Game Theory

Academic Year: (2022 / 2023) **Review date: 20-05-2022**

Department assigned to the subject: Economics Department

Coordinating teacher: FERREIRA GARCIA, JOSE LUIS

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

OBJECTIVES

Competences:

This course aims to familiarize students with the tools leading the student to:

- Understand the main concepts of game theory.
- Create a coherent and logical framework to analyze cooperative and conflictive situations.
- Learn how to use the tools that game theory provides to analyze economic situations in which there are strategic interactions among agents.
- Apply this theory to many economics problems in the subjects of industrial organization, regulation, public economics, political economics, etc.

Capacities:

Game theory helps the student to learn how to:

- Formalize economic problems.
- Identify the proper model for the analysis of different situations of conflict.
- Use game theory concepts for strategic analysis.

Attitudes:

The subject encourage the students to:

- Analyze economic problems without prejudice, with precision and rigor.
- Reason critically.
- Learn autonomously.
- Defend their point of view and evaluate the basis of other contrasting points of view.

DESCRIPTION OF CONTENTS: PROGRAMME

The problem of interaction among many agents and its impact on decision making is presented. There is an introduction to the basic concepts of game theory and to the different types of games depending on the nature of interaction (static, dynamic or repeated) as well as on the type of information agents have (perfect or imperfect). The main equilibrium concepts are studied (Nash equilibrium, sub game perfect equilibrium and Bayesian equilibrium) with economic applications: noncompetitive markets, political competition, bilateral bargaining, auctions, voting systems and the problem of cooperation in repeated games.

LEARNING ACTIVITIES AND METHODOLOGY

Acquisition of theoretical and applied knowledge through master classes, problems solving and discussion of case studies. These case studies will be taken from current issues (auctions in telecommunications, price collusion, wage bargaining) and they will allow to apply the studied tools to real problems. In addition the students must solve exercises on their own.

The learning and teaching methodology include three fields according to the key capacities students must acquire:

1) The student must develop a proper theoretical knowledge through master classes and problem solving so as to be able to model a strategic interaction as a game and to apply equilibrium concepts.

2) Acquisition of technical abilities through problems solving and the discussion of solutions in class. This methodology will develop the following competences: Apply the acquired knowledge to new situations and to obtain autonomously predictions on agents behavior.

3) Acquisition of solving abilities and skills to identify problems through the analysis of case studies. This methodology will develop the following competences: Apply the models to new situations, develop analysis and synthesis capabilities putting emphasis on improving the abilities and skills related to decision making, to defend a point of view keeping critical attitude on classmates proposals.

ASSESSMENT SYSTEM

The grading will be based on continuous evaluation on both the magistral and reduced classes and on a final exam. The continuous evaluation in the reduced classes will count up to a 40% of the final grade and will take place through problem sets, midterms and class participation. The midterms will include analytic problems related to the practical classes performed the previous weeks. The final exam is a 60% of the final grade. There will also be participation controls and tests in the magistral sessions, and will allow the professor in charge to change up to a 5% up or down the final grade.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Gardner, Roy Games for Business and Economics, John Wiley & Sons, 2003

- Gibbons, Robert A primer in Game Theory, Prentice Hall, 1992

- José Luis Ferreira Game Theory. An Applied Introduction. ISBN: 978-1-352-00791-6, Macmillan International Higher Education / Red Globe Press, 2020

ADDITIONAL BIBLIOGRAPHY

- BINMORE, K. Fun and Games., McGraw-Hill, 1994

- DIXIT, A y NALEBUFF, B. Thinking strategically., Norton, 1991

- VEGA, F. Game Theory and Economic Applications., Cambridge University Press, 2001