

## 29628 - Medium and High Voltage Electrical Installations

### Información del Plan Docente

Academic Year	2017/18
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**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on participation and the active role of the student favors the development of communication and decision-making skills. A wide range of teaching and learning tasks are implemented, such as lectures, guided assignments, laboratory sessions, autonomous work, and tutorials.

Students are expected to participate actively in the class throughout the semester.

## 29628 - Medium and High Voltage Electrical Installations

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

### 5.2.Learning tasks

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

The course includes 6 ECTS organized according to:

- Lectures (1.8 ECTS): 45 hours.
- Laboratory sessions (0.6 ECTS): 15 hours.
- Guided assignments (1.2 ECTS): 30 hours.
- Autonomous work (2.4 ECTS): 57 hours.
- Tutorials

**Lectures:** the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

**Laboratory sessions:** sessions will take place every 2 weeks (5 sessions in total) and last 3 hours each. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods. Also viewing of HV instalations.

**Guided assignments:** students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures. They will be submitted at the beginning of every laboratory sessions to be discussed and analyzed. If assignments are submitted later, students will not be able to take the assessment test.

## 29628 - Medium and High Voltage Electrical Installations

**Autonomous work:** students are expected to spend about 60 hours to study theory, solve problems, prepare lab sessions, and take exams.

**Tutorials:** the professor's office hours will be posted on Moodle and the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

### 5.3.Syllabus

The course will address the following topics:

Theory sessions

Topic 1. Fundamentals of Electrical Power System

Topic 2. Voltages, overvoltages and insulation

Topic 3. High voltage electrical equipment

Topic 4. Surge arresters and line shielding

Topic 5. Instrument transformers

Topic 6. Grounding systems

Topic 7. H.V. and M.V substations design

Topic 8. Fundamentals of protection practice

Topic 9. Insulation coordination

### 5.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course, please refer to the Escuela de Ingeniería y Arquitectura de la Universidad de Zaragoza, website, <https://eina.unizar.es/>.

### 5.5.Bibliography and recommended resources

## 29628 - Medium and High Voltage Electrical Installations

[BB: Basic bibliography / BC: Complementary bibliography ]

- [BB] Iriondo Barrenetxea, Andoni. Protecciones de sistemas de potencia / Andoni Iriondo Barrenetxea Bilbao : Universidad del Pais Vasco, D.L. 1997
- [BB] Ramírez Vázquez, José. Estaciones de transformación y distribución. Protección de sistemas eléctricos / José Ramírez Vázquez ; con la colaboración de Lorenzo Beltrán Vidal, José Luis Borniquel Baqué, Pedro Dagá Gelabert Barcelona : CEAC técnico electricidad, D.L. 2004
- [BB] Sistemas de puestas a tierra en instalaciones de alta tensión : diseño, cálculo y verificación / Jorge Moreno Mohíno, Pascual Simón Comín, Gabriel Asensio Madrid ... [et al.] . - 1ª ed., 1ª reimp. [Madrid] : Ibergarceta, D.L. 2015
- [BC] Montañés Espinosa, Antonio. Instalaciones eléctricas de Alta Tensión / Montañés Espinosa, A.. Santillán Lázaro, A.. Paraninfo

Listado de URL

- 1- Apuntes de la asignatura. Disponibles en copistería y en <http://moodle.unizar.es>2- Reglamentos, normativa de las compañías suministradoras y de las casas fabricantes de aparata y equipos.3- Enunciados de problemas y guiones de prácticas. Disponibles en <http://moodle.unizar.es>[<http://moodle.unizar.es>]