

This is an advanced course on auctions, mechanism design, and pricing strategies. We will cover several results on the design of trading institutions to maximize welfare and/or efficiency. The course covers classical results on the design of simple trading environments, to recent research on multiunit auctions and combinatorial assignment problems. The course also covers applications to the design of real world markets for telecommunication spectrum, fishing rights, internet trading, dynamic price discrimination, electricity, etc.

The course is intended to advanced students with interests in economics and related fields (finance, operations research, marketing, etc). The course assumes students have some background in game theory (IN701 or IN3202), probability theory, and optimization. If you are not familiar with concepts such as Nash equilibrium or Bayesian equilibrium, you should first take introductory game theory courses.

We will assign 3 or 4 homeworks. I expect you to write your homeworks on your own, but discussion of problem sets and material covered in lectures is encouraged. Students are also expected to give a one-hour talk on a recent research paper.

The final grade will be computed as

$$F = 40\%HG + 40\% \text{ presentation} + 20\% \text{ participation in class.}$$

The following textbooks are recommended.

1. Fudenberg and Tirole, Game Theory, 1991
2. Mas Colell, Whinston, and Green, Microeconomic Theory, 1995
3. Bolton and Dewatripont, Contract Theory, 2005
4. Putting Auction Theory to Work, Paul Milgrom 2004

The following is the list of some of the topics covered

1. Auctions and mechanism design (2 weeks)
 - The VCG mechanism
 - The mechanism design problem and the revelation principle
 - Revenue equivalence theorem (Myerson 1981)
 - Optimal auctions and the monopoly problem (Bulow 1989)
 - Common value auctions, affiliation, the linkage principle (Milgrom and Weber 1982)
 - Auction Design (Milgrom 2004)
 - Examples: efficient bargaining (Myerson and Satterthwaite 1983), optimal regulation (Baron and Myerson 1982), auctions versus negotiations (Bulow and Klemperer 1994), collusion with incomplete information and price rigidities (Athey, Bagwell, and Sanchirico 2004), Security Auctions
2. Commitment, bargaining, and the Coase conjecture (1 week)
 - Fudenberg and Tirole (1983), Fuchs and Skrzypacz (2010), Board and Pycia (2014)
 - Bargaining and delay: Abreu and Gul (2000)
3. Multiunit and combinatorial auctions (1 week)
 - Milgrom (2004), Ausubel, Cramton, Pycia, Rostek, and Weretka (2014)
4. Dynamic mechanism design and pricing (1 week)
 - Pavan, Segal, and Toikka (2014), Board and Skrzypacz (2016), Garrett (2016)

References

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- GARRETT, D. (2016): “Intertemporal Price Discrimination: Dynamic Arrivals and Changing Values,” *The American Economic Review*, 106(11), 3275–3299.
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- HOLMSTROM, B., AND P. MILGROM (1991): “Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design,” *Journal of Law, Economics, & Organization*, 7, 24–52.
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