

Selected Topics in Market Design: Matching and Auctions

Diseño de Mecanismos
Universidad del Rosario - Facultad de Economía
Semestre 2015 - I

Syllabus

Instructor: Çağatay Kayı.

Class Hours: Mondays and Thursdays 13:00-15:00.

Lecture Hall: Auditorio 1.

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Office: Pedro Fermin 315.

Office Hours: Thursdays between 09:00 –11:00. Otherwise, please e-mail me to arrange a mutually convenient time.

Objectives:

Economists are interested in the allocation of scarce resources, and for this reason they design economic institutions, such as markets, and develop mechanisms. Matching and auction mechanisms are frequently used in market design and the network structure of the markets is getting important.

Matching mechanisms have been successively applied in many contexts such as medical internship allocation, organ allocation (kidney exchange and liver allocation), college admission, job matching, house allocation, course enrollment, and law clerkships allocation. Auctions have been used for a long time for the sale of a variety of objects; commodities ranging from tobacco, fish, and tulips to scrap metal, treasury bonds, off-shore oil leases, procurement, electromagnetic spectrum etc. Networks play a central role in the trade of many goods and services and for designing markets. Social networks are also getting important in which products to buy, which language to speak, how we vote, how much education we obtain etc.

The purpose of the course is to provide some successful applications of economic theory. We will explore theory and practice of matching markets. We will try to answer why auctions are so prevalent as a selling mechanisms.

Requirements:

Your evaluation will be based on three parts: your participation in the lectures (20%), your final assignment: a presentation of a current working paper about the topics covered in class (40%), and a referee report of the paper (40%).

The schedule is as follows:

- *First day of classes:* 26 March 2015, Thursday.
- No classes on 13 March, Monday and 18 May 2015, Monday.
- *Presentations:* 25 – 28 May 2015, Monday and Thursday.
- *Last day of classes:* 28 May 2015, Thursday.
- *Final assignment:* 1 June 2015, Monday.

Tentative Course Outline:

1. Matching
 - (a) Two-Sided Matching Markets
 - i. Marriage Market
 - ii. College Admissions Problem
 - (b) One-Sided Matching Markets: Roommate Markets
 - (c) Object Allocation
 - i. With Endowments: Housing Market
 - ii. Without Endowments: House Allocation
 - iii. Mixed case: House Allocation with Existing Tenants
 - (d) School Choice
 - (e) Kidney Exchange
 - (f) Matching with Contracts
2. Auctions.
 - (a) Single Object Auctions
 - i. Private Value Auctions
 - ii. Revenue Equivalence Principle
 - iii. Mechanism Design and Efficient Mechanisms
 - iv. Auctions with Interdependent Values
 - (b) Multiple Object Auctions
 - i. Equilibrium and Efficiency with Private Values
 - ii. Sequential Sales
 - iii. Multiple Objects and Interdependent Values
3. Networks.
 - (a) Representing and Measuring Networks
 - (b) Models of Network Formation
 - (c) Diffusion through Networks
 - (d) Learning and Networks
 - (e) Allocation Rules, Networks, and Cooperative Games.

Suggested Readings:

- Jackson, M.O. (2008) Social and Economic Networks, Princeton University Press.
- Krishna, V (2002) Auction Theory, Academic Press.
- Roth, A.E. and Sotomayor, M.A. (1990) Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis, Cambridge University Press.