Universidad Zaragoza

Year : 2020/21

28840 - Advanced IT

Syllabus Information

Academic Year: 2020/21
Subject: 28840 - Advanced IT
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 4.0
Year: 4
Semester: Second semester
Subject Type: Optional
Module: ---

1.General information

1.1.Aims of the course

This subject and their results have to this goals

The general aim of this course is that student acquires knowledge and skills of advanced informatics related to mechatronics.

Students will be trained to use, install and program embedded devices and the operating systems involved. Students will be instructed about when to apply such devices.

1.2.Context and importance of this course in the degree

This subject has as main goal that students gain ability to use advanced IT related to mechatronics.

It is a non mandatory second semester subject at the fourth year.

Some not yet covered informatic questions are introduced here.

1.3.Recommendations to take this course

It is preferred that student has coursed the first year Informatic subject.

2.Learning goals

2.1.Competences

Upon passing the subject, the student will be more competent to:

Specifics

1. (EB03) Basic knowledge of computers use and programming, operating systems, databases and applications with use in engineering.
2. (EE05) Knowledge of microprocessors fundamentals and uses.
3. (EE11) Applied knowledge of industrial informatics and networks.

Generics

1. (GI03) Knowledge about basic and technology subjects that make them able to learn new methods and theories, and give them changeableness to adapt to new situations.
2. (GI04) Ability to problem solving with initiative, decision, creativity, critical reasoning and to communicate knowledge, capabilities and skills in Industrial Engineering and in particular in the industrial electronics field.
3. (GC02) To interpret experimental data, to compare with expected data and to elaborate conclusions.
4. (GC03) Ability to abstraction and logical reasoning.
5. (GC04) Ability to learn continuously in a self guided and autonomous manner.
6. (GC05) Ability to evaluate options.
7. (GC06) Ability to adapt to quick evolving technologies.
8. (GC07) Ability to be a team leader, and also to be a compromised participant.

9. (GC08) Ability to find technical information, and to understand and valorate it.
10. (GC09) Positivity related to technological innovations.
11. (GC10) Ability to write technical documentation and to expose it with adequate computer tools.
12. (GC11) Ability to clearly communicate their reasoning and designs to specialized and non specialized people.
13. (GC15) Ability to analyze and to apply simplified models to hardware and technological solutions that will be able to make predictions about their behaviour.

2.2.Learning goals

The student, to pass this subject, must demonstrate the following results:

- To identify and to evaluate fundamental criteria for computer systems design.
- To know how to select components and elements suitable to application.
- To implement systems for information processing in real time.
- To acquire basic foundations of operating systems, communications and hardware.

2.3.Importance of learning goals

Knowledge acquired in this subject, allows optimized use of operating systems and also better programming skill, obtaining more efficiency using computer systems.

3.Assessment (1st and 2nd call)

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

The student must demonstrate that they have achieved the expected learning outcomes through the following assessment activities

The evaluation process will include two types of action:

- **A continuous evaluation system**, which will be carried out throughout the learning period.
- **A global assessment test**, reflecting the achievement of learning results, at the end of the teaching period.

1 Continuous evaluation system .

Following the spirit of Bologna, regarding the degree of involvement and continued work of the student throughout the course, the evaluation of the subject considers the continuous evaluation system as the most appropriate to be in line with the guidelines set by the new framework from the EHEA.

The continuous evaluation system will have the following group of qualifying activities:

a) **Work 1** related to Operating Systems. Consisting of a little work that demonstrate the efficient use of the operating system studied. The percentage with respect to the global mark will be 25%.

b) **Work 2** related to Programming. Consisting of the building of a little program. The percentage with respect to the global mark will be 50%.

c) **Work 3** related to Data Bases. Consisting of the design of a data base and programming code that performs several operations with data. The percentage with respect to the global mark will be 25%.

All works are individual and compulsory works. It is necessary to pass all the works separately so that they can contribute to the average of the final grade. The correctness and quality of the results will be assessed, and also the approach, management and development.

To opt for the Continuous Assessment system, you must attend at least 80% of the face-to-face activities (practices, technical visits, classes, etc.)

2 Global final evaluation test .

The student must opt for this modality when, due to their personal situation, they cannot adapt to the rhythm of work required in the continuous evaluation system, have suspended or want to upload a grade having participated in said evaluation methodology.

The global final evaluation test will have the following group of qualifying activities:

- **Exam**: Compounded by questions and problems. It is carried out in the official calls. The assessment is conducted by the same procedures as the continuous evaluation system. The exam has three parts:
    - Part 1 related to Operating Systems (25 % of the global mark)
    - Part 2 related to Programming (50 % of the global mark)
    - Part 3 related to Data Bases (25 % of the global mark)

It is necessary to pass all the parts separately so that they can contribute to the average of the final grade.

The students who have not passed the continuous evaluation system, but have passed one or more activities, can promote the activities passed to the equivalent one in the global evaluation system.

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. The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The organization of teaching will be carried out using the following steps:

- Lectures: Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.
- Practice Sessions: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- Laboratory Workshop: The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.
- Individual Tutorials: Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online through moodle.

If classroom teaching were not possible due to health reasons, it would be carried out on-line.

4.2.Learning tasks

The course includes the following learning tasks:

- Face-to-face generic activities:
  - Lectures: The theoretical concepts of the subject are explained and illustrative examples are developed as a support to the theory when necessary
  - Practice Sessions: Problems and practical cases are carried out, complementary to the theoretical concepts studied
  - Laboratory Workshop: This work is tutored by a teacher, in groups of no more than 20 students
- Generic non-class activities:
  - Study and understanding of the theory taught in the lectures
  - Understanding and assimilation of the problems and practical cases solved in the practical classes
  - Preparation of laboratory workshops, preparation of summaries and reports
  - Preparation of the written tests for continuous assessment and final exams

The subject has 4 ECTS credits, which represents 100 hours of student work in the subject during the trimester.

4.3.Syllabus

The course will address the following topics:

1 Theoretical contents

- Operating systems
- Object-oriented programming
- Introduction to concurrency and real-time
- Data bases

2 Practical contents

- Learn to install, configure and use operating systems.
- Learn to programme with object-oriented languages.
- Learn to install, configure and use complementary software tools, involved in program creation.

4.4.Course planning and calendar

The dates of the works deadlines will be communicated in-class sessions or in Moodle platform: http://moodle.unizar.es.

The weekly timetable will be published in moodle at the start of the semester. The dates of continuous assessment work and the publication dates of qualifications will be published in moodle at the start of the semester.

The dates of the final exams will be those that are officially published at http://www.eupla.es/

In the global evaluation system, the delivery dates of works will be published in moodle and will be previous to final exams.

4.5.Bibliography and recommended resources

See following link