

30022 - Basic principles of electronics

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	436 - Bachelor's Degree in Industrial Engineering Technology
ECTS	6.0
Course	3
Period	First semester
Subject Type	Compulsory
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

Learning process designed for this subject is based on the following principles:

Learning process is developed through three main levels: lectures, exercise solving and laboratory practices, with increasing participation from the student.

- In lectures, theoretical basis of electronic systems will be shown, having several examples to illustrate them.

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- In exercise solving sessions several exercises will be explained and solved, with student participation.
- Laboratory practical sessions will be developed in small groups. The student will implement and test electronic circuits shown in the lectures and exercise sessions.

Materials for the subject will be available in the virtual platform "moodle" of the University of Zaragoza, from which the student will be able to download the following documents:

- Presentation of the subject. Includes contact data for teachers, timetables of tutorials, classes, laboratory practices, and evaluation dates. It also will include evaluation criteria for the different learning activities; objective description and subject program, and the most relevant bibliographic references.

- Slides for the lectures
- Manuals for the laboratory practices, and descriptive guide about instruments in the laboratory.
- Data sheet of main electronic components used in practices.
- Collection of small questions of theoretical/practical type to give support for evaluation preparation.
- Collection of exercises to be solved to give support to evaluation activity.
- Collection of exams of past courses with solutions

5.2.Learning activities

Lectures (30 hours) (classroom teaching)

This activity presents fundamental contents of the subject and is done in the classroom in face-to-face modality.

Practical learning activity in classroom (face to face activity) (15 hours)

In this activity, different exercises applying fundamental contents are solved in the classroom in a participative way. Students are encouraged to try and solve previously the exercises.

Laboratory Practices (15 hours) (face-to-face activity)

Students have the practical exercises manual available in university server. They include a description of the circuits to be implemented and indications to develop the activity. In order to achieve and adequate effectiveness of this work, students must come to this classes with the practical exercise previously prepared.

The practical exercises are:

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1. Introduction to electronics laboratory
2. Diodes. Linear power supply.
3. Electronic control of the speed of a DC motor
4. Digital electronics based PWM generator to control the speed of a DC motor
5. Analog electronics based PWM generator to control the speed of a DC motor
6. Audio Amplifier

Personal work and study (85 hours) (non face-to-face)

This section includes the previous work required to prepare laboratory sessions.

It is very important that the student develops study and exercises resolution in a continuous way during the subject.

Regularly the student will get proposals of exercises to solve. Some of them will be solved in classroom classes.

Tutorials (face-to-face)

Teachers are available for tutorials with students in a specific timetable, so they can ask any doubts and questions about the subject.

Evaluation (5 hours) (face-to-face)

Moreover to determine the grades of evaluation, it is also a learning tool with which the student may test his/her own degree of comprehension and assimilation of the subject.

5.3.Program

Theme 1. Pre-requisites

Theme 2. Semiconductors. Diodes

Theme 3. Bipolar transistor

Theme 4. Unipolar transistor

Theme 5. Transistor based voltage and current sources

Theme 6. Transistor switching

Theme 7. Introduction to digital devices

Theme 8. Operational amplifier (OA)

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Theme 9. OA based non-linear stages

Theme 10. Amplifiers

Theme 11. OA base linear stages

Theme 12. Non-ideal operational amplifier

Theme 13. Transistor based amplifiers

Theme 14. Frequency response

5.4.Planning and scheduling

5.5.Bibliography and recommended resources