Syllabus for Microeconomics II (Ph.D. Level)

Bonn University

Instructor: Benny Moldovanu, mold@uni-bonn.de

The course will focus on fundamental concepts and results from the theory of mechanism design and social choice. The original contributions behind the course have been honored by numerous Nobel prizes, e.g. to J. Harsanyi, K. Arrow, L. Shapley, W. Hurwicz, W. Vickrey, J. Mirrlees, G. Akerlof, R. Myerson, E. Maskin, A. Roth, P. Milgrom and B. Wilson.

The main Sections are:

1. The Mechanism Design Problem: social choice functions and mechanisms, implementability, equilibrium notions, direct mechanisms, the revelation principle
2. Dominant Strategy Implementation: the Condorcet paradox, Arrow's Impossibility Theorem, Gibbard-Satterthwaite theorem, single-peaked preferences and the Condorcet winner.
3. Quasi-Linear, Private-Values Environments: value maximization and the Clarke-Groves-Vickrey mechanism, budget-balance and the Arrow-Gerard Varet-D'Aspremont mechanism
4. Bayesian Implementation: Characterization of implementability, payoff and revenue equivalence in auctions.
5. Optimal Auctions: Myerson's characterization of the revenue maximizing mechanisms and its implications for standard auctions.
6. Bilateral Trade: The Myerson-Sattertwhaite impossibility result and its connections to the Clarke-Groves-Vickrey mechanisms.
7. Multidimensional types: characterization of implementability and potential functions.
8. Interdependent values: Akerlof's market for lemons and its connections to the Myerson-Sattertwhaite theorem, the Jehiel-Moldovanu impossibility theorem.
9. Two-Sided matching: stable matchings, the Gale-Shapley Algorithm, the top trading cycle algorithm, the assignment game, simultaneous ascending clock auctions.

References

Mas-Colell, A., Whinston, M. D., & Green, J. R. (1995). *Microeconomic theory* (Vol. 1). New York: Oxford University Press

Börgers, T. (2015): An Introduction to the Theory of Mechanism Design, Oxford University Press.

Milgrom, P.R. (2004): Putting Auction Theory to Work, Cambridge University Press.

Jehle, G.A. and Reny, P.J. (2011): Advanced Microeconomic Theory, Financial Times Prentice Hall.

Roth, AE, and Sotomayor, MAO (1990): Two-sided Matching-A Study in Game-theoretic Modeling and Analysis, Econometric Society Monographs

The main sources for more advanced material (time permitting) are my papers below and the literature cited therein:

"Extreme Points and Majorization: Economic Applications" (joint with Andreas Kleiner and Philipp Strack), *Econometrica*, Volume 89, Issue 4, July 2021, 1557-1593.

"On the equivalence of Bayesian and dominant strategy implementation" (joint with Alex Gershkov, Jabob K. Goeree, Alexey Kushnir and Xianwen Shi), *Econometrica*, Volume 81, Issue 1, January 2013, 197–220.

"Efficient Design with Interdependent Valuations" (with Philippe Jehiel), *Econometrica*, Volume 69, Issue 5, 2001, 1237-1259.

"The Limits of Ex-Post Implementation" (joint with Philippe Jehiel, Moritz Meyer-ter-Vehn and William R. Zame), *Econometrica*, Vol. 74, No. 3, May 2006, 585-610.

"Partnerships, Lemons and Efficient Trade" (with Karsten Fieseler and Thomas Kittsteiner), *Journal of Economic Theory*, Volume 113, 2003, 223-234.

"Multidimensional Mechanism Design for Auctions with Externalities" (with Philippe Jehiel and Ennio Stacchetti), *Journal of Economic Theory*, Volume 85, Issue 2, 1999, 258-294.