Market Design

Module 2, 2019/2020

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Course information

Course Website: at my.nes.ru

Instructor's Office Hours: TBA

Class Time: TBA

Room Number: TBA

TAs: TBA

Course description

How do economic agents interact with each other? The rules of games people play can be designed so that outcomes satisfy desired properties. Markets and marketplaces can be designed as well. In class, we would study in detail several main components of the mechanism and market designer toolbox: taking care of incentive constraints (auctions are leading examples), generating value from heterogeneous preferences via matching, and communicating appropriate information to shape incentives and outcomes. We would apply these components for analysis of real-life markets and phenomena in variety of shapes and forms, with a particular emphasis on modern online platforms.

Course requirements, grading, and attendance policies

There will be:

• 4+ homeworks, combined worth 40% of the grade;

• an extensive individual or small group project, worth 20%;

• and a final exam worth 40% of the grade.

Often, you will be asked to read certain materials before the lecture.

Course contents

The course has four main broad topics

1. Auctions
    - single-unit and multi-unit auctions, double auctions
    - revenue and payoff-equivalence
    - risk-aversion, budget-constraints, and other difficulties
    - practical design
    - collusion

2. Matching
    - one-sided and two-sided
    - one-to-one, many-to-many
    - school-choice problems
    - with contracts and transfers

3. Platforms/ Online markets
    - two-sided markets: pricing, access
    - many-sided markets
    - competition among platforms
    - online platforms as intermediaries
    - online advertisement
    - crowdfunding

4. Product/ Information Design (applications, extra topics)
    - bundling, lotteries
    - persuasion
    - selling information/ experiments
    - recommender systems

Sample tasks for course evaluation

Solve for an equilibrium of a particular auction format (find players' strategies, compute expected revenue to the seller).
Decide whether a particular matching algorithm is stable under given conditions? Offer a better alternative, if not.
Find the optimal pricing and access policy for the platform.

Course materials

Required textbooks and materials

Roth, Alvin E., and Robert B. Wilson. (2019.) "How Market Design Emerged from Game Theory: A Mutual Interview." *Journal of Economic Perspectives*, 33 (3): 118-43.

Roth, A. E. (2008). "What have we learned from market design?" *Innovations: Technology, Governance, Globalization*, *3*(1), 119-147.

Rochet, J. C., & Tirole, J. (2006). "Two-sided markets: a progress report." *The RAND journal of economics*, *37*(3), 645-667.

Klemperer, P. (2004). *Auctions: theory and practice*. Princeton University Press. (available online at http://www.paulklemperer.org/)

Roth, A. E. (2002), "The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools of Design Economics." *Econometrica*, vol. 70 (4), pp. 1341-1378.

Additional materials

Krishna, V. (2009). *Auction theory*. Academic press.

Milgrom, P., & Milgrom, P. R. (2004). *Putting auction theory to work*. Cambridge University Press.

Bergemann, D., Bonatti, A., & Smolin, A. (2018). "The design and price of information." *American Economic Review*, *108*(1), 1-48.

Strausz, R. (2017). "A theory of crowdfunding: A mechanism design approach with demand uncertainty and moral hazard." *American Economic Review*, *107*(6), 1430-76.

Azevedo, E. M., & Leshno, J. D. (2016). "A supply and demand framework for two-sided matching markets." *Journal of Political Economy*, *124*(5), 1235-1268.

Kamenica, E., & Gentzkow, M. (2011). "Bayesian persuasion." *American Economic Review*, *101*(6), 2590-2615.

Edelman, B., Ostrovsky, M., & Schwarz, M. (2007). "Internet advertising and the generalized second-price auction: Selling billions of dollars worth of keywords." *American Economic Review*, *97*(1), 242-259.

Porter, R. H. (2005). "Detecting collusion." *Review of Industrial Organization*, *26*(2), 147-167.

Wilson, R. (2002). "Architecture of power markets." *Econometrica*, *70*(4), 1299-1340.

Bulow, J., & Roberts, J. (1989). "The simple economics of optimal auctions." *Journal of political economy*, *97*(5), 1060-1090.

Kelso Jr, A. S., & Crawford, V. P. (1982). "Job matching, coalition formation, and gross substitutes." *Econometrica: Journal of the Econometric Society*, 1483-1504.

D. Gale & L. S. Shapley (1962). "College Admissions and the Stability of Marriage," *The American Mathematical Monthly*, 69:1, 9-15

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.