University of Rochester Political Science

Psc 288/Eco 288   Prof. Mark Fey
Game Theory   Spring 2012

Syllabus

This course will focus on the basics of game theory, which analyzes individual behavior in strategic situations. These are situations in which the benefits of taking particular actions for one person depends on the actions taken by other people.

The goal of the course is to equip students with a solid understanding of game theory and how the theory can be applied to real world situations. Examples and applications will be drawn from several different areas in political science and economics, including the American Congress, voting, bargaining, price competition, international relations, political economy, and law.

Although there is no mathematical prerequisite for the course, being comfortable with mathematical reasoning and formalism will be a plus.

Professor: My office hours are Friday, 1:30-3:00, Harkness 109E. My email is markfey@mail.rochester.edu. My office phone is x5-5810.

Teaching Assistants: There are two Teaching Assistants for this course.

Jeffrey Marshall: office hours: Thursday, 10:30–11:30, Harkness 109A.
        email: jeffrey.b.marshall@gmail.com

Kerim Kavakli: office hours: Monday, 1:00-2:00, Harkness 302.
        email: kerimcan.kavakli@rochester.edu

Course Meetings: Lectures for the course will be Mondays and Wednesdays from 3:25–4:40 in Meliora 203. In addition, the teaching assistants will hold two recitations: Monday, 11:00-12:00 and Tuesday, 1:00-2:00, beginning on January 30.

Course Work: To learn this material, there is no substitute for solving problems. Therefore, there will be approximately nine problem sets during the semester. Problem sets will be due on Wednesdays in class. No late work will be accepted, but instead I will drop your lowest problem set score in calculating your final grade.

There will also be two midterms and a final exam. The first midterm will be in class on February 22 and the second midterm will be in class on

April 4. According the Registrar's schedule, the final exam will by Monday, May 7, at 8:30AM.

Your final grade will be based on the problem set (15%), the two midterms (25% each), and the final (35%).

Course Books: The main textbook for the course is *An Introduction to Game Theory* by Martin Osborne. Lectures will be based on this book.

There are a number of other good game theory texts available as optional references. The following are at a level similar to the course text:

- *Strategy*, by Joel Watson

- *Games, Strategies, and Decision Making*, by Joseph Harrington

- *Strategies and Games*, by Prajit Dutta

In addition, *Games of Strategy*, by Avinash Dixit, David Reiley, and Susan Skeath, offers a more basic introduction to some of the topics for this course.

Schedule: Below is the list of topics for the course.

Topic 0   Overview and logistics of the course

Topic 1   Strategic Form Games
     Weeks 2–6: weak and strong dominance, IESDS, pure strategy Nash
     equilibrium, mixed strategies, zero-sum games, applications, continuous
     strategy spaces

Topic 2   Extensive Form Games
     Weeks 7–9: strategies in the extensive form, backward induction, credible
     threats

Topic 3   Games of Imperfect Information
     Week 10: information sets, subgame perfection

Topic 4   Repeated Games
     Weeks 11–12: repeated prisoner's dilemma, general repeated games, folk
     theorems

Topic 5   Simultaneous Games with Incomplete Information
     Week 13: Bayesian games, types, Bayesian Nash equilibrium.

Topic 5 Sequential Games with Incomplete Information
   Weeks 14–15: Beliefs, sequential equilibrium, perfect Bayesian
   equilibrium, signaling games