

## 29633 - Renewable Energy: Electricity-Producing 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	4
Semester	First 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 teaching process will involve three main levels: lectures, classes of problems and laboratory activities, with an increasing level of student participation. In the master classes, renewable energy generation systems will be shown, taking into account the principles of operation of its components, its operation and control, and illustrated with various examples of power generation facilities. In the classes of problems practical applications will be developed. Technical visit to solar power plants and wind farms, and laboratory activities will be done where students will practice the knowledge acquired.

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### **5.2.Learning tasks**

The program offered to achieve the expected results includes the following activities: ...

#### **Lectures and good practices (45 contact hours).**

These teaching sessions are the core of learning activities. The scientific body of the program is developed in them, while the student is facing new knowledge. The technique followed in these classes is based on an expository technique. Student participation is encouraged through questions, incorporating real-life situations.

As a complement to the program content, classes of problems will be developed, as they are the effective complement to theoretical classes, to acquire the necessary skills to apply this knowledge on their professional life.

#### **Laboratory (15 contact hours).**

These serve to bring students to the reality, being able to observe how the results that have already been explained in the theoretical lessons are obtained.

Some practices will be conducted in the laboratory, calculating, assembling, analyzing and checking the operation; others consist on external practices, visiting and analyzing and interpreting the operation of renewable energy facilities.

#### **Evaluation (3 hours).**

In addition to the qualifying function, evaluation is also a learning tool with which the student checks the degree of understanding and assimilation reached.

#### **Tutorial.**

Regular meetings between teacher and student which allow the identification of learning problems, orientation in the subject and individual help if needed.

#### **Tutored work (37 hours Non-contact).**

Throughout the course, several tutored work related to the content of the subject will be carried on. These case studies and work will be done in small groups and must be submitted before the deadline designated for each of them.

#### **Individual study (50 hours Non-contact).**

The ongoing work of the student will be encouraged by homogeneous distribution throughout the semester of the learning activities. This section also includes the preparation of laboratory practices and additional activities.

### **5.3.Syllabus**

### **5.4.Course planning and calendar**

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### Schedule sessions and work presentations

Lectures, classes of problem and laboratory sessions are given according to schedule set by the center and published prior to the course start date (<http://eina.unizar.es>).

Each teacher will inform of its tutorial hours.

The other activities will be planned depending on the number of students and will be announced in good time. It will be available on <http://moodle.unizar.es>

### 5.5. Bibliography and recommended resources

[BB: Bibliografía básica / BC: Bibliografía complementaria]

- [BB] 1. Sistemas eólicos de producción de energía eléctrica / Coordinadores, José Luis Rodríguez Amenedo, Santiago Arnalte Gómez, Juan Carlos Burgos Díaz Madrid : Rueda, D.L. 2003
- [BB] 2. 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] 3. Merino Azcárraga, José María. Eficiencia energética eléctrica. Tomo I, Introducción y auditoría energética eléctrica / José María Merino Azcárraga ; con la colaboración de, José Félix Miñambres Argüelles [Bilbao] : CADEM, 2000