

Market Design

Module 2, 2023/2024

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Course information

Course Website: at my.nes.ru

Instructor's Office Hours: Th (after class) and by appointment

Class Time: T Th 19:00-20:30

Room Number: 247 Beta (online)

TAs: Alexander Tonis

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 small group (3-4 people) 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 three 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. Platforms/ Online markets

- two-sided markets: pricing, access
- many-sided markets
- competition among platforms
- online platforms as intermediaries
- online advertisement
- crowdfunding

3. Product/ Information Design (applications, extra topics)

- bundling, lotteries
- persuasion
- selling information/ experiments
- recommender systems

There could be extra specific topics broadly related to the course (e.g. on matching, implementation, estimation)

Sample tasks for course evaluation

Solve for an equilibrium of a particular auction format (find players' strategies, compute expected revenue to the seller).

Find the optimal pricing and access policy for the platform.

Find the optimal disclosure policy for the seller of a certain product.

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.paulklempere.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.

Abdulkadiroğlu, A., & Sıınmez, T. (2003). School choice: A mechanism design approach. *American economic review*, 93(3), 729-747.

Aoyagi, M. (2003). Bid rotation and collusion in repeated auctions. *Journal of economic Theory*, 112(1), 79-105.

Armstrong, M. (2006). Competition in two-sided markets. *The RAND Journal of Economics*, 37(3), 668-691.

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Athey, S., & Ellison, G. (2011). Position auctions with consumer search. *The Quarterly Journal of Economics*, 126(3), 1213-1270.

Ausubel, L. M. (2004). An efficient ascending-bid auction for multiple objects. *American Economic Review*, 94(5), 1452-1475.

Ausubel, L. M., & Milgrom, P. R. (2002). Ascending auctions with package bidding. *The BE Journal of Theoretical Economics*, 1(1). Bergemann, D., Bonatti, A., & Smolin, A. (2018). "The design and price of information." *American Economic Review*, 108(1), 1-48.

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.

Battaglini, M. (2002). Multiple referrals and multidimensional cheap talk. *Econometrica*, 70(4), 1379-1401.

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

Bergemann, D., & Morris, S. (2016). Information design, Bayesian persuasion, and Bayes correlated equilibrium. *American Economic Review*, 106(5), 586-91.

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the Econometric Society, 1431-1451.

Courty, P., & Hao, L. (2000). Sequential screening. *The Review of Economic Studies*, 67(4), 697-717.

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.

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

Garratt, R. J., Truger, T., & Zheng, C. Z. (2009). Collusion via resale. *Econometrica*, 77(4), 1095-1136.

Hatfield, J. W., & Milgrom, P. R. (2005). Matching with contracts. *American Economic Review*, 95(4), 913-935.

Horner, J., & Skrzypacz, A. (2016). Selling information. *Journal of Political Economy*, 124(6), 1515-1562.

Izmalkov, S., Lepinski, M., & Micali, S. (2011). Perfect implementation. *Games and Economic Behavior*, 71(1), 121-140.

Jeziorski, P., & Segal, I. (2015). What makes them click: Empirical analysis of consumer demand for search advertising. *American Economic Journal: Microeconomics*, 7(3), 24-53.

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

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

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Myerson, R. B. (1981). Optimal auction design. *Mathematics of operations research*, 6(1), 58-73.

Ostrovsky, M. (2008). Stability in supply chain networks. *American Economic Review*, 98(3), 897-923.

Ottaviani, M., & Sørensen, P. N. (2006). Reputational cheap talk. *The Rand journal of economics*, 37(1), 155-175.

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

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381-392.

Rysman, M. (2009). The economics of two-sided markets. *Journal of economic perspectives*, 23(3), 125-43.

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Weyl, E. G. (2010). A price theory of multi-sided platforms. *American Economic Review*, 100(4), 1642-72.

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Academic integrity policy

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