

Spring 2020

Economics 703: Microeconomic Theory II

Modeling Strategic Behavior: Game Theory and Mechanism Design

January 15, 2020

Instructor: George J. Mailath, PCPSE 522, 898-7908 gmailath@econ.upenn.edu;
office hours: Monday 3–4pm and Wednesday 11am–12noon, or by appointment.

Teaching assistant:

Joao Ritto: jritto@sas.upenn.edu,
office hours: Monday 1:30–2:30 (PCPSE 208) Wednesday 2:30–3:30 (PCPSE 500).

Class time and place: Tues and Thurs 1:30pm–3:00pm, PCPSE 100.

Review sessions: Fridays 10:30a.m–12noon, WILL 1.

This is a graduate introduction to game theory and mechanism design. While it is designed for first year Economics Ph.D. students, others are welcome. While I provide more background verbally on many of the examples, I assume that students have seen some undergraduate game theory (such as covered in Osborne, 2004, Tadelis, 2013, and Watson, 2013). In addition, some exposure to intermediate microeconomics and decision making under uncertainty is helpful.

Problem sets: Problem sets will be assigned every week. They are an important part of the course; you should spend a great deal of time and effort on them. You are encouraged to work in groups on the problem sets. However, before meeting in the group you should have attempted each question—groups work well when they allow you to learn from each other, they do *not* work well when they are used to facilitate a division of labor (you learn nothing from copying another student's answer; a similar comment applies to copying from previous years' solutions).

Canvas: This reading list, problem sets, and their solutions will be available on Canvas (<http://upenn.instructure.com>).

Grading and Exams: There will be one midterm exam (in class time, March 17) and a cumulative final exam after classes at the regularly scheduled time (Thursday May 7, 9am–11am). Your grade will be based one third on the midterm and two thirds on the final.

Texts:

The TEXT for the course is Mailath (2019). While the book is available from Amazon, a cheaper alternative is the *free* PDF available on my website at <http://web.sas.upenn.edu/gmailath/books/modeling-strategic-behavior/>.

Three other books you may find useful:

1. Mas-Colell, Whinston, and Green (1995). For many years the standard first year graduate micro text.

2. Kreps (1990a). While a little older (and perhaps a little idiosyncratic, though no more so than Mailath, 2019), this book is another excellent first year graduate micro text with extensive discussion of the strengths and weaknesses of game theoretic modeling. (Some of the best material from Kreps (1990a) is in Kreps (1990b).)
3. Jehle and Reny (2011). A little less technical than the other two books. If you decide to purchase this online, make sure you buy the **third edition**, which is significantly different and improved from the second edition.

Tentative Course Outline

The current course schedule with readings will be available on canvas.

1. Normal and Extensive Form Games
2. A First Look at Equilibrium
3. Games with Nature and Games of Incomplete Information
4. Existence of Nash Equilibrium
5. Dynamic Games, Sequential Rationality, Perfect Bayesian and Sequential Equilibria
6. Signaling
7. Repeated Games
8. Topics in Dynamic Games (Markov Perfect Equilibrium, the Coase conjecture, and/or Reputations)
9. Bargaining
10. Mechanism Design, Revelation Principle and Revenue Equivalence
11. Principal-Agent Settings with Hidden Action

References

- JEHLE, G. A., AND P. J. RENY (2011): *Advanced Microeconomic Theory*. Pearson Education, third edn.
- KREPS, D. M. (1990a): *A Course in Microeconomic Theory*. Princeton University Press, Princeton, NJ.
- (1990b): *Game Theory and Economic Modelling*. Oxford University Press, Oxford.
- MAILATH, G. J. (2019): *Modeling Strategic Behavior: A Graduate Introduction to Game Theory and Mechanism Design*. World Scientific Press.
- MAS-COLELL, A., M. D. WHINSTON, AND J. GREEN (1995): *Microeconomic Theory*. Oxford University Press, New York, NY.

OSBORNE, M. J. (2004): *An Introduction to Game Theory*. Oxford University Press, New York.

TADELIS, S. (2013): *Game Theory: An Introduction*. Princeton University Press.

WATSON, J. (2013): *Strategy: An Introduction to Game Theory*. WW Norton.