Game Theory: Syllabus

Instructor: Xiang Sun

Wuhan University, Economics and Management School
Academic Year 2016–2017, Semester 1

Chinese title: 博弈论

Prerequisite: Calculus, Probability, Advanced Microeconomics, Basic Game Theory

Course description: This module introduces students in economics and other social sciences to game theory, a theory of interactive decision making. The module focuses on presenting basic concepts, core ideas, main results, and recent developments.

Modular credit: 3 modular credits

Modular number:

Time: Week 1–11, Wednesday 14:05–16:30 and Friday 09:50–12:15

Venue: 计-202

Module website: http://www.xiangsun.org/teaching.

Instructor: 孙祥

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- Homepage: http://www.xiangsun.org (VPN may be needed).
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- Telephone: +86 027 6875 5072
- Mailbox: 11-13

Office hours: By appointment

Teaching assistants: 伍玥

Main references:

[OR] Martin J. Osborne and Ariel Rubinstein, *A Course in Game Theory*, MIT Press, 1994.
Electronic version is available at Osborne's homepage or Rubinstein's homepage. The latest version is on 24 Sep. 2012.

[Sun] Xiang Sun, *Lecture Notes on Game Theory: Theory and Examples*, 2016.
Electronic version is available at Sun's homepage.

Language:

	Lecture notes	Lectures	Homework sets	Mid-term test	Final examination
Chinese		✓			
English	✓	✓	✓	✓	✓

Supplementary readings:

- * Robert J. Aumann, *Lectures on Game Theory*, Westview Press, 1989.
- * Drew Fudenberg and Jean Tirole, *Game Theory*, MIT Press, 1991.
- * Robert Gibbons, *Game Theory for Applied Economists*, Princeton University Press, 1992.
- Matthew O. Jackson, *Social and Economic Networks*, Princeton University Press, 2010.
- Geoffrey A. Jehle and Philip J. Reny, *Advanced Microeconomic Theory* (3rd Edition), Prentice Hall, 2011.
- Jean-Jacques Laffont and David Martimort, *The Theory of Incentives: The Principal-Agent Model*, Princeton University Press, 2002.
- * Vijay Krishna, *Auction Theory* (2nd edition), Academic Press, 2010.
- Harold Kuhn, *Lectures on Theory of Games*, Princeton University Press, 2003.
- * Michael Maschler, Eilon Solan, and Shmuel Zamir, *Game Theory*, Cambridge University Press, 2013.
- Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, *Microeconomic Theory*, Oxford University Press, 1995.
- Roger Myerson, *Game Theory: Analysis of Conflict*, Harvard University Press, 1997.
- Martin J. Osborne and Ariel Rubinstein, *Bargaining and Markets*, Academic Press, 1990.
- Alvin E. Roth and Marilda Sotomayor, *Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis*, Cambridge University Press, 1992.
- John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (3rd edition), Princeton University Press, 1953.

Grading:

- Individual report on papers: 30%; Selection criteria for a paper to be read

    – 2000 or more recent.
    – Related to the topics covered.
    – Published on Ecta, AER, JPE, QJE, REStud, JET, TE, GEB, Rand.
    – The chosen paper should be submitted to me for my approval before the last lecture.
    – Report should submit before Christmas.
    – Report should be written in TeX.

- Closed-book mid-term test: 20%

    – Date, and time: see time table
    – Venue: 计-202
    – Scope: Lectures 1–7
    – No helpsheet

- Closed-book final examination: 50%

    – Date, and time: see time table
    – Venue: 计-202
    – Scope: Lectures 1–19

- Bonus:

    – 10 marks for attendance
    – 1 mistake in my notes = 1 mark, up to 3 marks
      3 typos in my notes = 1 mark, up to 2 marks
      Each mistake and typo will be counted once. First come first get.

Examination policy:

- Each student should bring the student card with clear photo ID.
- Each student can bring one A4-size two-sided hand-written helpsheet.
- No permission is ever given to a student to write the mid-term test or final examination in advance of its date.
- Cheating = 0 mark
- The student who misses the mid-term test can have the weight of the missed mid-term test shifted to the final examination, if both of the following conditions are met:

    – The student notifies the instructor via e-mail and in advance of the date and time that the mid-term test will be missed.
    – The student submits an official medical certificate to the instructor within 3 working days of final examination.

- Students who do not write the mid-term test, and fail to meet both criteria receive a 0 mark.
- There is no make-up for the mid-term test or the final examination.

Course outline:

- Part 1: Lecture 1, history of game theory
- Part 2: Lectures 2–4, static game
- Part 3: Lectures 5–7, epistemic foundation
- Part 4: Lectures 8–11, dynamic game
- Part 5: Lectures 12, implementation theory
- Part 6: Lecture 13, cooperative game
- Part 7: Lectures 14–17, topics

Tentative time table:

Week	Lecture	Date	[OR]	[Sun]	Topics	Remarks
1	1	Sep. 7	1	1	Introduction	
1	2	Sep. 9	2.1–2.4	2	Strategic games	
2	3	Sep. 14	2.5–2.6	4	Bayesian games	
2	4	Sep. 16	3.1–3.3	6–7	Mixed-strategy Nash equilibrium, correlated equilibrium	
3	5	Sep. 21	4	8	Rationalizability	
3	6	Sep. 23	5.1–5.3	9	Knowledge model	
4	7	Sep. 28	5.4–5.5	10	Interactive epistemology	
4	8	Sep. 30	6	11	Extensive games	
6	9	Oct. 9	7	12	Bargaining games	
6	10	Oct. 12	8	13	Repeated games	
7	11	Oct. 14	11–12	14	Extensive games with imperfect information	
7		Oct. 19			*Mid-term test*	
8	12	Oct. 21	10	21	Implementation theory	
8	13	Oct. 26	13–15	22	Coalitional games	
9	14	Oct. 28		14.4	Cheap talk	
9	15	Nov. 2		14.5	Bayesian persuasion	
10	16	Nov. 9		15.5	Sequential screening	
11	17	Nov. 11			Network	
13		Dec. 2			*Final examination*	
18		Jan. 6			*Deadline for report submission*	
19		Jan. 13			*Annouce final marks*	
20		Jan. 20			*Submit final marks*	

Some useful web sites:

- http://www.gametheorysociety.org
- http://www.gametheory.net
- 关于博弈论学习和教材选择的一点建议 by 唐前锋