

Academic Year/course: 2021/22

29615 - Basic principles of electronics

Syllabus Information

Academic Year: 2021/22

Subject: 29615 - Fundamentos de electrónica

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 430 - Bachelor's Degree in Electrical Engineering

ECTS: 6.0

Year: 2

Semester: Second semester

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

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

The teaching process is guided by the need to the solution: circuits and devices. First, the scenario is presented. Second, most representative electronic systems are identified for covering the previously stated requirements. Third, the electronic devices are presented. At last, the design stage is reached. To do this, the course practices are presented, so that theory and practice are perfectly imbricated.

Regarding activities with the whole group, they are divided into lectures and problems solving. Student participation in these activities is sought. In parallel, the student must study and prepare suggested problems for better utilization of classes.

Besides, practices are mandatory. They are distributed throughout the semester and they are evaluated for the final course result. The prior practical work is individual and must show result estimations and question answers. An additional individual document has to be prepared discussing differences between correct and estimated results.

The autonomous work of the student and his application for solving exercises is essential in his learning process and for overcoming evaluation activities.

The material for the development of the course will be available in the virtual platform "Moodle" from the University of Zaragoza from which students can download the following documents:

- a) Presentation of the course: teaching guide of the course, contact data of the teachers and the tutorial schedule.
- b) Materials for lectures.
- c) Guides for the practice sessions.
- d) Other materials that may be of interest.

4.2. Learning tasks

The programmed activities to help the students for achieving the expected results include the following activities:

- 1: Lectures (30 hours)

Fundamental contents of the course are exposed.

2: Problems solving (15 hours)

Many application problems are solved in a participatory manner. The teacher proposes problems and students are encouraged to prior solving the problems.

3: Practice (15 hours)

Six practice are mandatory. Students have guides for the practices which have been provided in advance. These guides contain a description of the electronic systems, some guidelines and some questions about the theoretical or practical content.

Each student must prepare the previous work of the practice. This work should contain an estimation of the results and the responses to the questions indicated in the practice guide. An additional individual document has to be prepared discussing differences between correct and estimated results.

4: Practical work

These works relate to previous preparation of every practice and their documentation.

5: Study and personal work

It is very important that students develop their work steadily throughout the semester. The autonomous work of the student and his problem solving is essential for good evaluation results.

6: Tutorials

The teacher is available for the students in the tutorial schedule for solving their doubts.

7: Evaluation

In addition to the qualifying function, evaluation is also a learning tool with which the students realize the degree of understanding and assimilation that have reached about the course.

4.3. Syllabus

The course syllabus is as follows:

1. Introduction.
2. Diodes and linear power supplies.
3. Bipolar Junction Transistors (BJT) and Field Effect Transistors (MOSFET).
4. Operational Amplifiers.
5. Digital Electronics.

The course practices are:

1. Instrumentation of the laboratory and electromechanical dynamics.
2. Diodes and power supplies.
3. Analog speed control of a motor with BJT and MOSFET.
4. Temperature control using operational amplifiers.
5. Pulse width modulation (PWM) using operational amplifiers.
6. Digital speed control of a motor.

4.4. Course planning and calendar

Schedule of the sessions

Lectures, problem classes, and practice are arranged accordingly to the schedule published by the secretariat of the EINA. The schedule is published before the start date of the course.

Each teacher informs about his tutorial schedule and its modification throughout the semester if it happens.

The other activities will be planned depending on the number of students and will be announced in advance.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=29615&Identificador=13327>