Microeconomics 2
(Game Theory)
Syllabus

Information at a glance

Course:	Game Theory
Web Site:	<http://virgo.unive.it/licalzi/game-phd.html>
Professor:	Marco LiCalzi (email: licalzi@unive.it)
Lectures:	See schedule below

Description

This course is the second in the sequence of the microeconomics core courses for the first year Ph.D. students. The goal of this course is to attain a basic knowledge of game theory at a graduate level. Topics include: games in strategic form, Nash equilibrium, Bayesian games, extensive games with perfect information, bargaining games, repeated games, and extensive games with imperfect information.

Prerequisites

It is assumed that you have knowledge comparable to an undergraduate course in microeconomics, covering elementary game theory and basic oligopoly. You are also expected to be familiar with standard material in analysis and probability at the level of the mathematical appendices in Jehle and Reny (2011[3]), *Advanced Microeconomic Theory*, or in Mas-Colell, Whinston and Green (1995).

Teaching method

There will be fifteen meetings. Slides accompanying lectures are available on the class website.

This year I am trying a different approach and I am going to model this class after the second course in the sequence of the three micro core courses for the first year Ph.D. students at UCLA. I believe that, given equal opportunities, students and faculty at UCLA or Venice would have comparable performances. We will cover about the same program.

Examination policy

Grading is comparative. The final grade is based on six weekly homework sets (30%), one midterm take-home exam (20%), and one final written exam (50%). You are expected to refrain from plagiarism or other forms of cheating.

Homework. You get a weekly homework with a maximum of three questions. Each homework is due back by the end of the last class in the following week. (The last homework is due back on the day of the final exam.) For full credit, you are **required** to return at least one fully solved exercise (out of those handed out) and at least one sketch of an attempt to answer a second one. (Of course, you may return more solved exercises if you wish.)

You can discuss the exercises with your colleagues as much as you like. (There is a lot to learn from your fellow students.) Coauthored homework is encouraged, but the same set of solutions can have at most three coauthors: all coauthors get the same grade. A student cannot have the same coauthor in more than one homework. Late homework is not accepted.

Midterm take-home exam. The take-home midterm takes place during the whole Christmas break. You are asked to prepare and solve all the exercises from the first three homework that you have not handed in before. The exam is open-book and open-notes. Discussions with colleagues are allowed, under the same rules as above. However, coauthorships are ruled out.

Final exam. The final exam takes place at the end of the course. It will have one or two new questions on material covered in the first half of the course, one or two new questions on material covered in the second half of the course, and three questions chosen from homework assigned in the last three weeks (one per week). Questions from past homework that nobody has solved or turned in are substantially more likely to be picked for the final exam. The exam is open-book and open-notes. Its length will be at least 2h00' hours and no more than 3h30' (this is going to be discussed in class).

Textbooks

The course has three main references.

1. I. Obara, *Slides from Econ 201B, Winter 2012*, UCLA.
2. M.J. Osborne and A. Rubinstein (1994), *A Course in Game Theory*, The MIT press. (This book can be downloaded from the author's website).
3. R. Gibbons (1992), *Game Theory for Applied Economists*, Princeton University Press

It is useful to keep a few more textbooks at hand. When some concept from a source is not clear, it is helpful to look it up in other books and see it from a different perspective. Among usual first-year textbooks, I strongly recommend Jehle and Reny (2011[3]), and you probably own already Mas-Colell, Whinston and Green (1995).

- G.A. Jehle and P.J. Reny (2011), *Advanced Microeconomic Theory*, third edition, Addison-Wesley. [Chapters 7–9.]
- A. Karlin and J. Peres (2017), *Game Theory Alive.*
- K. Leyton-Brown and Y. Shoham (2008), *Essentials of Game Theory*, Morgan and Claypool.
- M. Maschler, E. Solan and S. Zamir (2013), *Game Theory*, Cambridge University Press. [Chapters 3–9, 12–13, 15.]

Schedule

The course meets in December and January. Classes are on MTW (10:30-12:00, Meeting room 2). There are fifteen lectures. The schedule below summarizes dates, times, and content. There may be minor changes, that will be communicated in class.

Class	Day	Time	Topic
1	4/12	10:30-12:00	Introduction
2	5/12	10:30-12:00	Dominant strategies
3	6/12	10:30-12:00	Nash equilibrium
4	12/12	10:30-12:00	Mixed strategies
5	13/12	10:30-12:00	Rationalizability
6	19/12	10:30-12:00	Other equilibrium notions
7	20/12	10:30-12:00	Supermodular games
8	8/1	10:30-12:00	Bayesian Nash equilibrium
9	9/1	10:30-12:00	Common knowledge
10	10/1	10:30-12:00	Extensive games
11	15/1	10:30-12:00	Subgame perfect equilibrium
12	16/1	10:30-12:00	Bargaining
13	17/1	10:30-12:00	Repeated games
14	22/1	10:30-12:00	Extensive games with imperfect information
15	23/1	10:30-12:00	Signaling games
	TBD		Final exam