



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
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COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000854 - Cloud Computing And Big Data Ecosystems Design

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2025/26 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000854 - Cloud Computing And Big Data Ecosystems Design
No of credits	4.5 ECTS
Type	Optional/elective
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AZ - Master Universitario en Innovación Digital
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 Martínez (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

CB06 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB07 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

CE-CD01 - Capacidad para seleccionar las soluciones de almacenamiento para datos estructurados y no estructurados adecuadas en función del problema a resolver

CE-CD03 - Capacidad para seleccionar las técnicas y herramientas para visualización de grandes cantidades de datos más adecuadas para resolver un determinado problema de ciencia de datos

CE-CD05 - Capacidad para usar herramientas de procesamiento de big data tanto en online como en modo batch

4.2. Learning outcomes

RA35 - Ser capaz de procesar datos masivos.

* 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 architectures for scalable distributed systems and data management systems: bigtable, data streaming, persistent queues

5.2. Syllabus

1. Introduction
2. Data management technologies
 - 2.1. NoSQL: key-value, graph databases, document oriented databases
 - 2.2. SQL y NewSQL: column oriented data stores
 - 2.3. Complex Event Processing/Data streaming
3. Data Streaming
4. Big Table. Dynamo
5. Diseño Ecosistemas Gestión de Datos Big Data y Cloud

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	Assignment 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	Assignment presentation. It cannot be redone	Group presentation in the classroom	Face-to-face	01:00	30%	5 / 10	
17	Exam	Written test	Face-to-face	03:00	70%	4 / 10	CB06 CB07 CE-CD01 CE-CD03 CE-CD05

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
17	Exam	Written test	Face-to-face	03:00	100%	5 / 10	CB06 CB07 CE-CD01 CE-CD03 CE-CD05

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	CB06 CB07 CE-CD01 CE-CD03 CE-CD05

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'Reilly. 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 teaching will be used during lectures

The course is related to ODS12