

Degree programme	Type	Course
Business Administration and Management	OP	4
Economics	OB	3
Contemporary History, Politics and Economics	OP	3
Contemporary History, Politics and Economics	OP	4

Contact lecturer

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Teaching staff

Peter Bayer

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

There are no prerequisites

Objectives

To learn the basic elements of game theory and to develop an understanding of its applications to economic analysis.

Non-cooperative games: Games in normal form and games in extensive form with perfect and imperfect information.

Solution concepts: Dominance, Nash equilibrium and subgame perfect Nash equilibrium.

Applications: Bargaining, Voting and Cost-sharing.

Cooperative games: Games in characteristic form, the core and the value of a game.

Learning outcomes

1. Analyse the strategic interactions between participants and the effects of their actions on third-party

decisions.

2. Apply the game theory to economic and business decisions.
3. Understand the different voting systems and the consequences of each of these.
4. Assess the consequences of changing a particular representation system for another.
5. Apply the game theory to the case of agents in a negotiation, in auctions and in macroeconomic matters.
6. Analyse the distribution of costs in view of the implementation of a new shared service.
7. Assess the different proposals of implementing public goods in terms of social welfare.
8. A capacity of oral and written communication in Catalan, Spanish and English, which allows them to summarise and present the work conducted both orally and in writing.
9. Select and generate the information needed for each problem, analyse it and make decisions based on this information.
10. Make decisions in situations of uncertainty and show an enterprising and innovative spirit.
11. Organise work, in terms of good time management and organisation and planning.
12. Demonstrate initiative and work independently when required.
13. Lead multidisciplinary and multicultural teams, implement new projects, coordinate, negotiate and manage conflicts.
14. Capacity to adapt to changing environments.
15. Use available information technology and be able to adapt to new technological settings.
16. Assess ethical commitment in professional activity.
17. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
18. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
19. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
20. Students must develop the necessary learning skills in order to undertake further training with a high degree of autonomy.
21. Demonstrate motivation regarding the quality of the work performed and sensitivity regarding the consequences on the environment and society.
22. Demonstrate capacity to adapt to changing environments.
23. Demonstrate initiative and work independently when required.
24. Organise work in relation to good time management and planning.
25. Value ethical commitment in professional practice.
26. Select and generate the information necessary for each problem, analyse it and take decisions based on that information.
27. Communicating in oral and written form in Catalan, Spanish and English, in order to be able to summarise and present the carried out project in both forms.
28. Use basic optimisation tools and the game theory, and include these elements in a theoretical model.
29. Identify the consequences of the existence of information asymmetry among different economic agents on the way in which these organise themselves and on the efficiency of the relationship they establish.
30. Work cooperatively in multidisciplinary and multicultural teams implementing new projects.

Contents

Module 1. Introduction to Game Theory and Examples

- The aim of Game Theory
- Decision Theory with one agent
- Decision Theory with at least two agents: Game Theory
- History of Game Theory

- Non-Cooperative Games *versus* Cooperative Games
- Examples

Module 2. Games in Normal Form

- Definition and examples
- Nash equilibrium
- Interpretations and problems of Nash equilibrium
- The mixed extension of a game
- Existence of Nash equilibrium: The Nash Theorem
- Computing Nash Equilibria

Module 3. Dominant Strategies

- Dominant strategies
- Elimination of dominated strategies
- Sophisticated equilibria and dominantsolvable games

Module 4. Games in Extensive Form

- Preliminaries
- Perfect information
- Backwards induction, Nash equilibrium and Kuhn's Theorem

Module 5. Cooperative Games

- Preliminaries
- The Core
- The Shapley value

Module 6. Applications

- Axiomatic and strategic bargaining
- Voting
- Dominant strategy implementation
- Cost-sharing

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Readings	9	0.36	8, 9, 10, 11, 12, 13, 14, 15, 16
Exercises and group discussions	17	0.68	1, 2, 3, 4, 5, 6, 7
Tutorials	15	0.6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
Study. Preparation of exercises and discussions	70.5	2.82	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
Lectures	32.5	1.3	1, 2, 3, 4, 5, 6, 7

Teaching will be offered on campus.

This course combines lectures with more applied sessions devoted to the resolution of problem sets and exercises.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Partial exams	32%	2	0.08	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 26, 27, 28, 30
Short tests	20%	2	0.08	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 26, 27, 28, 30

Final exam	48%	2	0.08	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
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Academic integrity and irregularities in assessment activities

Assessment activities are subject to the provisions established in this course guide, as well as to the "Policy of the Faculty of Economics and Business regarding the detection of irregularities during assessment activities," which regulates the conditions under which assessment tests are conducted and the procedures applicable in the event that irregularities are detected. Students are advised to consult its contents.

