Universidad Zaragoza

Academic Year/course: 2024/25

29813 - Electrotechnics

Syllabus Information

Academic year: 2024/25
Subject: 29813 - 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: 2
Semester: First semester
Subject type: Compulsory
Module:

1. General information

The subject is designed for the study of the practical application of electricity.

The main objectives are: to master the operation of the most important electrical machines, to know the most important industrial applications where each of the machines studied during the subject are used, and to develop a minimum skill in laboratory tests and handling of instrumentation with electrical machines.

2. Learning results

In order to pass this subject, the students shall demonstrate they have acquired the following results:

- Understand the principles of operation of electrical machines and has the ability to apply them to the analysis of steady-state and transient operation of electrical machines.
- Have the ability to identify, classify and describe the behavior of electrical machine systems through the use of analytical methods and modeling techniques of electrical machine analysis.
- Understand user needs in the selection of electrical machines.
- Have the skills to work in an electrical engineering laboratory.
- Understand the codes of practice and industry standards for electrical machines.
- Identify, classify and describe low, medium and high voltage electrical installations and electrical protections.

3. Syllabus

- The contents to be developed are as follows:
- The electrical power system.
- General aspects of electrical machines.
- Selection of electrical machines and regulations.
- Transformers
- Three-phase systems.
- Single-phase and three-phase transformer.
- Connection of transformers in parallel.
- Autotransformers and instrument and protection transformers.
- Rotary machines
- Winding and rotating magnetic field.
- The three-phase asynchronous machine.
- The three-phase synchronous machine.
- The direct current machine.

4. Academic activities

- Theory classes (30 hours): classroom with projector, blackboard, real examples, catalogs..
- Problem classes (15 hours): problems and typical cases will be developed in the classroom with the participation of students.
- Laboratory practicals (15 hours): in small groups, checking operation, connection, measurement of magnitudes of the main electrical machines.
- Assignments (24 hours): encourage continuous work by students through deliverable exercises, short exams, simulation practices, etc.

- Study (60 hours).
- Assessment tests (6 hours)

The EUPT teaches the subject in two different modalities: face-to-face (already mentioned) and blended learning (theory classes and problems through recorded classes and virtual tutorials); practices are online (40%) and face-to-face (60%) concentrated in one or two days to be agreed with the blended group).

5. Assessment system

Assessment throughout the semester (preferred):

- Evaluable activities (20%). No minimum grade to pass the subject.
- Laboratory practices (20%). Previous preparation (50% of this section) and performance, results, previous work , aptitude... (50% of this section). The practice not performed is scored with a 0. Internships are not made up (except with official proof, by prior agreement with the assigned teacher). Minimum grade to pass the subject: 5.0 (*) (valid in both calls). If the practice grade is less than 5.0, the Global Assessment must be taken.
    - Practoces are not validated. Exceptionally, a practice exam without notes may be taken.
- Exam (60%):

    a) Theoretical part (30% of this section). Minimum grade 4.0.

    b) Part problems (70% of this section). Minimum grade: 4.0.

    The minimum grade of the complete exam to pass the subject is 5.0 (*).

(*) If the minimum grade in practice or exam is not reached, the final grade in the course will be the lower value between the weighted average and "4.0"

Global assessment (exceptional): In both calls, students with an internship grade lower than 5.0 will be able to opt for a global assessment:

- Practical laboratory exam (30%). Minimum grade to pass the subject: 5.0 (*). It will be done at the end of the exam of the subject (date agreed between student-professor; without notes).
- Subject exam (70%). Similar structure to that of the assessment throughout the semester.

6. Sustainable Development Goals

7 - Affordable and Clean Energy
8 - Decent Work and Economic Growth