COURSE DATA

DATA SUBJECT

Code: 46569
Name: Introduction to data science
Cycle: Master's Degree
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2262 - Master's Degree in Data Science	Escola Tècnica Superior d'Enginyeria	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2262 - Master's Degree in Data Science	Introduction to data science	COMPULSORY

COORDINATION

MARTINEZ SOBER MARCELINO

SUMMARY

This subject aims to introduce all the concepts related to Data Science as well as providing an introduction to the computer tools that will be used in the rest of the master's degree (R and Python). It will review the mathematical concepts necessary to follow the rest of the modules of the master's degree.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

2262 - Master's Degree in Data Science

Ability to access and manage information in different formats for subsequent analysis in order to obtain

knowledge from data.

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.

Entender la utilidad de la ciencia de datos y sus elementos asociados, así como su aplicación en la resolución de problemas, eligiendo las técnicas más adecuadas a cada problema, aplicando de forma correcta las técnicas de evaluación y, finalmente,
interpretando los modelos y resultados.

Extraer conocimiento de conjuntos de datos en diferentes formatos.

Ser capaces de acceder a herramientas de información (bibliográficas y de empleo) y utilizarlas apropiadamente.

Students should demonstrate self-directed learning skills for continued academic growth.

DESCRIPTION OF CONTENTS

1. Data science definition, objectives and techniques. Programs/Languages used in data science.

2. Problem types in data science. Types of data: structured and unstructured. Types of learning: examples

3. Stages of a data analysis problem. Procedures for the evaluation of data-based models.

4. Measurements of error. Frequent problems: overfitting and imbalanced classes

5. Review of basic concepts needed for Data Science; Algebra, probability and theory of information

6. Practical introduction with examples of the use of R and Python languages, oriented to data science

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	28,00
Theoretical and practical classes	2,00
Laboratory	30,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	15,00
Independent study and work	0,00
Preparation of lessons	45,00
Preparation for assessment activities	15,00
Resolution of case studies	15,00
Total hours	**90,00**

TEACHING METHODOLOGY

Theoretical activities. Interactive lectures about the subject with the participation of the student in the resolution of specific issues. Conducting individual evaluation questionnaires.

Practical activities. Learning through problem solving exercises and case studies through which skills about different aspects of the subject are acquired.

Theoretical activities. Interactive lectures about the subject with the participation of the student in the resolution of specific issues. Conducting individual evaluation questionnaires. Practical activities. Learning through problem solving exercises and case studies through which skills about different aspects of the subject are acquired.

EVALUATION

Objective test to assess theoretical knowledge, consisting of one or more exams including theoretical questions (20%).

Objective test to assess laboratory work, consisting of one or more exams including practical questions (80%).

Subsequent examination sessions will follow the same evaluation criteria as the first.

REFERENCES

- 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
- 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.