Information economics

Instructor: Pietro Dall'Ara, pietro.dallara[at]unina.it.
Office hours: Wednesday, after class, office C27.

Introduction to the course This course is a graduate-level introduction to information economics. Although the course is designed to be self-contained, previous exposure to the material is helpful. The background knowledge of 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.

Grading The grade is based on:

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

Outline The course covers 3 main topics.

1. Screening (main reference: Börgers (2015), Chapter 1, 2, 5)
2. Mechanism design (main reference: Börgers (2015), Chapter 3, 4, 6)
3. The value of information and communication.

Readings Most of the course is taught at the board. There are no required readings, but the handouts and the suggested readings serve as a complement to your notes.

The following readings may help you to put the material in perspective, suggested readings are marked by an asterisk.

- Screening:
  - * first chapter of *Economics Briefs: Six Big Ideas*, by The Economist, available at https://www.economist.com/sites/de

fault/files/econbriefs.pdf; Tim Harford's column on the FT, available at https://www.nuffield.ox.ac.uk/teaching/Economics/Bargaining/pricediscriminationillustration.pdf

  - * Kreps (2023): chapter 17;
  - * Börgers (2015), Chapter 1, 2, 5 (main reading);
  - For alternative exposures of screening at approximately the same level as the course, see the relevant chapters in Bolton and Dewatripont (2005), Salanié (1997), and Fudenberg and Tirole (1991).
  - Original papers: Mussa and Rosen (1978).
  - Extra reading: Rochet (1985, 1987), Carroll (2023).

- Mechanism design:
  - * Börgers (2015): Chapter 3, 4, 6 (main reading).
  - Alternative textbook treatments: Jackson's notes (https://web.stanford.edu/~jacksonm/mechtheo.pdf), relevant chapters in Roughgarden (2016), Krishna (2002), MWG.
  - Original papers: Myerson (1981), Myerson and Satterthwaite (1983), Bulow and Klemperer (1996).
  - Extra reading: Wilson (2021).

- Communication:
  - Original papers: Crawford and Sobel (1982), Kamenica and Gentzkow (2011);
  - Extra reading: excerpt from Ran Spiegler's *The Curious Culture of Economic Theory*, Weitzman (2000), Gibbons, Matouschek, and Roberts (2013), de Oliveira (2018), Lipnowski and Ravid (2020), relevant chapters in Marschak and Radner (1972).
  - Surveys: Kamenica (2019), Bergemann and Morris (2019).

Graduate-level textbooks in microeconomic theory typically include chapters on screening and mechanism design, I recommend MWG. *Advanced Microeconomic Theory* by Jehle and Reny (2001) has a chapter on information economics written in game-theoretic language, which constitutes a complement to the mechanism-design–oriented treatment of screening in this course and deserves to be read carefully. Salanié (1997) and Bolton and Dewatripont (2005) cover screening, mechanism design, and communication in a somewhat alternative way, but studying one of these books is a great

idea. *Game Theory: Analysis of Conflict* by Myerson (1991) is a superb textbook on game theory with significant overlap of topics with this course; I strongly recommend reading this book.

References

Bergemann, Dirk and Stephen Morris (2019), "Information Design: A Unified Perspective." *Journal of Economic Literature*, 57(1), 44–95.

Bolton, Patrick and Mathias Dewatripont (2005), *Contract Theory*. MIT Press.

Bulow, Jeremy and Paul Klemperer (1996), "Auctions versus negotiations." *The American Economic Review*, 86(1), 180–194.

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

Carroll, Gabriel (2023), "Contract theory." In *Online and Matching-Based Market Design* (Federico Echenique, Nicole Immorlica, and and Vijay V. Vazirani, eds.), 614–634, Cambridge University Press.

Crawford, Vincent P. and Joel Sobel (1982), "Strategic information transmission." *Econometrica*, 50(6), 1431–1451.

de Oliveira, Henrique (2018), "Blackwell's informativeness theorem using diagrams." *Games and Economic Behavior*, 109, 126–131.

Fudenberg, Drew and Jean Tirole (1991), *Game Theory*. MIT Press.

Gibbons, Robert, Niko Matouschek, and John Roberts (2013), "Decisions in organizations." In *The Handbook of Organizational Economics*, 373–431, Princeton University Press.

Jehle, Geoffrey A. and Philip J. Reny (2001), *Advanced Microeconomic Theory*. Pearson.

Kamenica, Emir (2019), "Bayesian Persuasion and Information Design." *Annual Review of Economics*, 11, 249–272.

Kamenica, Emir and Matthew Gentzkow (2011), "Bayesian Persuasion." *American Economic Review*, 101(6), 2590–2615.

Kreps, David M. (2023), *Microeconomic Foundations II: Imperfect Competition, Information, and Strategic Interaction*. Princeton University Press.

Krishna, Vijay (2002), *Auction Theory*. Academic Press.

Lipnowski, Elliot and Doron Ravid (2020), "Cheap talk with transparent motives." *Econometrica*, 88(4), 1631–1660.

Marschak, Jacob and Roy Radner (1972), "Economic theory of teams." In *CFM 22*, Cowles Foundation for Research in Economics.

Mussa, Michael and Sherwin Rosen (1978), "Monopoly and product quality." *Journal of Economic Theory*, 18(2), 301–317.

Myerson, Roger B. (1981), "Optimal auction design." *Mathematics of Operations Research*, 6(1), 58–73.

Myerson, Roger B. (1991), *Game Theory: Analysis of Conflict*. Harvard University Press.

Myerson, Roger B. and Mark A. Satterthwaite (1983), "Efficient mechanisms for bilateral trading." *Journal of Economic Theory*, 29(2), 265–281.

Rochet, Jean-Charles (1985), "The taxation principle and multi-time hamilton-jacobi equations." *Journal of Mathematical Economics*, 14(2), 113–128.

Rochet, Jean-Charles (1987), "A necessary and sufficient condition for rationalizability in a quasi-linear context." *Journal of Mathematical Economics*, 16(2), 191–200.

Roughgarden, Tim (2016), *Twenty Lectures on Algorithmic Game Theory*. Cambridge University Press.

Salanié, Bernard (1997), *The Economics of Contracts: A Primer*. MIT Press.

Weitzman, Martin L. (2000), "An 'economics proof' of the supporting hyperplane theorem." *Economics Letters*, 68(1), 1–6.

Wilson, Robert B. (2021), "Strategic analysis of auctions." *Econometrica*, 89(2), 555–561.