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Spring 2015

## Economics 200C-Part 1: Games and Information

**Description:** Econ 200C is the final course in the micro core. I will teach the first half of the class. Simone Galperti will teach the last five weeks. My half of the class will cover a dynamic games, signaling, and applications.

**Objectives:** The class has three different goals. First, some students hope to pass the micro qual and get on with their lives. I want to identify the tools and concepts you must master to pass the qualifying exam. Second, the class introduces ideas that a well educated economist should know, both to show that one is an educated economist and to be able to use microeconomics in applications. Third, I want to stimulate (or at least not deaden) the enthusiasm of the small subset of students who might do research in microeconomic theory.

**Organization:** The class meets on Mondays and Wednesdays at 8 AM. There will be an examination on Wednesday, April 29. (Simone's half of the class begins on May 4. )

**Possible References:**

- Binmore, *Fun and Games*

- Dixit and Skeath, *Games of Strategy*

- Fudenberg and Tirole, *Game Theory*

- Gibbons, *Game Theory for Applied Economists*

- Gibbons, "An Introduction to Applicable Game Theory," *Journal of Economic Perspectives*, Winter 1997, vol. 11, 1, 127–49.

- Kreps, *A Course in Microeconomic Theory*

- Mailath and Samuelson, *Repeated Games and Reputations: Long-Run Relationships*

- Mas-Colell, Whinston, and Green, *Microeconomic Theory*

- McMillan, *Games, Strategies, and Managers*

- Osborne and Rubinstein, *Game Theory*

- Varian, *Microeconomic Analysis*

- Watson, *Strategy*

In addition to this list, I have already posted notes (written by Ali, Kartik, and Miller) covering material for the first three weeks. I will supplement this material if needed.

The list is in alphabetical order and is not comprehensive (talk to me for more suggestions).

You are familiar with Kreps, Mas-Colell, Whinston, and Green, and Varian. I have confusing advice on the value of these books. Officially, students who care only about completing this course and the micro qual need not go beyond the three of these books. In practice, these three books do not have sufficient coverage of the material on "folk theorems," so you should supplement your reading a bit. Pedagogically, if you are already comfortable with one of the books, it is reasonable to continue using it. That said, the texts are not good references for many of the topics I discuss and I urge you to find more complete sources. Finally, if you pick just one of these books and are otherwise indifferent, pick Mas-Colell, Whinston, and Green.

Fudenberg and Tirole, Gibbons, and Osborne and Rubinstein are game theory texts. Fudenberg and Tirole is comprehensive and difficult. Gibbons's book is elementary and mechanical. [The article written by Gibbons ("An Introduction to Applicable Game Theory," *Journal of Economic Perspectives*, Winter 1997) is a good substitute for his text.] Osborne and Rubinstein is terse, somewhat philosophical, but closer in level to Fudenberg and Tirole than to Gibbons. I imagine that students who like Mas-Colell, Whinston, and Green will like Fudenberg and Tirole; students who like Varian will like Gibbons; and students who like Kreps will like Osborne and Rubinstein.

Binmore's book is, for the most part, mathematically elementary, but it is conceptually challenging. It contains topics that are not standard for an economics class. McMillan's book is a non-technical introduction to strategic analysis. It contains some interesting commentaries. Dixit and Skeath and Watson are good upper-division undergraduate textbooks. These four books probably won't help you understand lectures, give insight into solving problems, or help you pass the qualifier, but they may provide general insight and appreciation of game theory and its applications.

Mailath and Samuelson is a book-length treatment that covers relatively recent contributions to the area of repeated games. It goes far beyond the material that I will present on repeated games, but it introduces the basic ideas. I will try to follow their notation so that someone interested in going further will know the language.

There are many other textbooks that cover all or part of the material in this class. Please ask me if you have questions about supplementary texts.

**What the Class is About:**  The first half of the class continues the study of strategic models in economics. It presents the basic results on repeated games and describes several canonical models of microeconomic models (signaling, screening, and adverse selection) that use incomplete information.

**How to Study:**  I recommend that you read the textbook coverage prior to the lecture. Doing so gives you a context in which to place the lecture material, it may generate questions to ask, and it should give you the confidence to listen to and participate in the classroom (rather than just write it down).

Leaving the classroom with a sense that you have understood the lecture is a weak sign that you understand the material. You must work problems. Do this seriously. Write down your answers with care. Talk about them with classmates, me, or the TA. Try to vary the assumptions in the main results of the class or in assigned problems.

Even better than working problems is posing them. If you can think up good questions for the class, then you are ready to teach the class. If you can think up good questions and answer them, you are ready to write your thesis.

**Exercises:** The texts have problems. I will provide additional problems. It would be sensible to use old qualifying exams as a source of questions.

I hope to point you to more problems than you can do. I will sometimes give subjective ratings to indicate how difficulty and relevance. The TA will grade a randomly selected subset of problems. You are welcome to work in groups (no more than four people per group). If you wish to receive comments on a specific question, please note this on your assignment.[1]

**Requirements and Grading:** I will base your grade for my half of the class on a midterm examination (40%) and homework (10%). Active (and positive) participation in class will serve to break ties (in your favor). I encourage you to collaborate on homework assignments (but to write down your own answers). The final grade for the class will be a simple average of the grades for the first two parts.

**Office Hours:** I encourage you to talk to me about course material. My office is 311 Econ. My email address is jsobel@ucsd.edu. John Rehbeck (jrehbeck@ucsd.edu) is the TA for the class. We'll figure out office hours in the first class meeting.

**Topics:** Here is a list of topics for the course. (Roughly three lectures per topic.)

1. Repeated Games

   - Basic Ideas (Nash Threats)
   - Subgame Perfect Equilibrium, Recursive Structure

   Reading on Repeated Games: MWG: 12D; Chapter 12, Appendix A; K: 14.1–4; OR: Chapter 8; MS: Chapters 1–3; Miller Notes: Sections 3 and 4.

2. Signaling

   - Two Types
   - Single-Crossing Conditions
   - Refinements

   Reading on Signaling:

   MWG: 13.C; Chapter 13, Appendix A; K: 17,2, 17.3; Ali Notes; Kartik Notes: Section 5.2.

3. Dynamic Games with Incomplete Information: Applications

   - Bargaining with Incomplete Information: One and Two Period Models
   - Applications: Bargaining with Incomplete Information, Reputation Formation, Dynamic Monopoly

   Readings on Applications: K: 9.5, 13.2, 14.5–6; MS: 17, 18.

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[1]We will try to honor this request, but only the randomly selected graded questions will count towards you grade.