

Game Theory and Application
ECO 4400
Summer A 2017 Syllabus

Course Information

Class Meeting: M, T, & W 11:00 am - 1:45pm; TH 11:00 am - 12:15pm

Classroom: HVNR 240.

Instructor: Dr. Wenche Wang, wangwc121@ufl.edu.

Office Hours: M & W 3pm - 5pm; other times may be available by appointment.

Office Hour Location: E261 UF Informatics Institutes E261 (next to the Marston Science Library)

Course Description

This course introduces some basic elements of Game Theory and discusses its economic applications. Game Theory is an analysis of situations in which the payoff from an individual's actions depend on the actions of others. It provides a formal framework and solution concepts to understand such situations and to make better strategic decisions. Game Theory has been widely applied in fields such as economics, political sciences, biology, and computer science.

Game Theory is a branch of applied mathematics. Rather than focusing on mathematical proofs or programming, this course emphasizes on the conceptual analysis and its economic applications. The math requirement is limited to basic calculus but more advanced mathematics techniques would help with understanding the game theory reasoning.

Prerequisites

ECO 2023 Principles in Microeconomics

Calculus I

Textbook

No textbook is required for this class. The following textbook is recommended if you would like to do further reading on the material.

Games, Strategies, and Decision Making, by Joseph Harrington, Worth Publishers. ISBN 1429239964.

Attendance Policy

Attendance is mandatory in this class, especially given the compact nature of a summer course. There will be quizzes at the beginning of class and in-class exercises. And I do not use presentation slides or post class notes. You must notify me at least two days in advance for excused absences, such as doctor's appointments and job interviews, in order to make up for in-class quizzes.

Classroom Policy

- Talking in class constitutes class disruption. You are welcome to raise questions regarding class materials but other discussion is not allowed.
- Please switch your cell phone to silent mode to avoid distracting the instructor and other students.

- You must have your laptop turned off during class. Laptops are not useful in taking notes in this class.
- Students with disabilities who require room accommodations should contact me early in the semester to discuss individual needs.
- Please check your e-mail regularly for any announcements.

Academic Honesty

Academic dishonesty (such as plagiarism and cheating on exams) will be referred to Student Conduct and Conflict Resolution and may result in a failing grade in the course. Further penalties can also be assessed by Student Conduct and Conflict Resolution.

Grading Policy and Scale

Your grade is determined by your performance in homework assignments, quizzes, exams, a final project, and class participation.

- *Homework*
There will be a total of five problem sets that will be distributed before the relevant materials are covered. We will work on the first few parts of the problems together at the end of each class. You will complete the rest of the problems after class. **Please bring the entire problem set to each class.** Discussion is encouraged and you can turn in answers in a group of no more than four students. Homework will be collected at the beginning of the class period. No late submission is accepted.
- *Quiz*
There will be in-class quizzes at the beginning of class. These quizzes test basic understanding of models and concepts covered in the previous lectures. There is no make-up quiz.
- *Exam*
There will be two midterm exams. The exams will be held during regular class periods.
- *Final Project*
Instead of a final exam, you are required to complete a final project. This project asks you to write an incomplete information game question to test your classmates' understanding of the material. Additionally, you will be responsible for grading your classmates. The final project can be completed in groups.

More specifically, the project consists of three parts:

1. Write a question on incomplete information game. You need to specify the background of the game, who the players are (sender and receiver), what strategies do the players have, and the payoffs associated with each strategy profile. Clearly state your question(s). Please type and print your question and distribute them in class.
2. Present your question and answer any clarification question your classmates may have. Leave 15 to 20 minutes for the class to work on the problem. Collect the completed questions before explaining your answer.
3. Grade your classmates. Make sure you maintain the same grading standard for each student. Submit your grades by the end of Friday, June 16.

Your final project will be graded on the following parts:

1. The relevancy and completeness of your signaling game and the correctness of your answer key.
2. Your presentation of the game and the answer as well as your ability to answer students' questions.
3. Your grades from completing other students'/groups' questions.

If you need assistance writing the game, please submit your draft to me or meet me before Tuesday, June 13th. I can proofread your question. I won't, however, check your answer keys.

- *Participation*

In-class participation is highly encouraged. You will be given a lot of in-class exercises. While these exercises are not graded, you can receive extra credits by volunteering to present your answers. When there is no volunteer, a student will be selected at random to present in class. If a student is selected but is absent from class, a point will be deducted from his overall final grade. Students who participate in class can receive up to 5 points of extra credits towards their final grades.

Scale	
Homework	20%
Quiz	20%
Midterm 1	20%
Midterm 2	20 %
Final Project	20%

90-100	A
87-90	B+
80-87	B
77-80	C+
70-77	C
67-70	D+
60-67	D
0-60	E

Calendar (tentative)

Dates	Topics	Assignment	Quiz
May 8	Introduction & Math review I Expected utility, Strategic form games		
May 9	Dominant strategies Nash equilibrium		
May 10	N-Player game Mixed strategies		<i>Quiz 1</i>
May 11	Summary and Review of Strategic Form Games		
May 15	Extensive form game Backward induction, Subgame perfection	<i>Homework 1</i>	
May 16	Backward induction, Subgame perfection Summary and Review of Extensive Form Game		
May 17	Review	<i>Homework 2</i>	<i>Quiz 2</i>
May 18	Midterm 1		
May 22	Cournot Model		
May 23	Stackelberg Model		
May 24	Bertrand Model		<i>Quiz 3</i>
May 25	Summary and Review of Oligopoly		
May 29	Memorial Day – No Class		
May 30	Math review II Repeated games	<i>Homework 3</i>	<i>Quiz 4</i>
May 31	Repeated games		
Jun 1	Review	<i>Homework 4</i>	
Jun 5	Midterm 2		
Jun 6	Incomplete Information Games (Static Game)		
Jun 7	Incomplete Information Games (Dynamic Game)		
Jun 8	Signaling Games		
Jun 12	Summary and Review of Incomplete Information Games	<i>Homework 5</i>	<i>Quiz 5</i>
Jun 13	Other Topics		
Jun 14	Final Project Presentation and Discussion		
Jun 15	Final Project Presentation and Discussion		