

# GAME THEORY: SYLLABUS

Instructor: Xiang Sun

Wuhan University, Economics and Management School  
Academic Year 2020–2021, Semester 3

**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:** 3 modular credits

**Modular number:**

**Time:** Week 1–4, Monday, Tuesday, Thursday, Friday, 09:50–12:15

**Venue:** 4-202 (Monday and Friday), 4-204 (Tuesday and Thursday)

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

**Instructor:** 孙祥

- E-mail: [xiangsun.econ@gmail.com](mailto:xiangsun.econ@gmail.com)
  - 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](#)
- Homepage: <https://www.xiangsun.org>
- Office: Room A227 or A501-2, Liangsheng Building
- Telephone: +86 027 6875 5072
- Mailbox: 11-13

**Office hours:** Week 1–4, Tuesday, 14:00–16:00, Tencent Meeting 381 473 0039.

**Teaching assistants:** 郭钰婷 (E-mail: [yitingguo@outlook.com](mailto:yitingguo@outlook.com)), 黄思杰 (E-mail: [15927574484@163.com](mailto: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: July 23, 2021, 09:30–12:00
  - Venue: 4-202
  - Scope: All lectures

### Examination policy:

- Each student should bring the student card with clear photo ID.

- 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 or the final examination.
- 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.
- For the student who misses the final examination, the University policy applies.

**Course outline:**

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

**Tentative time table:**

Week	Lecture	Date	Topics	Remarks
1	1	Jun. 28	[Gi] 1.1–1.2 Normal-form game, Nash equilibrium	
1	2	Jun. 29	[Gi] 1.2–1.3 Nash equilibrium	
1	3	Jul. 1	[Gi] 1.3–1.4 Mixed-strategy Nash equilibrium	Hw1
1	4	Jul. 2	[Gi] 2.1–2.2 Dynamic games and subgame perfect equilibrium	
2	5	Jul. 5	[Gi] 2.3–2.4 Repeated games	Hw2
2	6	Jul. 6	[Gi] 3.1 Bayesian Nash equilibrium	
2	7	Jul. 8	[Gi] 3.2 Auction	Hw3
2	8	Jul. 9	[Gi] 4.1–4.2 Perfect Bayesian equilibrium	
3	9	Jul. 12	[Gi] 4.2–4.3 Signing games	Hw4
3	10	Jul. 13	[G] 22 Cooperative game	Hw5
3	11	Jul. 15	[M] 2–3 Two-sided matching	
3	12	Jul. 16	[M] 4–6 One-sided matching	Hw6
4	13	Jul. 19	[G] 17 Social choice	
4	14	Jul. 20	[H] 2–3 Auction design	
4	15	Jul. 22	[H] 4–5 Auction design	Hw7
4	16	Jul. 23	Final	