1. OVERVIEW

Subject area	Cloud Computing Infrastructure
Degree	Bachelor's Degree in Data Science
School/Faculty	Faculty of Science, Engineering and Design
Year	Third-party
ECTS	6 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On campus
Semester	Semester 5

2. INTRODUCTION

Cloud Computing Infrastructure is one of the compulsory subject areas in the Degree in Data Science teaching syllabus at the Universidad Europea. This subject introduces students to the distributed computing technologies and tools, as well as current methods for developing complex services in distributed environments be they in the Cloud or on premises.

Students will learn basic concepts of security in APIs and how to develop them using programming skills learnt in previous years. We will also deal with the recent problem of working with distributed algorithms, breaking from the basic framework of sequence processing.

Students will be able to put this knowledge into practice by building from the start a complex service using a real BaaS model, which is currently used in industry.

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 or vocation in a professional manner and possess the skills which are usually evident through the forming and defending of opinions and resolving problems within their study area.

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

- CT2 - Independent learning: skills for choosing strategies to search, analyse, evaluate and manage information from different sources, as well as to independently learn and put into practice what has been learnt.
- CT3 - Teamwork: ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals.

- CT5 - Analysis and problem-solving: be able to critically assess information, break down complex situations, identify patterns and consider different alternatives, approaches and perspectives in order to find the best solutions and effective negotiations.

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

- CE7 - Ability to understand the life cycle of data, from data operation to data visualisation, including how to glean new information and how to use it.
- CE8 - Ability to design technology and infrastructure suitable for the development and deployment of distributed systems.

Learning outcomes (RA, by the acronym in Spanish):

- Understand the data life cycle and explain it with specific examples.
- Know the different approaches to project management and choose the most suitable based on quality criteria.
- Choose the right technology and infrastructure for the development and roll-out of distributed systems.
- Explain the importance of security in computer systems.

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

Skills	Learning outcomes
CB1, CT2, CE7	Understand the data life cycle and explain it with specific examples.
CB2, CT5, CE8	Know the different approaches to project management and choose the most suitable based on quality criteria.
CB2, CT3, CE8	Choose the right technology and infrastructure for the development and roll-out of distributed systems.
CT5, CE8	Explain the importance of security in computer systems.

4. CONTENTS

- Principles of data science infrastructure - security of connections and REST APIs
- Data acquisition and transfer - data access control and gathering through APIs
- Storage and distributed processing systems
- Cloud Computing
- Cloud infrastructures and platforms

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Master lectures
- Case studies
- Collaborative learning
- Problem-based learning

- Project-based learning
- Learning based on laboratory teaching

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 and practical seminars	29
Problem-solving	20
Case studies and field studies	12
Laboratory work	18
Debates and discussions	4
Learning contract (definition of interests, needs and objectives)	2
Autonomous learning	54
Tutorials	9
On campus knowledge tests	2
TOTAL	**150**

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the subject area, are as follows:

On campus:

Assessment system	Weighting
On campus tests to assess theory and practical learning (spoken presentations, case studies, problem solving)	55%
Off-site tests to assess theory and practical learning	20%

(problem solving)	
Attitude assessment tests (class participation)	10%
Self- and co-assessment (learning contract, learning outcomes)	5%
Laboratory, workshop or simulation tests (activity reports, spoken presentations)	10%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

8. BIBLIOGRAPHY

- JJ GEEWAX, API Design Patterns (2021)
- NEIL MADDEN, API Security in Action (2020)
- Diseño de Bases de Datos Distribuidas: Fundamentos y Aplicaciones
- Programación en C++. Un enfoque práctico. Serie Schaum (2006)

PLAGIARISM RULES

In accordance with the Disciplinary Regulations for Universidad Europea students:

- Plagiarism of all or part of any kind of intellectual work is considered a serious offence.
- Any student who commits the serious offence of plagiarism or cheating to pass an assessment test shall be disqualified from the corresponding exam(s), with the offence and reason for disqualification appearing on their academic record.