

Syllabus

Lecture on Market Design

Number of ECTS: 4

Number of hours: 24

Teacher:

Prof. Olivier Bos

ENS Paris-Saclay, Centre for Economics at Paris-Saclay

Email: [olivier.bos\[at\]ens-paris-saclay.fr](mailto:olivier.bos[at]ens-paris-saclay.fr)

Office: 2A17a

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 and Refugee Resettlement

Part II Mechanism Design

- Chapter 6 Introduction: Optimal Selling Procedure & (Single Unit) Auction Design
- Chapter 7 Social Choice
- Chapter 8 Mechanism Design: Settings & Implementation
- Chapter 9 Optimal Mechanisms

Part III Auction Design: Case Study

- Chapter 10 Online auctions
- (Chapter 11 Common values)
- (Chapter 12 Reminder : Multi-unit Auctions)
- Chapter 13 Keywords auctions
- Chapter 14 Spectrum Auctions

Measurement of learning outcomes / Assessment

The evaluation will be based on a referee report for an academic paper (and participation in class). This could be a theoretical, applied, or empirical paper.

Required/Essential Readings

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

Börgers, 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.