Economics 712: Fall 2017
Topics in Economic Theory: Learning, Information and Dynamic Games

This is an advanced topics course in microeconomic theory. We will study learning, information theory, information design, information aggregation, and dynamic games. The goal is to provide you with tools and techniques to transition from coursework to research. We will examine foundational contributions, recent developments, and open questions in the literature, and discuss applications of these ideas to political economy, industrial organization and development.

Course Logistics

Instructor. Aislinn Bohren
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Lecture. M 5:30-8:30pm in McNeil 286-7 (no class on 10/23).

Office Hours. By appointment, or when my door is open.

Prerequisites. You should have taken the first year Ph.D. sequence in the Economics department or have received consent from me. In general, you should be comfortable with real analysis, probability theory, and standard equilibrium concepts in dynamic games.

Course Content

All course material will be posted on Canvas.

Reading. Readings will consist of journal articles (there is no text for the course). The Reading Lists posted on Canvas list the papers for each part of the course. You should read all of the papers that we cover in class: many of these are “classics”, both for their formal innovation and because they have a powerful intuition and economic story. Reading papers at this stage is a great way to help you think about how to ask and answer research questions, and exposit your ideas. I don’t expect to cover all the papers mentioned and will adjust which papers to study based on our interests, pace, and progress.

Problem Sets. I will assign several problem sets based on the material we cover in class. They are due in my mailbox by 5pm on the due date, and will count for 20% of the grade. You are encouraged to work together on these problems, but the goal is that every student understands the relevant material. As such, assignments should be submitted individually acknowledging all those with whom problems were discussed.
Referee report. Each of you will write one referee report. This should be about 2-3 pages, briefly summarizing the main results and techniques in the paper, evaluating the technical and conceptual contributions, and listing any suggested improvements or additions. I will send you a list of potential papers to referee. This will comprise 20% of your grade.

Presentation. I will ask each of you to present a paper. Presentations should be about an hour and will be organized throughout the semester. They will focus on recent job market papers and working papers so you can get a sense of what makes a good theory paper in today’s market. This will comprise 20% of your grade.

Final project. The final project will be a toy model of a topic you find interesting or plan to study further, with the goal that this will give you something concrete to work on in terms of research over the summer. The focus will be on developing and solving a model, rather than the accompanying verbiage. You don’t need to write a lengthy intro, discussion of applications, lit survey, etc., but instead should develop a model of an interesting game, and a thorough examination of its equilibrium set, or one equilibrium (if that equilibrium happens to be complex to describe / prove optimality of, etc.). Solving and generalizing these toy models is what gets us started in writing papers. I’ll meet with each of you throughout the semester to provide guidance with this process. Presentations of the final project will take place during the last week of class (20 minutes), and the paper is due during exam week. The final project will comprise the remaining 40% of your grade.
"Economic theories should be judged by three criteria: generality, congruence with reality, and tractability."


1 Learning

1. Social Learning:

   - Boundedly Rational: Eyster and Rabin [2010]; Guarino and Jehiel [2013]; Bohren [2016a]; Bohren and Hauser [2017]
   - Financial Markets: Park and Sabourian [2011]
   - Costly Information Acquisition: Mueller-Frank and Pai [2016]; Ali [2017a]
   - Position Uncertainty: Monzón and Rapp [2014]
   - Learning from Payoffs: Wolitzky [2017]

(b) Repeated Decisions
   - Ellison and Fudenberg [1993, 1995]

(c) Networks
   - Observational Learning: Bala and Goyal [1998]; Acemoglu, Dahleh, Lobel, and Ozdaglar [2011]
   - Communicating Beliefs: DeGroot [1974]; Demarzo, Vayanos, and Zwiebel [2003]; Golub and Jackson [2010]

(d) Costly Communication: Niehaus [2011]

2. Experimentation

(a) Single Agent: Aghion, Bolton, Harris, and Jullien [1991]; Moscarini and Smith [2001]

(b) Strategic: Bolton and Harris [1999]; Keller, Rady, and Cripps [2005]; Keller and Rady [2015]; Bonatti and Hörner [2017]

(c) Social Learning: Murto and Välimäki [2011]; Frick and Ishii [2016]; Che and Horner [2017]
(d) Delegation: Guo [2016]

3. Boundedly Rational Information Processing

(a) Theory: Epstein, Noor, and Sandroni [2010]; Rabin and Schrag [1999]; Gottlieb [2011]; Bénabou [2013]; Wilson [2014]; Schwartzstein [2014]; Bohren and Hauser [2017]

(b) Empirical Evidence: Enke and Zimmermann [2017]; Eyster and Weizsacker [2010]

4. Other Learning Models

(a) Views in Society: Piketty [1995]

(b) Fact-Free Learning: Aragones, Gilboa, Postlewaite, and Schmeidler [2005]

2 Value of Information

1. Single Agent Decision Problem

(a) Information Orders

- Blackwell’s: Blackwell [1951]; Leshno and Spector [1992]; Lehrer and Shmaya [2008]
- Signals as Complements or Substitutes: Börgers, Hernando-Veciana, and Krähmer [2013]
- Entropy and Prices: Cabrales, Gossner, and Serrano [2013]

(b) Monotone Likelihood Ratio

- Foundations: Karlin and Rubin [1956]; Whitt [1979]
- Classifying Information as “Good” or “Bad”: Milgrom [1981]

(c) Marginal Value of Information

- Non-Concavity: Radner and Stiglitz [1984]; Chade and Schlee [2002]; De Lara and Gilotte [2007]
- Demand: Moscarini and Smith [2002]; Keppo, Moscarini, and Smith [2008]

(d) Monotone Decision Problems

- Athey and Levin [2001]

2. Strategic Settings:


(b) Comparison of Information Structures: Gossner [2000]

3 Information Design

1. Foundations: Bergemann and Morris [2016b, 2017]

(a) Bayes Correlated Equilibria: Bergemann and Morris [2013, 2016a]
(b) Bayesian Persuasion (single agent): Kamenica and Gentzkow [2011]
(c) Games (multiple agents): Taneva [2016]; Mathevet, Perego, and Taneva [2017]
(d) Dynamic: Ely [2017]

2. Applications

(a) Price Discrimination: Bergemann, Brooks, and Morris [2015]
(b) Selling Information: Horner and Skrzypacz [2016]; Bergemann, Bonatti, and Smolin [2016]
(c) Belief-based Utility: Ely, Frankel, and Kamenica [2015]

4 Information Aggregation

1. Strategic Voting and Elections:

(a) Common Values: Austen-Smith and Banks [1996]; Feddersen and Pesendorfer [1998]


5 Information in Continuous Time Games


3. Repeated Games: Sannikov [2007]


5. Optimal Monitoring: Varas, Marinovic, and Skrzypacz [2017]

Survey Articles

- Before information economics (see how far we have come!): Stigler [1961]
- An overview of information in economics: Stiglitz [2000]
References


