

Econ 490 – Syllabus
Game Theory
Spring 2008

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Lecture Time and Location:

Tues & Thurs 1:00PM – 2:15PM, BS 222

Course Description:

This course is an introduction to *game theory*, the study of strategic behavior among parties having opposed, mixed or similar interests. This course will sharpen your understanding of strategic behavior in encounters with other individuals--modeled as *games*--and as a participant in broader *markets* involving many individuals. You will learn how to recognize and model strategic situations, to predict when and how your actions will influence the decisions of others and to exploit strategic situations for your own benefit.

Learning Objectives:

The aim of the course is to provide you with sufficient knowledge of game theory to understand strategic interactions among people or organizations in order to maximize their own payoffs. In studying game theory, you will be able to think strategically, understand and explain a wide range of problems from oligopoly pricing to the evolution of trust. We will use mathematical tools to formalize the analysis, but economic intuition will be equally important. This course focuses on non-cooperative game theory and its applications. The major topics covered are decision theory, strategic form games, extensive form games, Bayesian games, mechanism design, infinite horizon games, repeated games and evolutionary games. Relevant experimental results will be discussed, and as part of the class you will participate in several in-class experiments.

Prerequisites:

You should be aware that game theory emerged as a branch of applied mathematics. I will try to keep the level of mathematics to a minimum and emphasize on conceptual analysis. However, you should have basic knowledge of calculus (e.g. functions of one or several variables, derivatives) and probability theory (e.g. random variables, probability distribution, expectation).

Textbooks:

Required: *An Introduction to Game Theory* Martin Osborne, Oxford University Press, 2004. ISBN 0-19-512895-8; ISBN-13: 978-0-19-512895-6.

Optional: Robert Gibbons, *Game Theory for Applied Economists*, 1992

Grading:

Midterm 1	25%
Midterm 2	25%
Final Exam	40%
Course Participation	10%

There will be several assignments to help students practice and prepare for exams. I will distribute several problem sets. They will not be collected. However, students should consider them as reviews for the midterm and final. I strongly encourage you to work together on the problem sets. Form study groups and meet regularly. However, you should be sure that you master the material yourself as there will not be group work on the tests.

The course participation includes participating in-class experiments, discussions, and group projects.

There will be No make up exam. All questions regarding grades of exams must be asked during office hours within ONE WEEK of the time that your exam grade is announced.

Grade Scale: This course uses the standard University +/- system for A (90-100); B (70-89); C (70-79); D (60-69); Below 60 = F. (in percent):

<u>Grade</u>	<u>Point Range</u>	<u>Grade</u>	<u>Point Range</u>	<u>Grade</u>	<u>Point Range</u>
A+	96.7 – 100	A	93.4 – 96.6	A-	90.0 – 93.3
B+	86.7 – 89.9	B	83.4 – 86.6	B-	80.0 – 83.3
C+	76.7 – 79.9	C	73.4 – 76.6	C-	70.0 – 73.3
D+	66.7 – 79.9	D	63.4 – 66.6	D-	60.0 – 63.3
F	Below 60.0				

Student Academic Rights and Responsibilities:

The University Code of Student Rights and Responsibilities establishes the rights to which the student is entitled and the responsibilities the student must assume. Along with preparing and attending class, each student has the responsibility of promoting high academic standards. High academic standards will not allow the College of Business and Public Administration to tolerate cheating, plagiarism, disruption of class, or other inappropriate classroom behavior. The College of Business and Public Administration has a strong policy of action against students who cheat, plagiarize, or conduct themselves inappropriately in the classroom. Proven cases of cheating or plagiarism will normally result in a grade of F with the student being denied admission to or dismissal

from the College. Inappropriate classroom behavior will result in the student being withdrawn from the class.

Tentative Course Schedule:

<u>Dates</u>	<u>Topics</u>	<u>Readings</u>
<u>Static games of complete information</u>		
Jan 8, Tues	Introduction	Ch 1
Jan 10, Thurs	Decision Theory	Ch 1
Jan 15, Tues	Strategic Game	Ch 2
Jan 17, Thurs	Nash Equilibrium	Ch 2
Jan 22, Tues	Nash Equilibrium Continued	Ch 2
Jan 24, Thurs	Applications	Ch 3
Jan 29, Tues	Mixed Strategy Equilibrium	Ch 4
Jan 31, Thurs	Mixed Strategy Equilibrium Continued	Ch 4
<u>Dynamic games with complete information</u>		
Feb 5, Tues	Extensive Games	Ch 5-7
Feb 7, Thurs	Backward Induction	Ch 5-7
Feb 12, Tues	Midterm 1	
Feb 14, Thurs	Applications	Ch 5-7
Feb 19, Tues	Extensive-form representation of Games	Ch 5-7
Feb 21, Thurs	Subgame Perfect Equilibrium	Ch 5-7
Feb 26,	Last day to withdraw.	
Feb 26, Tues	Repeated Games	Ch 14 -15
Feb 28, Thurs	More Applications	Ch 14 -15
<u>Static games of incomplete information</u>		
March 4, Tues	Bayesian Games	Ch 9
March 6, Thurs	Bayesian Nash Equilibrium	Ch 9
March 11, Tues	Midterm Break	
March 13, Thurs	Midterm Break	
March 18, Tues	Applications	Ch 9
March 20, Thurs	Midterm 2	
<u>Dynamic games with incomplete information</u>		
March 25, Tues	Perfect Bayesian Equilibrium	Ch 10
March 27, Thus	Signaling Games	Ch 10
Apr 1, Tues	Applications	Ch 10
<u>Other topics</u>		
Apr 3, Thurs	Asymmetric Information and Mechanism Design	Lecture notes
Apr 8, Tues	Applications	Lecture notes
Apr 10, Thurs	Evolutionary Games	Ch 13
Apr 15, Tues	Applications	Ch 13
Apr 17, Thurs	Final Review	
Apr 25, Fri	Final Exam 2:30PM - 5:00PM	