

1. BASIC INFORMATION

Course	GAME THEORY
Degree program	GLOBAL BACHELOR'S DEGREE IN ENTREPRENEURSHIP AND MANAGEMENT
School	SOCIAL SCIENCES
Year	FOURTH
ECTS	6
Credit type	OPTIONAL
Language(s)	ENGLISH
Delivery mode	PRESENTIAL
Semester	SECOND SEMESTER
Academic year	2024-2025
Coordinating professor	BRUNO BROSETA, Ph.D.

2. PRESENTATION

Game Theory studies simplified models of Strategic interactions in which the optimal decision for an agent depends not only on his/her actions but also of those chosen by other agents. As a result, choosing your best strategy depends on what you think others will do, which in turn depends on what others think that you will do, etc... The Nash equilibrium –and some similar concepts- is the main tool by which we solve this problem and make predictions. Game Theory covers many different situations, representing both conflict and cooperation environments, as for example in industrial organization and business competition, bargaining, auctions or strategic information management.

This is an introductory course in which we will analyze different equilibrium concepts for different environments – normal and extensive form games- and information conditions – complete and incomplete information- and we will study practical applications of Game Theory in economics and business, politics and sociology and international relations. The language of Game Theory is basically a mathematical one, but we will try to focus on the qualitative implications of Strategic situations; however, we will sometimes use some intermediate mathematics when needed.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB2: Students should be able to apply their knowledge at work and in other environments in a professional manner, and exhibit the competencies related to debate preparation and presentation and problem solving within their study area.

- CB3: Students should be able to gather and interpret relevant data (within their area of study) in order to reason on important subjects of a social, scientific or ethical nature.
- CB4: Students should be able to transmit information, ideas, problems and solutions to both a specialized and non-specialized audience

Cross-curricular competencies:

- CT4: Ability for analysis and synthesis: being able to decompose complex situations into their constituent parts; to evaluate other alternatives and perspectives to find optimal solutions. The synthesis attempts to reduce complexity in order to better understand it and/or solve problems.
- CT5: Ability to apply knowledge to practice, to use knowledge acquired in academic settings in situations as similar as possible to the reality of the profession for which they are being trained.
- CT13: Problem Solving: ability to find a solution to a confusing issue or a complicated situation without a predefined solution, which makes it difficult to achieve a given end.
- CT14: Innovation-Creativity: ability to propose and develop new and original solutions that add value to problems posed, even in different areas than the original problem itself.
- CT16: Decision making: ability to choose among alternatives or methods to effectively solve different situations or problems.

Specific competencies:

- CE5. Ability to analyze and evaluate the competitive environment of a firm, especially to the market, and use this analysis to develop new endeavors.
- CE16. Ability to understand and analyze consumers' behavior: to evaluate and predict behaviors and trends in the different customer segments for a given product or service, geographically, culturally or demographically.
- CE21. Ability to use the mathematical tools needed to solve economic problems, as well as basic methods in calculus, algebra and programming..

Learning outcomes:

- LO1: Being able to know and understand decision making in Game Theory, to study individual and organizational behavior in interactive situations , design business strategies and build models for strategic decision making

- LO2: Being able to analyze and research decision making in Game Theory, applied to the study of individual and organizational behavior in interactive situations, design business strategies and to building models for strategic decision making.
- LO3: Being able to solve practical situations and develop real cases about decision making in Game Theory, individual and organizational behavior in interactive situations , design business strategies and build models for strategic decision making

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
CB2, CB3, CE5, CB21	LO1: Being able to know and understand decision making in Game Theory, to study individual and organizational behavior in interactive situations , design business strategies and build models for strategic decision making
CB2, CB3, CB4, CE16	LO2: Being able to analyze and research decision making in Game Theory, applied to the study of individual and organizational behavior in interactive situations, design business strategies and to building models for strategic decision making
CB2, CB4, CE21	LO3: Being able to solve practical situations and develop real cases about decision making in Game Theory, individual and organizational behavior in interactive situations , design business strategies and build models for strategic decision making

4. CONTENT

- Unit 1: Introduction
- Unit 2: Sequential Games
- Unit 3: Simultaneous Games: Dominance and Nash Equilibrium
- Unit 4: Simultaneous Games: Strategic Interactions
- Unit 5: Mixed Strategies

- Unit 6: Repeated Games
- Unit 6: Games with Incomplete Information

Different game theoretic applications to different disciplines (Business, International Relations,...) will be covered in each of the Units.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Class Lectures
- Cooperative Learning
- Problem-based Learning
- Project-based Learning

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
LECTURES	20
AUTONOMOUS WORK	20
ORAL PRESENTATIONS	15
CASE ANALYSIS AND PROBLEM SOLVING	20
VISITS/EXTERNAL ACTIVITIES	5
TEAM ACTIVITIES	20
GRADES ACTIVITIES/EXAMS	10
TUTORING	20
PAPERS AND PROJECTS	20
TOTAL	150

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
EXAMINATIONS	30%
CASE-BASED AND PROBLEM SOLVING	20%
REPORTS AND WRITING	15%
ORAL PRESENTATIONS	5%
PARTICIPATION IN FORUMS AND DEBATES	5%
PAPERS AND PROJECTS	25%
TOTAL	100%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

The grading policy for the semester is based on continuous evaluation so that if you fail in completing (totally or partially) any of the Assessable Activities above within the specified deadline, the grade for the corresponding activity will be a 0/10, unless explicitly stated otherwise by the instructor on an individual and justifiable basis. Make-up exams will only be given in exceptional, duly justified occasions and when requested at least 24 hours before the exam date. Class attendance will be registered either through the technological devices set by the University or, alternatively, through the attendance registration mechanism determined by the instructor.

In order to pass the course in the first exam period, you will need to have a final weighted average grade of at least 5/10 across all Assessable Activities above, a minimum weighted average of 5/10 in the Examination part and a class attendance of at least 50%. Should you fail to satisfy any of these three requirements, you will fail the course in this period.

7.2. Second exam period

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of at least 5.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place. In each case, the professor will indicate the remedial activities that have to be submitted by the student; these activities will have to be submitted before the final exam date, as instructed

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
PROBLEM SET 1	2ND WEEK OF FEBRUARY
PROBLEM SET 2	4TH WEEK OF FEBRUARY
PROBLEM SET 3	2ND WEEK OF MARCH
PROBLEM SET 4	4TH WEEK OF MARCH
PROBLEM SET 5	2ND WEEK OF MAY
PROBLEM SET 6	4TH WEEK OF MAY
TEAM PROJECT AND ORAL PRESENTATION	1ST WEEK OF JUNE

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The main contents, cases and exercises of the Course are included in the lecture notes and activities you will be assigned during the semester. Some useful additional sources are:

Basic Bibliography:

- A. Dixit, S. Skeath (2004), *Games of Strategy*, Norton. This is a basic textbook; the level is appropriate for the class, but we will see many more examples and cases in class. Available in the University library.

The recommended Bibliography is:

- A. Dixit, B. Nalebuff (2008), *The Art of Strategy: A Game Theorist's Guide to Success in Business and Life*, W.W. Norton and Company. Not exactly a textbook, but a classic. Available in the University library.

- S. Tadelis (2013), *Game Theory: An Introduction*, Princeton University Press. A good undergraduate text, but mathematically demanding.
- W. Spaniel (2011), *Game Theory 101 The Complete Textbook : A User Friendly Introduction to Game Theory*, self-edited ([Amazon](#)), and the accompanying video tutorials series on [You Tube](#). We will use it sparingly in class.

10. EDUCATIONAL GUIDANCE DIVERSITY AND INCLUSION UNIT

From the Educational Guidance Diversity and Inclusion Unit (ODI) we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa.uev@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.