Industrial Organization III (G6255):
Theory of Auctions, Matching, and Market Design

Yeon-Koo Che

Market Design is an emerging field in economics that attempts to devise a practical scheme for allocating scarce resources to individuals who value them. Its applications involve many important real life problems ranging from allocation of government resources such as public land, fishing/mineral rights, radio spectrum licenses, allocation of school choice and transplantable human organs, assignment of workers to jobs, to placement of advertising in Internet search engines. Mechanism design underpins the field as a general methodological framework, which is in turn operationalized by two branches of theories: (1) Auction Theory and (2) Matching Theory. The course shall provide a guide through these theories and discusses a few applications, along the way.

• General Information:
  Class Hours: Tuesday, 11:00A-12:50P
  Place: IAB 326
  Contract Information: (Phone) 854-8276; (E-mail) yk.che@columbia.edu

• Grading:
  1. Occasional Problem Sets
  2. Research Proposal with Preliminary Results

• Text Books

• Reading Group: Optional but encouraged.
The reading group meets on (almost) every Friday and covers additional related literature.
Lecture Schedules

Part I: Mechanism and Auction Design

Lecture 1: General Overview, Revelation Principle, VCG, and AGV


- Chapter 5 of Krishna.

Lecture 2: Optimal Auction Design in IPV auctions, Scoring Rule Auctions


Lecture 3: Public Good, Bilateral Bargaining, Property Right Allocation


Lecture 4: Correlated Types, Interdependent Values, and Winners’ Curse


Lecture 5: Multidimensional Types, Budget Constraints


Lecture 6: Multunit Auctions and Package Auctions

Lecture 7: Internet Ad (“Sponsored Links”) Auctions


Part II: Matching Theory and Market Design

Lecture 8. One-Sided Matching


Lecture 9. Two-Sided Matching: One-to-one Matching ("Marriage Problem")

- Roth and Sotomayor, Chapters 2 and 3
Lecture 10. Two-Sided Matching: Incentives and Equilibria

- Roth and Sotomayor, Chapter 4

Lecture 11. Two-Sided Matching: Many-to-one Matchings (”College Admissions Problem”)

- Roth and Sotomayor, Chapter 5

Lecture 12. Two-Sided Matching: Unified Approach in Matchings

- Roth and Sotomayor, Chapter 5

Lecture 13: Many-to-Many Matchings


Lecture 14: School Choice Application

- Abdulkadiroglu, Atila, Yeon-Koo Che, and Yosuke Yasuda, ”Expanding Choice to School Choice.” (to be made available soon)