

29635 - Fundamentals of Electrical Engineering

Syllabus Information

Academic year: 2024/25

Subject: 29635 - Fundamentals of Electrical Engineering

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 430 - Bachelor's Degree in Electrical Engineering

ECTS: 6.0

Year: 1

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The objective of the subject is that the student obtains a functional tool that allows them to advance in subjects of a fundamentally electrical and also electronic nature.

A solid knowledge of Mathematics I (first year, first semester) is recommended.

2. Learning results

- Know the fundamentals and principles of circuit theory and electrical machines
- Have the ability to apply these principles to the analysis of simple problems involving electrical circuits and electrical machines.
- Handle the instruments used in a basic electrical engineering laboratory

3. Syllabus

1. Fundamental quantities and circuit elements
2. Circuit analysis methods. Application to resistive networks
3. Steady state with sinusoidal excitation
4. Power with sinusoidal excitation

4. Academic activities

Theoretical and problem classes (45 hours)

Theoretical classes will present the concepts and fundamentals of electrical circuit analysis, illustrating them with real examples and typical problems. Student participation will be encouraged through questions and brief discussions.

In the problem classes, problems and cases of increasing complexity will be developed with the participation of the students, coordinated at all times with the theoretical classes. Students will be encouraged to pre-work the problems and perform similar exercises as personal work.

Laboratory (15 hours)

The student will calculate, simulate, assemble and test the operation of electrical circuits in the laboratory. A script for each practice session will be available and should be prepared in advance.

Evaluable activities

Different tests will be conducted throughout the semester

Personal study

Assessment tests.

5. Assessment system

The student will be able to choose between two assessment options: continuous and global. Continued work will be encouraged, therefore the continuous assessment is recommended.

Gradual or continuous assessment:

- Laboratory practices (20%): the grade for practices will be obtained from the average of two exams taken in the third and sixth sessions. A minimum score of 4 out of 10 is required to pass the subject.
- Evaluable activities (20%): the grade for this part will be obtained from a compendium of different activities carried out throughout the semester, which may be deliverable problems, partial written tests or practical work.

- Exam call (60%): written exam at the end of the semester. A minimum score of 4 out of 10 is required to pass the subject.

Global assessment.

- Global assessment of the practices (20%): an exam of practices in the laboratory will be carried out. A minimum score of 5 out of 10 is required to pass.
- Exam call (80%): written exam at the end of the semester. A minimum score of 5 out of 10 is required to pass.

6. Sustainable Development Goals

7 - Affordable and Clean Energy
13 - Climate Action