

GAME THEORY: SYLLABUS

Instructor: Xiang Sun

Wuhan University, Economics and Management School
Academic Year 2020–2021, Semester 1

Chinese title: 博弈论

Prerequisite: Calculus, Probability

Course description: This module introduces the basic concepts and thoughts in game theory. The module focuses on presenting basic concepts, core ideas, and main results.

Modular credit: 2 modular credits

Modular number:

Time: Week 1–11, Tuesday 18:30–20:55 (need four or five more courses)

Venue: 5-111

Module website: <https://www.xiangsun.org/teaching>, for announcements and lecture notes downloading.

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 - Before asking questions, please briefly read [提问的智慧](#)
 - Before sending e-mails, please read Topic 7 in [WISE 学生礼仪指南](#)
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Office hours: By e-mail appointment

Teaching assistants: 郭钰婷 (E-mail: yitingguo@outlook.com), 黄思杰 (E-mail: 15927574484@163.com)

Main references:

- [Gi] Robert Gibbons, *Game Theory for Applied Economists*, Princeton University Press, 1992.
A good copy version is available at some printing stores on campus.
Do not use its Chinese translation—it contains lots of errors and typos.
- [G] Xiang Sun, *Lecture Notes on Game Theory: Theory and Examples*, 2018.
Electronic version is available at [Sun's homepage](#). The latest version is on March 5, 2018.
- [M] Xiang Sun, *Matching and Market Design: Theory and Practice*, 2018.
Electronic version is available at [Sun's homepage](#). The latest version is on February 28, 2018.
- [H] Guillaume Haeringer, *Market Design: Auctions and Matching*, MIT Press, 2018.

Language:

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

Supplementary readings:

- Avinash K. Dixit and Barry J. Nalebuff, *The Art of Strategy: A Game Theorist's Guide to Success in Business and Life*, W. W. Norton & Company, 2008.
中文翻译: 迪克西特, 奈尔伯夫, *妙趣横生博弈论 (珍藏版)*, 机械工业出版社, 2015。
- Avinash K. Dixit and Barry J. Nalebuff, *Thinking Strategically: The Competitive Edge in Business, Politics, and Everyday Life*, W. W. Norton & Company, 1993.
中文翻译: 迪克西特, 奈尔伯夫, *策略思维*, 中国人民大学出版社, 2016。
- 张维迎, *博弈论与信息经济学*, 格致出版社, 2012。
- 张维迎, *博弈与社会讲义*, 北京大学出版社, 2014。
- Toyotaka Sakai, *Market Design*, Chikumashobo Ltd., 2013.
中文翻译: 坂井丰贵著, 蔡晓智译, *合适*, 后浪出版公司, 江西人民出版社, 2016。
- Alvin E. Roth, *Who Gets What—and Why: The New Economics of Matchmaking and Market Design*, Eamon Dolan/Houghton Mifflin Harcourt, June 2, 2015.
中文翻译: 埃尔文·罗斯著, 傅帅雄译, *共享经济*, 机械工业出版社, 2015。(中文翻译很糟糕, 建议购买美国亚马逊英文电子版)
- [关于博弈论学习和教材选择的一点建议 by 唐前锋](#)。

Grading:

- Homework: 60%
 - Prepare the homework as a single PDF file.
 - Upload PDF homeworks to 坚果云收件箱 before the corresponding deadlines.
- Closed-book final examination: 40%
 - Date and time: January 9, 2021 (Examination week), 18:30–20:30
 - Venue: 1 区 4-103
 - Scope: All lectures

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.
- Cheating = 0 mark.
- No permission is ever given to a student to write the mid-term test or final examination in advance of its date.
- There is no make-up for the mid-term test (if any) or the final examination (if any).
- The student who misses the mid-term test (if any) 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 (if any), and fail to meet both criteria receive a 0 mark.
- For the student who misses the final examination (if any), the University policy applies.

Course outline:

- Part 1: Lectures 1–9, non-cooperative game
- Part 2: Lectures 10, cooperative game
- Part 3: Lectures 11–15, market design

Tentative time table:

Week	Lecture	Date	Topics	Remarks
1	1	Sep. 8	[Gi] 1.1–1.2 Normal-form game, Nash equilibrium	
2	2	Sep. 15	[Gi] 1.2–1.3 Nash equilibrium	
3	3	Sep. 22	[Gi] 1.3–1.4 Mixed-strategy Nash equilibrium	
4	4	Sep. 29	[Gi] 2.1–2.2 Dynamic games and subgame perfect equilibrium	Hw1 due
5	5	Oct. 6	[Gi] 2.3–2.4 Repeated games	
6	6	Oct. 13	[Gi] 3.1 Bayesian Nash equilibrium	Hw2 due
7	7	Oct. 20	[Gi] 3.2 Auction	
8	8	Oct. 27	[Gi] 4.1–4.2 Perfect Bayesian equilibrium	Hw3 due
9	9	Nov. 3	[Gi] 4.2–4.3 Signing games	
10	10	Nov. 10	[G] 22 Cooperative game	Hw4 due
11	11	Nov. 17	[M] 2–3 Two-sided matching	
12	12	Nov. 24	[M] 4–6 One-sided matching	Hw5 due
13	13	Dec. 1	[G] 17 Social choice	
14	14	Dec. 8	[H] 2–3 Auction design	
15	15	Dec. 15	[H] 4–5 Auction design	
16	16	Dec. 22	Tutorial Final	Hw6 due