



## COURSE DATA

### Data Subject

<b>Code</b>	35831
<b>Name</b>	Strategic behaviour
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	4.5
<b>Academic year</b>	2022 - 2023

### Study (s)

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1313 - Degree in Business Management and Administration	Faculty of Economics	4	First term
1330 - Degree in Business Management and Administration (Ontinyent)	Faculty of Economics	4	First term
1926 - Double Degree Program Tourism and BMA	Faculty of Economics	5	Annual

### Subject-matter

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1313 - Degree in Business Management and Administration	23 - Management tools and skills	Optional
1330 - Degree in Business Management and Administration (Ontinyent)	23 - Herramientas y Habilidades Directivas	Optional
1926 - Double Degree Program Tourism and BMA	8 - Asignatura optativa de quinto curso	Optional

### Coordination

<b>Name</b>	<b>Department</b>
CALABUIG ALCANTARA, VICENTE	10 - Economic Analysis

## SUMMARY

This course offers an introductory view of game theory applied to the problems of the corporate and business world. Game theory is a method aimed at the decision making of individuals and companies in an environment of strategic interdependence, that is, when the consequences of their decisions depend on (and have effects on) the decisions of other individuals or companies. Nowadays, knowledge of game theory is an unavoidable necessity for the analysis of economic situations of great importance for



companies, such as the functioning of markets in imperfect competition, auctions, bilateral negotiation in an economic exchange, effort incentives and contracts, etc. These tools can be applicable to the most important markets of modern economies such as labor markets, credit or financial markets, etc....

The emphasis will be on concepts and results. Likewise, a large part of the course will be devoted to the resolution of practical cases and/or the performance of exercises and the study of various applications of the concepts explained to the business world. These applications will have a role almost as relevant as the theory itself: in each topic two or three practical cases and simple applications will be discussed.

The program begins with a series of basic concepts on the elements that characterize a strategic situation (game) involving two or more individuals or companies (topic 1), necessary for the understanding of later topics. Next (topics 2 and 3) we analyze games characterized by an isolated strategic interaction and where the agents make decisions simultaneously, in which there is complete information, and we analyze applications of great economic importance such as auctions, incentives to effort in a production team, etc. For this purpose, solution concepts for this type of strategic situations are introduced and applied.

Subsequently (topic 4), the program analyzes situations that develop over time, sequential or dynamic games, paying special attention to the credibility of the strategic moves that may occur in a framework of perfect information.

Applications of great importance in real life are also studied (topic 5), such as those strategic situations that are repeated in a stationary way (repeated games) over time. Finally, the block of games with private information is analyzed (topic 6). In these games, a detailed analysis of dynamic games is carried out, but when there is incomplete or imperfect information about some important aspect of the game, studying the incentives that agents have to hide or signal information they possess.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

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## COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

### 1313 - Degree in Business Management and Administration

- Demonstrate capacity for analysis and synthesis.
- Have organisation and planning skills.



- Be able to solve problems.
- Be able to make decisions.
- Be able to transmit and communicate complex ideas and approaches to both specialised and lay audiences.
- Be able to work in a team.
- Have critical and self-critical capacity.
- Be able to learn autonomously.
- Show motivation for quality.
- Acquire interdisciplinary knowledge of the company and its social, economic, institutional and legal environment, and of the basic elements of the management process, such as organisation and administration, accounting, taxation, operations, human resources, marketing, financing and investment.
- Be able to identify the sources of relevant economic information and their contents, and to understand economic institutions as the result and implementation of theoretical or formal approaches to how the economy works.
- Be able to carry out strategic diagnoses in complex and uncertain environments using the appropriate methodologies to resolve them.
- Be able to make decisions under certainty and uncertainty environments.
- Be able to apply analytical and mathematical methods for the analysis of economic and business problems.
- Be able to express oneself in formal, graphic and symbolic languages.
- Be able to apply and introduce continuous improvement procedures in all areas of the organisation.

### LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

At the end of the course, students should be able to analyze a strategic, economic and/or social situation, with the tools provided by game theory, obtaining a prediction on the behavior of companies and agents participating in the game, and be able to make decisions in these situations. For these purposes the students must be able to:

- Convert an informal description of a strategic situation into a formal game theory problem that can be analyzed using game theory tools.
- Determine the key variables that determine the behavior of firms and agents in the market.
- Analyze the strategic behavior of firms and agents participating in the game, anticipating the strategies of each player.
- Apply the solution concepts in such situations as well as evaluate the feasibility and efficiency of the proposed solution.
- Analyze the robustness of the proposed solution to changes in the behavior, motivation or other variables of the agents or the strategic situation.

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## DESCRIPTION OF CONTENTS

### 1. INTRODUCTION

- 1.1 What is a game?
- 1.2 What does game theory study?
- 1.3 Strategic reasoning.
- 1.4 Game theory and the behavior of firms.

[OCRL], [Ch. 1, 1.1-1.4] and instructor's lecture notes.

