University of Rochester Political Science

Psc 584   Prof. Mark Fey
Game Theory   Fall 2024

Syllabus

Office: Harkness 109
Phone: x5-5810
E-mail: mark.fey@rochester.edu
Office Hours: TBA

This course is designed to teach graduate students in political science the tools of game theory. The course will cover the standard group of essential concepts and some additional topics that are particularly important in formal theory. In addition, we will cover some specific applications of game theory in political science.

The prerequisite for the course is Psc 408, or an equivalent background in basic game theory. The course picks up where Psc 408 left off, with more coverage of games of incomplete information. After covering this material, we will return to complete information for a deeper look at the theory.

Course Meetings: Lectures for the course will be twice weekly, Monday and Wednesday in Harkness 329, from 10:30 to 12:00.

Course Work: Game theory, as with most mathematical topics, is best learned by doing, rather than reading. Thus, there will be problem sets assigned (more or less) every other week covering the lecture material and readings. Due dates for the problem sets will be announced and late work will not be accepted. Solutions to the problem sets will be covered in class. The components of the final grade are: final exam (40%), midterm exam (25%), problem sets (25%), and class participation (10%).

Course Readings: I will be distributing course notes regularly and these notes will serve as the basis for the lectures.

The required text is *Game Theory*, by Drew Fudenberg and Jean Tirole, MIT Press. An additional recommended text is *Game Theory for Applied Economists*, by Robert Gibbons, Princeton University Press.

The topics for the course and the relevant sections in the textbooks are listed on the next page. Naturally, this schedule may change as the semester unfolds.

Topic 0 The Basic of Bargaining

- Fudenberg and Tirole, sec. 4.4

- Gibbons, sec. 2.1.D

- Ariel Rubinstein, "Perfect Equilibrium in a Bargaining Model," *Econometrica* 50:1 (1982), 97–110 (JSTOR)

- John Nash, "The Bargaining Problem," *Econometrica* 18:21 (1950), 155–162 (JSTOR)

Topic 1 Bayesian Games and Bayesian-Nash Equilibrium

- Fudenberg and Tirole, ch. 6

- Gibbons, ch. 3

- John C. Harsanyi, "Games with Incomplete Information Played by 'Bayesian' Players, I-III," *Management Science* 14 (1967), 159–182, 320–334, 486–502 (JSTOR)

- John C. Harsanyi, "Games with randomly disturbed payoffs: a new rationale for mixed-strategy equilibrium points," *International Journal of Game Theory* 2 (1973), 1-23

- Thomas R. Palfrey and Howard Rosenthal, "Private incentives in social dilemmas : The effects of incomplete information and altruism," *Journal of Public Economics* 35 (1988) 309–332 (link)

Topic 2 Perfect Bayesian Equilibrium and Sequential Equilibrium

- Fudenberg and Tirole, ch. 8

- Gibbons, sec. 4.1

- Drew Fudenberg and Jean Tirole, "Perfect Bayesian equilibrium and sequential equilibrium," *Journal of Economic Theory* 53 (1991), 236–260

Topic 3 Signaling Games

- Fudenberg and Tirole, sec. 11.2

- Gibbons, sec. 7.1

- Michael Spence, "Job Market Signaling," *Quarterly Journal of Economics* 87 (1973), 355–374 (JSTOR)

- In-Koo Cho and David M. Kreps, "Signaling Games and Stable Equilibria," *Quarterly Journal of Economics* 102 (1987), 179–222 (JSTOR)

- Jeffrey S. Banks and Joel Sobel, "Equilibrium Selection in Signaling Games," *Econometrica* 55 (1987), 647–661 (JSTOR)

- David Epstein and Peter Zemski, "Money Talks: Deterring Quality Challengers in Congressional Elections," *American Political Science Review* 89 (1995), 295–308 (JSTOR)

Topic 4 Preplay Communication and Cheap Talk

- Gibbons, sec. 4.3.A

- Joseph Farrell and Matthew Rabin, "Cheap Talk," *Journal of Economic Perspectives* 10 (1996), 103–118 (JSTOR)

- Vincent P. Crawford and Joel Sobel, "Strategic Information Transmission," *Econometrica* 50 (1982), 1431–1451 (JSTOR)

Topic 5 Advanced Topics in Strategic Form Games

Dominance

- Fudenberg and Tirole, sec. 11.2
- Gibbons, sec. 1.1.B

Nash Equilibrium

- Fudenberg and Tirole, sec. 1.2–1.3
- Gibbons, sec. 1.1.C & 1.3
- John Nash, "Non-Cooperative Games," *Annals of Mathematics* 54 (1951), 286–295 (JSTOR)
- Matthew O. Jackson, Leo K. Simon, Jeroen M. Swinkels, and William R. Zame, "Communication and Equilibrium in Discontinuous Games of Incomplete Information," *Econometrica* 70 (2002), 1711–1740 (JSTOR)
- R. Selten, "Reexamination of the perfectness concept for equilibrium points in extensive games," *International Journal of Game Theory* 4 (1975), 25–55

Topic 6 Advanced Topics in Extensive Form Games

Strategies

- Fudenberg and Tirole, sec. 3.1–3.4
- Gibbons, sec. 2.1

Subgame Perfection

- Fudenberg and Tirole, sec. 3.5–3.6
- Gibbons, sec. 2.2–2.4

Topic 7 More Bargaining

- Fudenberg and Tirole, sec. 4.4

Topic 8 Repeated Games

- Fudenberg and Tirole, ch. 5
- Gibbons, sec. 2.3
- Dilip Abreu, Prajit K. Dutta, and Lones Smith, "The Folk Theorem for Repeated Games: A NEU Condition," *Econometrica* 62 (1994), 939–948 (JSTOR)

Topic 9 Markov Perfect Equilibrium

- Fudenberg and Tirole, ch. 13

Topic 10 Common Knowledge

- Fudenberg and Tirole, ch. 14