

## 28828 - Embedded Systems

### Syllabus Information

---

**Academic year:** 2024/25

**Subject:** 28828 - Embedded Systems

**Faculty / School:** 175 - Escuela Universitaria Politécnica de La Almunia

**Degree:** 424 - Bachelor's Degree in Mechatronic Engineering

**ECTS:** 6.0

**Year:** 3

**Semester:** Second semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The objective of the subject is to train students in the design and programming of programmable electronic systems with special requirements of consumption, portability, reliability and cost. Additionally, acquire skills in the use of software development and debugging tools in assembly language and C.

### 2. Learning results

- Acquire programming skills in  $\mu P$ .
- Master simulation tools and basic laboratory instruments.
- Understand and interpret commercial equipment documentation.
- Drawing and interpreting planes and diagrams according to the appropriate standards and symbology.

### 3. Syllabus

Topic I: Introduction to the design of microprocessor-based systems.

Topic II: AVR family architecture.

Topic III: Programming in C language.

Topic IV: I/O ports.

Topic V: The interruption system.

Topic VI: Timers and counters.

Topic VII: A/D and D/A conversion (digital filters).

Topic VIII: Serial Communications.

Topic IX: Advanced microcontrollers.

### 4. Academic activities

#### Lectures: 28 hours

The contents of the subject will be presented, with a practical orientation towards the design and programming of electronic systems

#### Laboratory practices: 28 hours

During these practices the systems studied in the lectures will be seen in real operation for a better understanding of the subject.

#### Study and personal work: 90 hours

This non-attendance part is valued at about 90 hours, necessary for the study of theory, problem solving and development of assignments of work.

#### Assessment tests. 4 hours

### 5. Assessment system

The subject will be evaluated in the continuous assessment mode by means of the following activities:

- **Laboratory practicals** (50% of the grade, minimum 4 out of 10)

In each of the practices, the results obtained and the process followed will be evaluated. Once the practice has been completed, a report of the practice is handed in. This activity will be carried out individually.

- **Written evaluation tests and proposed works** (50% of the grade, minimum 4 out of 10)

The evaluation test may consist of theoretical questions, problems to be solved and theoretical-practical questions. The proposed works may replace the examination of a part of the subject in the continuous assessment method.

To be eligible for the Continuous Assessment system, students must attend at least 80% of the face-to-face classes (practicals, technical visits, lectures, etc.)

**Global assessment test.**

Following the regulations of the University of Zaragoza in this regard, if the student has not passed any of these activities during the semester, they will have the opportunity to pass the subject by means of a global test in two official calls.

## **6. Sustainable Development Goals**

4 - Quality Education

5 - Gender Equality