Universidad Zaragoza

Academic Year/course: 2023/24

29511 - Programmable Electronic Systems

Syllabus Information

Academic year: 2023/24
Subject: 29511 - Programmable Electronic Systems
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 625 - Bachelor's Degree in Industrial Processes' Data Engineering
ECTS: 6.0
Year: 2
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The objective of the subject is to train the student 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.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (https://www.un.org/sustainabledevelopment/es/), such that the acquisition of learning results of the subject provides training and competence to contribute to some extent to the achievement of targets 4.3 and 4.4 of Goal 4, and target 5.1 of Goal 5.

2. Learning results

- To understand the inner workings of microprocessors.
- Analyze the internal operating logic of a microprocessor.
- To know the internal architecture of a microcontroller.
- The student should be able to write programs in C or similar language that use the resources of a microcontroller.

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: 36 hours

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

Laboratory practices: 20 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 internship has been completed, a report of the practice will be sent to . This activity will be carried out individually.

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

The 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.