

30220 - Hardware Project

Syllabus Information

Academic year: 2023/24

Subject: 30220 - Hardware Project

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: 439 - Bachelor's Degree in Informatics Engineering: 3

443 - Bachelor's Degree in Informatics Engineering: 3

330 - Complementos de formación Máster/Doctorado: XX

Semester: First semester

Subject type: 439 - Compulsory

330 - ENG/Complementos de Formación

443 - Compulsory

Module:

1. General information

Hardware Project is a practical subject with the following objectives:

- Reinforce the knowledge acquired in previous subjects.
- Demonstrate that this knowledge is applicable to real cases.
- To develop almost all the basic competences of the degree, allowing the student to be able to face new problems autonomously in the future.
- Develop the ability to debug code execution at both high (e.g. in C) and low level (assembler).
- Improve teamwork, document writing and oral presentation skills.

These approaches and objectives are aligned with targets 9.5 and 9.C of Sustainable Development Goal 9, SDGs, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>).

This subject reinforces, through the application to practical cases, the knowledge acquired in Operating Systems, Computer Networks, Computer Architecture and Organization I and II. Therefore, recommends the student to have taken all these subjects or to be in the process of doing so.

2. Learning results

Understand and know how to perform the basic steps of the life cycle of an embedded system with soft real-time constraints.

Know the steps to take to commercialize an embedded system, from its conception and feasibility study to its sale.

Have advanced knowledge of assembler programming of processing routines and interaction with peripherals, using a development platform (compilation, debugging and libraries).

Know examples of commercial platforms for embedded systems development (processor and peripheral architecture, hardware support for debugging).

3. Syllabus

- Assembly code optimization.
- Integration of assembler with high-level language and libraries.
- Compilation, assembly and debugging.

- Input/output devices.
- Development of an embedded software project with real-time constraints.
- Introduction to performance analysis.
- Performance evaluation and verification of response times.

4. Academic activities

Lectures (5 hours): in these classes there will be an introduction to each project, reviewing the necessary theoretical knowledge, relating it to the knowledge acquired in previous subjects, describing the available support material and briefly explaining the tasks to be performed.

Practical sessions (48 hours, 4 per week during the whole term): in these sessions a teacher is available in a laboratory so that students can ask questions they may have.

Personal study and work (72 hours estimated): students work on their own, using the available material to acquire the necessary skills and carry out the required projects.

Writing the documentation (20 hours): once a project has been completed and the teacher has approved the work done, students must submit a report.

Submissions and corrections (5 hours): students must periodically submit their work to one of the teachers. These deliverables serve both to evaluate the student and to guide the student. In addition, teachers will review the reports submitted by the students and will meet with them to discuss them.

5. Assessment system

There are two assessment modalities:

1. Continuous assessment: students must make a series of deliveries within deadlines that will be established well in advance. In addition, they will have to defend their work orally, and deliver reports. In order to pass the subject, all deliveries must be satisfactorily completed.
2. Assessment by means of a global exam in the second call: this exam will be practical, and will be related to the project developed in the subject.