Course guide
820331 - TDEE - Electrical Energy Transmission and Distribution

Unit in charge: Barcelona East School of Engineering
Teaching unit: 709 - DEE - Department of Electrical Engineering.
Degree: BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan

LECTURER

Coordinating lecturer: Bullich Massagué, Eduard
Others:
Primer quadrimestre:
EDUARD BULLICH MASSAGUÉ - T11
EDORTA LÓPEZ URZAINQUI - T11

Segon quadrimestre:
EDUARD BULLICH MASSAGUÉ - M11, M12

PRIOR SKILLS

Complex numbers

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEENE-250. Knowledge of the principles of operation of electric power transmission and distribution systems.
CEENE-28. Explain the operating principles of power conversion systems and their application to transport and distribution systems.

Transversal:
2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

TEACHING METHODOLOGY

The course uses the methodology exhibition by 30%, 10% in laboratories, individual work on self by 60%. We performed a transversal project on the theme of the course.

LEARNING OBJECTIVES OF THE SUBJECT

Technologies in the field of transport and distribution of electricity
Application of the technologies of transportation and distribution of electricity to the current electrical systems
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

Introduction

Description:
Introduction. Structure components and functions of the distribution system and electricity transmission

Specific objectives:
Understanding the transmission system and power distribution including economic and comparison of different systems

Related competencies:
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Full-or-part-time: 6h 30m
Theory classes: 1h 30m
Self study: 5h

Overhead lines and cables 1

Description:
Electrical parameters. Equivalent circuits

Specific objectives:
Knowing the electrical parameters of overhead lines and cables for power transmission

Related competencies:
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Full-or-part-time: 17h 30m
Theory classes: 4h 30m
Laboratory classes: 3h
Self study: 10h
### Overhead lines and cables 2

**Description:**
Overhead lines and cables: Steady state analysis

**Specific objectives:**
Ability to perform steady state analysis of overhead lines and cables

**Related competencies:**
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

**Full-or-part-time:** 35h
- Theory classes: 12h
- Laboratory classes: 3h
- Self study: 20h

### Overhead lines and cables 3: pu

**Description:**
Calculate the system with pu an overhead lines and cables

**Specific objectives:**
Ability to perform calculations in pu

**Related competencies:**
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

**Full-or-part-time:** 11h
- Theory classes: 3h
- Laboratory classes: 3h
- Self study: 5h

### Transformers

**Description:**
Transformers: Types, connections, equivalent circuits

**Specific objectives:**
Ability to model transformers for system analysis

**Related competencies:**
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

**Full-or-part-time:** 35h
- Theory classes: 12h
- Laboratory classes: 3h
- Self study: 20h
Load flow in power grids

**Description:**

**Specific objectives:**
Ability to perform load flow in power grids

**Related competencies:**
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

**Full-or-part-time:** 32h
- Theory classes: 9h
- Laboratory classes: 3h
- Self study : 20h

Electricity distribution

**Description:**
Elements and definitions of the distribution system. Radial network structure. Planning.

**Specific objectives:**
Knowing the specific elements of the electrical distribution, namely the differences in the transport system and be able to perform an analysis of the electrical distribution system.

**Related competencies:**
06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

**Full-or-part-time:** 13h
- Theory classes: 3h
- Self study : 10h

**GRADING SYSTEM**
The evaluation was carried out by the assessment by the teacher. Partial controls account for 40%, the last control 40% and 20% practice of the final grade. Generic competence (solvent use source of information) is a separate grade. This subject has no reassessment test. Lab lessons are mandatory to pass the course

**EXAMINATION RULES.**
Calculators are permitted.
BIBLIOGRAPHY

Basic: