

## 27435 - Decisions and Games

### Información del Plan Docente

Academic Year	2017/18
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**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The learning process of the course is based on the following items:

1. Lectures and interactive regular school class.
2. Active learning which involves reading, writing, discussion, and engagement in solving problems, analysis, synthesis, and evaluation. The teacher also favors any cooperative learning.
3. Weekly tutorial activities.

### 5.2. Learning tasks

The following activities help students to achieve the expected results and to pass the course

1. Voluntary defense of a report, at the end of the course, about the topics of the course.
2. Presentation and discussion, at the end of the course, of a significant collection of problems and exercises
3. Voluntary exams on the course topics
4. Global final exam for students. The student can only get with this exam 7.5 points of the 10 possible points.

### 5.3. Syllabus

#### 1. Basic elements of the game theory

##### 1.1. What is a game? Historical notes and examples

##### 1.2. Utility theory.

##### 1.3. Von Neumann-Morgenstern expected utility

##### 1.4. Attitudes toward Risk

#### 2.- Noncooperative and static games with complete information

##### 2.1. Introduction.

##### 2.2. Decision criteria: Prudent strategy, Nash equilibrium or best response strategy, Dominance and Pareto optimal outcome.

##### 2.3. Finite two-person games with mixed strategies. The minimax theorem

##### 2.4. Solutions of Cournot and Bertrand oligopolies

##### 2.5. The Clarke-Gloves mechanism and the provision of public goods

#### 3. Sequential or dynamic games with complete information

##### 3.1. Introduction.

##### 3.2. Subgame perfection.

##### 3.3. Solution by backward induction. Credible treats and promises.

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3.4. Credible solutions for Stackelberg oligopoly. Repeated games.

3.5. Subgame perfect equilibrium in repeated games.

3.6. Repetition and bounded rationality. Application to Cournot duopoly.

3.7. Application to biology. Replicator equation and evolutionarily stable strategies.

4. Games with incomplete information

4.1. Introduction.

4.2. Static Bayesian games. Harsanyi's framework.

4.3. Auctions

4.4. Design of optimal auctions

5. Bargaining Games

5.1. Introduction.

5.2. Criteria of rationality and Nash bargaining solutions.

5.3. Kalai-Smorodinsky solutions.

5.4. Sequential bargaining with perfect information

6. Cooperative games

6.1. Introduction to cooperative games.

6.2. Imputations. Core and nucleolus of the game.

6.3. The Shapley value.

### 5.4.Course planning and calendar

The timing schedule for lectures and regular school classes is established by the Faculty of Economics and Business. It usually is published in May or June.

Tutorial calendar will be announced at starting academic year in October

The course starts in the second half of February and ends in late May, with an approximate duration of 15 weeks. The contents will be a temporary development similar to the order shown in the program. Each topic will take approximately 2 weeks. There will be presentations of works throughout the whole period, but these presentations will take place especially at the end of the course.

### 5.5.Bibliography and recommended resources

#### *Basic references*

Aguado Franco, Juan Carlos. Teoría de la decisión y de los juegos / Juan Carlos Aguado Franco Las Rozas (Madrid) : Delta Publicaciones, D.L. 2006

Gardner, Roy. Juegos para empresarios y economistas / Roy Gardner ; traducción de Paloma Calvo y Xavier Vilà . - [1ª ed., reimp.] Barcelona : Antoni Bosch, D.L. 2009

Pérez Navarro, Joaquín : Teoría de juegos / Joaquín Pérez Navarro, José Luis Jimeno Pastor, Emilio Cerdá Tena . - 2ª ed. Madrid : Ibergarceta, D.L. 2013

#### *Additional references*

Binmore, K.G.. La teoría de juegos : una breve introducción / Ken Binmore ; [traducción de Pepe Ventura López] . 2ª ed. Madrid : Alianza, 2011

Dixit, Avinash K.. Pensar estratégicamente : un arma decisiva en los negocios, la política y la vida diaria / Avinash K.Dixit y Barry J.Nalebuff ; traducción de Ana Varela y Alicia Valls Barcelona : Antoni Bosch, 1992

Friedman, James W.. Teoría de juegos con aplicaciones a la economía / James W. Friedman ; versión española de Manuel Pascual Morales Madrid : Alianza Editorial, D.L.1991

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Girón Gonzalez-Torre, Francisco Javier. Teoría de juegos / preparada por Francisco Javier Girón González-Torre . - 2a. ed., 2a. reimp. Madrid : Universidad Nacional de Educación a Distancia, 2001

Luce, R.Duncan. Games and decisions : introduction and critical survey / R. Duncan Luce, and Howard Raiffa New York [etc.] : John Wiley & Sons, cop. 1957

Moulin, Hervé. Game theory for the social sciences / Hervé Moulin . - 2nd. ed. revised New York : New York University Press, 1986

Vega Redondo, Fernando. Economía y juegos / Fernando Vega Redondo Barcelona : Antoni Bosch, D.L.2000