1 Overview

What this class is: This is an intermediate-level, mathematically oriented class in game theory, aimed at economics PhD students (but qualified students in other departments are very much welcome to attend). The goals are twofold: to provide technical tools for studying game-theoretic problems that arise in economic models, and to discuss conceptual issues in interpreting the predictions of game theory.

What this class is not:

- A class just for micro theorists. This class is meant to provide concepts and analytical tools useful in every area of economics (and beyond).

- A first course in game theory. Technically, the mathematical content will be developed in a way that doesn’t presume game theory background; but in practice, if you haven’t taken a previous game theory class it will be steep going. (The official prerequisite is ECON 203. If you have taken a different game theory class and are unsure if you are prepared, you are encouraged to discuss with me.)

- An introduction to the research frontiers. This is intended as a foundational course, although we will run across a few relatively recent papers. ECON 290 or MGTECON 616 are more like “advanced topics” classes.

Textbooks: The main source for this class is the still-classic


Other books that will provide helpful reading for specific parts of the class are


There are also a couple more recent books that overlap substantially with parts of the class. I haven’t made them official materials for the course, and haven’t referred directly to them on the reading list, but you might find them useful:


The course will also draw on assorted papers, as listed below.

Other materials: I don’t have detailed lecture notes to distribute, although I can make outlines available. If any students are interested in typing up fully fleshed-out notes as a public good, I am happy to help coordinate.

Assignments: There will be two types of assignments.

• **Problem sets.** There will be four of these assigned (tentative due dates 4/15, 4/29, 5/13, 5/27). I will not grade these. However, you should do them carefully! They will help build your intuitions for the concepts in the course, and will also cover some classic results not covered in lecture.

  The class will collaboratively write official solutions for each problem set. Everyone who is enrolled in the class for credit is expected to pitch in. More details will be issued with the first problem set.

• **Final projects.** These do not need to be original research. Instead, you should summarize and critically review several existing papers related to some topic from this course. You can choose either pure theory papers, or papers that do more
applied modeling as long as they draw on some tools from the course. The intent is for you to dive into the literature on a topic you find interesting, and understand the motivating questions, the approaches that existing research has taken, and the challenges and possible limitations. These will be due 6/6. More instructions will emerge later.

2 Schedule of classes

The lectures will aim to adhere to the following schedule, but in practice there will probably be some adjustment.

2.1 First half: Static games

- 4/1: Basics of static games, solution concepts
  - Fudenberg & Tirole, chapters 1, 2, section 8.4
- 4/3: Knowledge and rationality
  - Osborne & Rubinstein, chapter 5
  - Fudenberg & Tirole, sections 14.1–14.2
- 4/8: Incomplete-information games
  - Fudenberg & Tirole, sections 6.1–6.6
- 4/10: Almost-common knowledge
  - Fudenberg & Tirole, section 14.4
- 4/15: Special classes of games
• 4/17, 4/22, 4/24: Supermodular games
  
  – Fudenberg & Tirole, section 12.3
  – Topkis, chapter 2, sections 3.1–3.3, chapter 4

• 4/29, 5/1: Evolutionary foundations
  
  – Fudenberg & Levine, sections 1.1–1.6, 2.1–2.4, 5.1–5.5

2.2 Second half: Dynamic games

• 5/6: Basics of dynamic games
  
  – Fudenberg & Tirole, chapter 3, sections 4.2, 8.1–8.3

• 5/8: Intuitive criterion, forward induction
  
  – Fudenberg & Tirole, sections 11.2–11.3

• 5/13, 5/15: Repeated games
  – Fudenberg & Tirole, section 5.1

• 5/20: Imperfect monitoring
  – Fudenberg & Tirole, sections 5.5–5.6

• 5/22, 5/27: Reputation
  – Fudenberg & Tirole, sections 9.1–9.2

• 5/29, 6/3: Bargaining
  – Fudenberg & Tirole, section 4.4, chapter 10