220686 - Game Theory: Non-Cooperative Games

**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 MANAGEMENT ENGINEERING (Syllabus 2012). (Teaching unit Optional)

**ECTS credits:** 3

**Teaching languages:** Catalan

**Coordinator:** VICENÇ SALES i INGLÈS

**Degree competences to which the subject contributes**

**Generical:**
1. Ability to apply knowledge to solve problems in new environments or unfamiliar environments within broader contexts (or multidisciplinary) related to engineering.

**Teaching methodology**

The teaching methodology will consist of three parts:
- Classroom sessions devoted to presenting the contents.
- Classroom sessions devoted to practical work.
- 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.

In (3) the students will work with the material presented in (1) and the exercises discussed or proposed in (2), in order to obtain a good knowledge of the topic.

**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.
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Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group: 13h 17.33%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h 0.00%</td>
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<td></td>
<td>Hours small group: 0h 0.00%</td>
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<tr>
<td></td>
<td>Guided activities: 14h 18.67%</td>
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<tr>
<td></td>
<td>Self study: 48h 64.00%</td>
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</tbody>
</table>

Content

Module 1: Non-cooperative constant-sum games

Learning time: 37h 30m
- Theory classes: 6h 30m
- Guided activities: 7h
- Self study: 24h

Description:
- Non-cooperative constant-sum games
- Mixed extension of non-cooperative constant-sum games

Related activities:
- Lectures
- Examination

Module 2: Non-cooperative games with arbitrary sum

Learning time: 37h 30m
- Theory classes: 6h 30m
- Guided activities: 7h
- Self study: 24h

Description:
- Non-cooperative games with arbitrary sum
- Mixed extension of non-cooperative games with arbitrary sum

Related activities:
- Lectures
- Examination
Qualification system

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

- Examination (weight: 50%)
- Exercises (weight: 50%)

In case of Exercises are failed but the Exam is passed, Exercises will be considered passed with a mark of 5.

Regulations for carrying out activities

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

Bibliography

Basic:


Others resources:

Hyperlink

https://atenea.upc.edu/moodle/login/index.php