

Economics 816: Topics in Advanced Microeconomic Theory

Overview. This is an advanced course in microeconomic theory, with a main focus on auction theory and the theory of implementation in general equilibrium. This course is intended for students who are interested in theory or who want a good theory background to do applied work. The course will cover a combination of standard results on mechanism design and implementation, and some other research topics in microeconomic theory.

Textbook. The lectures on auction theory will draw materials mainly from Paul Milgrom's auction textbook, *Putting Auction Theory to Work* (Cambridge University Press, 2004), which gives a unified and elegant treatment to auction theory.

Grading. Your course grade will be based on several homework assignments (50%) and one presentation (50%).

Outline of Topics (tentative)

1. Introduction to Market Design and Auction Theory

Milgrom (2004), Ch. 1

2. Mechanism Design Basics, Vickrey Auction and VCG Mechanism

Mas-Colell, A., M. Whinston, and J. Green, *Microeconomic Theory*, Oxford University Press, Ch. 23

Milgrom (2004), Ch. 2

Myerson, R. and M. Satterthwaite, "Efficient Mechanisms for Bilateral Trading," *Journal of Economic Theory*, 29: 265-281.

Mookherjee, D. and S. Reichelstein (1992), "Dominant Strategy and Bayesian Implementation of Bayesian Incentive Compatible Allocation Rules," *Journal of Economic Theory*, 56: 378-99.

Vickrey, William (1961): "Counterspeculation, Auctions, and Competitive Sealed Tenders," *Journal of Finance* XVI: 8-37.

Clarke, E.H. (1971): "Multipart Pricing of Public Goods," *Public Choice* XI: 17-33

Groves, Theodore (1973): "Incentive in Teams," *Econometrica* 41:617-631.

Green, Jerry and Jean-Jacques Laffon (1977): "Characterization of Satisfactory Mechanisms for the Revelation of Preferences for Public Goods," *Econometrica* 45: 427-438.

Holmstrom, Bengt (1979): "Groves Schemes on Restricted Domains," *Econometrica* 47: 1137-1144.

3. The Envelope Theorem and Payoff Equivalence

Milgrom (2004), Ch. 3

Milgrom, Paul and Ilya Segal (2002): "Envelope Theorems for Arbitrary Choice Sets," *Econometrica* 70 (2): 583-601

Jehiel, Philippe and Benny Moldovanu (2001): "Efficient Design with Interdependent Valuations," *Econometrica* 69 (5): 1237-1259.

Matthews, Steven (1983): "Selling to Risk Averse Buyers with Unobservable Tastes," *Journal of Economic Theory* 30: 370-400.

McAfee, Preston and John McMillan (1992): "Bidding Rings," *American Economic Review* 82 (3): 579-599

Myerson, Roger (1981): "Optimal Auction Design," *Mathematics of Operation Research* 6(1): 58-73

Riley, John and William Samuelson (1981): "Optimal Auctions," *American Economic Review* 71(3): 381-392

Weber, Robert (1983): "Multiple-Object Auctions," *Auctions, Bidding, and Contracting: Uses and Theory*. R. Engelbrecht-Wiggans, M. Shubik, and R.M. Stark. New York: New York University Press. 165-191.

Williams, Steven (1999): "A Characterization of Efficient, Bayesian Incentive Compatible Mechanism," *Economic Theory* XIV: 155-180.

4. The Constraint Simplification Theorem and Revenue Differences

Milgrom (2004), Ch. 4

Avery, Christopher (1998): "Strategic Jump Bidding in English Auctions," *Review of Economic Studies* 65: 185-210

Bulow, Jeremy and Paul Klemperer (1996): "Auctions versus Negotiations," *American Economic Review* 86(1): 180-194.

Bulow, Jeremy and Paul Klemperer (1999): "The Generalized War of Attrition," *American Economic Review* 89(1): 175-189.

Bulow, Jeremy and John Roberts (1989): "The Simple Economics of Optimal Auctions," *Journal of Political Economy* 97 (5): 1060-1090.

Che, Yeon-Koo and Ian Gale (1998), "Standard Auctions with Financially Constrained Bidders," *Review of Economic Studies* 65 (1, No. 222): 1-21.

Griesmer, Levitan and Shubik (1967): "Toward a Study of Bidding Processes, Part IV: Games with Unknown Costs," *Naval Research Logistics Quarterly* 14(4): 415-443.

Hansen, Robert (1988): "Auctions with Endogenous Quantity," *Rand Journal of Economics* 19 (1): 44-58.

Laffont, J., H. Ossard, and Q. Vuong (1995): "Econometrics of First-Price Auctions," *Econometrica* 63 (3): 439-454.

Maskin, Eric and John Riley (2000): "Asymmetric Auctions," *Review of Economic Studies* 67(3): 413-438.

Milgrom, Paul and Chris Shannon (1994): "Monotone Comparative Statics," *Econometrica* 62: 157-180.

