

ECO 4400: Game Theory and Applications

Syllabus

Instructor: Luca Mantegazza
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Fall 2018
Course Time: T/R period 7-8
Course Location: MAT 107

Prerequisites: Principles in Microeconomics (ECO 2023 *or equivalent*) and Calculus I (MAC 2233 *or equivalent*)
[suggested only] Intermediate Microeconomics (ECO 3101 *or equivalent*)

Optional Texts: “Political Game Theory: an introduction” by N. McCarty and A. Meirowitz,
“An Introduction to Game Theory” by Martin J. Osborne,
“Game Theory” by M. Maschler, E. Solans and S. Zamir

COURSE DESCRIPTION

This course examines the main ideas and tools in the field of Game Theory and it is divided in to three main sections: foundations of non-cooperative game theory, advanced topics in non-cooperative game theory and mechanism design, cooperative game-theory and behavioral economics. The main goal of the course is for the student to understand the logic and the reasons behind the main topics explained in class and their applications to real life problems. For this reason, the focus of each lecture will be more on the understanding of each tool and idea and less on its mathematic description and discussion. However, this does not mean that mathematic applications will not be discussed in class or required to succeed in the tests.

COURSE REQUIREMENTS AND GRADING

1. Class presence and participation (10% of the final grade):

Attendance is highly correlated with better grades and thus strongly encouraged. You are required to be in class on time as a form of respect towards both the instructor and your classmates. I will take attendance at the start of each class but I will not use the Canvas system to automatically take off points for missed classes and late arrivals; at the end of the course I will weigh the number of absences and delays with participation in class to determine the contribution to the final grade. Timely and appropriate justification are encouraged and appreciated. If you have missed a class, it is your responsibility to find out relevant information from other students – therefore make sure you have the contact details of at least one other student in the class. In order to show respect for classmates and the instructors and to improve the learning experience for everybody, the use of cell phones, email, texting etc. is not tolerated. You can use your electronic devices only to take notes even though I strongly encourage you to use pen and notepad since during most classes we will study and analyze graphs, diagrams, and tables.

2. Two midterm tests (20% each, for a total of 40% of the final grade)

Each test will cover all the topics presented after the previous midterm, or the beginning of the course in the case of the first midterm, up to the last class before the midterm. The tests dates are: September 27 and November 1. Each midterm will last the two periods of the class on that day and will consist of a combination of short open answer questions, and mathematical and/or analytical exercises.

3. Group project (20% of the final grade, 10% for the project and 10% for the presentation)

The group project will analyze a real-world topic using the tools studied in class. Each project, to be submitted exclusively in a PDF form, must include a short presentation of the topic with a few sources (newspapers articles, academic papers, etc.), four games analyzing the topic, two examples of comparative statics, and an example of mechanism design. More specifically, the project must include one normal form game, one extended form game without uncertainty, one game with uncertainty (either a Bayesian game or an extended form game), and a fourth game of the types covered in class (i.e. repeated game, bargaining game, coalitional game). The “mechanism” must be applied to the topic analyzed in the first part of the project. The project will be presented to the other students during one of the final classes of the course. During the presentation, I will ask question about the theory used to prepare the project. The grade for the project will be determined by both the quality and originality of the work submitted. The grade for the presentation will depend on the performance of each student during the presentation. Since I will ask questions to each member of the group individually, the grade for the presentation could vary across group members, while the grade for the project will be the same for each member of the group.

IMPORTANT: Students are required to attend both days, first out of respect for their classmates’ work and second because it is a good opportunity to review the main topics before the finals. Unjustified absence during one presentation day will result in a score of 0% for the presentation. The size of the group and the time allotted to each presentation will depend on the number of students taking the class.

4. Final cumulative test (30% of the final score)

The test will cover some of the topics presented during the whole course with a particular focus on the topics covered after the second midterm.