### 2. TOPIC 2. SIMULTANEOUS GAMES. ANTICIPATING THE OPPONENT'S BEHAVIOR. DOMINANT AND DOMINATED STRATEGIES.

- 2.1 The strategic form of a game and its matrix representation.
- 2.2 Dominant strategy: the Prisoners' Dilemma.
- 2.3 Efficiency: the problem of cooperation.
- 2.4 The best response function of a player.
- 2.5 Successive elimination of dominated actions.

[OCRL], [Chap. 2, 2.1-2.5] and instructor's lecture notes.

### 3. TOPIC 3 NASH EQUILIBRIUM: THE COORDINATION PROBLEM.

- 3.1 Nash equilibria of a game.
- 3.2 Simple properties of Nash equilibria.
- 3.3 The multiplicity of equilibria.
- 3.4 Social Preferences.

[OCRL], [Chap. 3, 3.1-3.7] and instructor's lecture notes.

### 4. TOPIC 4 SEQUENTIAL GAMES WITH PERFECT INFORMATION. CREDIBILITY AND STRATEGIC PLAYS

- 4.1 The decision tree of a game.
- 4.2 Strategies and action plans.
- 4.3 Strategic moves.
- 4.4 Commitments, threats and credible promises: the principle of sequential rationality.
- 4.5 Backward induction and the Perfect Nash Equilibrium.

[OCRL], [Ch. 4, 4.1-4.6] and instructor's lecture notes.



**5. TOPIC 5. REPEATED GAMES AND TACIT COOPERATION**

**TOPIC 5. REPEATED GAMES AND TACIT COOPERATION**

- 5.1 Time preferences.
- 5.2 Threat of punishment and cooperation.

[OCRL], [Ch. 6 , 6.1-6.4] and instructor's lecture notes.

**6. TOPIC 6. GAMES WITH PRIVATE INFORMATION**

- 6.1 Equilibria in games with private information.
- 6.2 The problem of adverse selection: the used car market.
- 6.3 Signaling in the market: warranties, advertising and education.

[OCRL], [Ch. [Cap. 7, 7.1-7.5]] and instructor's lecture notes.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Classroom practices	15,00	100
Study and independent work	15,00	0
Preparation of evaluation activities	15,00	0
Preparation of practical classes and problem	10,00	0
Resolution of case studies	15,00	0
Resolution of online questionnaires	5,00	0
<b>TOTAL</b>	<b>105,00</b>	

**TEACHING METHODOLOGY**

The methodology for teaching the subject of Strategic Behavior, both in theoretical and practical classes, will be oriented to combine the capacity for individual work with that of teamwork. More precisely, this methodology can be described as follows:

Theoretical and practical classes where the professor will explain the most interesting concepts and will develop the most complex instruments for the course. Attendance is essential because it guarantees the correct transmission of knowledge and guides the students in their personal work.

- For the practical classes, students will previously prepare a set of practical cases and exercises to be worked on in the classroom. On the one hand, each student must prepare these tasks individually and, on the other hand, students will be asked (either individually or in groups) to solve and present some of these tasks in the classroom for the rest of their classmates. This is intended to develop the student's ability to organize forms of group work, to solve problems, to communicate orally and in writing. The assigned tasks, whether individual or joint, may give rise to "deliverables" to be evaluated by the teacher.



## EVALUATION

The course of Strategic Behavior will be evaluated based on the consideration of the following aspects: The evaluation of the subject is based on a set of continuous assessment activities and a final exam. The total evaluation is broken down as follows: 40% of the overall grade corresponds to the continuous evaluation tasks and 60% of the overall grade corresponds to the final exam.

The final exam is compulsory and passing it is a prerequisite for passing the course. The test is considered passed when the grade is equal or higher than 3 points out of 6.

The continuous evaluation will consist of individual or group tests in the classroom, solving exercises and problems, handing in questionnaires, active participation in class, exercises to identify strategic situations in real life, etc.

The final grade will be obtained as the sum of the final test grade plus the continuous evaluation grade.

The course will be considered passed if the student obtains 5 points out of 10 in the sum of the final exam and the continuous evaluation.

In the first call, in case of not doing the continuous evaluation tasks, the student will only be able to obtain the points of the final exam (6 maximum), and would need to obtain a grade of 5 out of 6 in the final exam to pass the course.

It is considered that part of the continuous evaluation is recoverable (20%) and the other 30% is not recoverable. This means that in the second and subsequent exams, the student has two options:

- (i) waive the grade of the continuous evaluation (indicating it in the exam) and the final exam will be graded on a maximum of 8 points (being necessary to obtain 5 points to pass the subject); or.
- (ii) maintain the grade of the continuous evaluation and the final exam will be graded on a maximum of 6 points.

## REFERENCES

### Basic

- Olcina, G. , Calabuig, V., y Rodriguez-Lara, I., Introducción a la Teoría de Juegos y la Conducta Estratégica, , 2018, E. Pearson. [OCRL]

### Additional

- Gardner, R., Juegos para empresarios y economistas, 1999, Antoni Bosch Editor,
- Ferreira, J.L., Game Theory: An applied introduction , Palgrave Macmillan, 2019.
- Dixit, A. y Nalebuff, R., El arte de la estrategia, 2012, Antoni Bosch Editor.
- Dixit, A. and Skeath, S., Games of Strategy, 2004, Norton.