Microeconomics 4

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Office hours: Wednesday, after class, office C27.

Introduction to the course This course offers a rigorous introduction to information economics and mechanism design. The background knowledge in mathematics and game theory at the level of Mathematics 1 (Lomys), Mathematics 2 (Caruso and Ceparano), and Game Theory (Bizzarri) at the Naples School of Economics is required for the course. Taking notes in class, participating actively, and working through the problem sets are essential for understanding the material. By the end of the course, students should be familiar with important theoretical results in the literature and the relevant proof techniques.

Grading The grade is based on:

1. Exam, weighted by $2/3$.
2. Problem sets, weighted by $1/3$. Three to four problem sets will be distributed. One of your lowest scores is dropped and the remaining two are equally weighted.

Topics The course covers 3 main topics.

1. Screening;
2. Mechanism design;
3. Communication and information design.

Tentative outline

1. Weeks 1 through 2: Envelope theorem for arbitrary choice sets, Revelation Principle, characterization of IC, pricing an indivisible good, nonlinear pricing, Taxation Principle, ironing; time permitting: the demand-profile approach to nonlinear pricing.
2. Weeks 2 through 4: Characterization of BIC, optimal auction, reserve-pricing approximations, Bulow–Klemperer Theorem, VCG and AGV mechanisms,

Myerson–Satterthwaite Theorem, double auctions, Crémer–McLean full-surplus extraction, introduction to dominant-strategy mechanism design: Green–Holmström–Laffont uniqueness, Green–Laffont impossibility, BIC-DSIC equivalence; time permitting: belief–determine-preferences conditions.

3. Weeks 4 through 5: Cheap talk, Blackwell's theorem, Bayesian persuasion and information design, cheap talk with transparent motives; time permitting: Bayes-correlated equilibrium.

Readings Most of the course is taught at the board. There are no required readings, but the suggested readings serve as a complement to your notes. The following readings may help putting the material in perspective. Suggested readings are marked by an asterisk.

- Screening:
  - * Harford's "At your disservice" (https://www.nuffield.ox.ac.uk/teaching/Economics/Bargaining/pricediscriminationillustration.pdf).
  - * Börgers (2015), Chapter 1, 2, 5.
  - Alternative textbook treatments: Salanié (1997).
  - Classic articles: Mussa and Rosen (1978).
  - Extra reading: Rochet (1985), Milgrom and Segal (2002), Carroll (2023).
- Mechanism design:
  - * Varian's "Designing the perfect auction" (https://dl.acm.org/doi/epdf/10.1145/1378704.1378708), Hartline and Kleinberg's "Badminton and the science of rule making" (https://jasonhartline.com/HuffingtonPost-2012-badminton.pdf).
  - * Börgers (2015): Chapter 3, 4, 6.
  - Alternative textbook treatments: Jackson's notes (https://web.stanford.edu/~jacksonm/mechtheo.pdf), MWG, Krishna (2002), Milgrom (2004), and Hartline's book (http://jasonhartline.com/MDnA/).
  - Classic articles: Myerson (1981), Hurwicz (1960).
  - Extra reading: Myerson and Satterthwaite (1983), Crémer and McLean (1988), Bulow and Roberts (1989), Wilson (2021).

- Communication:
  - * Kreps (2023): chapter 17.
  - Classic articles: Crawford and Sobel (1982), Kamenica and Gentzkow (2011).
  - Extra reading: Spiegler's *The Curious Culture of Economic Theory* (https://doi.org/10.7551/mitpress/14884.001.0001), Gibbons, Matouschek, and Roberts (2013), de Oliveira (2018), Lipnowski and Ravid (2020), Kamenica (2019), Bergemann and Morris (2019).

Textbooks in microeconomic theory typically include chapters on information economics, I recommend MWG. Myerson (1991) is a superb textbook on game theory covering some topics of this course, I strongly recommend reading this book.

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