Information economics

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Office hours: Tuesday, after class, office C27.

Introduction to the course This course offers a graduate-level introduction to information economics and constitutes the second half of Microeconomics II. Information asymmetries are pervasive in markets and modern economics began studying them in detail with the work of Akerlof, Mirrlees, Spence, and Stiglitz in the seventies. The Nobel prize awards to Mirrlees and Vickrey in 1996, to Akerlof, Spence, and Stiglitz in 2001, and to Hart and Holmstrom in 2016 are explicitly motivated by contributions to the economics of information.

Taking notes in class, active participation, and working through the problem sets are necessary to understand the material. In the course, we deal with concave programming, probability distributions, and Bayesian updating. The background knowledge of real analysis and probability that is expected from LMEF and MEF students, combined with an interest in economics, will (hopefully) make you enjoy this course.

Grading Your grade will be 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.

You can get up to two extra points by solving bonus questions in any problem set. Such bonus questions are otherwise ungraded (but they consitute good prep towards your exam.) For example, if your grades are: 20 in the exam, 28, 26, and 26 in the problem sets, and you satisfactorily answer a two–point-worth bonus question, your grade in this portion of Microeconomics II is calculated as

$$20.(2/3) + ((28 + 26)/2)/3 + 2 = 25.$$

Outline The course covers 4 main topics:

1. Screening;
2. Moral hazard;
3. Competitive screening;
4. Introduction to public goods and externalities.

Here is a tentative breakdown of classes; topics, order, and dates are tentative and may change.

- Week 1 (introduction and screening): admin, principal-agent models, first-best analysis, incentive compatibility and implementability, second-best analysis, revelation principle.
- Week 2 (screening and moral hazard): comparative statics, applications of screening, introduction to and first-best analysis of moral hazard. Problem set (PS) 1 is due on Friday, Feb 21, 5 pm.
- Week 3 (moral hazard and competitive screening): second-best analysis, first-order approach, MLRP, Holmstrom's sufficiency principle, introduction to and first-best analysis of competitive screening. PS2 is due on Friday, Feb 28, 5 pm.
- Week 4 (competitive screening, public goods, and externalities): second-best analysis of competitive screening, introduction to public goods and externalities. PS3 is due on Monday, Mar 10, 5 pm.

You are encouraged to submit problem sets earlier than the deadline, since working on screening problems when moral hazard is covered in class may not be an optimal study strategy. The deadlines are set late in order to accommodate unexpected events.

Readings There is no required reading. The handouts that are distributed make the course self-contained — in conjunction with notetaking.

The coverage of screening and moral hazard in class follows chapters 2 and 4 of *The Theory of Incentives* by Laffont and Martimort (2002, LM). For alternative exposures at approximately the same level as the course, see: *Contract Theory* by Bolton and Dewatripont (2005, BD) and *The Economics of Contracts* by Salanié (1997). Graduate-level textbooks in microeconomic theory typically include chapters on screening and moral hazard. I recommend: *Microeconomic Foundations II* by Kreps (2023, KR) for screening and competitive screening, *Microeconomic Analysis* by Varian (1992) for public goods and externalities, and MWG (Mas-Colell et al., 1995). *Advanced Microeconomic Theory* by Jehle and Reny (2001) has a great chapter on information economics written in game-theoretic language at a slightly higher level of formalism than what we do in class.

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/default/files/econbriefs.pdf`;
  - * KR: chapter 17;
  - * LM: chapter 2;
  - Mussa and Rosen (1978);
  - KR: chapter 20.
- Moral hazard:
  - * LM: chapter 4 and 5.1.3;
  - Holmström (2017);
  - Hurwicz (2008);
  - BD: chapter 4.
- Competitive screening:
  - KR: chapter 19;
  - Rothschild and Stiglitz (1976).
- Public goods and externalities:
  - * Relevant chapters in Varian (1992).

References

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

Holmström, Bengt (2017), "Pay for performance and beyond." *American Economic Review*, 107(7), 1753–77, URL https://www.aeaweb.org/articles?id=10.1257/aer.107.7.1753.

Hurwicz, Leonid (2008), "But who will guard the guardians?" *American Economic Review*, 98(3), 577–85, URL https://www.aeaweb.org/articles?id=10.1257/aer.98.3.577.

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

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

Laffont, Jean-Jacques and David Martimort (2002), *The Theory of Incentives: The Principal-Agent Model*. Princeton University Press, URL http://www.jstor.org/stable/j.ctv7h0rwr.

Mas-Colell, Andreu, Michael D. Whinston, and Jerry R. Green (1995), *Microeconomic Theory*. Oxford University Press.

Mussa, Michael and Sherwin Rosen (1978), "Monopoly and product quality." *Journal of Economic Theory*, 18(2), 301–317, URL https://www.sciencedirect.com/science/article/pii/0022053178900856.

Rothschild, Michael and Joseph Stiglitz (1976), "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information." *The Quarterly Journal of Economics*, 90(4), 629–649.

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

Varian, Hal R. (1992), *Microeconomic Analysis*. W. W. Norton & Company.