

SUBJECT TEACHING GUIDE

M1518 - Intelligent Data Analysis and Decision-Taking

Master's Degree in Mathematics and Computing

Academic year 2022-2023

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|---|------------------|--------------------|------------------|--------------|
| Degree | Master's Degree in Mathematics and Computing | | Type and Year | Optional. Year 1 | |
| Faculty | Faculty of Sciences | | | | |
| Discipline | | | | | |
| Course unit title and code | M1518 - Intelligent Data Analysis and Decision-Taking | | | | |
| Number of ECTS credits allocated | 3 | Term | Semester based (2) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | No | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|
| Department | DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION | | | |
| Name of lecturer | ANGEL COBO ORTEGA | | | |
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| Office | E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 4. DESPACHO (S4045) | | | |
| Other lecturers | MARIA PATRICIA GOMEZ GARCIA | | | |

| 3.1 LEARNING OUTCOMES |
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| - Knowledge of the basic principles of "Business Analytics" |
| - Access to sources of structured and unstructured information that can facilitate decision-making processes |
| - Use of operations research techniques in decision-making |
| - Identify problems which can be dealt with multicriteria decision techniques |
| - Recognize the most appropriate multi-criteria techniques to address different decision problems |

4. OBJECTIVES

The course aims to introduce the concept of business analytics and to show how intelligent analysis of data combined with appropriate strategies of operations research can help in the process of decision making in organizations. The potential use of open data to improve business processes is analyzed. The course discuss the main difficulties of classic optimization techniques to move to present multicriteria decision methodologies and software tools to improve decision-making processes.

6. COURSE ORGANIZATION

CONTENTS

| | |
|---|---|
| 1 | Basic concepts of business analytics and decision-making in the organizations |
| 2 | Data, information and knowledge as key elements of decision making |
| 3 | Operations research and decision making: concepts and tools. |
| 4 | Multicriteria decision strategies |
| 5 | Multiobjective programming: concepts and techniques |
| 6 | Discrete multicriteria techniques |

7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|--|-----------------------|-------------|-----------|---------------|
| Work of practical application | Work | No | Yes | 30,00 |
| Analysis of practical cases in the computer room | Laboratory evaluation | No | Yes | 70,00 |
| TOTAL | | | | 100,00 |

Observations

There is a single annual evaluation period. If the subject is not passed in the ordinary evaluation activities carried out in the first or the second quarters, an extraordinary evaluation will be available.

Observations for part-time students

Part-time students can be assessed with a work of practical application (50%) and a list of simple exercises proposed by the teacher (50%)

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Papathanasiou, J., Ploskas, N. (2018). Multiple criteria decision aid. Methods, examples and Python implementations. Springer

Hardoon, D.R., Shmueli, G. (2013). Getting started with business analytics : insightful decision-making. CRC Press.

Romero, C. (1993). Teoría de la decisión multicriterio : conceptos, técnicas y aplicaciones. Madrid : Alianza, D.L. 1993.