

Academic Year/course: 2021/22

27447 - ICT for Decision-Making

Syllabus Information

Academic Year: 2021/22

Subject: 27447 - Sistemas informáticos de ayuda a la decisión

Faculty / School: 109 - Facultad de Economía y Empresa

Degree: 417 - Degree in Economics

ECTS: 3.0

Year: 4

Semester: First semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Having the subject an orientation eminently practical, the presentation of the contents will take place in the computer room following a professional guidance. In parallel, the exploitation with cognitive purposes of the decisional tools studied in the classroom will be held in a narrative way, using unstructured methods (lateral thinking, group discussion...) for enhancing creativity and emotional skills. When possible, individual class projects will be grouped to be performed in a context of multiple actors, to train the students in the group decision making process (co-decision and co-creation).

4.2. Learning tasks

Apart from the regular lectures in the computer room, the students' training will be complemented by three group work sessions, according to the schedule described in the next section. Furthermore, a collaborative tool for discussion and debate on the more relevant economic and business issues will be enabled.

The teaching methodology is planned to be in-person. However, if necessary for health reasons, lectures may be taught online.

4.3. Syllabus

Unit 0: Presentation of the subject (objectives, programme, methodology, schedule, assessment)

Unit 1: Introduction to Decision Support Systems

- 1.1 Decision-making problems and decision-making processes
- 1.2 Components of a Decision Support System
- 1.3 Case study: Google Maps
- 1.4 Case study: tracking, screening and classification of messages on social networks

- Unit 2: Optimization of economic problems
- 2.1 Linear optimization
 - 2.2 Distribution routing and distribution networks
 - 2.3 Decision making under uncertainty
 - 2.4 Multi-criteria optimization techniques

- Unit 3: Design and exploitation of data bases
- 3.1 Sources and technologies of data storage
 - 3.2 Relational database model
 - 3.3 Office and corporate database management systems
 - 3.4 Design of relational data bases
 - 3.5 Query design

4.4. Course planning and calendar

The activities and key dates will be communicated in class and through the teaching platform at the beginning of the semester. The dates of the final exams can be consulted on the website of the Faculty and will be announced in due time by the same means.

| Week | Type | Contents |
|------|--|---|
| 1 | Lecture | Introduction to the subject |
| 2 | Lecture | Introduction to Decision Support Systems |
| 3 | Theory session Practice session Group work | Optimization of economic problems Optimization with Microsoft Excel, Solver Group work assignment |
| 4 | Practice session | Linear optimization - Continuous Programming |
| 5 | Practice session | Linear optimization - Integer and binary programming |
| 6 | Practice session | Distribution routing and distribution networks |
| 7 | Practice session | Decision making under uncertainty - Portfolio optimization |
| 8 | Practice session | Decision making under uncertainty - Game theory |
| 9 | Practice session | Multi-criteria optimization techniques - Goal programming |
| 10 | Practice session Group work | Multi-criteria optimization techniques - Compromise optimization Groups progress monitoring |
| 11 | Lecture Practice session | Design and exploitation of data bases Data base design with Microsoft Access |
| 12 | Practice session | Query design - Selection queries |
| 13 | Practice session | Query design - Aggregated data queries |
| 14 | Practice session Group work | Query design ? Update queries Groups progress monitoring |
| 15 | Assessment | Oral presentation of group projects |