5. Auctions with Interdependent Valuations

Milgrom (2004), Ch. 5

Milgrom, Paul and Robert Weber (1982): "A Theory of Auctions and Competitive Bidding," *Econometrica* 50: 463-483.

Athey, Susan (2001): "Single Crossing Properties and the Existence of Pure Strategy Equilibria in Games of Incomplete Information," *Econometrica* 69(4): 861-890.

Bulow, Jeremy, Ming Huang, and Paul Klemperer (2002): "Toeholds and Takeovers," *Journal of Political Economy* 107(3): 427-454.

Bulow, Jeremy and Paul Klemperer (2002), "Prices and the Winner's Curse," *Rand Journal of Economics* 33(1): 1-21

Cremer, Jacques and Richard McLean (1985): "Optimal Selling Strategies under Uncertainty for a Discriminating Monopolist when Demands Are Independent," *Econometrica* 53 (2): 345-361.

Engelbrecht-Wiggans, Richard, Paul Milgrom and Robert Weber (1983): "Competitive Bidding with Proprietary Information," *Journal of Mathematical Economics* 11: 161-169.

Hendricks, Kenneth, Robert Porter, and Charles Wilson (1994), "Auctions for Oil and Gas Leases with an Informed Bidder and a Random Reservation Price," *Econometrica* 63 (1): 1-27.

Milgrom, Paul (1981): "Good News and Bad News: Representation Theorems and Applications," *Bell Journal of Economics* 12: 380-391.

Milgrom, Paul (1981): "Rational Expectations, Information Acquisition, and Competitive Bidding," *Econometrica* 49 (4): 921-943.

Wilson, Robert (1967): "Competitive Bidding with Asymmetric Information," *Management Science* 13: 816-820.

6. Auctions in Context:

Milgrom (2004), Ch. 6

Levin, Dan and James Smith (1994): "Equilibrium in Auctions with Entry," *American Economic Review* 84 (3): 585-599.

McAfee, Preston and John McMillan (1987): "Auctions with Entry," *Economics Letters* 23: 343-348.

Rezende, Leonardo (2004): "Biased Procurement," University of Illinois Champaign-Urbana Working Paper.

Ye, Lixin (2007): "Indicative Bidding and A Theory of Two-Stage Auctions," *Games and Economic Behavior*, 58 (1): 181-207.

Kagel, John, Svetlana Pevnitskaya, and Lixin Ye: "Indicative Bidding: An Experimental Analysis," forthcoming, *Games and Economic Behavior*.

Zheng, Charles (2001): "High Bids and Broke Winners," *Journal of Economic Theory* 100 (1): 129-171.

7. Multi-Unit Auctions

Milgrom (2004), Ch. 7, 8

Ausubel, Lawrence and Peter Cramton (2002): "Demand Reduction and Inefficiency in Multi-unit Auctions," University of Maryland Working Paper.

Ausubel, Lawrence and Paul Milgrom (2002): "Ascending Auctions with Package Bidding," *Frontiers of Theoretical Economics* 1(1): Article 1.

Bernheim, Douglas and Michael Whinston (1986): "Menu Auctions, Resource Allocation and Economic Influence," *Quarterly Journal of Economics* 101: 1-31.

Kagel, John and Dan Levin (2002): *Common Value Auctions and the Winner's Curse*, Princeton University Press.

Milgrom, Paul (2000), "Putting Auction Theory to Work: The Simultaneous Ascending Auction," *Journal of Political Economy* 108 (2): 245-272.

Wilson, Robert (1979): "Auctions of Shares," *Quarterly Journal of Economics* XCIII(4): 675-689.

8. Implementation in General Equilibrium

Hurwicz, Leonid. *The Design of Resource Allocation Mechanisms* (Richard T. Ely Lecture), *American Economic Review*, Vol. 63, No. 2, May 1973, pp. 1-30.

Hurwicz, Leonid. Outcome Functions Yielding Walrasian and Lindahl Allocations at Nash Equilibrium Points, *Review of Economic Studies*, Vol. 46, No. 2, April 1979, pp. 217-225.

Hurwicz, Leonid. On Allocations Attainable Through Nash Equilibria, *Journal of Economic Theory*, Vol. 21, No. 1, August 1979, pp. 140-165.

Hurwicz, Leonid, Eric Maskin and Andrew P. Postlewaite. Feasible Nash Implementation of Social Choice Rules When the Designer Does Not Know Endowments or Production Sets, in *The Economics of Informational Decentralization: Complexity, Efficiency and Stability; Essays in honor of Stanley Reiter*, edited by John O. Ledyard, Kluwer Academic Publishers, 1995, pp. 367-433.

Postlewaite Andrew. And David Wettstein: "Implementing Constrained Walrasian Equilibria Continuously," *Review of Economic Studies* 56, 1989, pp. 603-612.