

220218 - Game Theory

Coordinating unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering		
Teaching unit:	749 - MAT - Department of Mathematics		
Academic year:	2019		
Degree:	MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional) MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional) MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)		
ECTS credits:	3	Teaching languages:	English

Teaching staff

Coordinator:	Francesc Carreras
Others:	Antoni Magaña

Teaching methodology

The teaching methodology will consist of three parts:

- (1) Classroom sessions devoted to presenting the contents.
- (2) Classroom sessions devoted to practical work.
- (3) Self study including complementary exercises and activities.

In (1) the teacher will introduce the theoretical basis of the matter, that is, concepts, methods and results, and will illustrate them by means of suitable examples for ensuring a good comprehension of them.

In (2) applications of the theory to solve a variety of practical examples will be proposed by the teacher. Reasoning, analytical thinking and criticism will be promoted. Exercises to be solved individually or in small groups will also be proposed, as well as activities for self study. Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

Learning objectives of the subject

- To discover the subject and methodology of Game Theory, a branch of Operations Research devoted to the analysis of conflicts of interest.
- To realize the convenience of applying Game Theory to solve problems of management decision making, illustrated by means of examples of this field.

Study load

Total learning time: 75h	Hours large group:	27h	36.00%
	Self study:	48h	64.00%

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Content

<p>Module1: Non-cooperative games: strategies</p>	<p>Learning time: 45h Theory classes: 14h Self study : 31h</p>
<p>Description: Representation of conflicts: essential elements Finite and infinite games, with or without constant sum Optimal strategies and Nash equilibriums Cournot and Bertrand duopoly models and product differentiation</p> <p>Related activities: Exercises Examination 1</p>	
<p>Module2: Cooperative games: sharing rules</p>	<p>Learning time: 30h Theory classes: 13h Self study : 17h</p>
<p>Description: Communication, cooperation and negotiation Sharing rules for costs, profits, and transferable utilities in general Economic games: the Shapley value Political games: the Shapley-Shubik power index</p> <p>Related activities: Exercises Examination 2</p>	

Qualification system

The final mark will be obtained by weighting activities as follows:

- Exercises, weight: 20%
- Examinations, weight: 40% each

Examinations will be at individual level. Exercises might be occasionally allowed to be solved by small groups

Bibliography

Basic:

Carreras, F.; Magaña, A.; Amer, R. Teoría de juegos [on line]. 2001. [Barcelona]: Edicions UPC, 2001 Available on: <<http://hdl.handle.net/2099.3/36427>>. ISBN 8483014777.