Universidad Zaragoza

Academic Year/course: 2023/24

28822 - Power Grids and Electric Machines

Syllabus Information

Academic year: 2023/24
Subject: 28822 - Power Grids and Electric Machines
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 6.0
Year: 3
Semester: First semester
Subject type: Compulsory
Module:

1. General information

The purpose of this subject is for the student to acquire the necessary knowledge to understand the fundamentals and applications of three-phase power systems, lines and electrical machines.

It implies an important impact on the acquisition of the competences of the degree, in addition to providing a useful training in the performance of the functions of the Mechatronics Engineer related to the field of electricity.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (https://www.un.org/sustainabledevelopment/es/) and certain specific targets, such that the acquisition of the learning results of the subject will contribute to some extent to the achievement of target 7.1 of goal 7.

2. Learning results

- Notions of theoretical and practical aspects of electrical machines.
- Resolution of electrical lines.
- Mastering basic laboratory instruments.
- To know aspects related to the generation, transport and distribution of electric energy.
- Drawing and interpretating plans and diagrams according to the appropriate standards and symbology.

3. Syllabus

The subject program is structured around two complementary content components:

THEORETICAL CONTENTS.

- TOPIC 1: Three-phase sinusoidal alternating current.
- TOPIC 2: Direct current lines.
- TOPIC 3: Single-phase alternating current lines.
- TOPIC 4: Three-phase alternating current lines.
- TOPIC 5: Single-phase transformers.
- TOPIC 6: Three-phase transformers.
- TOPIC 7: Direct current motors.
- TOPIC 8: Three-phase asynchronous motors.

PRACTICAL CONTENTS.

Laboratory practices related to electrical measurements and automatisms will be carried out.

4. Academic activities

Bearing in mind that the degree of experimentality considered for this subject is low, the indicative time distribution of the academic activities for the 15 weeks of duration will be as follows:

- 45 hours of lectures, 40% of theoretical exposition and 60% of problem solving.
- 10 hours of laboratory practice.
- 5 hours of evaluation tests.
- 90 hours of study and personal dedication.

As well as group and individual tutoring, at the request of the students.

5. Assessment system

CONTINUOUS ASSESSMENT SYSTEM:

- Individual activities in class: They will be carried out at the end of each of the topics. At least 80% of of these activities must be carried out in order to be eligible for this evaluation system, due to their nature. Its minimum average grade will be 5 out of 10 points, for its contribution to 10% of the final grade.

- Laboratory practices: Its minimum average grade will be 5 out of 10 points, for its contribution to 20% of the final grade.

- Written tests: Its minimum average grade will be 5 out of 10 points, for its contribution to 70% of the final grade, as long as there is no grade lower than 3 points in any of the tests, in which case the activity will be considered failed. Two tests will be conducted:

    - Test 1: Topics 1, 2, 3 and 4.

    - Test 2: Topics 5, 6, 7 and 8.

GLOBAL ASSESSMENT SYSTEM.

- Laboratory practices: Its minimum average grade will be 5 out of 10 points, for its contribution to 20% of the final grade.

- Written examination: Its minimum grade will be 5 out of 10 points, for its contribution to 80% of the final grade.