GAME THEORY AND INDUSTRIAL ORGANIZATION

Bachelor in Philosophy, Politics, Law and Economics PPLE
SEP-2023 GTIO-PP.3.M.A

Area Economics
Number of sessions: 30
Academic year: 23-24
Degree course: THIRD
Number of credits: 6.0
Semester: 1º
Category: COMPULSORY
Language: English

Professor: **CARLOS PARRA LOPEZ**

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Prof. Parra has a professional background in transport consulting as economic adviser and analyst, working for public administrations and state-owned firms in project evaluation, regulatory and policy advice. He holds a MSc. in Industrial Economics and Markets from Universidad Carlos III de Madrid (UC3M) and a bachelor degree in Economics from Universidad Complutense de Madrid (UCM). Prof. Parra also teaches Game Theory and Microeconomics at Universidad Carlos III de Madrid, as associated professor. Currently, he is working on his PhD thesis as well.

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SUBJECT DESCRIPTION

Game Theory consists of a mathematical approach for strategy and decision making. Real-life situations are decomposed, modelized and analysed by identifiying its main components, such as the number of actors, the range of strategies available to them, the possible outcomes deriving from their interactions or the timing of the relevant events. This analysis enables to design optimal decision making, and most important, to build efficient mechanisms in which agents interact as the design is intended to. This subject has applications in several areas, such as politics or psycology, but specially in economics.

Industrial Organization, on the other hand, is a branch of Microeconomics dedicated to the study of markets and firms behaviour via competition models. Knowing the structure and the type of competition present in markets allows to asses their efficiency and how the different agents participate of the resulting supluss. This is of key importance in order to make any policy reccomendations to regulate an industry.

PREREQUISITES

Foundations of Microeconomics (Theory of the Firm) and Mathematics (differential calculus and algebra).

LEARNING OBJECTIVES

Students will learn how to decompose, modelize and analyse real-life situations in order to derive optimal decision-making. The course will go over the basic types of games (static and dynamic) so students get familiar with the main concepts of the subject, acquaring a new perspective complementing their views in politics, business and economics.

Students will also learn how to analyse markets' structure. The main types of competition will be studied, focusing on how they affect production, efficiency and surpluss sharing. Students will also go over basic concepts for public intervention in markets, such us market failures or the role of regulators and competition authorities.

TEACHING METHODOLOGY

Lectures will be held weekly in an "in-person" format, and will cover the broad contents of the course. Sessions are to be divided into theoretical and practical. In theoretical sessions, students might have to read selected pieces of text before hand so they can understand the concepts explained by the professor over the lesson. As for practical sessions, students will have to work on problem sets that will be solved at class by volunteers and the teacher. Participation in class is expected in all sessions. At the end of the course, the students will briefly present to the class a topic related to the contents studied.

Learning Activity	**Weighting**	**Estimated time a student should dedicate to prepare for and participate in**
Lectures	30.0 %	45.0 hours
Discussions	10.0 %	15.0 hours
Exercises in class, Asynchronous sessions, Field Work	20.0 %	30.0 hours
Group work	10.0 %	15.0 hours
Individual studying	30.0 %	45.0 hours
TOTAL	100.0 %	150.0 hours

GENERAL OBSERVATIONS

Each student has four attempts over two consecutive academic years to pass this course. Students who are in the third or fourth attempt must contact the professor during the first two weeks of the course.

Students whose grade in the Final Exam (or the largest assignment) is below 4 will fail the course. Dates and location of the final exam will be posted in advance and will not be changed.

Students must attend at least 70% of the sessions. Students who do not comply with the 70% attendance rule will receive a 0.0 on their first and second attempts and go directly to the third one (they will need to enroll in this course again the following academic year).

The program presented will be subject to time availability and the proper progress of students' learning process. If necessary, some of the lessons might be omitted, dedicating the sessions to review previous concepts.

PROGRAM

SESSION 1 (LIVE IN-PERSON)

Theory: Introduction, main elements. Normal form games. Dominance.

The corresponding PPT and Cabral L. (2017), Ch. 7.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 7 (See Bibliography)

SESSION 2 (LIVE IN-PERSON)

Theory: Iterated Elimination of Strategies. Solution concept (Nash Equilibrium).

The corresponding PPT and Cabral L. (2017), Ch. 7.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 7 (See Bibliography)

SESSION 3 (LIVE IN-PERSON)

Practical: Exercises on static, normal form games. Game descriptions, normal form representation, NE identification. Coordination.

