Market Design: Syllabus

Instructor: Xiang Sun

Wuhan University, Economics and Management School
Academic Year 2021–2022, Semester 1

Chinese title: 市场设计.

Prerequisite: Market Design.

Course description: This course introduces the theory of matching and market design, and discusses how the theory can be applied to these and other applications.

Modular credit: 3 modular credits.

Modular number: EC419.

Time: Week 1–16, Tuesday, 09:50–12:15.

Venue: 3-102 for onsite teaching, and Tencent Meeting 381 473 0039 (password 123456) for online teaching.

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

Instructor: 孙祥.

- E-mail: 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.
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Office hours: Week 1–16, Tuesday, 15:30–16:30, Tencent Meeting 381 473 0039 (password 123456).

Teaching assistant: 李一凡 (E-mail: 906440405@qq.com)

Main references:

[RS] Alvin E. Roth and Marilda Sotomayor, *Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis*, Cambridge University Press, 1992.

[SU] Tayfun Sönmez and M. Utku Ünver, Matching, Allocation, and Exchange of Discrete Resources, in *Handbook of Social Economics, Volume 1A* (Jess Benhabib, Alberto Bisin and Matthew O. Jackson eds.), Chapter 17, 781–852, Elsevier B.V., 2011.

[AT] Atila Abdulkadiroğlu and Tayfun Sönmez, Matching Markets: Theory and Practice, in *Advances in Economics and Econometrics Theory and Applications, Volume II*, Tenth World Congress.

[Sun] 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	✓	✓	✓	✓	✓

Your submissions on homework/report/etc should be written in Chinese, except terminologies.

Supplementary readings:

- 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）
- Information for the Public: Stable matching: Theory, evidence, and practical design.
- Scientific Background: Stable allocations and the practice of market design.

Grading:

- 10% for the class performance,
- 50% for the individual presentation on the chosen paper,
- 40% for the individual report on the chosen paper.

The selection criteria for a paper to present/report are as follows:

- 2010 or more recent.
- Related to the topics covered.
- Published on *Econometrica*, *American Economic Review*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Review of Economic Studies*, *Journal of Economic Theory*, *Theoretical Economics*, *Games and Economic Behavior*, *American Economic Journal: Microeconomics*, *Management Science*.
- Theoretical paper, not empirical or experimental paper.
- The chosen paper should be submitted to me for my approval before the lecture on Week 13.

The criteria for presentation are as follows:

- I will determine the date/time of the presentation.
- Prepare for a 30-minute talk, including questions from the audience.
- A good number of slides is 15.
- Most of your presentation should be devoted to providing a clear overview of what the paper is about and what its main results are.
- Towards the end of your talk, you should also provide a critical assessment of the paper's contribution.
- Typical structure:
    1. Introduction
    2. The model
    3. Main results
    4. Critical assessment and conclusion
- Do not go too wild with math on your slides. Your talk should be accessible to everybody in the audience. That being said, you can expect me to ask technical questions, such as "How is this proven?"

The criteria for report are as follows:

- At most 6 pages long, including everything (A4 paper, 12-pt font, somewhat generous line spacing, etc.).
- The report should be written in Chinese, except terminologies.
- The report should be submitted before Tuesday of Week 18.
- Around 50% of the report: Summary of the paper's contribution.
- Remaining 50%: Critical assessment of the paper's contribution; outline of potential extensions. These are broad guidelines; the weights can be adjusted if need be.
- About potential extensions:
    - You shouldn't feel obliged to write about extensions. Some of the papers have already been extended to death.
    - If you choose to outline an extension, you should tell me why it is interesting. What issue in the paper are you trying to address? Why is it important to address it?
    - Explain how you would go about solving the extension.
    - Try to work out the extension yourself. If you manage to get some new results, great, this should go into your report.
    - If you don't manage to carry out your extension, that's interesting too. You can explain what went wrong in your report.
- What is a critical assessment? Here are some questions you could ask yourself when drafting up your critical assessment:
    - What research question is the paper trying to address? Is it interesting? Is the paper well motivated?
    - Relative to the existing academic literature, what do we learn from the paper?
    - Are the results surprising/interesting? Why do we need a model to obtain those results?
    - Is the model reasonable? Are its assumptions believable? (Relaxing assumptions you dislike is a good way of coming up with extensions.)
    - Is the analysis correct? (Some paper have mistakes.)
    - Does the model generate testable predictions? (Most models give rise to predictions. Predictions are testable if they can be related to things that would be observable to a putative econometrician.)
    - Does the model provide novel explanations for real-world phenomena? Are those explanations plausible? Are they more plausible than earlier explanations provided in the existing literature?

Tentative time table:

#	Week	Date	Topics	Sections
1	1	Sept. 7	Introduction, Marriage problem 1: DA algorithm	[RS] 2.1–2.3, [Sun] 1–2.3
2	2	Sept. 14	Marriage problem 2: Properties of stable matchings	[RS] 2.3–3.1, [Sun] 2.4–2.6
	3	Sept. 21	Mid-Autumn Festival	
3	4	Sept. 28	Marriage problem 3: Incentive compatibility	[RS] 4.1–4.3, [Sun] 2.7–2.8
	5	Oct. 5	National Day	
4	6	Oct. 12	College admissions	[RS] 2.4–2.5, [Sun] 3.1–3.6
5	7	Oct. 19	Housing market and TTC	[SU] 2.2, [Sun] 4.1–4.4
6	8	Oct. 26	House allocation and dictatorship	[SU] 2.1, [Sun] 5.1–5.6
7	9	Nov. 2	House allocation with existing tenants and YRMH-IGYT	[SU] 2.3, [Sun] 6.1–6.5
8	10	Nov. 9	Random matching: RP and PS	[Sun] 8.1–8.6
9	11	Nov. 16	School choice 1: Acyclicity	[SU] 4.3–4.4, [Sun] 9.1–10.2
10	12	Nov. 23	School choice 2: Efficiency improvement	[Sun] 11.1–11.4
11	13	Nov. 30	School choice 3: Affirmative action	[Sun] 12
12	14	Dec. 7	Kidney exchange	[Sun] 13.1–13.3
	15	Dec. 14	Presentation 1	
	16	Dec. 21	Presentation 2	
	18	Jan. 4	Reports submission	