ECON3160: Game Theory

Fall 2017

Department of Economics

The Chinese University of Hong Kong

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- Lectures: Tuesday 8:30-10:15am, Thursday 12:30-1:15pm @ LT3 ELB
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Course Description: This module introduces students to game theory, a theory of interactive decision making. The aim of this module is to provide students with the basic solution concepts for non-cooperative games, including static and dynamic games under complete and incomplete information. We will cover Nash equilibrium, subgame perfect equilibrium, Bayesian equilibrium, and perfect Bayesian equilibrium. The module focuses on presenting basic concepts and core ideas, and emphasizes the applications to economics, such as duopolies, auctions, and bargaining.

Learning Outcomes: After completing this course, the students are expected to:

1. Acquire basic knowledge in game theory;

2. Develop skills in game theoretic modeling and analysis.

Textbook The lecture is mainly based on the lecture notes and the following book.

- Robert Gibbons, *A Primer in Game Theory*, Prentice Hall, 1992

Grading:

- 20% Four assignments
- 30% Midterm Test, closed book, in class, 17 October (Tuesday)
- 50% Final Examination, 2 hours, closed book

Policy:

- There will be no make-up exam for the midterm. The percentage weight of the missed midterm could be shifted to the final, provided that the student submits an official document (e.g., medical certificate) to the instructor within one week of the exam.
- The final exam would be scheduled centrally. All students must take the final exam.
- Students must present their University Photo ID in order to take the exams.

Course Outline:

1. Introduction
2. Static Games of Complete Information

    - normal form games and Nash equilibrium: Prisoners' Dilemma, Cournot duopoly, Bertrand duopoly, Matching Pennies
    - mixed strategies

3. Dynamic Games of Complete Information

    - backwards induction: Stackelberg duopoly, sequential bargaining
    - extensive form representation and subgame perfect equilibrium: bank runs, tariffs and imperfect international competition
    - repeated games: collusion between Cournot duopolist

4. Static Games of Incomplete Information

    - Bayesian games and Bayesian equilibrium: Cournot duopoly under asymmetric information, mixed strategies revisited, auctions and double auctions

5. Dynamic Games of Incomplete Information

    - perfect Bayesian equilibrium: signaling games, the market for "lemons"
    - refinements of perfect Bayesian equilibrium (optional)

Academic Honesty and Related Procedures:

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at http://www.cuhk.edu.hk/policy/academichonesty/.

With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures.

- In the case of group projects, all students of the same group should be asked to sign the declaration, each of whom is responsible and liable to disciplinary actions should there be any plagiarized contents in the group project, irrespective of whether he/she has signed the declaration and whether he/she has contributed directly or indirectly to the plagiarized contents.

- For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment.

Assignments without the properly signed declaration will not be graded by teachers.

Only the final version of the assignment should be submitted via VeriGuide.

The submission of a piece of work, or a part of a piece of work, for more than one purpose (e.g. to satisfy the requirements in two different courses) without declaration to this effect, shall be regarded as having committed undeclared multiple submission. It is common and acceptable to reuse a turn of phrase or a sentence or two from one's own work; but wholesale reuse is problematic. In any case, agreement from the course teacher(s) concerned should be obtained prior to the submission of the piece of work.