



Course guide

820122 - CEEREE - Power Plants and Renewable Energies

Last modified: 27/05/2024

Unit in charge: Barcelona East School of Engineering
Teaching unit: 709 - DEE - Department of Electrical Engineering.

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JORGE DE LA HOZ CASAS

Others: Primer quadrimestre:
JOSE MATAS ALCALA - Grup: T11, Grup: T12

Segon quadrimestre:
ALEXANDRE ALONSO TRAVESSET - Grup: M11, Grup: M12, Grup: M13
JOSE MATAS ALCALA - Grup: M11, Grup: M12, Grup: M13

REQUIREMENTS

MÀQUINES ELÈCTRIQUES I - Prerequisit

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

- 2. Design power stations.
- 5. Understand the applications of renewable energies.

Transversal:

- 3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

TEACHING METHODOLOGY

The teaching methodology used is a mixed methodology based on the application of PBL methodology together with a theoretical introduction. This structure allows students contextualizing the work to be developed.

LEARNING OBJECTIVES OF THE SUBJECT

The aim of the course is to provide the basic knowledge regarding the power generation activity in the Spanish electricity sector.

STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	10.00
Hours large group	45,0	30.00
Self study	90,0	60.00



Total learning time: 150 h

CONTENTS

(ENG) Introduction to the electricity production activity

Description:

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Specific objectives:

The European framework
The main figures of the electricity generation in Spain
The Spanish framework. The evolution of energy prices and their implications

Full-or-part-time: 7h 30m

Theory classes: 3h 30m
Self study : 4h

(ENG) Electricity production. Technical aspects

Description:

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Specific objectives:

Types and classification of power plants in the Ordinary Regime
Types and classification of power plants in the Special Regime
Operating principles
Control and regulation

Full-or-part-time: 7h 30m

Theory classes: 3h 30m
Self study : 4h

(ENG) Management and control of power plants.

Description:

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Specific objectives:

The electricity market and the management of power plants
Simplified models for the management and control of power plants
Conception and design of the control mechanisms associated to the power plants management
Introduction to renewable power plants control

Full-or-part-time: 40h

Theory classes: 10h
Laboratory classes: 15h
Self study : 15h



(ENG) Introduction to the feasibility study of a renewable power plant

Description:

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Specific objectives:

Market study and implementation

Technical feasibility study of the various options identified by means of the market study and implementation

Economic feasibility study of the various options identified by means of the market study and implementation

Evaluation of the projects. Selection and justification of the proposed solution

Full-or-part-time: 95h

Theory classes: 28h

Self study : 67h

GRADING SYSTEM

The evaluation will be conducted by carrying out different projects (and / or tests) related to the contents of the subject. These projects (or tests) include the activity carried out in the laboratory. Within these associated activities one can find the generic skill that will have a weight of 10% from the total grade. The subject does not possess a reassessment process.

BIBLIOGRAPHY

Basic:

- El-Sharkawi, Mohamed A. Electric energy: an introduction. 2nd ed. Boca Raton: CRC Press, cop. 2009. ISBN 9781420062199.
- Carta González, José Antonio [et al.]. Centrales de energías renovables : generación eléctrica con energías renovables. Madrid: Pearson Educación, 2009. ISBN 9788483226001.
- Yazdani, Amirnaser; Iravani, Reza. Voltage-sourced converters in power systems : modeling, control, and applications. Hoboken, N.J.: Wiley, cop. 2010. ISBN 9780470521564.