

**Información del Plan Docente**

<b>Academic Year</b>	2017/18
<b>Faculty / School</b>	110 - Escuela de Ingeniería y Arquitectura
<b>Degree</b>	534 - Master's in IT Engineering
<b>ECTS</b>	6.0
<b>Year</b>	1
<b>Semester</b>	First semester
<b>Subject Type</b>	Compulsory
<b>Module</b>	---

**1.General information****1.1.Introduction****1.2.Recommendations to take this course****1.3.Context and importance of this course in the degree****1.4.Activities and key dates****2.Learning goals****2.1.Learning goals****2.2.Importance of learning goals****3.Aims of the course and competences****3.1.Aims of the course****3.2.Competences****4.Assessment (1st and 2nd call)****4.1.Assessment tasks (description of tasks, marking system and assessment criteria)****5.Methodology, learning tasks, syllabus and resources****5.1.Methodological overview**

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as:

**Classroom activities**

- Lectures. The instructor presents and explains the class contents, including illustrative examples.

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- Problem-Based Learning. Educational approach to learning and instruction in which students tackle real problems in small groups under the supervision of the teacher.
- Practice sessions. Any practical and collaborative activity taught in the class.
- Laboratory sessions. Activities done in laboratories with special equipment (computing and networking)
- Tutorials. Students can discuss and review with the teacher the materials explained in the class.
- Assessment. A set of written or oral tests, exercises, laboratory sessions, project, assignments, etc.

### Autonomous work

- Assignments. Preparation of seminars, readings, small research projects, documents to be presented on the classroom or handed in to the teacher.
- Coursework. Preparation of activities to be presented or submitted in the practice sessions.
- Study of theory. Exam preparation, library research, readings, problem solving, etc.
- Study of practical contents related to assignments.
- Complementary activities. Optional and voluntary activities unrelated to the exams and grading such as readings, seminars, workshops, videos, etc.

## 5.2.Learning tasks

The course (150 hours) includes the following learning tasks:

- Lectures (20 hours).
- Practice sessions (10 hours). Problem-solving tasks.
- Laboratory sessions (15 hours).
- Assignments and research projects (20 hours).
- Tutorials (5 hours).
- Autonomous work and study (70 hours).
- Assessment (5 hours). Exam and defense of the course project.

## 5.3.Syllabus

The course will address the following topics:

1. Basic concepts: Architecture and components. Communication. Coordination. Consistency. Virtualisation
2. High availability: Fault detection. Quorums. Group Communication
3. Cloud systems: Unique image. Elasticity. Example PASS: Cloud Foundry. Example IAAS: Openstack
4. Software Defined Networks: Architecture and Implementation. Abstractions. Network Virtualisation. SDN programming. Applications
5. Cloud distributed services: Scheduling. Storage. Security
6. Administration of distributed systems

## 5.4.Course planning and calendar

The planning at the Rio Ebro campus is organised as follows:

- Lectures. 2h/week
- Practice sessions and problem-solving tasks 1h/week
- Laboratory sessions 2h/every 2 weeks

The exact hours will be announced beforehand in the Center's and course's websites.

The class projects will be submitted at the end of the semester, on the proposed dates.

## 5.5.Bibliography and recommended resources

- Coulouris, George F.. Distributed systems : concepts and design / George Coulouris, Jean Dollimore, Tim Kindberg . - 4th ed., 5th print. Harlow (England) : Addison-Wesley, 2009

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- Göranson, Paul. Software Defined Networks, A comprehensive Approach / Paul Göransson and Chuck Black Morgan Kaufman, 2014
- Kshemkalyani, Ajay D.. Distributed computing : principles, algorithms, and systems / Ajay D. Kshemkalyani and Mukesh Singhal. Cambridge : Cambridge University Press, 2011
- Nadeau, Thomas D.. SDN : software defined networks / by Thomas D. Nadeau, Ken Gray. - 1st ed. Beijing [etc.] : O'Reilly Media, 2013