

29844 - Real-Time Systems

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	440 - Bachelor's Degree in Electronic and Automatic Engineering
ECTS	6.0
Course	4
Period	First semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

- The course will be based on combining theoretical explanations with practical exercises and laboratory work.
- Lectures will provide theoretical and practical concepts of real-time systems, illustrated with examples. For these examples a real-time kernel and a specific microcontroller will be used.
- Students will be organized by groups of two. Each group will develop a project.

5.2.Learning activities

Classroom activities: 2.4 ECTS (60 hours)

1) Course lectures (type T1) (30 hours).

Lectures of theoretical and practical content. The theoretical and practical aspects of real-time systems is presented, illustrating them with examples. Student participation is considered very important in order to acquire the learning outcomes and skills needed.

2) Case studies (type T2) (15 hours).

Different case studies will be worked out at the classroom. Students are encouraged to prepare them in advance.

3) Lab (type T3) (15 hours).

Five sessions of three hours each in which the working groups will develop the assigned project with the teacher assistance.

Personal work: 3.6 ECTS (90 hours)

4) Project (T6 type) (40 hours).

Two-person course projects will be assigned.

5) Personal study (type T7) (46 hours).

Student Personal study of the theoretical issues and resolution of problems.

6) Evaluation (T8) (4 hours).

Evaluation is also a learning tool with which the student checks the degree of understanding and assimilation reached. Assessment will be based on the project assignment and a final examination.

5.3.Program

1. Real-time systems introduction.
2. The microcontroller F2812
3. Concurrency in applications. Priorities and time.
4. Real-time kernels. Structure, tasks and time. SYS-BIOS.

29844 - Real-Time Systems

5. Deadline Monotonic Scheduling.
6. Resource sharing between tasks.
7. Priority inheritance and priority ceiling protocols.
8. Aperiodic tasks.
9. Fault Tolerance.

5.4.Planning and scheduling

Timetables for classroom and laboratory sessions will be published prior to the beginning of the course at the web of the EINA <https://eina.unizar.es/> and EUPT <https://eupt.unizar.es/>

5.5.Bibliography and recommended resources