The corresponding problem set.

SESSION 4 (LIVE IN-PERSON)

Theory: discrete vs continuos variables. Monopoly model.

The corresponding PPT and Cabral L. (2017), Ch. 5.3.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 5.3 (See Bibliography)

SESSION 5 (LIVE IN-PERSON)

Practical: Exercises on continuous variables, monopoly.

The corresponding problem set.

SESSION 6 (LIVE IN-PERSON)

Theory: oligopoly, Cournot.

The corresponding PPT and Cabral L. (2017), Ch. 8.2.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 8.2 (See Bibliography)

SESSION 7 (LIVE IN-PERSON)

Practical: Exercises on Cournot model
The corresponding problem set.

SESSION 8 (LIVE IN-PERSON)

Theory: oligopoly, Betrand
The corresponding PPT and Cabral L. (2017), Ch. 8.1.
Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 8.1 (See Bibliography)

SESSION 9 (LIVE IN-PERSON)

Practical: Exercises on Bertrand model
The corresponding problem set.

SESSION 10 (LIVE IN-PERSON)

Practical: exercises on IO models.
The corresponding problem set.

SESSION 11 (LIVE IN-PERSON)

Pre-midterm review
No specific materials.

SESSION 12 (LIVE IN-PERSON)

Midterm

SESSION 13 (LIVE IN-PERSON)

Theory: oligopoly, differentiated products. Price discrimination. Concentration indicators.
The corresponding PPT and Cabral L. (2017), Ch. 14.1, 14.2, 6.1, 6.2 and 10 (Introduction).
Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapters 14.1, 14.2, 6.1, 6.2 and 10 (Introduction) (See Bibliography)

SESSION 14 (LIVE IN-PERSON)

Practical: Exercises on differentiated products, price discrimination, concentration measures.
The corresponding problem set.

SESSION 15 (LIVE IN-PERSON)

Theory: Perfect competition model, public goods.
The corresponding PPT and Cabral L. (2017), Ch. 4.1 and 5.1.
Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapters 4.1 and 5.1 (See Bibliography)

SESSION 16 (LIVE IN-PERSON)

Practical: Exercises on perfect competition and cooperation models.

The corresponding problem set.

SESSION 17 (LIVE IN-PERSON)

Practical: exercises on model comparison and cost increases.

The corresponding problem set and Cabral L. (2017), Ch. 8.3. and 8.4.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapters 8.3 and 8.4 (See Bibliography)

SESSION 18 (LIVE IN-PERSON)

Theory: dynamic games and negotiations. Extensive form. Backwards Induction, SPNE.

The corresponding PPT and Cabral L. (2017), Ch. 7.2.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 7.2 (See Bibliography)

SESSION 19 (LIVE IN-PERSON)

Theory: Applications of Game Theory

The corresponding PPT.

SESSION 20 (LIVE IN-PERSON)

Practical: Exercises on dynamic games and negotiations

The corresponding problem set.

SESSION 21 (LIVE IN-PERSON)

Theory: Market failures. Externalities, agency problems. Principles of public intervention (taxes & subsidies, provision and regulation).

The corresponding PPT and Cabral L. (2017), Ch. 5.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 5 (See Bibliography)

SESSION 22 (LIVE IN-PERSON)

Theory: Introduction to Regulatory Economics.

The corresponding PPT and Cabral L. (2017), Ch. 5.4 and 5.6.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapters 5.4 and 5.6 (See Bibliography)

SESSION 23 (LIVE IN-PERSON)

1st day of assignments and presentations.

Topics and assigments are described in the corresponding document.

SESSION 24 (LIVE IN-PERSON)

2nd day of assignments and presentations.

Topics and assigments are described in the corresponding document.

SESSION 25 (LIVE IN-PERSON)

Theory: Introduction to Competition Policy

The corresponding PPT and Cabral L. (2017), Ch. 5.5.

Book Chapters: Luis Cabral. (2017). Introduction to industrial organization - Chapter 5.5 (See Bibliography)

SESSION 26 (LIVE IN-PERSON)

3rd session of assignments and presentations.

Topics and assigments are described in the corresponding document.

SESSION 27 (LIVE IN-PERSON)

4th session of assignments and presentations.

Topics and assigments are described in the corresponding document.

SESSION 28 (LIVE IN-PERSON)

Practical: exercises on Market failures

The corresponding problem set.

