Game Theory with Applications to Finance and Marketing, I

The Course Syllabus, Fall 2024

Class meet: Room 203, Management Building 1, 6:30pm-9:20pm, Wednesday

Instructor: Chyi-Mei Chen, R1102
(TEL) 3366-1086
(email) cchen@ntu.edu.tw
(Course website) http://www.fin.ntu.edu.tw/∼cchen/lecture1.html

This course introduces the modern non-cooperative game theory to interested undergraduate and graduate students. A game may or may not involve asymmetric information, and may be static or dynamic in nature. Thus we can classify games into four categories, and define four associated equilibrium concepts, which are Nash equilibrium (NE), subgame perfect Nash equilibrium (SPNE), Bayesian equilibrium (BE), perfect Bayesian equilibrium (PBE), and other refined equilibrium concepts. We shall first talk about these four different classes of games and the associated equilibrium concepts, and then give applications to auction and bidding, securities trading, bargaining, and firms' imperfect competition in price, quantity, and location. We shall also talk about online trading platforms and social and economic networks. Our emphases will be on signalling, screening, and reputation games, which prove to be most useful in the study of securities trading, corporate agency problems, and marketing strategies.

Our applications in finance may include financial signaling, financial contract design, insider trading, market manipulation, and the strategic roles of forward and option contracts. Our applications in marketing may include optimal product line design, interactions of members in a non-integrated distribution channel, competition between online retail platforms (like Amazon Marketplace and eBay) and physical retailers (like Walmart), optimal design of a promotion mix, influencer marketing, competitive advertising strategies under Google Ads, and competitive mobile targeting strategies.

Lecture notes are available for download at our course website. Students will form study groups to solve problem sets, which, together with in-class midterm and final examinations, will determine a student's course grade. A tentative schedule now follows.

Week No.	Contents
1	Some Examples
2	Static Games with Complete Information, I
3	Static Games with Complete Information, I (continued)
4	Static Games with Complete Information, II
5	Static Games with Complete Information, II (continued)
6	Multistage Games and Repeated Games
7	Multistage Games and Repeated Games (continued)
8	Static Games with Incomplete Information
9	Screening Games
10	Signaling and Reputation Games
11	Perfect Bayesian Equilibrium and Refinements
12	Midterm Exam
13	Perfect Bayesian Equilibrium and Refinements (continued)
14	Interactions between Financial and Product Markets
15	Financial Contracts
16	Product Line Design and Return Policy
17	Online Trading Platforms
18	Social and Economic Networks