30221 - Distributed Systems

Syllabus Information

Academic year: 2024/25
Subject: 30221 - Distributed Systems
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 330 - Complementos de formación Máster/Doctorado
439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 439 - Bachelor's Degree in Informatics Engineering: 3
330 - Complementos de formación Máster/Doctorado:
443 - Bachelor's Degree in Informatics Engineering: 3

Semester: First semester
Subject type: Compulsory
Module:

1. General information

The Distributed Systems course aims to expand and apply the knowledge acquired in previous courses about operating systems, computer networks and programming of concurrent and distributed systems. This course also provides support for other subjects, such as Software Engineering, Software Project, Systems Administration II, Web Engineering, Web Systems and Technologies, E-Commerce and Distributed Information Systems. The applied approach of the course allows students to better understand how the theoretical concepts are applied in the real world and how to manage distributed systems and communication networks in professional settings.

2. Learning results

In order to pass this course, the student must demonstrate the following outcomes:

- Understands the basic principles of distributed systems, the services they provide and the most relevant technologies, as well as aspects of implementing applications based on them.
- Understands the basic principles of security in distributed systems.

3. Syllabus

Basic concepts :

- Architectures. Processes and threads. Inter-process communication. Interface definition languages. Client-server model. Status and event ordering. Synchronization. Logical time. Group communication.

Resource management :

- Resource naming. Scheduling. Virtualization. Migration. Mutual exclusion. Leader election. Deadlocks.

Technologies:

- Message systems. File systems. Object systems. Web systems. P2P systems.

Fault tolerance:

- Consensus. Distributed transactions. Replication.

Security:

- Encryption services. Kerberos. Digital certificates. Public key infrastructures.

4. Academic activities

In order to achieve the learning objectives of this course, students should dedicate about 150 hours distributed as follows:

- approximately 56 hours of in-person activities (lectures, problems and laboratory practice).
- 91 hours of effective personal study (studying notes and texts, solving problems, preparing for classes and practices, developing of code).
- 3 hours of the final written exam.

The schedule of exams and deadlines for assignments will be announced well in advance.

5. Assessment system

The assessment of the course will follow the global assessment procedure.

The global exam of the course consists of two parts:

- A written exam in which problems must be solved, conceptual questions must be answered, or exercises to be solved. A minimum grade of 5.0 on the written exam is required to pass the course. The grade obtained in this exam will be weighted 70% of the grade of the course.
- Practical work in the laboratory. The solutions provided will be assessed based on their compliance with the specifications, the quality of their design, and the time spent. A minimum grade of 5.0 points in the practical laboratory work is required to pass the course. The grade obtained in this work accounts for 30% of the course grade. Students who need to achieve the minimum required grade or simply want to improve their grade in this section may take a comprehensive practical exam, which will be held on the same day as the written theory exam.

If a grade of 5.0 points is not achieved in either of the two parts of the evaluation, the overall grade for the course will be the lower of 4.0 or the result obtained by weighting the percentages of each part.

6. Sustainable Development Goals

7 - Affordable and Clean Energy
8 - Decent Work and Economic Growth
9 - Industry, Innovation and Infrastructure