SESSION 29 (LIVE IN-PERSON)

Review, doubts.

No specific materials.

SESSION 30 (LIVE IN-PERSON)

Final exam.

EVALUATION CRITERIA

Evaluation will be based on a midterm (25%), a final exams (50%) and the assignment (25%). Up to an additional point (+10%) will be given for significant contributions during classes.

criteria	percentage	Learning Objectives	Comments
Final Exam	50 %		The final exam will be composed of multiple choice questions and two practical exercises

Intermediate tests	25 %		The midterm will be composed of multiple choice questions and one practical exercise
Group Work	13 %		Report of the assignment
Group Presentation	12 %		Presentation of the assignment

RE-SIT / RE-TAKE POLICY

Any student whose weighted final grade is below 5 will be required to sit for the retake exam to pass the course (except those not complying with the attendance rules, whom are banned from this possibility).

Grading for retakes will be subject to the following rules:

- The retakes will consist of a comprehensive exam. The grade will depend only on the performance on this exam; continuous evaluation over the semester will not be taken into account.

- Dates and location of the retakes will be posted in advance and will not be changed.

- The exam/assignment will be designed bearing in mind that the passing grade is 5 and the maximum grade that can be attained is 8 out of 10.

BIBLIOGRAPHY

Compulsory

- Luis Cabral. (2017). *Introduction to industrial organization.* 2nd. MIT press.. ISBN 0262035944 (Printed)

Recommended

- Ferreira, J. L.. (2019). *Game Theory: An Applied Introduction.* 1st. Bloomsbury Publishing. ISBN 1352007916 (Printed)

- Avinash K. Dixit and Barry J. Nalebuff. (2009). *The Art of Strategy: A Game Theorist's Guide to Success in Business and Life.* W.W. Norton. ISBN 0393062430 (Printed)

BEHAVIOR RULES

Please, check the University's Code of Conduct here. The Program Director may provide further indications.

ATTENDANCE POLICY

Please, check the University's Attendance Policy here. The Program Director may provide further indications.

Attendance is mandatory at IE University, as it is an essential factor of IE´s learning methodology. While we do closely monitor attendance in each course, we also consider our students responsible for their own agenda and commitments, as adult university students. With that in mind, each student may miss up to 30% of the sessions within a given course and still maintain the possibility of passing that given course. This 30% "buffer" is to be used for any absences, such as: illnesses, personal emergencies, commitments, official/governmental matters, business and/or medical appointments, family situations, etc. Students should manage their various needs, and situations that may arise, within that 30% buffer. If a student is absent to more than the allowed 30% of the sessions (regardless of the reason), s/he will obtain a 0.0 grade for that course in both the ordinary and extraordinary calls of the current academic year, and s/he will have to retake the course during the following academic year.

Please pay close attention to your attendance. The program strongly encourages attending 100% of the sessions as it will improve your learning outcomes, it will increase the class performance and it will benefit your participation grade.

ETHICAL POLICY

Please, check the University's Ethics Code here. The Program Director may provide further indications.

Plagiarism is the dishonest act of presenting another person's ideas, texts or words as your own. This includes in order of seriousness of the offense:

- providing faulty sources;

- copy-pasting material from your own past assignments (self-plagiarism) without the instructor's permission;

- copy-pasting material from external sources even while citing them;

- using verbatim translations from sources in other languages without citing them;

- copy-pasting material from external sources without citing them;

- and buying or commissioning essays from other parties.

IEU students must contact the professor if they don’t know whether the use of a document constitutes plagiarism. For help with your academic writing, contact the Writing Center (writingcenter@faculty.ie.edu). The professor will also advise the student on how to present said material. All written assignments must be submitted through Turn-it-in, which produces a similarity report and detects cases of plagiarism. Professors are required to check each student's academic work in order to guarantee its originality. If the originality of the academic work is not clear, the professor will contact the student in order to clarify any doubts. Students using external tutorial support should report it to the professor and the PPLE Program from the moment they began receiving this support. In the event that the meeting with the student fails to clarify the originality of the academic work, the professor will inform the Director of the Bachelor Program about the case, who will then decide whether to bring the case forward to the PPLE Academic Review Panel. Very high similarity scores will be automatically flagged and forwarded to the Academic Review Panel. Plagiarism constitutes a very serious offense and may carry penalties ranging from getting a zero for the assignment to expulsion from the university depending on the severity of the case and the number of times the student has committed plagiarism in the past.