

30014 - Basic principles of electrical technology

Syllabus Information

Academic year: 2023/24

Subject: 30014 - Basic principles of electrical technology

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 436 - Bachelor's Degree in Industrial Engineering Technology

ECTS: 6.0

Year: 2

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The subject fundamentally presents the language with which electrical and electronic systems will be described, analyzed, modeled and designed and, if necessary, electronic systems that will be dealt with in later subjects.

The subject builds on the skills acquired in the mathematics and physics subjects, but is one of the opening subjects of the industrial training block (electrical/electronic) for which it provides, in addition, a first contact with some of the basic fundamental problems of electrical engineering, such as the interconnection of electrical circuits, the concept of impedance, active and reactive energies, resonances, etc.

From the experimental point of view, the subject establishes the bridge between the electrical magnitudes used and the way of acquiring them by means of measuring instruments, as well as the ability to translate a circuit diagram into its corresponding physical realization, and vice versa.

With respect to the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), the evaluable contents of this subject do not contribute in a direct way to their achievement. However, they are essential to inform the subsequent knowledge of the rest of the degree that does relate more directly to the SDGs and the 2030 Agenda.

2. Learning results

The student, in order to pass this subject, must demonstrate the following 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 .

3. Syllabus

- 1.- Fundamental quantities and circuit elements.
- 2.- Direct current circuits. Methods of analysis.
- 3.- Permanent regime with sinusoidal excitation.
- 4.- Balanced three-phase systems.
- 5.- Power with sinusoidal excitation in steady-state mode

4. Academic activities

- Theoretical classes (3 hours per week). These class hours will alternate lectures, analysis and problem solving.
- Practical classes (5 sessions of 3 hours each)

5. Assessment system

FIRST CALL. There are two assessment modalities:

Gradual assessment. The final grade will be the weighted average of the grades obtained in the following sections

- * Laboratory practices (20%). The grade will be obtained through the completion of a set of mandatory practices.
- * Subject problems (10%). The grade will be obtained through the completion of a set of mandatory practices.
- * Final exam (70%). Final exam of the subject.

Global assessment: The final grade will be the weighted average of the grades obtained in the following sections

- * Laboratory practices (30%). The grade will be obtained through the completion of a final practical exam.
- * Final exam (70%). Final exam of the subject.

Remarks. A minimum grade of 4.5 points in Laboratory Practicals and Final Exam is required. The laboratory practices may be validated to those students who have previously taken them and with the criteria that will be indicated at the beginning of the term.

SECOND CALL: In the second round, the grade will be the weighted average of the grade obtained in the following sections:

* Laboratory practices (30%). Completion of a practice exam.

* Final exam (70%). Final exam of the subject.

Remarks. A minimum grade of 4.5 points in Laboratory Practicals and Final Exam is required. The grade of the Final Exam or Laboratory Practicals will be retained from the first session as long as it is greater than or equal to 5.0.