1. Martin J. Osborne (OB) “An introduction to Game Theory,” Oxford University Press.

## 4 Course Requirement and Evaluation

- Evaluation will be based upon written assignments (25%), class participation (5%), a mid-term (35%), and a final exam (35%).
- Weekly assignments (5-6 times) will be handed out. They are due at the beginning of class the following week. It will be collected in class. 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 13, 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.

## **5 Course Outline (tentative, subject to change.)**

### **Week1 (September 1): What is Game Theory?**

### **Week2 (September 6 & 8)**

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

### **Week3 (September 13 & 15)**

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

### **Week4 (September 20 & 22)**

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

### **Week5 (September 27 & 29)**

- Lecture Note 4: Mixed-strategy (DSR Chapter 7, 8 / OB Chapter 4)

### **Week6 (October 4 & 6)**

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

### **Week7 (October 11: No Class / October 13: Midterm)**

### **Week8 (October 18 & 20)**

- Lecture Note 5: Signaling Games (DSR Chapter 9 / OB Chapter 10)

### **Week9 (October 25 & 27)**

- Lecture Note 6: The Prisoners' Dilemma and Repeated Games (DSR Chapter 11 / OB Chapter 14)

### **Week10 (November 1 & 3)**

- Lecture Note 7: Auction & Mechanism Design (DSR Chapter 14, 17 / OB Chapter 9)
- November 3: **No Class**, a make-up class (on Saturday, the same week) will be arranged if necessary.

### **Week11 (November 8 & 10)**

- Lecture Note 8: Bargaining (DSR Chapter 18 / OB Chapter 16)  
[Classroom Experiment] Ultimatum Bargaining

### **Week12 (November 15 & 17)**

- Lecture Note 9: Evolutionary Games (DSR Chapter 13 / OB Chapter 13)

### **Week13 (November 22 & 24)**

- Lecture Note 10: Rationality and Bounded-rationality (OB Chapter 12)  
[Classroom Experiment] 11-20 Money Request Game.

### **Week14 (November 29)**

- Review, Q/A

**Final Exam: TBA**

## **6 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/vpaa0/conduct/good\\_learning\\_experience.pps](http://www.ust.hk/vpaa0/conduct/good_learning_experience.pps).

## **7 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/vpaa0/integrity/>.