Microeconomics-5

5th module, 2023/24 academic year

Dmitry Dagaev
NES
ddagaev@nes.ru

Course information

Course Website: my.nes.ru

Instructor's Office Hours: Wednesday, 13:30-15:00

Lectures Time: Tuesday, 11:45-13:15, Wednesday, 11:45-13:15.

Seminars Time: Tuesday, 13:45-15:15 and 15:30-17:00

Room Number: 427

TAs: Alexander Kalchevskiy, Anna Vinovets

Course description

This course completes mandatory Microeconomics sequence at MAE program; topics covered include social choice theory, mechanism design, auctions, and two-sided matching.

Course requirements, grading, and attendance policies

Successful completion of all previous Microeconomics courses is a prerequisite for this course.

Grading policy is as follows.

Final grade = 0,5 Exam + 0,3 Midterm + 0,2 HA

At the A4-format midterm and exam, students will be asked to solve and analyze modifications of the models discussed during regular classes.

There will be 5 written home assignments. HA mark is the average mark for the best 4 of them.

Course contents

Week 1. Social choice theory. The case of 2 alternatives. May's Theorem. The case of ≥3 alternatives. Arrow's Theorem.

Week 2. Manipulability of aggregation rules. The case of a single winner. Gibbard–Satterthwaite theorem. The case of multiple winners. Duggan–Schwartz theorem.

Week 3. Auctions. First price auction, second price auction. All-pay auction. Descending and ascending auctions. Sealed-bid auctions and prevention of collusion. Vickrey–Clarke–Groves auction. Famous historical auctions.

Week 4. Mechanism design. Implementation in Nash equilibrium. Implementation in Bayesian Nash equilibrium.

Week 5. Revenue equivalence theorem.

Week 6. Two-sided matching. Marriage market. Gale-Shapley algorithm. Stable roommates problem. School admissions.

Week 7. Platforms, preferences, and matching.

Sample tasks for course evaluation

Problem 1. The seller of the painting organizes a sealed-bid first-price auction. The valuation of painting is distributed uniformly on [0,1] for the first bidder and uniformly on [0,5] for the second bidder. Hoping to increase his expected income, the seller plans to charge entry fee to the auction—any bidder must pay $p \geq 0$ to enter. Potential buyers are rational. They know their own valuation of the painting, but only know the distribution about the other bidder's valuation. The seller also knows only the distribution. Draw a graph of the seller's expected revenue in the Bayes-Nash equilibrium as a function of p and label all key points. What entry fee p should the seller choose?

Problem 2. Prove that each of the assumptions of the Gibbard–Satterthwaite theorem is essential.

Problem 3. Some marriage market is non-manipulable under M-proposing DAA. What can you say about the agents' preferences and the number of stable matchings?

Course materials

Required textbooks and materials

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

2. Krishna, V. (2009) Auction Theory. Elsevier.

3. Roth, A.E. and Sotomayor, M.A.O. (1990). Two-Sided Matching, Cambridge University Press.

4. Geanakoplos, J. (2005). Three brief proofs of Arrow's impossibility theorem. Economic Theory, 26(1), 211-215.

5. Barberá, S. (1983). Strategy-proofness and pivotal voters: a direct proof of the Gibbard-Satterthwaite theorem. International Economic Review, 24(2), 413-417.

6. Hitsch, G. J., Hortaçsu, A., & Ariely, D. (2010). Matching and sorting in online dating. American Economic Review, 100(1), 130-163.

Academic integrity policy

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