
Syllabus

Market Design

Number of ECTS: 4

Number of hours: 24

Teacher:

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Brief Course Description

This course introduces the fundamentals of market design. It aims to study how to allocate scarce resources through both price mechanisms (e.g., the market for mobile radio frequencies) and non-price allocation procedures (e.g., the allocation of kidneys), and how to create successful markets. Market design aims to create real-world markets with desirable goals such as allocative efficiency and stability, achieving notable success stories in recent decades.

The first part of the course investigates matching markets with applications to school choice, housing markets, and refugee resettlement. The second part focuses on mechanism design and key theoretical concept, while the third part applies this new knowledge to analyze online auctions, keyword auctions, and spectrum auctions.

Learning Outcomes

To start research projects on market design using the new theoretical knowledge provided in class: theoretical and/or applied investigations which affect many of today's relevant economic policy fields and very diverse markets. Examples are diverse: structuring broadband expansion; electricity markets (for electricity from renewable energies); markets for CO2 certificates or other emission rights; auctioning of government bonds; auctioning of *toxic* securities after the financial crisis; the markets for patents; rules for public procurement; design of reputation systems on digital platforms, allocation of schoolchildren and students to childcare centers, schools and universities; regional distribution of refugees.

Indicative Contents

Chapter 1 Introduction to Market Design

Part I Matching markets

- Chapter 2 Introduction to Matching markets
- Chapter 3 School choice
- Chapter 4 Housing market
- Chapter 5 Beyond TTC: Kidney Exchange

Part II Mechanism Design

- Chapter 6 Optimal Selling Procedure & (Single Unit) Auction Design
- (Preliminary for Chapter 7: Social Choice)
- Chapter 7 Mechanism Design: Settings & Implementation
- Chapter 8 Optimal Mechanisms

Part III Auction Design: Case Study

- Chapter 10 Online auctions
- Chapter 11 Reminder : Multi-unit Auctions
- Chapter 12 Spectrum Auctions

Measurement of learning outcomes / Assessment

The final three to five sessions of the course, depending on the number of students enrolled, will be organized around student presentations and discussions of selected research papers. Each session will include **two paper presentations**. All students are expected to read the papers before class and actively participate in the discussions.

Paper presentation (25%). Each student will present one paper selected from the list available on the course website. Presentations should last approximately 40-45 min and will be followed by 15-20 min of class discussion.

The purpose of the presentation is not simply to summarize the paper. Students should explain the research question and contribution, present the main elements of the model or methodology and the key results, and critically discuss the paper's strengths, limitations, and broader implications for market design.

The list of papers available for presentation can be found on the course website. Please send me your choice of paper by **November 5**.

Participation (25%). All students are expected to have read the papers being presented before each class and to actively participate in the discussions following the presentations. The purpose of these discussions is to learn how to read, question, and critically assess research in market design. Participation will be evaluated on the quality and relevance of contributions to the discussion, rather than simply on their frequency.

Response papers (50%). All students are required to write a response paper on each paper presented by themselves and their classmates.

Writing a response paper provides you with an opportunity to practice commenting on other people's work. This is a skill that you will need frequently in academic research, whether as a referee, discussant, seminar participant, or researcher responding to work related to your own.

Response papers should be constructive: they should not simply point out weaknesses, but should also suggest possible improvements, identify overlooked contributions, or discuss extensions and implications of the paper. Consult these two guides on [how to read](#) and [how to critique papers](#) as a guide to writing your response papers.

Since response papers are submitted after the presentation, you are encouraged to use the presentation and class discussion to refine your own assessment of the paper. However, your response should develop your own arguments rather than simply reproduce points raised during the discussion.

Your response paper should have the following structure:

1. Begin with one paragraph that highlights the paper's contribution. What did you learn from the paper, and what is its core strength? Ideally, take a fresh perspective and do not simply restate the authors' framing of the contribution.
2. Develop a small number of points that critically assess the paper by highlighting weaknesses, possible improvements, or extensions. You may reflect on the relevance of the research question, the assumptions and structure of the model, the solution concept or mechanism developed, the interpretation and robustness of the results, or the relationship between the theoretical results and the market-design problem under consideration. Be detailed and specific in developing your arguments.

Good response papers will typically be around **1 000 words**. Each response paper should be emailed to me no later than the beginning of the following class. The grade for this component will be based on the overall quality of your response papers throughout the course.

Required/Essential Readings

M. Bichler (2017), *Market Design (A Linear Programming Approach to Auctions and Matching)*, Cambridge University Press.

Börger, T. (2015): *An Introduction to the Theory of Mechanism Design*, Oxford University Press.

G. Haeringer (2019), *Market Design: Auctions and Matching*, MIT Press.

V. Krishna (2009), Auction Theory, 2nd edition, Academic Press.

Roth, A., & Sotomayor, M. (1990). Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis (Econometric Society Monographs), Cambridge University Press.

Recommended/Supplementary Readings

A reading list will be sent for each lecture.