30212 - Concurrent and Distributed Systems Programming

Syllabus Information

Academic Year: 2021/22
Subject: 30212 - Programación de sistemas concurrentes y distribuidos
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 439 - Bachelor's Degree in Informatics Engineering
       443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 2
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 methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks will be implemented, according to the following items:

- students must work on the subject since the beginning of the semester.
- lectures for the presentation of the main concepts and methodologies for the development of concurrent and distributed systems. The teacher will make the lectures as interactive as possible so that students should also participate.
- the use of the presented methodologies in practical problem sessions, where students should have a participative attitude.
- the laboratory sessions, where students will learn the necessary technologies for the development of programming projects where different entities should have to cooperate. For that, the studied synchronization mechanisms should have to be used.
- some teamwork programming projects, which should be conveniently designed, developed, documented and demonstrated.

4.2. Learning tasks

The course includes the following learning tasks:

- about 60 hours of face-to-face activities, including lectures, problem sessions and laboratory sessions
- about 30 hours of teamwork
- about 55 hours of student individual work

- about 5 hours for evaluation

4.3. Syllabus

The course will address the following topics:
- Introduction to concurrency (4h approx.)
- Modelling of concurrent systems (6h approx.)
- The critical section problem (5h approx.)
- Semaphores (8h approx.)
- Monitors (6h approx.)
- Introduction to distributed systems (3h approx.)
- Coordination by means of tuple spaces (3h approx.)
- Distributed algorithms (7h approx.)
- Introduction to real-time systems (1.5h approx.)
- Introduction to event-based systems (1.5h approx.)

The laboratory sessions will cover the following topics:
- Concurrent programming. Threads and shared data. Problems generated by the sharing of data and resources (2h)
- Solutions to the critical section problem (2h)
- Synchronization by means of semaphores (2h)
- Synchronization by means of monitors (2h)
- Synchronization in distributed systems by message passing (4h)
- Analysis of the teamwork project (2h)

4.4. Course planning and calendar

The concrete schedule of the proposed activities will be established according to the faculty organization.

4.5. Bibliography and recommended resources

Teruel:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30212&Identificador=12947

Zaragoza:
http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30212&Identificador=13379