Course guide
240267 - 240AU123 - Infrastructure and Electric Charging Systems

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

Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).
MASTER'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2019). (Optional subject).

Academic year: 2023  ECTS Credits: 4.5  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Villafáfila Robles, Roberto

PRIOR SKILLS

Electrotechnology background.

TEACHING METHODOLOGY

Lectures and individual work to be developed by the student to assimilate the knowledge.

LEARNING OBJECTIVES OF THE SUBJECT

Understand technical requirements of electric vehicle charging installations.
Sizing and define management strategies for charging installations.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>72,0</td>
<td>64.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>27,0</td>
<td>24.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>13,5</td>
<td>12.00</td>
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</tbody>
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Total learning time: 112.5 h
# CONTENTS

## Introduction

**Description:**
- Charging infrastructure.
- Electrotechnology review.

**Specific objectives:**
- Know the state of the art of charging infrastructure for electric vehicles.
- Review concepts of electrotechnology.

**Full-or-part-time:** 16h 30m
- Practical classes: 7h
- Laboratory classes: 1h 30m
- Self study: 8h

## Design of charging infrastructure

**Description:**
- Sizing electrical installation.
- Electrical protections.

**Specific objectives:**
- Understand the criteria to be taken into account for the design of electrical installations for charging electric vehicles and the requirements regarding the required protections.

**Related activities:**
- Design of a charging installation

**Full-or-part-time:** 48h
- Practical classes: 10h
- Laboratory classes: 6h
- Self study: 32h

## Control of charging installation

**Description:**
- Electricity markets and contracting.
- Demand management.

**Specific objectives:**
- Understand the operation of the electric market and electrical contracting.
- Understand demand management mechanisms.

**Related activities:**
- Control of electric vehicle charging installation (designed in the previous activity)

**Full-or-part-time:** 48h
- Practical classes: 10h
- Laboratory classes: 6h
- Self study: 32h
GRADING SYSTEM

There are two individual assignments, corresponding to each of the main subjects of the course, and each has a weight of 50% of the final grade.

Each assignment consists of a report and a presentation. The report weights 70% and the presentation 30%.

If both reports are not delivered and the two presentations are not made, the subject will not be evaluated.

EXAMINATION RULES.

The activities are individual and have to follow the approach proposed by the teacher.

RESOURCES

Audiovisual material:
- Nom recurs. Resource

Other resources:
- Reglamento Electrotécnicopara BajaTensión– REBT de 2002 (BOE 18/09/02)
- ITC-BT-52. Instalaciones con fines especiales. Infraestructura para la recarga de vehículos eléctricos (BOE 31/12/14)
- Instal·lació d'infraestructura de recàrrega del vehicle elèctric. Col·lecció Quadern Pràctic, nº 9 (3a edició 2019)