

## 66332 - Fundamentals of electrical and energy engineering

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 66332 - Fundamentals of electrical and energy engineering

**Faculty / School:** 110 -

**Degree:** 330 - Complementos de formación Máster/Doctorado

535 - Master's in Renewable Energies and Energy Efficiency

**ECTS:** 6.0

**Year:** 535 - Master's in Renewable Energies and Energy Efficiency: 1

330 - Complementos de formación Máster/Doctorado: XX

**Semester:** 330 - First semester

535 - First semester

535 - First semester

535 - First semester

**Subject Type:** 535 - Compulsory

330 - ENG/Complementos de Formación

**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 achievement of the learning objectives. During theory sessions, the basic concepts are explained and related to the technical characteristics of processes using short exercises to improve understanding of these concepts. In laboratory and computer sessions more complex practical cases are studied. Thus, these practice sessions reinforce and complete the contents developed during the theory sessions. Students should do several assignments, which are individual solving of questions or problems similar to those explained during the classroom sessions.

### 4.2.Learning tasks

The course includes the following learning tasks:

- A01 Lectures (30 hours). Presentation of theoretical contents by a faculty or by external experts to all the students enrolled in the course. Although it is not a mandatory activity, regular attendance is highly recommended.
- A02 Problem and case solving (15 hours). Solve practical problems and exercises with all the students. Although it is not a mandatory activity, regular attendance is highly recommended.
- A03 Laboratory sessions (15 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (24 hours). Students will complete assignments, problems and exercises related to concepts seen in the laboratory sessions and lectures.
- A07 Autonomous work (60 hours). Students are expected to spend about 60 hours to study theory, solve problems and prepare lab sessions
- A08 Assessment (6 hours).

The indicated hours are for guidance and will be adjusted depending on the academic calendar.

At the beginning of the course, lecturers will communicate the schedule of practice sessions, which will be set according to the syllabus and the availability of laboratories and computer rooms.

### **4.3.Syllabus**

The course will address the following topics:

Section 1. Thermal Engineering:

1. Thermodynamic elements and first principle
2. Thermal properties
3. Energy balance of technical systems
4. Second law of thermodynamics
5. Thermodynamic cycles

Section 2. Electrical Engineering:

1. Circuit analysis
2. Alternating current circuits
3. Electric Machines
4. Electric System

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

Classroom sessions: four hours a day during 12 afternoons.

Evaluation period: two weeks after the class period is finished.

Presentation of assignments: during the course or the evaluation period, depending on their number and difficulty.

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