Universidad Zaragoza

Academic Year: 2025/26

29628 - Medium and High Voltage Electrical Installations

Teaching Plan Information

Academic year: 2025/26
Subject: 29628 - Medium and High Voltage Electrical Installations
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 430 - Bachelor's Degree in Electrical Engineering
ECTS: 6.0
Year: 3
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The objective of the course is that the student obtains a functional tool that will allow him/her to advance in the development, calculation and design of high voltage installations, specifically those related to electrical substations and medium voltage transformation stations.

2. Learning results

- Identify, classify and describe Medium and High Voltage (MV and HV) electrical installations.
- Meet and to select the characteristics of materials (conductors, switchgear and measuring and protection equipment,...) used in MV and HV electrical installations.
- Understand, select and properly use electrical protection techniques.
- Select and use appropriate tools for the design of MV and HV electrical installations.
- Calculate and design M.V. and A.V. electrical installations.
- To know and use the specific legislation and regulations for MV and HV electrical installations.
- Select and understand the use of technical literature and other sources of information in Spanish and English.

3. Syllabus

1. Introduction to the Electrical Power System
2. Voltages, overvoltages and insulation level
3. High voltage switchgear
4. Instrument transformers
5. Lightning arresters
6. Grounding systems
7. Design of electrical substations and transformer stations
8. Fundamentals of high voltage electrical protection
9. Isolation coordination

4. Academic activities

Lectures (45 hours).

Theoretical sessions that will explain the contents of the course, and practical sessions both for the understanding of the subject, and in the sense of instructing the student to approach the solution of practical exercises that he/she will have to face in their professional life.

Laboratory / visits to high voltage installations (15 hours).

Some practices will be carried out in the laboratory, while others consist of external practices, visiting and analyzing the operation and design of transformer stations and electrical substations.

Assessment (3 hours).

Teaching assignments (34 hours).

Periodically, exercises and cases will be proposed to the student to develop on their own. These can be obtained in the Ring Digital Teaching (http://moodle.unizar.es).

Personal study (53 hours).

5. Assessment system

The assessment of the subject will be of a global nature will the following structure:

1. 1. Assessment during the teaching period:

1.1. Laboratory Practices (5%)

The laboratory practices will be evaluated in the laboratory sessions themselves. The factors to be taken into account in the qualification will be:

- Previous preparation of the practice.
- Initiative and participation in the practice sessions.
- Correction and quality of the report, along with the provided technical documentation.

The grade for this activity will be from 0 to 10 points and will represent 5% of the overall grade. A student who fails to attend a session, unless there is a justified cause, at the scheduled time will receive a grade of 0 for that session.

1.2. Tutored Works (15%)

In order to encourage the student's continuous work, in addition to laboratory practices, the following activities will be carried out:

A tutored work related to some of the topics of the subject (groups of 2-3 students). Dates will be set for deliveries and will be published in the ADD. The grade for these assignments and activities will be from 0 to 10 points and will represent 15% of the overall grade.

1.3. Written exam (80%)

There will be a written exam, which will be graded from 0 to 10 points and will represent 80% of the student's overall grade.

Final grade of the course

In order to pass the course, it is necessary to obtain a final grade equal to or higher than five points. The final grade is composed of:

Final Grade = 0.80*(Written exam)+0.05*(Laboratory practicals)+0.15*(Supervised work)

2. Global assessment.

It will be carried out by means of a written exam that will have a theoretical part (type test) and a practical part (problems), and will take place at each official convocation. The grade for this activity will be from 0 to 10 points, and in order to pass the subject it is necessary to obtain a final grade equal to or higher than five points.

This global evaluation test, to which all students are entitled, is intended in the first call for those who do not wish to follow the continuous evaluation; and it will constitute the evaluation method in the second official call.

6. Sustainable Development Goals

7 - Affordable and Clean Energy
9 - Industry, Innovation and Infrastructure