

Academic Year/course: 2022/23

## 30319 - Microprocessor-based Eletronics Systems

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 30319 - Microprocessor-based Eletronics Systems

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 438 - Bachelor's Degree in Telecommunications Technology and Services Engineering  
581 - Bachelor's Degree in Telecommunications Technology and Services 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 process of teaching and learning designed for this subject is based on the following. It will involve three different training activities with increasing student participation as the course progresses: lectures and laboratory sessions.

- Face-to-face sessions will have an eminently practical orientation. In the more theoretical lectures, the basis of microprocessor-based system design (software and hardware) will be presented.
- The second training activity will focus on the laboratory sessions in small groups, where the students will work with embedded software design CAD tools.

#### 4.2. Learning tasks

The program, offered to the students to achieve the learning goals, includes the following activities:

##### **IN-PERSON ACTIVITIES.**

##### **Lectures (A01) and exercises and cases solving (A02):**

In this activity, the fundamental contents of the subject will be presented, with a practical orientation. This activity will take place in person. The necessary materials will be available to students through the ADD.

##### **Laboratory sessions (A03):**

This activity is structured in 6 practical sessions of 2.5 hours each. The scripts will be available to students in the ADD well in advance. In these sessions, the required software and hardware tools for embedded software design will be used, so that students will acquire the necessary skills and abilities.

**Tutoring sessions (A05):** Personalized teacher-student sessions in order to mentor the proposed works.

**Evaluation tests (A08):** Evaluation activity includes performing a global test.

##### **NOT IN PERSON ACTIVITIES.**

**Study (T7):**

This activity includes personal work aimed at achieving the adequate pursuit of the subject, conducting lab sessions and the proposed works and the tutoring process.

### 4.3. Syllabus

The distribution into thematic units of the theoretical program of the subject is as follows:

- Introduction to microprocessor-based systems
  - Microprocessor architecture
  - C Programming
  - Number systems, fixed point.
  - Microprocessor peripherals.
  - Microprocessor-based systems design.
    - Memory Integrated Circuits
    - Analog-digital/Digital-Analog Converters.

Labs:

1. Introduction to Development Tools and Prototyping Board.
2. Controlling peripherals by polling.
3. Interrupts.
4. Signal modulation. FSK Modukator.
5. Fixed point numbers. FSK Demodulator.
6. Design exercise.

(The specific design of each practice can be modified)

### 4.4. Course planning and calendar

Both theoretical classes and laboratory sessions are held according to the schedule set by the centre (available on the corresponding website). The other activities will be planned depending on the number of students and will be announced well in advance.

Each teacher will inform of the particular tutoring hours.

### 4.5. Bibliography and recommended resources

**1. Basic teaching materials.** Available in <http://add.unizar.es> (To access this resource, the student must be enrolled in the subject).

- **Slides.** They are considered the notes of the subject.
- **Practices scripts.**
- **Supplementary teaching materials.** Set of useful materials for the course: catalogs of manufacturers, component data sheets, CAD tools, manuals, etc.

**2. Reference books:**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30319>