

30319 - Electronic Systems with Microprocessors

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	438 - Bachelor's Degree in Telecommunications Technology and Services Engineering
ECTS	6.0
Year	3
Semester	First semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.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, laboratory sessions and workshops (T6 activities).

- Face-to-face sessions will have an eminently practical orientation. In the more theoretical lectures, the basis of

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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.
- The third activity (T6) is workshop orientated, where the autonomous student work will be encouraged to achieve as a result the complete design of a microprocessor based system. The required material to develop these activities will be provided to the student well in advance.

5.2.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 adequate pursuit of the subject, conducting lab sessions and the proposed works and the tutoring process.

Workshops and/or seminars (T6):

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In this activity both T6 type activities and the reports elaboration associated to lab sessions are included. In order to meet the request result, students will have the material provided by the teachers. The student autonomy, the quality of the solution, and the participation of each of the group members will be considered in the evaluation process for each job.

5.3.Syllabus

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

- Introduction to microprocessor based systems
 - o Microprocessor architecture
 - o C Programming
 - o DSP architecture and programming
 - o Number systems, fixed point.
 - o Microprocesor peripherals.
 - o Microprocessor based systems design.
 - Memory Integrated Circuts
 - Analog-digital/Digital-Analog Converters.

Labs:

1. Software tolos and DSK C5515
2. Controlling peripherals by polling.
3. Interrupts.
4. Signal modulation. FSK Modukator.
5. Fixed point numbers. FSK Demodulator.
6. Design exercise.

5.4.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.

5.5. 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:

- Sen M. Kuo, Bob H. Lee, Wenshun Tian, "Real-Time Digital Signal Processing, Implementations and Applications", John Wiley & Sons, Inc. 2006.
- Peter Prinz, Tony Crawford. "C in a Nutshell, 2nd Edition, The Definitive Reference". O'Reilly 2015
- Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", Second Edition, Prentice Hall, Inc., 1988.
- J.I. Artigas, L.A. Barragán, C. Orrite, I. Urriza, "Electrónica Digital. Aplicaciones y problemas con VHDL", Prentice-Hall, 2002.
- T. L. Floyd "Fundamentos de Sistemas Digitales", Pearson, 2006.