

66332 - Fundamentals of electrical and energy engineering

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	535 - Master's in Renewable Energies and Energy Efficiency 330 - Complementos de formación Máster/Doctorado
ECTS	6.0
Course	XX
Period	Half-yearly
Subject Type	ENG/Complementos de Formación, Compulsory
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

Energy systems, generation, transmission and distribution of electricity as intensive energy systems are multidisciplinary systems. Moreover, in any industrial system power supply is needed. To understand and analyse energy systems requires knowledge of electrical engineering, electrical machines, technical thermodynamics and heat transfer.

Many students who study this Masters in renewable energy and energy efficiency have completed their previous studies in these disciplines deep enough to successfully address the master. This subject is oriented to these students who have not seen these topics in sufficient depth in their previous studies or with the appropriate approach.

IMPORTANT

EXCHANGE STUDENTS : This is a leveling-out course, and depending on your previous studies and learning agreement plan, you will be in either of two situations, which will be established by the Master's Academic Commission.

a) IF you have enough basic knowledge of electrical engineering and thermal sciences, OR if your only interest in this master is this course, YOU ARE NOT ALLOWED TO ENROLL.

b) IF you don't have basic knowledge of electrical engineering and thermal sciences, AND you want to enroll in at least one basic or specialty (not transversal) course of this master, YOU ARE OBLIGED TO ENROLL additionally in this one.

3. Context and competences

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3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

During theoretical sessions, the basics are explained and related to the technical characteristics of processes using short exercises to improve understanding of these concepts. Laboratory and computer sessions in which more complex practical cases than those presented on the board are studied. Thus, these practical sessions reinforce and complete the contents developed during the theory sessions. Several works of course are also included.

In this subject, because of its special characteristics, subject works are based on individual resolution of questions or problems of a similar level than those solved during classroom sessions.

5.2.Learning activities

Lectures: In four hour session: two hours will be electrical engineering and two thermal engineering.

Laboratory or computer room:

- Laboratory session in electrical engineering (4 hours)
- Computer session in thermal engineering (4 hours)

At the beginning of the subject, lecturers will inform the schedule of practical sessions, which will be set according to the program and the availability of laboratories and computer rooms.

5.3.Program

Thermal Engineering:

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

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5. Thermodynamic cycles

Electrical Engineering:

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

5.4.Planning and scheduling

Classroom sessions: four hours a day during 12 afternoons.

Evaluation period: two weeks after the class period.

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

5.5.Bibliography and recommended resources

Fundamentos de sistemas eléctricos : energías renovables / Ángel Antonio Bayod Rújula (coordinador) ; Juan Bautista Arroyo García ... [et al.], Prensas Universitarias de Zaragoza, 2008.
Análisis de circuitos eléctricos I / Ángel Antonio Bayod Rújula ... [et al.], Prensas Universitarias de Zaragoza, 2007.