Use of Artificial Intelligence (AI)

In this course, the use of Artificial Intelligence (AI) technologies is not permitted in any phase. Any work containing AI-generated fragments will be considered a breach of academic honesty and may result in a partial or total penalty in the grade for the activity, or more severe sanctions in serious cases.

Continuous Evaluation

There will be a continuous assessment of student progress by way of one partial exam, a final exam and two short tests. Final grades will be computed according to the weights of 48% the final exam, 32% the partial exam and 10% each short test.

A student will only be eligible to the "not evaluable" status if he or she has not taken part in any of the assessments.

Calendar of evaluation activities

The dates of the evaluation activities (midterm exams, exercises in the classroom, assignments, ...) will be announced well in advance during the semester.

The date of the final exam is scheduled in the assessment calendar of the Faculty.

"The dates of evaluation activities cannot be modified, unless there is an exceptional and duly justified reason why an evaluation activity cannot be carried out. In this case, the degree coordinator will contact both the teaching staff and the affected student, and a new date will be scheduled within the same academic period to make up for the missed evaluation activity." Section 1 of Article 264. Calendar of evaluation activities (Academic Regulations UAB).

Students of the Faculty of Economics and Business, who in accordance with the previous paragraph need to change an evaluation activity date must process the request by filling out an Application for exams' reschedule: [e-Formulari per a la reprogramació de proves](#).

Grade revision process

After all grading activities have ended, students will be informed of the date and way in which the course grades will be published. Students will be also be informed of the procedure, place, date and time of grade revision following University regulations.

Retake Process

"To be eligible to participate in the retake process, it is required for students to have been previously been evaluated for at least two thirds of the total evaluation activities of the subject." Section 2 of Article 261. The recovery (UAB Academic Regulations). Additionally, it is required that the student to have achieved an average

grade of the subject greater than or equal to 3.5 and less than 5.

The date of the retake exam will be posted in the calendar of evaluation activities of the Faculty. Students who take this exam and pass, will get a grade of 5 for the subject. If the student does not pass the retake, the grade will remain unchanged, and hence, student will fail the course.

Irregularities in evaluation activities

In spite of other disciplinary measures deemed appropriate, and in accordance with current academic regulations, "in the case that the student makes any irregularity that could lead to a significant variation in the grade of an evaluation activity, it will be graded with a 0, regardless of the disciplinary process that can be instructed. In case of various irregularities occur in the evaluation of the same subject, the final grade of this subject will be 0". Section 11 of Article 266. Results of the evaluation. (UAB Academic Regulations).

Comprehensive evaluation

By requesting the comprehensive evaluation the student waives the option of continuous evaluation.

The comprehensive evaluation must be requested at the Academic Management (Gestió acadèmica) of the Campus where the degree/master's degree is taught. The request must be filed according to the procedure and the deadline established by the administrative calendar of the Faculty of Economics and Business.

Attendance :

Student attendance is mandatory on the day of the comprehensive assessment. The date will be the same as that of the final exam of the semester as per the evaluation calendar published by the Faculty of Economics and Business and approved by the Faculty's Teaching and Academic Affairs Committee. The duration of the comprehensive assessment must be specified in the characteristics of such activity.

100% of the evaluation evidences must be handed in by the student on the day of the comprehensive assessment.

The evaluation evidences carried out in person by the student on the same day of the comprehensive assessment must have a minimum weight of 70%.

Evidence Type: Exam

Weight in the final assessment: 100%

Duration of the activity: 2 hours

Is the activity that corresponds to this evaluation evidence to be carried out in person on the date scheduled for the comprehensive evaluation? YES

Bibliography

Basic references

- Roy Gardner. *Games for Business and Economics*. John Wiley & Sons, Inc. (1995).
- Robert Gibbons. *A Primer in Game Theory*. Princeton University Press (1992).
- Martin J. Osborne. *An Introduction to Game Theory*. Oxford University Press (2004).

Advanced references

- Michael Maschler, Eilon Solan, and Shmuel Zamir. *Game Theory*. Cambridge University Press (2013).
- Roger B. Myerson. *Game Theory: Analysis of Conflict*. Harvard University Press (1991).
- Martin J. Osborne and Ariel Rubinstein. *A Course in Game Theory*. The MIT Press (1994).
- Fernando Vega Redondo. *Economics and the Theory of Games*. Cambridge University Press (2003).

Software

No specific software is used

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Spanish	second semester	morning-mixed
(PAUL) Classroom practices	1	Spanish	second semester	morning-mixed
(TE) Theory	8	English	second semester	morning-mixed
(PAUL) Classroom practices	8	English	second semester	morning-mixed
(TE) Theory	14	Spanish	second semester	morning-mixed
(PAUL) Classroom practices	14	Spanish	second semester	morning-mixed
(TE) Theory	51	Spanish	second semester	afternoon
(PAUL) Classroom practices	51	Spanish	second semester	afternoon