Course guide
295911 - EDAN - Data Engineering and Business Analytics

Last modified: 02/10/2025

Unit in charge: Barcelona East School of Engineering
Teaching unit: 732 - OE - Department of Management.

Degree: BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: JUAN MARTINEZ SANCHEZ

Others: Primer quadrimestre:
JUAN MARTINEZ SANCHEZ - Grup: T11

PRIOR SKILLS

Interest in business management and strategy, big data and data analysis.
Have passed the statistics course. Students must be able to read the bibliography in English, although some parts of the material will be given exclusively in Catalan.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEB-03. Understand the basics behind the use and programming of PCs, operating systems, databases and software with applications in engineering.
CEI-17. Understand the applications of business organisation.

Transversal:
01 EIN N1. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.
06 URI N1. EFFECTIVE USE OF INFORMATI0N RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

This course alternates lectures with individual exercises and a team project. You must have a minimally updated computer to be able to install the free KNIME and ORANGE software:
https://www.knime.com/downloads/download-knime
https://orangedatamining.com/download/

LEARNING OBJECTIVES OF THE SUBJECT

The objectives of this course are to learn the main concepts of data science and make introduction to their application in business management, marketing and innovation and decision-making to achieve a competitive advantage.
Learn to apply basic machine learning tools to business problems using high-level visual programming software KNIME and ORANGE that are workflow-based and require no coding. In the second part of the course, Pycaret will be used, a Python library that facilitates the creation of machine learning models by writing very few lines of Python. Basic knowledge of Python is recommended.

STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Self study	90,0	60.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

title english

Description:
1 – Introduction to data science applied to decision-making in business management and main technological solutions used.
2- Introduction to KNIME/ORANGE Visual programming software based on workflows.
3 – Basic Machine Learning with KNIME/ORANGE and business applications.
4 – Analysis of text, social networks and web pages, applied to business decision-making
5 – Management of data analysis projects in the company and preparation of reports.
6 - AutoML with Pycaret

Specific objectives:
Learn how to manage data analysis projects as a data capture tool and learn about KNIME as a high-level data analysis software and how it integrates with other solutions such as R or python

Full-or-part-time: 150h
Theory classes: 45h
Practical classes: 15h
Self study : 90h

GRADING SYSTEM

The grade for the course is obtained through the arithmetic mean of the following grades which all have equal weight
• Partial Exam 1 (25%)
• Practical exercises (25%)
• Short questionnaires distributed throughout the course (25%)
• Partial exam 2 (25%)
There is no reassessment exam in this course
There is no reevaluation exam in this course

BIBLIOGRAPHY

Basic:
- Vijay Kotu, Bala Deshpande. Data science : concepts and practice. Second edition. Amsterdam: Morgan Kaufmann, 2018. ISBN 9780128147610.
- Marr, Bernard. Big data en la práctica : cómo 45 empresas exitosas han utilizado análisis de big data para ofrecer resultados extraordinarios. Zaragoza: TEELL, 2017. ISBN 9788416511167.
- Silipo, Rosaria; Prinz, Jeanette. KNIME Beginner's Luck. Switzerland: KNIME Press, 2020. ISBN 9783033028500.
- Silipo, Rosaria; Prinz, Jeannette. KNIME Advanced Luck. Switzerland: KNIME Press, 2019. ISBN 9783952392607.
- Melcher, Kathrin ; Silipo, Rosaria. Codeless Deep Learning with KNIME. Birmingham: Packt Publishing Ltd., 2020. ISBN 9781800566613.

RESOURCES

Other resources:
Notes distributed at ATENEA in CATALAN.