University of Rochester Political Science

PSC/ECO 288   Instructor: Brad Smith
Game Theory   Spring 2017

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 political science and economics, including the American Congress, voting, bargaining, 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.

Instructor: My office hours are Friday, 2:00-3:00, Harkness 336. My email is bradley.carl.smith@gmail.com.

Teaching Assistants: There are three teaching assistants for this course.

Seda Ozturk: Office hours Tuesday 2:30pm-3:30pm Harkness 336
email: sozturk@ur.rochester.edu

Hun Chung: Office hours Wednesday 2:00pm-3:00pm Harkness 308
email: hunchung1980@gmail.com

MaryClare Roche: Office hours Monday 9:00am-10:00am Harkness 316
email: maryclare.roche@rochester.edu

Course Meetings: Lectures for the course will be Mondays and Wednesdays from 3:25-4:40 in Meliora 203.

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. However, I will drop your lowest problem set score when 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 5. According to the Registrar's schedule, the final exam will be Monday, May 8, at 8:30am.

Your final grade will be based on the problem sets (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. Of course, you may wish to supplement this with another text. The following are a few additional texts that may prove useful as optional reference material:

- *Strategy*, by Joel Watson

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

- *Strategies and Games*, by Prajit Dutta

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

- Topic 0: Introduction and Logistics

- Topic 1: Strategic Form Games

  - Weak and strong dominance, IESDS, pure strategy Nash equilibrium, mixed strategies, zero-sum games, applications, continuous strategy spaces

- Topic 2: Extensive Form Games

  - Strategies in the extensive form, backward induction, credible threats

- Topic 3: Games of Imperfect Information

  - Information sets, subgame perfection

- Topic 4: Repeated Games

  - Repeated prisoner's dilemma, general repeated games, folk theorems

- Topic 5: Simultaneous Games with Incomplete Information

    - Bayesian games, types, Bayesian Nash equilibrium

- Topic 6: Sequential Games with Incomplete Information

    - Beliefs, sequential equilibrium, perfect Bayesian equilibrium, signaling games