

29638 - Safety of Electrical Installations and Equipment

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	430 - Bachelor's Degree in Electrical Engineering
ECTS	6.0
Course	4
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

It is recommended to have passed the subjects of Fundamentals of Electrical Engineering, Analysis of electrical circuits, statistics, low voltage electrical installations, electrical installations in medium and high voltage, Electrical Machines I, Electrical Machines II electrical machines and drives.

The continued study and work, from the first day of the course, are critical to reach the maximum use the course.

It is important to solve as soon as possible questions that may arise, for which the student has the advice of the teacher during lectures and tutoring in the schedule established by the teacher.

1.2.Activities and key dates for the course

Detailed agenda of the various activities to be developed in the course will be established once the University and the School of Engineering have approved the academic calendar.

The student can found on the website of the School of Engineering information about:

* academic calendar.

* classrooms and timetable where both lectures and laboratory works will be carried out.

* dates of the two official calls of the subject exams.

The relationship and dates of various activities, together with all information and documentation on the subject, will be indicated by the teacher in the appropriate way.

2.Initiation

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2.1. Learning outcomes that define the subject

The student, for passing this subject, should demonstrate the following results...

- It has ability to identify, classify, describe and evaluate potential electrical hazards at a facility.
- It is able to calculate and design facilities necessary electrical safety according to existing technical specifications.
- Meet and select the characteristics of materials and personal safety equipment in accordance with current regulations.
- Identifies and considers the costs associated with the measurement, calculation and design of electrical installations in different buildings or infrastructure.

2.2. Introduction

Safety in electrical installations and equipment, is an optional subject of 6 ECTS credits, equivalent to 150 total hours of work, corresponding to 60 hours (theoretical and practical classes and laboratory practice) and 90 non-contact hours (mentored Work, study Individual and assessment tests).

This course develops and applies the fundamentals of calculation and design of safety in electrical installations and equipment, using its rules and specific legislation.

3. Context and competences

3.1. Goals

The subject and its expected results meet the following approaches and objectives:

The aim of the course is that students design safety measures in electrical installations and equipment, using its rules and specific legislation and acquire a set of functional foundations that allow them to develop independent learning strategies in the field of prevention and safety of electrical installations and equipment.

3.2. Context and meaning of the subject in the degree

To study the subject acquired knowledge and skills are required to take the following subjects "Fundamentals of Electrical Engineering (1)" "Analysis of electrical circuits (2nd)", "Statistics (2nd)", "Electrical installations low voltage (3rd)" " electrical installations in medium and high voltage (3rd) ", " power Lines (3rd) ", " electrical machines I (2nd) ", " electrical machines II (3rd) "and" Drives of electrical machines (3rd) " .

In addition, the acquired knowledge and skills to take this course in the field of prevention and safety of electrical installations and equipment, will complement those acquired to study the subjects of "lighting and home automation (4th)", "Power plants (4th) ", " electricity production facilities with renewable energy (4th) "and" Industrial Maintenance and ancillary facilities (4th) " .

3.3. Competences

After having passed the course, students will be more competent to...

Generic competences of the degrees of Engineering Ebro River Campus:

1. Ability to conceive, design and develop projects of Electrical Engineering (C1).

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2. Ability to combine basic knowledge and expertise of Electrical Engineering to generate innovative and competitive proposals for professional activity (C3)
3. Ability to communicate and transmit knowledge, skills and abilities in Castilian (C6)
4. Ability to analyze and assess the social and environmental impact of technical solutions acting with ethics, professional responsibility and social commitment, always looking for quality and continuous improvement (C8)
5. Ability to work in a multidisciplinary group and in a multilingual environment (C9)
6. Capacity information management, handling and application of technical specifications and legislation necessary for the practice of the Electrical Engineering (C10)

Specific powers of the degrees of Engineering Ebro River Campus:

1. Ability to know and understand the basic knowledge about the use and programming software with applications in electrical engineering installations (C14)
2. Ability to calculate and design of integrated low voltage electrical installations (C32)
3. Ability to perform measurements, calculations, assessments, appraisals, surveys, studies, reports and work plans (C40)
4. Ability to acquire knowledge and understanding of the basic concepts and procedures to apply to carry out engineering projects in the field of electrical engineering and power systems (C41)

3.4.Importance of learning outcomes

The knowledge, skills and tools acquired in this course will allow the student to implement prevention and safety in facilities and electrical equipment, according to their regulations and legislation.

