

Academic Year/course: 2021/22

## 30221 - Distributed Systems

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 30221 - Sistemas distribuidos

**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:** 3

**Semester:** First semester

**Subject Type:** Compulsory

**Module:**

## 1. General information

## 2. Learning goals

## 3. Assessment (1st and 2nd call)

## 4. Methodology, learning tasks, syllabus and resources

### 4.1. Methodological overview

The methodologies used in this course are:

- Theoretical lectures explaining the concepts and design of Distributed Systems.
- Problem solving lectures where students apply theoretical knowledge.
- Practical sessions in labs with smaller groups where students design and implement, in computers, different solutions to basic problems.

### 4.2. Learning tasks

The course includes the following learning tasks:

- Study of Distributed Systems concepts.
- Analysis of architectures and technologies.
- Problem-based learning.
- Design and implementation of Distributed System solutions in a lab.

### 4.3. Syllabus

The course will address the following topics:

- Basic concepts: Architectures. Processes and threads. Interprocess communication. Interface definition languages. Client-Server model. Management of events. Timing. Logical time. Group communication.
- Resource management: Assignment of the resource. Scheduling. Virtualization. Migration. Mutual exclusion.

- Leader election. Locks.
- Technologies: Messaging systems. File systems. Objects systems. Web systems. P2P systems.
- Fault Tolerance: Consensus. Distributed transactions. Replication.
- Security: Cryptographic services. Kerberos. Digital certificates. Public key infrastructures.

#### 4.4. Course planning and calendar

##### Schedule of sessions and presentation of works

The educational organization of the course is as follows:

- Lectures and lessons of problems: 3 hours a week
- Computer lab sessions

Escuela de Ingeniería y Arquitectura de Zaragoza: 2 hours every two weeks

Escuela Universitaria Politécnica de Teruel: 1 hour a week

In computer lab sessions students work in small groups supervised by a teacher.

##### Student Work

To achieve the objectives of this subject, students have to spend about 150 hours distributed as follows:

- 56 hours approximately, during learning activities (lectures, problems and practical lab sessions)
- 91 hours of personal study (the study of notes and texts, problems solving, preparation for classes and practices, and learning of the software development process)
- 3 hours for the written final exam

#### 4.5. Bibliography and recommended resources

EINA:

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30221&Identificador=14670>

EUPT:

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30221&Identificador=13593>