



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingenieros  
Informáticos

# 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

2019/20 - Semester 1

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## 1. Description

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### 1.1. Subject details

<b>Name of the subject</b>	103000639 - Design Of Cloud Computing And Big Data Ecosystems
<b>No of credits</b>	4.5 ECTS
<b>Type</b>	Optional
<b>Academic year of the programme</b>	Second year
<b>Semester of tuition</b>	Semester 3
<b>Tuition period</b>	September-January
<b>Tuition languages</b>	English
<b>Degree programme</b>	10AN - Master Universitario En Ingenieria Informatica
<b>Centre</b>	10 - Escuela Tecnica Superior de Ingenieros Informaticos
<b>Academic year</b>	2019-20

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

<b>Name and surname</b>	<b>Office/Room</b>	<b>Email</b>	<b>Tutoring hours *</b>
Tonghong Li	2312	tonghong.li@upm.es	M - 14:00 - 16:00 W - 14:00 - 16:00 Th - 14:00 - 16:00
Marta Patiño Martínez (Subject coordinator)	2313	marta.patino@upm.es	Tu - 12:00 - 14:00 Th - 10:00 - 12:00 Th - 14:00 - 15:00 Please, send an email in order to minimize waiting time

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

## 2.2. Research assistants

Name and surname	Email	Faculty member in charge
Azqueta Alzúaz, Ainhoa	ainhoa.azqueta@upm.es	Patiño Martinez, Marta

## 3. Prior knowledge recommended to take the subject

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### 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 \*

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### 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

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### 5.1. Brief description of the subject

This course presents architectures for scalable distributed systems and data management systems: map-reduce, 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	Face-to-face classroom activities	Face-to-face laboratory activities	Other face-to-face activities	Assessment activities
1	<b>Introducción</b> Duration: 02:00 Lecture			
2	<b>Tema 1</b> Duration: 02:00 Lecture			
3	<b>Tema 1</b> Duration: 02:00 Lecture			
4	<b>Tema 1</b> Duration: 02:00 Lecture			
5	<b>Tema 2</b> Duration: 02:00 Lecture			
6	<b>Tema 2</b> Duration: 02:00 Lecture			
7	<b>Tema 3</b> Duration: 02:00 Lecture			
8	<b>Tema 3</b> Duration: 02:00 Lecture			
9	<b>Tema 4</b> Duration: 02:00 Lecture			
10	<b>Tema 4</b> Duration: 02:00 Lecture			
11	<b>Tema 5</b> Duration: 02:00 Lecture			
12	<b>Tema 5</b> Duration: 02:00 Lecture			
13	<b>Tema 6</b> Duration: 02:00 Lecture			
14	<b>Tema 6</b> Duration: 02:00 Lecture			

15	<b>Tema 6</b> Duration: 02:00 Lecture			<b>Practical assignment</b> Group work Final examination Duration: 15:00  <b>Practical assignment</b> Problem-solving test Continuous assessment Duration: 10:00
16				
17				<b>Exam</b> Written test Continuous assessment and final examination Duration: 03:00

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

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.

\* The subject schedule is based on a previous theoretical planning of the subject plan and might go through experience some unexpected changes along throughout the academic year.



## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
15	Practical assignment	Problem-solving test	Face-to-face	10:00	35%	5 / 10	CG10 CE5 CE8 CE4 CE18 CE19 CE1 CE9 CE10
17	Exam	Written test	Face-to-face	03:00	65%	4 / 10	CE4 CE19 CE1 CE9 CE10

#### 7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
15	Practical assignment	Group work	Face-to-face	15:00	35%	5 / 10	CE8 CE4 CG10 CE5 CE18 CE19 CE1 CE9 CE10
17	Exam	Written test	Face-to-face	03:00	65%	4 / 10	CE4 CE19 CE1 CE9 CE10

#### 7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Assignment	Group work	Face-to-face	10:00	35%	5 / 10	CG10 CE5 CE8 CE4 CE18 CE19 CE1 CE9 CE10
Exam	Written test	Face-to-face	03:00	65%	4 / 10	CG10 CE5 CE8 CE4 CE19 CE1 CE9 CE10

## 7.2. Assessment criteria

Assignments 70%

Exam 30%

## 8. Teaching resources

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### 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