

GAME THEORY AND ECONOMIC ANALYSIS, ECONOMICS 521, FALL 2009
PROF. MARZENA ROSTEK
UNIVERSITY OF WISCONSIN-MADISON



SYLLABUS

TIME AND LOCATION: MW 2:30-3:45PM, 6240 SS

COURSE DESCRIPTION: Game theory studies behavior in strategic situations, in which agents' payoffs depend on behavior of others. The goal of this course is to teach you how to think strategically and how to predict outcomes of interactive situations. I will introduce you to the key concepts and tools of game theoretic analysis. Applications of game theory extend well beyond economics to political science, biology, anthropology, sociology, and other fields. We will analyze some of these applications in class. We will also play some games.

COURSE TEXT: *Games, Strategies, and Decision Making* by Joseph Harrington, Worth Publishers, 2009. You can view the table of contents and sample chapters online at:

<http://www.worthpublishers.com/newcatalog.aspx?search=harrington&isbn=0716766302>

This is the only required textbook and I recommend that you buy it. For those of you who would like to see an alternative treatment, I also recommend: *An Introduction to Game Theory* by Martin J. Osborne, Oxford University Press, 2003, of which table of contents as well as the first three chapters you can view online at:

<http://www.economics.utoronto.ca/osborne/igt/index.html>

or *Strategies and Games: Theory and Practice* by Prajit K. Dutta, MIT Press, 1999 (it is a Google book).

PREREQUISITES: Econ 301 and Math 222 (or my consent).

CONTACT INFORMATION: My office hours are on Mondays, 4:00-5:30pm in 7432 SS or by appointment. You can reach me by e-mail at mrostek@ssc.wisc.edu or by phone at 608.262.6723.

COURSE WEBSITE: Readings will be announced before each class at:

<http://www.ssc.wisc.edu/~mrostek/521.htm>

Course material can be accessed through Learn@UW (<https://learnuw.wisc.edu>).

EVALUATION: Your grade will be determined by: Weekly problem sets (20%); Two midterm exams (2x20%); Final exam (40%).

Exam dates: Midterm 1: Oct 7 (W, in class); Midterm 2: Nov 11 (W, in class); Final: Dec 23 (W, 12:25-2:25 pm).

Please plan ahead. If extraordinary circumstances prevent you from taking the midterm, you will need a written excuse from the Dean to take a makeup exam.

Problem sets will be posted every Wednesday before class. Late problem sets will not be accepted. The last “problem set” will be an assignment: You will be asked to pick an economic phenomenon and write a short (one-page) analysis/explanation using game-theoretic tools. I encourage you to think about an interesting problem as we move along.



SOME ADVICE: The pace of the course will be quite fast. Therefore, it is essential that you study and read systematically. Solving problem sets will be the key to your fully understanding the fine details of game theory. (It is also the best way to prepare for the midterms and the final.) You might find it helpful to complete the readings prior to lectures. I strongly encourage you to discuss the course material and problem sets with your classmates. The assignments must be written individually (read: in your own words).

COURSE OUTLINE:

Week 1: Normal form games, Dominance

Week 2: Best response, Iterative elimination

Week 3: Nash equilibrium

Week 4: Mixed strategies

Week 5: Applications

Week 6: Review, Midterm 1

Week 7: Extensive-form games with perfect information, Subgame perfection

Week 8: Mover advantage, Applications

Week 9: Bargaining, Extensive-form games with imperfect information

Week 10: Evolutionary game theory

Week 11: Review, Midterm 2

Week 12: Finitely and infinitely repeated games

Week 13: Games with incomplete information

Week 14: Applications

Week 15: Applications

Week 16: Auctions, Review

(The schedule might be subject to minor changes.)