Universidad Zaragoza

Academic Year/course: 2024/25

29809 - Fundamentals of Electrotechnics

Syllabus Information

Academic year: 2024/25
Subject: 29809 - Fundamentals of Electrotechnics
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering
444 - Bachelor's Degree in Electronic and Automatic 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.

This is a subject whose evaluable contents alone do not yet provide the student with direct capabilities to contribute to the achievement of the 2030 Agenda , however, they are essential to base the subsequent knowledge of the rest of the degree that is more directly related to the SDGs and therefore to the 2030 Agenda.

2. Learning results

- Know the fundamentals of circuit theory and electrical machines.
- Understand the principles of circuit theory and electrical machines and acquire the ability to apply them to the analysis of simple electrical circuit and electrical machine problems .
- Analyze electrical circuits in sinusoidal steady state and transient regime.
- Handle the instruments used in a basic electronics laboratory.

3. Syllabus

- Circuit elements.
- Resistive networks.
- Permanent regime with sinusoidal excitation.
- Magnetic coupling between coils.
- Power with sinusoidal excitation in steady state.
- Transient and stationary regime.
- Introduction to electrical machines.
- Introduction to three-phase systems.

Practical activities program:

- Instrumentation: Polymeter.
- Instrumentation: Oscilloscope.
- Direct current I.
- Direct current II.
- Sinusoidal steady state.
- Electrical measurements.

4. Academic activities

- Lectures (30 hours). Expository and explanatory sessions of contents illustrated with real examples. Student participation will be encouraged.
- Problem classes (15 hours). Problems and cases will be developed with student participation. Laboratory practices (15 hours). Circuits will be calculated, simulated, assembled and tested in the laboratory.
- Exercises and practical work (42 non face-to-face hours). Students will be proposed exercises and cases to develop on their own , preparation of laboratory practices, etc.
- Theoretical-practical study (45 non face-to-face hours). The continuous work of the student will be encouraged through the homogeneous distribution throughout the semester of the various learning activities.

- Assessment (3 hours). In addition to the grading function, the assessment is also a learning tool with which the learner checks the degree of understanding and assimilation they have achieved.
- Tutoring. Direct attention to the student, identification of learning problems, orientation in the subject, etc.

At EUPT, the degree is offered in two different modalities: on-site (as indicated above) and blended learning. In the blended mode, lectures and problems will be conducted through recorded classes and virtual tutorials. There will be 10 hours of online internships and 5 hours of face-to-face internships (concentrated in a day to be arranged with the blended students).

5. Assessment system

The assessment will consist of:

- Laboratory Practices (14%): The student must pass a practical exam in the laboratory. Minimum qualification: 4.0
- Proposed works (36%): An exam (6%) and two sets of exercises (12% for the first set and 18% for the second set) will be proposed for the student to solve at home. In relation to the exercises, students will be invited to to solve one of the problems (slightly modified) that they have previously had to solve and hand in. This will be done for each set of exercises.
- Exam (50%-86%): Generally composed of problems. Minimum qualification: 4.0. It will represent a maximum of 86% of the student's overall grade, and may be weighted less (up to 50%) if any of the proposed work is exceeded. If all the proposed papers are passed, the exam of the first official exam will be weighted 50%. If any of the papers are not passed, the exam will be weighted 50% plus the value that would have for that paper. If none of the proposed work is passed, the official exam of the first call will be worth 86% of the final grade.

6. Sustainable Development Goals

7 - Affordable and Clean Energy
9 - Industry, Innovation and Infrastructure
12 - Responsible Production and Consumption