Universidad Zaragoza

Year : 2020/21

29632 - Electrical Power Stations

Syllabus Information

Academic Year: 2020/21
Subject: 29632 - Electrical Power Stations
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 430 - Bachelor's Degree in Electrical Engineering
ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

The subject and its expected results respond to the following approaches and objectives:
The objective of the course is for the student to obtain the necessary knowledge that will allow them to advance in the analysis, calculation and design of power plants and transformation parks.

1.2.Context and importance of this course in the degree

This subject is supported by the rest of the contents taught in the 1st, 2nd and 3rd courses of the Degree in Electrical Engineering, with special emphasis on Electrical Engineering, Electrical Machines, Low Voltage Installations and Medium and High Voltage Electrical Installations.

The different activities that are proposed during the development of this subject (practices, assignments and problem classes) not only seek to assimilate the concepts set out in the agenda, but also acquire the ability to interpret, describe, calculate and design traditional generation systems and analyze the operating principles of generation in energy markets.

On the other hand, other subjects of an electrical nature are supported on this discipline, mainly Alternative Energies and Power Systems.

1.3.Recommendations to take this course

The student needs to have a series of previous knowledge for a correct learning of the subject. Above all, the student needs a good base of electrical circuits, electrotechnics, low voltage installations and medium and high voltage electrical installations.

Continuous monitoring of the subject in both theory and problem classes as well as laboratory and external classes is essential, as well as personal study and the preparation of the assignments.

The continued work of this subject is essential to obtain an adequate use of the knowledge transmitted in the class as well as to successfully pass it. To facilitate this continuous work, the student has the advice of the teacher, both during classes and in the tutoring hours specially designed for it.

2.Learning goals

2.1.Competences

Upon passing the subject, the student will be more competent to ...

Generic skills:

Ability to combine basic and specialized knowledge of Electrical Engineering to generate innovative and competitive proposals in professional activity (C3)
Ability to solve problems and make decisions with initiative, creativity and critical reasoning (C4).
Ability to communicate and transmit knowledge, abilities and skills in Spanish (C6)
Ability to use the techniques, skills and tools of Electrical Engineering necessary to practice it (C7).
Ability to work in a multidisciplinary group and in a multilingual environment (C9).
Ability to manage information, manage and apply the technical specifications and legislation necessary for the practice of Electrical Engineering (C10).

Specific competences:

Capacity for the design of power plants (C38).

2.2.Learning goals

The student, to pass this subject, must demonstrate the following results ...
Learn about the various energy systems that can be used to obtain electrical energy.

It includes the processes of electrical generation from traditional energy sources.

Knows and knows how to select and dimension the set of elements that make up the electrical generation system of power plants.

Knows and knows how to select and size the various auxiliary systems that are part of power plants.

Learn about the operating principles of energy markets.

2.3.Importance of learning goals

The importance of the results obtained during the learning of the subject is clear since it provides the student with the basic knowledge, as well as the necessary tools, to be able to tackle in the professional field the design and analysis of the various electrical energy production systems, as a Graduate in Electrical Engineering.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that they have achieved the expected learning outcomes through the following assessment activities
The evaluation system plays a fundamental role in the learning process, since it establishes the way to measure the degree of achievement of the proposed objectives. The formation of a graduate in electrical engineering is theoretical-practical and therefore, in the evaluation of the students, the knowledge acquired in theory and practice must be taken into account.

Below is the evaluation proposal of the proposed subject as well as the way to obtain the overall grade.

The evaluation of the subject will be global and the structure will be as follows:

1. Assessment during the teaching period:

1.1. Laboratory practices (20%)

Laboratory practices are compulsory to pass the subject. They will be evaluated in the laboratory sessions themselves and the factors to take into account in the qualification will be:

Previous preparation of the practice.
Fill the quiz.
Complementary technical documentation provided by the student.
The qualification of this activity will be from 0 to 10 points and will suppose 20% of the global qualification. The student who does not attend a session, unless justified, at the scheduled time will have a grade of 0 in that session.

To pass the subject it is necessary to obtain a minimum score of 5 points out of 10.

1.2. Tutored Works (20%)

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

A tutored work related to some of the subjects of the subject (groups of 2-3 students).
Dates for deliveries will be set.
2. Evaluation on the dates provided by the center for Official Calls:

2.1. Final Exam (60%)

This exam will have a theoretical part (test type) and a practical part (problems) with an estimated duration of three hours. There will be a written exam at each official call.

The qualification of this activity will be from 0 to 10 points and will suppose 60% of the student's global qualification.

To pass the final exam it is necessary to obtain a minimum score of 4 points out of 10, both in theory and in problems.

2.2. Additional substitute evaluation of laboratory practices (20%)

Those students who have not passed the practices in the teaching period may choose to evaluate them by means of a practical exam, which will also include 20% of the overall grade. The minimum score in this section necessary to pass the course will be the same as that indicated in section 1.1.

Final grade of the subject

To pass the course it is necessary to obtain a final grade equal to or greater than five points. The final note is made up of:

Final Note = 0.6 * (Final exam) + 0.2 * (Laboratory practices) + 0.2 * (Tutored works)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process that has been designed for this subject is based on the following:

The teaching process will be developed in three main levels: theory classes, problems and laboratory, with increasing level of student participation. In theory classes, electrical power generation systems will be presented, illustrated with numerous examples of operating power plants. Problems classes will develop problems and practical applications. External and

laboratory practices will be developed in small groups, where the student will put into practice the knowledge acquired.

4.2.Learning tasks

The program offered to students includes the following activities

Theoretical classes and problems (45 hours).

They constitute the core teaching. The technique followed in these classes is primarily expository. The participation of the students through questions and comments will be encouraged.

Classes of problems will complement theoretical classes, since they are useful for the understanding of the matter and to instruct students in the design of real installations of generation.

Laboratory (15 hours).

These will serve to bring the student to the reality, and to apply the concepts explained in the theoretical lessons.

Some practices will be carried out in the laboratory, calculating, assembling, analyzing and checking operation; others consist of externships, visiting power plants.

Evaluation (3 hours).

The evaluation is a learning tool in order to the student checks the degree of understanding and assimilation that has reached.

Tutoring.

Direct attention to the student.

Works (non-presential hours).

Periodically exercises and cases will be proposed to the student. These will be available at http://moodle.unizar.es. This section also includes the preparation of additional activities and laboratory practices.

Individual study (67 hours).

The continuous work of the student will be encouraged.

4.3.Syllabus

The course will address the following topics:

- Description of electric power generation systems.
- Remote control, regulation and ancillary services.
- Electrical and electromechanical components.
- Operation of power generation systems.
- Electricity market. Tariffs.

4.4.Course planning and calendar

Calendar of sessions and presentations

The dates and times of the sessions (theoretical classes, practices, etc.) will be scheduled by the Center and published at the start of the course (http://eina.unizar.es).

Each teacher will inform about the hours of tutoring.

Other activities will be planned according to the number of students and will be announced in advance (http://moodle.unizar.es)

4.5.Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=29632&Identificador=14515