ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000639 - Design Of Cloud Computing And Big Data Ecosystems

DEGREE PROGRAMME

10AN - Master Universitario En Ingenieria Informatica

ACADEMIC YEAR & SEMESTER

2025/26 - Semester 1

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	103000639 - Design Of Cloud Computing And Big Data Ecosystems
No of credits	4.5 ECTS
Type	Optional/elective
Academic year ot the programme	Second year
Semester of tuition	Semester 3
Tuition period	September-January
Tuition languages	English
Degree programme	10AN - Master Universitario en Ingenieria Informatica
Centre	10 - E.T.S. De Ingenieros Informáticos
Academic year	2025-26

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Marta Patiño Martinez (Subject coordinator)	2313	marta.patino@upm.es	Sin horario. Office hours available at http://dlsiis.fi.upm.es/tutorias-2526 Please, write an email to agree on a date

Tonghong Li	2312	tonghong.li@upm.es	Sin horario. Office hours available at http://dlsiis.fi.upm.es/tutorias-2526 Please, write an email to agree on a date
Ainhoa Azqueta Alzuaz		ainhoa.azqueta@upm.es	Sin horario. Office hours available at http://dlsiis.fi.upm.es/tutorias-2526 Please, write an email to agree on a date

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Java programming, concurrent programming, databases

4. Skills and learning outcomes *

4.1. Skills to be learned

CE1 - Capacidad para la integración de tecnologías, aplicaciones, servicios y sistemas propios de la Ingeniería Informática, con carácter generalista, y en contextos más amplios y multidisciplinares.

CE10 - Capacidad para comprender y poder aplicar conocimientos avanzados de computación de altas prestaciones y métodos numéricos o computacionales a problemas de ingeniería.

CE18 - Capacidad para comprender el mercado, sus hábitos y necesidades de productos o servicios tecnológicos

CE19 - Capacidad para desarrollar e implantar una solución informática en un entorno empresarial

CE4 - Capacidad para modelar, diseñar, definir la arquitectura, implantar, gestionar, operar, administrar y mantener aplicaciones, redes, sistemas, servicios y contenidos informáticos.

CE5 - Capacidad de comprender y saber aplicar el funcionamiento y organización de Internet, las tecnologías y protocolos de redes de nueva generación, los modelos de componentes, software intermediario y servicios

CE8 - Capacidad para analizar las necesidades de información que se plantean en un entorno y llevar a cabo en todas sus etapas el proceso de construcción de un sistema de información.

CE9 - Capacidad para diseñar y evaluar sistemas operativos y servidores, y aplicaciones y sistemas basados en computación distribuida.

CG10 - Conocimiento y comprensión de la informática necesaria para la creación de modelos de información, y de los sistemas y procesos complejos

4.2. Learning outcomes

RA173 - Conocer las métricas de rendimiento y escalabilidad para sistemas de gestión de datos

RA174 - Evaluar sistemas de gestión de datos

RA171 - Diseñar ecosistemas para gestión de datos en la nube y big data

RA172 - Conocer las tecnologías actuales para la gestión de datos

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

This course presents traditional data management systems and architectures for scalable distributed systems and data management systems: bigtable, data streaming, persistent queues

5.2. Syllabus

1. Introduction

2. Data management technologies

3. Data Streaming

4. Big Table. Dynamo

6. Schedule

6.1. Subject schedule*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	**Introduction** Duration: 02:00 Lecture			
2	**Tema 1** Duration: 02:00 Lecture			
3	**Tema 1** Duration: 02:00 Lecture			
4	**Tema 1** Duration: 02:00 Lecture			
5	**Tema 2** Duration: 02:00 Lecture			
6	**Tema 2** Duration: 02:00 Lecture			
7	**Tema 3** Duration: 02:00 Lecture			
8	**Tema 3** Duration: 02:00 Lecture			
9	**Tema 4** Duration: 02:00 Lecture			
10	**Tema 4** Duration: 02:00 Lecture			
11	**Tema 5** Duration: 02:00 Lecture			
12	**Tema 5** Duration: 02:00 Lecture			
13	**Exercices** Duration: 02:00 Problem-solving class			
14	**Assignmentt presentation** Duration: 02:00 Additional activities **Assingment presentation** Duration: 02:00 Additional activities **Assignment presentation**			**Assignmentt presentation. It cannot be redone** Group presentation in the classroom Progressive assessment Presential Duration: 01:00

	Duration: 02:00 Additional activities			
15	**Assignment presentation** Duration: 02:00 Additional activities **Assignment presentation** Duration: 02:00 Additional activities			
16				
17	**Exam** Duration: 03:00 Additional activities			**Exam** Written test Progressive assessment Presential Duration: 03:00 **Examn** Written test Global examination Presential Duration: 03:00

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
14	Assignmentt presentation. It cannot be redone	Group presentation in the classroom	Face-to-face	01:00	30%	5 / 10	CG10 CE1 CE4 CE5 CE8 CE9 CE10 CE18 CE19
17	Exam	Written test	Face-to-face	03:00	70%	4 / 10	CG10 CE1 CE4 CE5 CE8 CE9 CE10 CE18 CE19

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Examn	Written test	Face-to-face	03:00	100%	5 / 10	CG10 CE1 CE4 CE5 CE8 CE9 CE10 CE18 CE19

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Exam	Written test	Face-to-face	03:00	100%	5 / 10	CG10 CE1 CE4 CE5 CE8 CE9 CE10 CE18 CE19

7.2. Assessment criteria

Progressive assessment consists of a presentation (30%) and an exam (70%). Both components are recoverable. However, the exam is not recoverable during the global evaluation, as it takes place during the official exam week.

In the global evaluation, the presentation may be recovered by taking an exam that accounts for 100% of the final grade.

During the extraordinary evaluation period, a single exam will also be administered, which will account for 100% of the final grade.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Bibliografía	Bibliography	NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence. P. Sadalage, M. Fowler. 2012.
Libro	Bibliography	Big Data Now: Current Perspectives from O'Reilly Radar. O?Reilly. 2011
libro2	Bibliography	Graph Databases. I. Robinson, J. Webber, E. Eifrem. O?Really. 2013
Slides	Bibliography	Slides
Papers	Bibliography	List of papers to be provided

9. Other information

9.1. Other information about the subject

Research based learning tecching will be used during lectures

The course is related to ODS12