

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

Code	44659
Name	Data science in business
Cycle	Master's degree
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2221 - M.U. en Ciencia de Datos	School of Engineering	1	Second term

Subject-matter

Degree	Subject-matter	Character
2221 - M.U. en Ciencia de Datos	11 - Data science in business	Obligatory

Coordination

Name	Department
MONTORO PONS, JUAN DE DIOS	110 - Applied Economics
PAVIA MIRALLES, JOSE MANUEL	110 - Applied Economics

SUMMARY

This course is divided into two major thematic blocks. The first part is devoted to the main concepts and objectives of a company, the different business models and the sources of data collection shown by the company. The objectives of a decision making process and its monitoring is also presented in the first block.

The second part is dedicated to pose and solve, using quantitative techniques, specific problems that can arise in various departments of the company. Issues related to market segmentation, pricing or prediction will be studied in this second block. The issues raised are not intended to be exhaustive or cover all possibilities, but rather to show the opportunities that scientific data can find in this environment.



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

OUTCOMES

2221 - M.U. en Ciencia de Datos

- Students are able to integrate knowledge and handle the complexity of formulating judgments based on information that, while being incomplete or limited, includes reflection on social and ethical responsibilities linked to the application of their knowledge and judgments.
- Students can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences, clearly and unambiguously.
- Students have the learning skills that will allow them to continue studying in a way that will be largely self-directed or autonomous.
- Students have the knowledge and understanding that provide a basis or an opportunity for originality in developing and/or applying ideas, often within a research context.
- Be able to assess the need to complete their technical, scientific, language, computer, literary, ethical, social and human education, and to organise their own learning with a high degree of autonomy.
- Capacidad de organización y planificación de actividades de investigación, desarrollo y consultoría en el área de ciencia de datos.
- Capacidad para trabajar en equipo para llegar a soluciones de problemas interdisciplinarios usando técnicas de análisis de datos.
- Ser capaces de acceder a herramientas de información (bibliográficas y de empleo) y utilizarlas apropiadamente.
- Ser capaces de asumir la responsabilidad de su propio desarrollo profesional y de su especialización en uno o más campos de estudio, aplicando los conocimientos adquiridos en la identificación de salidas profesionales y yacimientos de empleo.
- Saber realizar las labores propias de su profesión incluyendo, entre otras, la adquisición y clasificación de datos de forma eficiente, aplicación de las técnicas de análisis de datos avanzado para llegar a la extracción de información (científica, de mercado, etc.) a partir de los mismos.
- Diseñar y poner en marcha soluciones basadas en análisis de datos en el ámbito de la medicina y de los negocios, teniendo en cuenta los requisitos específicos de este tipo de casos de uso.



LEARNING OUTCOMES

- Meet business objectives in which the different techniques of data analysis apply.

Apply the methods of science data in business applications.
Apply data analysis to business and economic decisions.
Knowing risk decisions, investment, and fraud.
Know the procedures of market analysis, competition and consumer.
Apply these methods in e-commerce. Analysis of case studies.

DESCRIPTION OF CONTENTS

1. Business decisions and Data Science. KPI.

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2. Consumer Analytics

Studies of preferences, habits, behaviors, tastes, needs, desires of consumers for decision-making.

3. Internal databases

Internal information sources in the company and organization

4. Social networks

Social networks and businesses. Data source. Sentiment analysis.

5. E-commerce

E-commerce

6. Time series prediction.

Example of a problem of time series prediction within the company and / or economics.



7. Price fixing

Example of a pricing problem in non-competitive markets and/or markets with information asymmetries.

8. Applications and problems of causal inference with observational data.

9. Market segmentation

Example problem of market segmentation

10. Fraud detection

Example of a fraud detection problem

11. Marketing campaign

Example of a problem of implementation and evaluation of a marketing campaign

12. Classification problems in economics and business

Application and evaluation of different classification models for data of economic and / or business content.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theoretical and practical classes	60,00	100
Development of individual work	20,00	0
Study and independent work	12,00	0
Readings supplementary material	3,00	0
Preparation of evaluation activities	12,00	0
Preparing lectures	20,00	0
Preparation of practical classes and problem	13,00	0
Resolution of case studies	10,00	0
TOTAL	150,00	



TEACHING METHODOLOGY

The lessons of the first block will combine the theoretical and the practical part, without separating sessions devoted to theory from those devoted to practice. The classes of the second part, which can be combined temporarily with the first part, will be eminently practical. The lessons will be taught in a computer equipped classroom.

In the theoretical part of the classes, the teacher will introduce the concepts and methods Statistics and Optimization, with examples and exercises to be solved by the students.

The practical sessions will be synchronized with the theory. In these sessions, the students will learn by solving problems, exercises and case studies (usually with real data), in order to acquire the skills of this course.

EVALUATION

The educational evaluation of knowledge and skills achieved by the students will be made continuously throughout the course, and will consist in the following blocks of evaluation:

1. Exercises and the class work submitted during the course and / or partial exams: 80% of the final grade.
2. Final exam: 20% of the final grade.

Grades earned in paragraph 1 shall be kept in the two examination sittings of the academic year in which they were made, since their evaluation is only possible in the teaching period.

REFERENCES

Basic

- Bigné, E. (2015). *Fronteras de la Investigación en Marketing. Hacia la Unión Disciplinaria*. Universitat de Valencia, Valencia.



- Davenport, T. (2014). Big data at work: dispelling the myths, uncovering the opportunities. Harvard Business Review Press.
- Guerras, L.A. y Navas, J.E. (2015): La Dirección Estratégica de la Empresa. Teoría y Aplicaciones, Thompson-Cívitas, Madrid, 5ª edición.
- Kotler, P. Y Keller, K.L. (2016) Dirección de Marketing. Pearson, Madrid. 15 ed.
- Mikosch, T (2004). Non-Life Insurance Mathematics. Springer-Verlag New York, Inc. New York.
- Provost, F y Fawcett, T (2013) Data Science for Business, OReilly Media.
- Rackley, J. (2015). Marketing Analytics Roadmap. New York City: Apress.
- Torgo, L (2011) Data Mining with R. Learning with case studies, CRC Press

Additional

- Klugman, SA.; Harry H. Panjer y Gordon E. W (1998). Loss Models: From Data to Decisions. John Wiley & Sons, Inc. New York
- Rodríguez, Inma (2014) Marketing digital y comercio electrónico. Pirámide, Madrid.
- Venables, V.N. (2013). An Introduction to R. <http://cran.r-project.org>.