

27435 - Decisions and Games

Syllabus Information

Academic year: 2024/25

Subject: 27435 - Decisions and Games

Faculty / School: 109 - Facultad de Economía y Empresa

Degree: 417 - Degree in Economics

ECTS: 6.0

Year: 3

Semester: Second semester

Subject type: Optional

Module:

1. General information

This subject enables students to increase their ability to make strategic decisions in an economic framework characterized by constraints and conflicting interests of agents. It provides general rules to optimize the behaviour of agents in environments of competition, negotiation and cooperation, with applications in finance and industrial organization, among many other fields.

It is assumed that the student has the logical capacity of a university student, as well as an adequate verbal and written expression, although Mathematics I and II, Microeconomics I, II and III or Macroeconomics I and II will be very useful for an adequate learning in the subject

2. Learning results

At the end of the subject the students will be able to:

1. Know the content of the subject, especially the decision criteria and the different types of solutions of a game or conflict, according to the economic context.
2. Obtain solutions of the different types of games, either in concrete problems or in real situations analysed as games.

3. Syllabus

Unit 1. Introduction to decision theory.

- 1.1. Formal framework: preferences and ordinations.
- 1.2. Ordinal utility theory.
- 1.3. Usefulness in risk environment.
- 1.4- Application: optimal decisions.

Unit 2. Static games with complete information.

- 2.1- Brief introduction to game theory.
- 2.2- Definition and representation.
- 2.3- Types of games and examples. Zero-sum games.
- 2.4- Solution concepts: Dominance, Nash Equilibrium and Prudence.
- 2.5- Finite bipersonal games with mixed strategies. Symmetrical games. The minimax theorem.

Unit 3. Dynamic games.

- 3.1- Dynamic games with complete information.
- 3.2 Perfection in subsets and backward induction algorithm.
- 3.3- Repeated games.

Unit 4. Negotiation and cooperation.

- 4.1- Negotiation games.
- 4.2- Nash and Kalai-Smorodinsky bargaining solutions.
- 4.3- Cooperative games.
- 4.4- Shapley's core and value.

4. Academic activities

The following activities are proposed:

Master classes: 30 hours, in which the master class will combine the presentation of concepts and results with the participatory

resolution of exercises, in which the theoretical aspects will be applied immediately.

Practical classes: 30 hours, in which students will solve, with the teacher's help, more complete exercises and problems of an economic nature. These exercises can be found on the platform indicated by the teacher.

Other activities (Tutorials, Personal Study, Papers, Seminars, Evaluation Tests, ...): 90 hours.

6 ECTS = 150 hours

In principle, the teaching methodology and its evaluation is planned to be based on face-to-face classes . However, if circumstances so require, they may be carried out online.

5. Assessment system

This subject can be passed by means of a continuous evaluation that will consist of two midterm written tests, together with the completion of different activities that will be specified throughout the term, and that will go from the delivery of exercises proposed in class, resolution of questionnaires in class, active participation in the development of the classes, to different tasks oriented to the resolution of games in an economic context.

The percentage between the two midterm written tests will be 50% of the total grade, and the percentage corresponding to the rest of the activities will be 50%

If the student chooses this modality of continuous evaluation, then it will be necessary the regular and participative attendance to class (at least 85%) and the completion of all the proposed activities of a compulsory nature

Likewise, the subject can be passed by taking a final exam worth 10 points and obtaining at least 5 points. The weight of each of the parts will be the same as that of the continuous evaluation.

All of the above refers exclusively to the first call. In the second call, a final exam will be the only way to pass it. Naturally, the above only applies to the current academic year.

6. Sustainable Development Goals

4 - Quality Education

8 - Decent Work and Economic Growth

9 - Industry, Innovation and Infrastructure