

## Subject

### Big Data and Digital Ecosystem III

**Year:** 4

**Credits:** 3 ECTS

**Language:** Spanish

## Competencies

### Core competences:

CB1. Students have demonstrated knowledge and understanding in an area of study that builds on the foundation of general secondary education and is usually at a level that, while relying on advanced textbooks, also includes certain elements involving cutting-edge knowledge in their field of study

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the skills that are typically demonstrated through the development and defence of arguments and problem solving within their field of study.

CB5. Students have developed those learning skills that are necessary to undertake further studies with a high degree of autonomy.

### General competences:

CG4. Flexible and broad-minded Outlook

### Specific competences:

CE1. Understand, know and apply the theories, tools and processes for capturing data sources from different types of data sources and for data warehousing

## Learning outcomes

RA4. Ability to think and devise solutions and responses beyond the common and that stipulated by convention. Ability to respond to unexpected current and possible future circumstances by thinking outside the box, allowing them to understand the situation in which they find themselves.

RA8. Understand, know and apply the theories, tools and processes for the storage of data of a different type.

## Syllabus

### AWS:

- Introduction to cloud computing.
- Practical: create EC2 machine.
- Basic elements:
  - ❖ EC2 computing layer:
    - Basic concepts.
    - Creation and deployment of templates.
    - Guided exercises.
    - Practical experience.
  - ❖ Data Centres: regions + availability zones
  - ❖ VPC network layer:
    - Basic concepts: sub-networks, gateways, network security (security groups).
    - Practical experience.
  - ❖ Storage layer:
    - Basic concepts: S3 + CDN.
    - Exercises + practical.
  - ❖ Databases: RDS + NRDS
    - Practical experience.

### Docker:

- Introduction to Docker:
  - ❖ General concepts.
  - ❖ Setting up the environment.
  - ❖ Basic commands.
  - ❖ Basic examples.
  - ❖ Practical experience.
- Docker Engine:
  - ❖ General concepts.
  - ❖ Basic commands.
- Docker images:
  - ❖ Basic concepts.
  - ❖ Basic operations.
  - ❖ Practical experience.

- Docker containers:
  - ❖ Basic concepts.
  - ❖ Basic operations.
  - ❖ Practical experience.
- Use of containers for applications: containerising a simple Linux application.
  - ❖ Containerising an application in a single container.
  - ❖ Good practice.
  - ❖ Basic commands.
- Deploying Apps using Docker Compose: deploy and manage multi-container applications on Docker nodes operating in single-engine mode.
- Networking: network basics in Docker.
  - ❖ General concepts.
  - ❖ Connection between containers.
  - ❖ Basic commands.
  - ❖ Practical experience.
- Volumes in Docker: managing data in Docker.
  - ❖ Non-persistent data.
  - ❖ Persistent data.
  - ❖ Practical experience.

## Training activities

The training activities planned for this module are the following:

- Challenge-based learning (2 ECTS)
- Workshops (1 ECTS)
- Online resources (0.5 ECTS)
- Reflection (0.5 ECTS)
- Individual work (1 ECTS)
- Learning communities (1 ECTS)

## Assessment system

Assessment will be by means of the continuous assessment system, providing constant feedback to both teachers and students on the learning process throughout the academic period:

- Learning activities involving the presentation of knowledge and individual study may be assessed by means of oral and/or written tests, which will account for a maximum of 60% of the final mark.
- The training activities aimed at acquiring the practical skills of the subjects will be assessed through the completion of various activities (assignments, case studies, challenges, etc.) accounting for at least 40% of the final mark.

Details of the assessment and marking will be made explicit in the annual academic planning of the subjects, in accordance with the teachers responsible and the determining factors of each course.

## Bibliography

- Wittig, M., & Wittig, A. (2018). *Amazon web services in action*. Simon and Schuster.
- Morris, K. (2016). *Infrastructure as code: managing servers in the cloud*. "O'Reilly Media, Inc."