Strategic Behavior and Experimental Economics

Course Preliminaries

The course is research oriented and has three main purposes. The first is to review basic concepts and methods of game theory and their economic applications. The second is to critically assess game theoretic predictions in the light of people’s actual behavior in the economic laboratory. Some of the recent developments in experimental economics will be surveyed. The third is to introduce the students in the course to the methods of conducting laboratory research.

The course will include seminar type meetings and laboratory sessions. Students are required to actively participate in both class discussions and laboratory sessions. The assessment will consist of the following:

1. (10% of the grade) Problem sets. There will be two or three problems sets covering basic concepts of game theory.

2. (40% of the grade) An original research proposal in experimental economics, which will be due in the last week of classes. The proposal should contain the statement of research problem, summary of the relevant existing literature, description of experimental design, and discussion of how one intends to analyze experimental results. (Students with the best proposals will be encouraged to proceed with their research projects.)

3. (50% of the grade) Final exam An equal weight will be given to game theory and experimental economics parts.

You are encouraged to discuss any problems and research ideas with me and with each other, but your assignments should be independent. Each student is also expected to present in class several research papers in experimental economics on the topics we cover. All students are expected to actively participate in class discussions.
Given the research orientation, the amount of reading for the course will be substantial. The three texts for the course are


Gibbons is the main textbook for a review of game theory. You are also encouraged to refer to the standard graduate micro textbooks by Mas-Colell, Whinston and Green, Varian, and Kreps, and to

Fudenberg and Tirole, 1992, *Game theory*.

Davis and Holt is the main experimental economics textbook. Kagel and Roth is supplementary; it provides excellent surveys of state-of-the-art research in the key areas of experimental economics.

All these books are put on reserve in the Sinclare library.

In addition, students will be required to read, present and discuss journal articles in experimental economics. Four excellent review articles are:


Tentative Course Syllabus

The following syllabus and reading list may change during the course of the semester, depending on your preferences and on our progress. Any changes will be announced in class. I expect you to read most of the papers on the reading list.

Part I: Review of Game Theory

BASIC ELEMENTS

Topic 1 Introduction to game theory: background and motivation; noncooperative foundations; examples of games.

Topic 2 Formal structure of games: actions, strategies, payoffs; normal and extensive form; information; common knowledge; equilibrium.

Reading:
* Gibbons, Sections 1.1A, 2.4A
  MWG, Ch.7; FT 3-6, 77-90, 541-48; Kreps 11

STATIC GAMES OF COMPLETE INFORMATION

Topic 3 Dominant strategies; iterated dominance; Nash equilibrium; focal points; Cournot and Bertrand games; mixed strategies.

Reading:
* Gibbons, Sections 1.1B, 1.1C, 1.2, 1.3A

DYNAMIC GAMES OF COMPLETE INFORMATION

Topic 4 Games of Complete and Perfect information: backward induction; subgame perfect Nash equilibrium; Stackelberg game.

Reading:
* Gibbons, Section 2.1

Topic 5 Games of Complete but Imperfect information: simultaneous move; sequential move; information sets; applications.

Reading:
* Gibbons, Sections 2.2, 2.4
**Topic 6** Repeated Games: finite and infinite games; cooperation; trigger strategies; folk theorems; applications

**Reading:**

* Gibbons, Section 2.3
  

**STATIC GAMES OF INCOMPLETE INFORMATION**

**Topic 7** Types; beliefs; Bayesian updating; Bayes-Nash equilibrium; applications

**Reading:**

* Gibbons, Sections 3.1, 3.2, 3.3
  
  MWG 8.E; FT 207-226
Part II: Experimental Economics

METHODOLOGY

**Topic 1** Introduction to experimental economics; methodology

**Reading:**

*D*avis and *H*olt, Chapter 1.


GAMES

**Topic 2** Oligopoly or Public goods experiment; discussion

**Topic 3** Non-cooperative equilibrium and prisoners’ dilemma; cooperation and repeated interactions

**Reading:**

*D*avis and *H*olt, Sections 2.1, 2.5.


**Reading on learning in repeated oligopoly:**


**Reading on cooperation in experiments:**


Topic 4

- Coordination games and mixed strategies
- Extensive forms and backward induction; centipede game.
- Depth of reasoning; unraveling in guessing game.
- Discussion: features of bounded rationality.

Reading:
* Davis and Holt, Section 2.5, 2.6.

Reading on Coordination Games:

Reading on Mixed Strategies:

Reading on Backwards Induction and Depth of Reasoning:


**Topic 5** Ultimatum bargaining.

**Reading:**

*Davis and Holt, Section 5.1, 5.4.*


**Topic 6** Reconciling theory and experiments: introspection, learning and bounded rationality

**Reading:**


**MARKETS**

**Topic 7** Laboratory session: double auction

**Topic 8** Double auction and posted offer markets

**Reading:**

*Davis and Holt, Chapters 3, 4.*


Topic 9 Applications to issues in industrial organization.

Reading:


Auctions


Topic 11 Ascending and sealed bid auctions. Collusion.

Reading:

*Davis and Holt, Chapter 5.6-5.10.


Overview