GRADING POLICY AND SCALE

- Grades are calculated as follows: Attendance (10%), Midterm 1 (20%), Midterm 2 (20%), Group Project (20%), Final test (30%).
- Make-up exams must be arranged before the exam date/time and will only be offered for UF-related conflicts and religious holidays.
- Unexcused absences from in-class exams results in a grade of 0.
- No Extensions No Substitute Work

91.00-100	A
89.00-90.99	A-
87.00-88.99	B+
78.00-86.99	B
76.00-77.99	B-
74.00-75.99	C+
61.00-73.99	C
59.00-60.99	C-
57.00-58.99	D+
51.00-56.99	D
50.00-50.99	D-
0-49.99	E

A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

---AND---

<http://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

UF POLICIES AND ASSISTANCE

Attendance:

Absences will be excused in accordance with UF policy. Acceptable excuses include illness, religious holidays, military obligation, & the 12-day rule. More info about attendance and make-up policies can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Academic Honesty:

The University places a high premium on academic honesty. Accordingly, severe penalties are imposed for plagiarism and other instances of deception or fraud. The university's policies regarding intellectual honesty are detailed in the Student Honor Code (see <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>).

Counseling:

If you are ever having general issues with your coursework in any course or trouble in your personal life, please seek help from myself or another faculty member. I also encourage you to utilize the FREE and ANONYMOUS services of the UF Counseling and Wellness Center (352-392-1575; <http://www.counseling.ufl.edu/cwc/>).

Disabilities:

Students with disabilities can request classroom accommodations. They should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) and then bring the provided accommodation letter to the instructor.

Online Course Evaluations:

Students' feedback on the quality of instruction is extremely useful to the instructor to improve the quality of the course, therefore I strongly encourage you to conduct the online evaluation at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>.

CALENDAR

References' code:

- (1) "Political Game Theory: an introduction" by N. McCarty and A. Meirowitz,
- (2) "An Introduction to Game Theory" by Martin J. Osborne,
- (3) "Game Theory" by M. Maschler, E. Solans and S. Zamir

Lecture	Date	Topic	References		
			(1)	(2)	(3)
1	Aug 23	Syllabus + Choice theory under certainty	Ch.2	X	Ch.2
<u>Non-cooperative Games: Foundations</u>					

2	Aug 28	Normal form games: theory and applications	Ch.5	Ch.2	Ch.4
3	Aug 30	Normal form games: theory and applications	Ch.5	Ch.2	Ch.4
4	Sep 4	Mixed Strategies in Normal form games	Ch.5	Ch.4	Ch.5
5	Sep 6	Extensive form Games: theory	Ch.7	Ch.5	Ch.3 + Ch.7
6	Sep 11	Extensive form Games: applications	Ch.7	Ch.6	Ch.3
7	Sep 13	Choice theory under uncertainty	Ch.3	X	Ch.2
8	Sep 18	Bayesian Games	Ch.6	Ch.9	Ch.9
9	Sep 20	Extensive form games under uncertainty	Ch.8.1	Ch.10	Ch.7
10	Sep 25	<i>Personal study before the midterm</i>			
11	Sep 27	<i>FIRST MIDTERM & DEADLINE choice of the group project</i>			
<u>Advanced Non-cooperative Games and Mechanism Design</u>					
12	Oct 2	Signaling games: theory	Ch.8.2	Ch.10	X
13	Oct 4	Signaling games: applications	Ch.8	Ch.10	X
14	Oct 9	Repeated games: theory	Ch.9	Ch.15	Ch.13
15	Oct 11	Repeated games: applications	Ch.9	Ch.14	Ch.13
16	Oct 16	Bargaining Theory	Ch.10	Ch.16	Ch.15
17	Oct 18	Social Choice Theory	Ch.4	X	Ch.21
18	Oct 23	Mechanism Design	Ch.11	X	Ch.12
19	Oct 25	Mechanism Design	Ch.11	X	Ch.12
20	Oct 30	Maxminimization and zero-sum games	X	Ch.11	Ch.4
21	Nov 1	<i>Personal study before the midterm</i>			
22	Nov 6	<i>SECOND MIDTERM</i>			
<u>Cooperative Games and Behavioral Economics</u>					
23	Nov 8	Coalitional Games: transferable payoffs	X	Ch.8	Ch.16
24	Nov 13	Coalitional Games: solution mechanisms	X	Ch.8	Ch.17-18
25	Nov 15	Coalitional Games: matching	X	Ch.8	Ch.22
26	Nov 20	Behavioral Economics: introduction	Readings provided in class		
27	Nov 24	<i>DEADLINE submission of the project</i>			
	Nov 27	Behavioral Economics: introduction	Readings provided in class		
28	Nov 29	<u>Presentations</u>			
29	Dec 4	<u>Presentations</u>			
Exam week		<u>Finals</u>			