



POLITÉCNICA

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PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000387 - New trends in distributed systems

DEGREE PROGRAMME

10AK - Master Universitario en Software y Sistemas

ACADEMIC YEAR & SEMESTER

2017/18 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000387 - New trends in distributed systems
No of credits	4 ECTS
Type	Optional
Academic year of the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	10AK - Master Universitario en Software y Sistemas
Centre	Escuela Tecnica Superior de Ingenieros Informaticos
Academic year	2017-18

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	Th - 11:00 - 14:00

* 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
Vianello ., Valerio	valerio.vianello@upm.es	Patiño Martinez, Marta
Fernandez Gallego, Rafael	r.fernandez@upm.es	Patiño Martinez, Marta

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

El plan de estudios Master Universitario en Software y Sistemas no tiene definidas asignaturas previas recomendadas para esta asignatura.

3.2. Other recommended learning outcomes

- Java programming, concurrent programming, databases

4. Skills and learning outcomes *

4.1. Skills to be learned

CEM2 - Analizar y sintetizar soluciones a problemas que requieran aproximaciones novedosas para la definición de la infraestructura computacional que permita el procesamiento y el análisis de datos de diversa naturaleza

CEM6 - Realizar trabajos de investigación en las principales líneas de investigación activas en el área de los paradigmas de la computación distribuida, sus aplicaciones prácticas y la gestión de la infraestructura necesaria

CGI20 - Adquirir conocimientos científicos avanzados del campo de la informática que le permitan generar nuevas ideas dentro de una línea de investigación.

4.2. Learning outcomes

RA60 - Ser capaz de entender artículos de investigación en el área de sistemas distribuidos

RA58 - Conocer principales protocolos de control de concurrencia y recuperación

RA57 - Conocer principios sistemas transaccionales

RA53 - Ser capaz de identificar los principales retos que aborda una línea de investigación emergente en sistemas distribuidos

RA52 - Ser capaz de relacionar una línea de investigación emergente en sistemas distribuidos con los fundamentos de los sistemas distribuidos

RA49 - Conocer principales líneas activas en sistemas distribuidos

RA59 - Conocer principales protocolos de replicación de datos y de procesos y criterios de corrección

RA109 - RA57

RA105 - RA50

RA106 - RA51

RA107 - RA52

RA110 - RA59

RA111 - RA60

RA108 - RA53

RA51 - Ser capaz de estudiar y analizar un nuevo área de investigación en sistemas distribuidos

RA50 - Ser capaz de encontrar e identificar artículos seminales de un área de investigación en sistemas distribuidos

RA104 - RA49

* 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: map-reduce, 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. Performance Evaluation. Benchmarks

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	Introducción 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			Practical assignment Group work Continuous assessment and final examination Duration: 12:00
13	Tema 6 Duration: 02:00 Lecture			

14	Tema 6 Duration: 02:00 Lecture			
15	Tema 6 Duration: 02:00 Lecture			
16	Tema 6 Duration: 02:00 Lecture			
17				Paper presentation Individual presentation Continuous assessment Duration: 02:00

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
12	Practical assignment	Group work	Face-to-face	12:00	35%	5 / 10	CEM2 CGI20 CEM6
17	Paper presentation	Individual presentation	Face-to-face	02:00	65%	4 / 10	CEM2 CEM6

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
12	Practical assignment	Group work	Face-to-face	12:00	35%	5 / 10	CEM2 CGI20 CEM6

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

Assignments 70%

Exam 30%

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