

## 29643 - Smart Electrical Grids

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 29643 - Smart Electrical Grids

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 430 - Bachelor's Degree in Electrical Engineering

**ECTS:** 6.0

**Year:** 4

**Semester:** Second semester

**Subject Type:** Optional

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

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

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives.

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

#### 4.2.Learning tasks

The course includes the following learning tasks:

**Lectures (45 hours):** The teacher explains the course contents and solves representative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the course. Regular attendance is highly recommended.

**Laboratory sessions (15 hours):** Students are provided in advance with task guidelines for each session.

**Assignments (18 hours):** Students will complete assignments, problems, and exercises related to concepts seen in laboratory sessions and lectures.

#### 4.3.Syllabus

The course will address the following topics:

1. Introduction to Smart Grids (SG): definition, objectives and benefits.

2. Technologies applied in SG: Distributed Generation (DG), Demand Side Management (DSM), Energy Storage and Vehicle to Grid (V2G)
3. Operation of Smart Grids: System Protection, Control and Automation.

#### **4.4.Course planning and calendar**

Further information concerning the timetable, classroom, office hours, assessment dates, other details and further information regarding this course will be provided on the first day of class or please refer to the EINA (Escuela de Ingeniería y Arquitectura de la Universidad de Zaragoza), website (<http://eina.unizar.es>).

#### **4.5.Bibliography and recommended resources**