

**COURSE DATA****Data Subject**

Code	35835
Name	Teams and cooperative games
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
1313 - Degree in Business Management and Administration	Faculty of Economics	4	First term

Subject-matter

Degree	Subject-matter	Character
1313 - Degree in Business Management and Administration	52 - Optatividad Dirección de Operaciones y Logística	Optional

Coordination

Name	Department
CALVO RAMON, EMILIO	10 - Economic Analysis

SUMMARY

This course provides an introductory overview of the literature of the Cooperative Games applied to cost allocation problems

Some of these examples are: The problem of sharing a good among several agents. The problem of the treatment plant, the airport, networking costs. The two sided market and matching problems. Bankruptcy problems and rationing. Demand for homogeneous goods.

On one hand, motivation will be offered from the point of view of cost allocation for some of the central concepts in cooperative games. Stable allocations and the core, the nucleolus and the Shapley value.

In addition, cost allocation is an eminently practical problem, so the validity and appropriateness of the solutions depend largely the context in which they are applied. Thus the second objective of the course is to illustrate by examples how to model situations of cost sharing.



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

No prerequisites are required. Only some basic knowledge of elementary calculus is needed.

OUTCOMES

1313 - Degree in Business Management and Administration

- Demonstrate capacity for analysis and synthesis.
- Be able to solve problems.
- Be able to negotiate and reconcile interests effectively.
- Be able to apply analytical and mathematical methods for the analysis of economic and business problems.
- Be able to identify, measure and value business costs in order to design and implement cost allocation models and methods.

LEARNING OUTCOMES

- Knowledge of the fundamentals of cooperative games.
- Knowledge of the different cost allocation contexts where cooperative game theory applies.
- Knowledge of how to calculate the solutions in each context.

DESCRIPTION OF CONTENTS

1. THEORY

- 1- Introduction: Problems of cost allocation / profit sharing
- 2- Efficient solutions and individual rationality
- 3- Stable solutions: The core
- 4- The nucleolus
- 5- The Shapley value
- 6- The proportional, egalitarian and serial rules



2. PRACTICAL APPLICATIONS

- Homogeneous goods: The treatment plant problem
- Networking costs: Sharing the cost, and the maintenance of the tree networks
- Airport and highway games
- Matching problems: students/carriers, medics/hospitals
- Assignment problems: Two sided house markets
- Sharing costs: consum cooperatives
- Bankruptcy and rationing problems

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Classroom practices	15,00	100
Development of individual work	60,00	0
TOTAL	120,00	

TEACHING METHODOLOGY

This is an introductory course to present cooperative game theory applied in economics.

The emphasis will be on concepts and results. Also, much of the course will be devoted to the exercises and study of several economic applications.

More specifically, these applications will have a role almost as important as the theory itself. In each subject will be discussed simple but important applications, both in the theoretical and practical classes.

Any advanced mathematical requirement is not required to take this course.

EVALUATION

- Throughout the course several practical works based on the examples that will be analyzed along the theoretical and practical classes will be delivered. This constitute 40% of the note.

This continuous evaluation has the character of recoverable in the second call

- A final exam will be made. In there, students will use the course materials to solve a problem among those analyzed in the course . This constitute the other 60% of the note.



REFERENCES

Basic

- Juegos para empresarios y economistas. Roy Gardner. Antoni Bosch, editor.
- Teoría de juegos con aplicaciones a la economía. James W. Friedman. Alianza Universidad
- Game Theory. Analysis of conflict. Roger B. Myerson. Harvard University Press
- Juegos Coalicionales. Estela Sánchez Rodríguez, Juan Vidal Puga. Universidade de Vigo, Servizo de Publicacións, 2014