ECO 4400: Game Theory and Applications
Syllabus

Instructor: Luca Mantegazza   **Spring 2020**
Office: MAT 329   **Course Time: T/R period 3-4**
Office Hours: W period 3 - 4 (or by appointment)   **Course Location: MAT 18**
Email: mantegazza@ufl.edu
Phone: 392-0117

<u>**Prerequisites**</u>:	**Principles in Microeconomics (ECO 2023** *or equivalent*) **and Calculus I (MAC 2233** *or equivalent*) **[suggested only] Intermediate Microeconomics (ECO 3101** *or equivalent*)
<u>**Optional Texts**</u>:	**"Political Game Theory: an introduction" by N. McCarty and A. Meirowitz** **"Introduction to Game Theory" by Martin J Osborne** **"Game Theory: An introduction" by Steven Tadelis**

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, non-cooperative game theory with uncertainty and behavioral economics, mechanism design and cooperative game-theory. 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 (5% 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. ***Three midterm tests (15% each, for a total of 45% 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. 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.
See the calendar below for the exact dates

3. *Group project (50% of the final grade)*

The group project will analyze a real-world topic using the tools studied in class. Each project consists of four sections to be submitted at different dates during the semester: the first two sections relates to the topics in the first module of the course and the other two sections relates to the last two modules of the course. Since the first two sections cover easier topics, they are worth 10% each of the final grade, while the last two sections are worth 15% each of the final grade. Each section is further divided into sub-parts: each group member will be responsible for specific sub-parts and the grade for each section of the project is calculated as the average of the grade of the parts the student was responsible for and the average grade of the section. This should encourage students to work together to improve the overall quality of the project while rewarding additional effort of individual students. Additional instructions will be provided during class and on Canvas. During the classes dedicated to revision, I will randomly ask students to present their parts of the project to the class. This should help reviewing the material and also control that each student actually completed the assigned sub-parts. Ideally, each group will consist of four students, but the actual number will depend on the number of students taking the class. All works must be submitted exclusively as a PDF file by the deadline.
See the calendar below for the exact dates

GRADING POLICY AND SCALE

• Grades are calculated as follows: Class attendance and participation (5%), Midterm 1 (15%), Midterm 2 (15%), Midterm 3 (15%), Group Project: Part 1 (10%), Group Project: Part 2 (10%), Group Project: Part 3 (15%), Group Project: Part 4 (15%).
• 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: an Introduction" by Steven Tadelis

Lecture #	Date	Topic	References		
			(1)	*(2)*	*(3)*
1	Jan 7	Syllabus + Choice theory under certainty	Ch.2	X	Ch.1
2	Jan 9	Description of the Group Project			
Non-cooperative Games: Foundations					
	Jan 14	*Deadline for the choice of the Group*			

3	Jan 14	Normal form games: theory and applications	Ch.5	Ch.2	Ch.3-5
4	Jan 16	Normal form games: comparative statics	Ch.5	Ch.2	Ch.3-5
5	Jan 21	Mixed Strategies in Normal Form Games	Ch.5	Ch.4	Ch.6
6	Jan 23	Max-minimization and zero-sum games	X	Ch.11	X
	Jan 26	*Deadline first part of the Group Project*			
7	Jan 28	Extensive form Games: theory	Ch.7	Ch.5	Ch.7
8	Jan 30	Extensive form Games: applications	Ch.7	Ch.6	Ch.8
9	Feb 4	Repeated games: theory	Ch.9	Ch.15	Ch.10
10	Feb 6	Repeated games: applications	Ch.9	Ch.14	Ch.10
	Feb 9	*Deadline second part of the Group Project*			
11	Feb 11	*Review before the midterm and group presentations*			
12	Feb 13	**FIRST MIDTERM**			
Non-cooperative Games: Uncertainty and Behavioral Economics					
13	Feb 18	Choice Theory under uncertainty	Ch.3	X	Ch.2
14	Feb 20	Bayesian Games	Ch.6	Ch.9	Ch.12
15	Feb 25	Extensive form games under uncertainty	Ch.8.1	Ch.10	Ch.15
16	Feb 27	Signaling games and applications	Ch.8.2	Ch.10	Ch.16
		Spring Break			
	Mar 8	*Deadline third part of the Group Project*			
17	Mar 10	Signaling games and applications	Ch.8.2	Ch.10	Ch.18
18	Mar 12	Behavioral Economics: Introduction	Readings provided in class		
19	Mar 17	*Review before the midterm and group presentations*			
20	Mar 19	**SECOND MIDTERM**			
Mechanism Design and Cooperative Games					
21	Mar 24	Social Choice Theory	Ch.4	X	X
22	Mar 26	Mechanism Design	Ch.11	X	Ch.14
23	Mar 31	Mechanism Design	Ch.11	X	Ch.14
24	Apr 2	Mechanism Design	Ch.11	X	Ch.14
25	Apr 7	Coalitional Games: theory	X	Ch.8	X
26	Apr 9	Coalitional Games and the Core: applications	X	Ch.8	X
27	Apr 14	Coalitional Games and the Core: applications	X	Ch.8	X
28	Apr 16	*Review before the midterm and group presentations*			
29	Apr 21	**THIRD MIDTERM**			