1. OVERVIEW

Subject area	Introduction to Data Science
Degree	Bachelor's Degree in Data Science
School/Faculty	Faculty of Science, Engineering and Design
Year	First
ECTS	6
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On campus
Semester	First
Academic Year	2022/2023

2. INTRODUCTION

Introduction to Data Science is a compulsory subject area in the first year of the Degree in Data Science at the Universidad Europea de Valencia. Students gain insight into a career in data science through an introduction to the basic concepts in each area of this field.

Students learn what data science is, the main responsibilities of a data scientist, the tools and technology, the impact on different areas of life (business, health, education, society, etc.) and the legal and ethical implications of data processing.

Theory classes are in Spanish, considering practical cases (including on-line courses) and attending seminars and workshops associated with data science.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by the acronym in Spanish):

- CB1. Students have shown their knowledge and understanding of a study area originating from general secondary school education, and are usually at the level where, with the support of more advanced textbooks, they may also demonstrate awareness of the latest developments in their field of study.
- CB2. Students can apply their knowledge to their work professionally and possess the necessary skills, usually demonstrated by forming and defending opinions, as well as resolving problems within their study area.
- CB3. Students must have the ability to gather and interpret relevant data (usually within their study area) to form opinions which include reflecting on relevant social, scientific or ethical matters.

Cross-curricular skills (CT, by the acronym in Spanish):

- CT03. Teamwork: ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals.
- CT05. Analysis and problem-solving: be able to critically assess information, break down complex situations, identify patterns and consider different alternatives.
- CT08. Entrepreneurial spirit: ability to take on and carry out activities that generate new opportunities, foresee problems or lead to improvements.

Specific skills (CE, by the acronym in Spanish):

- CE10. Ability to apply Big Data methods, architecture and techniques to manage data effectively.
- CE11. Ability to apply computational learning techniques in order to design and implement applications and systems that use them, including those dedicated to the automatic extraction of information and knowledge from large volumes of data.
- CE12. Understanding of system interoperability techniques and data integration and aggregation.
- CE13. Ability to design efficient interfaces in the context of Big Data that guarantee accessibility and usability, using graphic and analytical representation techniques.

Learning outcomes (RA, by the acronym in Spanish):
After passing the course the student will be able to:

- RA1: Interpret and apply models and standards in the field of big data systems to practical cases.
- RA2. Describe automated learning techniques, choosing the most suitable and using them to come up with a solution to any given problem.
- RA3. Compile information to analyse trends in the field of big data and relate them to real cases and then defend their evolution and future use.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB1, CB2 CT3, CT5 CE10, CE11, CE12	RA1: Interpret and apply models and standards in the field of big data systems to practical cases.
CB2, CB3 CT3, CT5, CT8 CE10, CE11	RA2. Describe automated learning techniques, choosing the most suitable and using them to come up with a solution to any given problem.
CB2 CT3, CT5, CT8 CE11, CE12, CE13	RA3. Compile information to analyse trends in the field of big data and relate them to real cases and then defend their evolution and future use.

4. CONTENTS

UA 1. Data science and scientists

- What is data science?
- Why learn data science?
- Why do we have so many data?
- Data science is changing the world
- What is a data scientist?

- What does a data scientist do?
- Difference with other professions

UA 2. Data and types of data / Data analysis tools

- Data and types of data
- Data analysis tools
- The most common programming languages in data science
- Introduction to R

UA 3. Applied data science

- Definition of problems and problem-solving
- Data capture
- Extraction, transformation and load.
- Case studies

UA 4. Data and society

- General Data Protection Regulation
- Identifying and handling data bias.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Master lectures.
- Problem-solving and work experience.
- Applied courses.
- Practical seminars.
- Debates and discussions.
- Tutorials.
- Autonomous learning.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Master lectures.	44
Problem solving and case studies	12
Laboratory work.	4
Practical seminars and debates/discussions	10
Tutorials	6
Independent working	74
TOTAL	**150**

7. EVALUACIÓN

A continuación, se relacionan los sistemas de evaluación, así como su peso sobre la calificación total de la asignatura:

Modalidad presencial:

Sistema de evaluación	Peso
Pruebas presenciales para evaluar objetivos de contenidos teórico/prácticos (pruebas objetivas tipo test, exposiciones escritas, exposiciones orales, estudio de casos/resolución de problemas, debates, pruebas de simulación) • Actividad 1. Práctica de laboratorio	15%
Pruebas no presenciales para evaluar objetivos de contenidos teórico/prácticos (estudio de casos/resolución de problemas) • Actividad 2. Estudio de caso • Actividad 4. Informe de seminario	 15% 10%
Observación del desempeño en actividades digitales (DataCamp) • Actividad 5	10%
Pruebas presenciales para evaluar objetivos de contenidos teórico/prácticos • Actividad 3. • Actividad 6	 10% 40%

En el Campus Virtual, cuando accedas a la asignatura, podrás consultar en detalle las actividades de evaluación que debes realizar, así como las fechas de entrega y los procedimientos de evaluación de cada una de ellas.

8. BIBLIOGRAPHY

The reference publication to accompany this subject area is:

- RPubs by RStudio, https://rpubs.com/

The recommended bibliography is indicated below:

- Pierson, L. (2015). Data Science for Dummies
- O'Neil C, Schutt R. (2013) Doing Data Science: Straight Talk from the Frontline, ed OReilly.
- Kannan R., Blum A., Hopcroft J. (2013). Foundations of Data Science.
- Gareth James (2013). An Introduction to Statistical Learning: With Applications in R.
- Wickham H., Grolemund G. (2016). R for Data Science.