Universidad Zaragoza

Academic Year/course: 2023/24

28820 - Electronic Technology II

Syllabus Information

Academic year: 2023/24
Subject: 28820 - Electronic Technology II
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 6.0
Year: 3
Semester: First semester
Subject type: Compulsory
Module:

1. General information

The general objective of the subject is to provide the necessary knowledge to interpret and solve digital electronic circuits, especially in the areas of combinational and sequential circuits.

For this purpose, it is necessary the correct use of the most common computer applications for circuit simulation and of the measurement and power supply devices commonly used in the electronics laboratory, andd also to correctly interpret the technical documentation of the components used.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), so that the acquisition of the learning results of the subject provides training and competency to contribute to some extent to their achievement:

- Target 9.1: Develop reliable, sustainable, resilient and quality infrastructure, including regional and cross-border infrastructure, to support economic development and human well-being, with a particular emphasis on affordable and equitable access for all
- Target 9.4: By 2030, upgrading infrastructure and converting industries to be sustainable, using resources more efficiently and promoting the adoption of clean and environmentally sound technologies andindustrial processes, with all countries taking action in accordance with their respective capabilities

2. Learning results

- Interpret and solve analog and digital electronic circuits.
- Acquire programming skills in µP.
- To know sensor and transducer typologies.
- Master simulation tools and basic laboratory instruments.
- Understand and interpret commercial equipment documentation.
- Drawing and interpretating plans and diagrams according to the appropriate standards and symbology.

3. Syllabus

Contents of the subject indispensable for the achievement of the learning results.

Theoretical contents

***Block 0*: INTRODUCTION: DIGITAL TECHNIQUES**

***Block 1*: ANALYSIS AND DESIGN OF LOGIC AND COMBINATIONAL CIRCUITS**

1.- Basic elements of digital technology and integrated circuits

2.- Combinational logic design methods

3.- Combinational Logic Circuits (Encoders and Decoders, Multiplexers and Demultiplexers, and Other Combinational Functions)

***Block 2*: ANALYSIS AND DESIGN OF SEQUENTIAL LOGIC CIRCUITS**

4.- Basic and synchronized bistables

5.- Digital counters and digital registers

6.- P.L.D. and A.S.I.C. matrix architectures / Semiconductor memories

Practical contents

Each block described in the previous section has practical exercises associated, by means of practical assumptions and/or physical or simulated assembly works, leading to obtaining the results and their analysis and interpretation.

4. Academic activities

- Theoretical classes: The theoretical concepts of the subject will be explained and practical examples will be developed.
- Types of problems: The teacher solves problems or case studies for illustrative purposes. This type of teaching complements the theory presented in the lectures with practical aspects. On the other hand, Tutored problem solving: Students will develop examples and carry out practical problems or casesrelated to the theoretical concepts studied.
- Laboratory Practices: The total group of theory classes may or may not be divided into smaller groups, as appropriate. The students will perform assemblies, measurements, simulations, etc. in the laboratories in the presence of the practical teacher.
- Tutored autonomous activities: These activities will be tutored by the teachers of the subject.
- Reinforcement activities: Through a virtual teaching portal, various activities will be directed to to reinforce the basic contents of the subject. Its performance will be monitored through the same.

5. Assessment system

The subject is divided into two thematic blocks, which will be evaluated as following:

1. Laboratory practices (30%): In each of the practices, the dynamics followed for its correct execution and operation will be evaluated. It will be assessed whether the required data are correct and has been correctly answered to the questions posed, as well as the quality of the analysis that the students carry out ofthe results obtained.

2. Theoretical-practical written tests (70%) in which questions and/or problems of similar complexity to those used during the term will be posed . The quality and clarity of resolution, the concepts used to solve the problems, absence of errors, and the correct use of terminology and notationwill be evaluated.

In order to pass the subject, in each of the practical blocks and the theoretical-practical written tests that will be carried out, students must obtain a grade equal to 4 to pass the subject.

The final grade will be the average of the grades obtained in each of the blocks. **NOTE = (Block1)-50%+ (Block2)-50**

The student will be able to choose between a continuous evaluation, carried out in the form of two written tests and the delivery of the scripts of practices throughout the term, or a global test carried out at the end of the term corresponding to the written tests and/or a global test corresponding to the practices of laboratory. This global test will be divided into two parts corresponding to the blocks of the subject, the student must achieve a minimum grade of 4 points in each of them to average.

It is an indispensable condition to pass the subject in continuous assessment, the attendance to 80% of the face-to-face activities: classes, technical visits, practices, etc.

The grades obtained in each of the blocks may be promoted to the next session/s within the same academic year, provided that the grade is equal to 4 points.