28828 - Programmable Electronic Instruments

Syllabus Information

Academic Year: 2019/20
Subject: 28828 - Programmable Electronic Instruments
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

1.1.Aims of the course

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. Furthermore, acquire dexterity in the use of software development tools and debugging in assembly language and C.

1.2.Context and importance of this course in the degree

The subject of programmable electronic systems, is part of the group of subjects that make up the module called Electricity and Electronics. It is a subject of the third course located in the second semester and it has a mandatory character, with a 6 ECTS credits teaching load. Creates the basis of knowledge in programmable electronics systems that constitutes the nucleus of decision and control of a current mechatronic system.

1.3.Recommendations to take this course

The subject Electronic programmable systems, has no mandatory prerequisites, but students of the Mechatronics Engineering are advised to at least have completed, the following subjects: Computer Science, Electrical Engineering and Electronic Technology I.

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as:

1. Lectures: The theoretical concepts of the subject are explained and illustrative examples are developed as a support to the theory when necessary, focus on calculation, design and development of a mechatronic system.
2. Laboratory Workshop. These classes are highly recommended for a better understanding of the concepts because those items whose calculation is done in lectures are shown in working mode.
3. Tutorials related to any concept of the subject. This activity is developed in an on-site mode with a defined schedule

or through the messaging and forum of the virtual classroom Moodle.

4.2.Learning tasks

The course includes the following topics:

Lectures. it will take 2 hours per week till the 40 hours, necessary to accomplish the objectives of the subject study, will be reached.

Laboratory Workshop. it will take 10 sessions of 2 hours duration. The group is divided up into various groups, according to the laboratory capacity.

Study and autonomous work. This off-site part is valued in about 90 hours, necessary for the study of theory, problem solving and revision of documents Individual tutorials. Each teacher will publish a schedule of attention to the students throughout the four-month period.

4.3.Syllabus

The contents are distributed in nine teaching units forming treatment indivisible blocks. These topics collect the contents needed for the acquisition of predetermined learning outcomes.

Tema I	Introduction to the design of microprocessor based systems.
Tema II	Architecture of the AVR family.
Tema III	Programming in C.
Tema IV	Input/output digital.
Tema V	Interrupt system.
Tema VI	Timers and counters.
Tema VII	ADC amd DAC. (digital filters)
Tema VIII	Serial Communications.
Tema IX	Advanced microcontrollers.

4.4.Course planning and calendar

The theory classes and problems are given in the timetable established by the center, as well as the hours assigned to the practices.

The presentation of the works will be done on the last day of class of the subject.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28828&year=2019

Material	Format
Topic theory notes Topic presentations	Paper/repository
Topic presentations Topic problems Related links	Digital/Moodle E-Mail
technical manuals	Paper/repository Digital/Moodle
Software compiler and simulator	laboratory work station
Board Arduino UNO ATMEGA328 ATAVRDRAGON emulator, programmer for AVR.	laboratory