4.Evaluation

The student must demonstrate that it has achieved the intended learning outcomes through the following evaluation activities.

The student may choose between the following two options assessment:

1. Gradual Rating :

Only entitled to the gradual evaluation are students who take the so-called other activities raised evaluable

The student must demonstrate that it has achieved the intended learning outcomes through the following evaluation

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activities:

1.1 Evaluation of laboratory work (30%)

The laboratory work will be assessed in the own laboratory sessions. The rating of this activity will be from 0 to 10 points. The student who does not attend a session, except for justified cause, at the scheduled time will have a rating of 0 in the session.

1.2. Other evaluable activities (40%)

In order to encourage the ongoing work of the student, in addition to the labs, other assessment activities distributed throughout the semester will be done. These activities may include: deliverable problems, partial written tests, practical work or other activities.

The rating of this activity will be from 0 to 10 points.

1.3. Final exam (30%)

The final exam will cover all descriptive and comprehensive aspects of learning outcomes. The rating of this activity will be from 0 to 10 points

To pass the course you must have attended every practice sessions, get a minimum score of 5 out of 10 in assessment practices, delivering the raised evaluable activities and a minimum score of 4 out of 10 in the final exam.

2. Overall assessment :

The student must demonstrate that it has achieved the intended learning outcomes through the following evaluation activities:

2.1. Evaluation of practical exam (30%)

The laboratory work will be assessed in the own laboratory session. The rating of this activity will be from 0 to 10 points. The student who does not attend a session, except for just cause, at the scheduled time will have a rating of 0 in the session.

2.2. Final exam (70%)

Examination final will cover all descriptive and comprehensive aspects of learning outcomes. The rating of this activity will be from 0 to 10.

5.Activities and resources

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5.1. General methodological presentation

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

The learning process has been proposed to encourage continued student work focused on the theoretical aspects to understand, analyze and apply that knowledge to solve real problems.

For the development of the subject, on the one hand theoretical sessions will be held with the whole group, in which the theoretical foundations of the subject will be presented in the form of lectures and supplemented by problem solving-type.

Moreover laboratory sessions, in which each student will work as a member of a small group of students, putting into practice the knowledge acquired in the theoretical lectures will be made.

In parallel, during the teaching period of the semester, students will do one or more work supervised by the teacher.

5.2. Learning activities

The program offered to the student to help him to achieve the expected results includes the following activities...

Theoretical lectures (45 contact hours). Sessions exposure and explanation of contents, along with problems and cases of practical application of such content. Student participation through questions and brief discussions will be encouraged.

Laboratory Practice (15 contact hours). The student will have a script practice previously provided at the beginning of the practical session, which will be accompanied with explanations and instructions necessary for the completion thereof, in the session itself, and given by the corresponding teacher.

Tutored work (18 hours Non-contact). During the first weeks of the course, the subject teacher raise students solving a set of problems and cases or conducting course work, which are applied in a practical way the contents of the developed subject in different course topics.

Individual study (68 hours Non-contact). Spread over the 15-week semester. the ongoing work of the student will be promoted by the evenly distributed throughout the semester of the various learning activities.

Assessment tests (4 contact hours). Assessment tests besides having a qualifying function, also a learning tool with which the student checks the degree of understanding and assimilation of knowledge and skills achieved.

Tutorial activities. Direct student care, identification of learning problems, orientation in the subject, attention to exercises and assignments...

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5.3.Program

The theoretical program of the subject is as follows:

1. Introduction to electrical safety
2. European directives, regulations and standards
3. Related Organizations with equipment safety
4. Electrical Safety
5. Standards and tests for safety equipment
6. Safety of machinery
7. Safety of facilities. Technical instructions

The laboratory course syllabus is based on 5 sessions of 3 hours and it is as follows:

1. Measurement of leakage current, standby and peak power
2. Testing heating
3. Tests on electric cables
4. Measurement of dielectric strength and insulation resistance
5. Marking of equipment

5.4.Planning and scheduling

Scheduled sessions and presentation of works

The theoretical lectures and laboratory sessions are held in the classroom or in the laboratory according to schedule set by the center and published prior to the start date of the course,

Each teacher will inform about its hours of tutoring and they will be published in the network.

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The other activities will be planned depending on the number of students and will be announced in time.

5.5. Bibliography and recommended resources

- *Bibliography* can be found in <http://psfunizar7.unizar.es/br13/eGrados.php?id=220>