

30023 - Electrical Power Systems

Syllabus Information

Academic year: 2024/25

Subject: 30023 - Electrical Power Systems

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

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

ECTS: 6.0

Year: 3

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The subject aims to provide the student with a training related to electric power systems, and more specifically related to electrical networks, with emphasis on their operation both in permanent and transient regimes.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) and certain specific targets, such that the acquisition of the learning results of the subject provides training and competence to the student to contribute to some extent to the achievement of targets 7.1 and 7.3 of Goal 7, and target 9.4 of Goal 9.

In order to take this module it is recommended to have successfully completed the following subjects: Fundamentals of electric engineering, Electrical Machines.

2. Learning results

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

- Know how to use methods and techniques for calculating electrical lines.
- Know the fundamentals about permanent and transient regimes of power electrical systems.
- Be able to expand knowledge about electrical power systems and their applications in high and low voltage electrical installations.
- Be able to work in multidisciplinary and multilingual teams.
- Know the social, environmental, economic and industrial implications of the practice of electrical network engineering practice.

3. Syllabus

The contents of the theory-problem sessions are structured in the following sections:

I.- Elements of the electrical power systems.

II.- Power lines.

III.- Electrical parameters of the lines.

IV.- Power lines in permanent regime.

V.- Electrical networks in permanent regime

VI.- Electrical networks in transient regimes.

The contents of the practical laboratory sessions, as well as other activities, will be related to those of the theory-problem sessions. The practical sessions are structured in the following sections:

A.- Electric lines practices (two practices).

B.- Practice of electrical networks in permanent regime (one practice).

C.- Practices of electrical networks in transient regimes (two practices).

4. Academic activities

The **theory-problem sessions** contain fundamental concepts that are applied to practical exercises, which contribute to the understanding of those concepts. The methodology consists of lectures.

The **practical sessions** contain laboratory experiments, including computer-based practices, where practical situations are analyzed. It also includes health and safety knowledge specific to the work activities of the engineer in the industry.

Other evaluable activities may consist of deliverable problems, partial written tests, practical work or other activities on the application of the concepts studied. Such work may be in English.

5. Assessment system

Global Gradual Assessment:

- Laboratory practices (20% of the grade). Attendance is compulsory; absence from one or more practicals will result in the taking of the practical exam.
- Other evaluable activities (10% of the grade). They may consist of deliverable problems, a written midterm, a practical assignment or other activities.

Exam Call (70%). It will consist of an evaluable written test, to be taken within the period of exams of the center.

In order to pass this Global Gradual Assessment, it is also necessary to have done all the practical exercises in the laboratory, as well as to obtain a minimum score of 4 points out of 10 in both the exam and the laboratory practices.

Students who do not complete all the assessment tests indicated above (Gradual Global Assessment), will be able to pass the subject by means of the Final Global Assessment.

Final Global Assessment:

Exam Call (80%). It will consist of an evaluable written test.

- Practical exam (20% of the final grade). There will be a test consisting of an exam in the laboratory related to the practices.

In order to pass the subject, in these two Final Global Assessment tests it is necessary to obtain a minimum score of 4 out of 10 in each one of them.

6. Sustainable Development Goals

7 - Affordable and Clean Energy

9 - Industry, Innovation and Infrastructure