Philadelphia University
Faculty of Science
Department of Basic Sciences and Mathematics
Spring 2008/2009

Course Syllabus			
Course Title	Game Theory	**Course Code**	250476
Course Level	"4"	**Course Prerequisite**	Math. "250241"
Lecture Time		**Credit Hours**	"3"

Academic Staff Specific				
Name		**Office Hours**	Sun.	
Rank			Mon	
Office Number			Tue.	
Location	Faculty of Science		Wed.	
E – mail			Thu.	

Course Description:

In this course on game theory, we will be studying a range of mathematical models of Conflict and cooperation between two or more agents.

Course Objectives:

1. **To give an overview of a broad range of models that are studied in game theory.**
2. **To discuss the main concepts in the game theory.**
3. **To explain the classes of games .**
4. **To study the mathematics associated to zero-sum games.**
5. **To discuss the application of game theory .**

Course components (Text Book):

Title	**:**	An Introduction to Game Theory
Author	**:**	Martin J. Osborne
Publisher	**:**	**Oxford University Press, USA**
Edition	**:**	10^{th} Edition.
Year	**:**	2008
ISBN	**:**	0195128958

Teaching methods:

1. To learn it is imperative for the student to take an active interest in their own education. To learn mathematics the student must read, think, and write in an analytical manner and this takes practice. Such practice is by working exercises. When troubles arise, and they will, the student must ask questions. Questions may be posed to the instructor or to other students in a variety of ways; online office hours, or in class.
2. Homework will be assigned each week; not to be collected or graded by the instructor. In addition, at the end of a chapter, challenge problems will be assigned for "work–hard" students. Further more, mathematical projects on game theory problems will be assigned to the students through out the semester.
3. Learn the students how to:
    a. Understand the main concepts on game theory.
    b. Explain the classes of games .
    c. Know the mathematics associated to game theory.
    d. Use the applications on game theory in real-life problems.

Learning outcomes:

- **Knowledge and understanding** .
  1. Be familiar with the main concepts on game theory.
  2. Use the Minimax (Maximin) criterion.
  3. Derive the classes of games.
  4. Use matrix games .
- **Cognitive skills (thinking and analysis).**
  To identify and solve problems in real-life . Work with given information , form games classes and try to solve them.
- **Communication skills (personal and academic).**
  Encourage the students to be self starters (creativity, decisiveness, initiative) and to finish the mathematical problems properly (flexibility, adaptability). Also to improve general performance of students through the interaction with each other in solving different game problems.
- **Practical and subject specific skills (Transferable Skills).**
  Gaining knowledge and experience of working with certain game theory problems in real-life .

Assessment instruments

Allocation of Marks	
Assessment Instruments	**Mark**
First Examination	20
Second Examination	20
Homeworks and Projects	10
Final Examination	50
Total	**100**

Course academic calendar

Week	
(1)	Introduction
(2)	Impartial Combinatorial Games
(3)	Impartial Combinatorial Games
(4)	Two-Person Zero-Sum Games
(5)	Two-Person Zero-Sum Games
(6) **First examination**	Two-Person Zero-Sum Games
(7)	Two-Person Zero-Sum Games
(8)	Two-Person General-Sum Games
(9)	Two-Person General-Sum Games
(10)	Two-Person General-Sum Games
(11) **Second examination**	Two-Person General-Sum Games
(12)	Games in Coalitional Form
(13)	Games in Coalitional Form
(14)	Games in Coalitional Form
(15)	Games in Coalitional Form
(16) **Final Examination**	Review.

Expected workload:

On average students need to spend, at least, 9 hours of study and preparation per week for this course.

Attendance policy:

Absence from lectures shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references:

Title : Game Theory
Author : Thomas S. Ferguson

Title : Game Theory
Author : Drew Fudenberg

Title : Game Theory for Applied Economists
Author : Robert Gibbons

Website:

http://ecourse.philadelphia.edu.jo/login/index.php