**Course guide**

**240161 - 240161 - Electrical Machines**

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

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2022  
ECTS Credits: 6.0  
Languages: Catalan

**LECTURER**

Coordinating lecturer: SAMUEL GALCFRAN ARELLANO

Others:

**DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES**

Specific:  
1. Capacity to calculate and design electric machines.  
2. Knowledge on machines control and electrical drives and their applications.

**TEACHING METHODOLOGY**

Teaching methodology consist on:  
Explanatory classes  
Problem classes  
Laboratory/Practical classes

**LEARNING OBJECTIVES OF THE SUBJECT**

At the end of the subject, have to be able to:  
Formulate and calculate electromagnetic circuits.  
Describe, identify and recognize electric machines.  
Describe, identify and recognize power electronics converters to drive electric machines.  
Compare and evaluate what kind of machine and drive are the correct ones for a specific application.

**STUDY LOAD**

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>50,0</td>
<td>33.33</td>
</tr>
<tr>
<td>Hours small group</td>
<td>10,0</td>
<td>6.67</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### (ENG) Tema 1: Materials elèctrics i magnètics. Circuits electromagnètics.

**Related competencies:**
CETI7. Capacity to calculate and design electric machines.

**Full-or-part-time:** 10h  
Theory classes: 4h  
Practical classes: 4h  
Laboratory classes: 2h

### (ENG) Tema 2: Màquina de corrent continu.

**Related competencies:**
CETI7. Capacity to calculate and design electric machines.  
CETI8B. Knowledge on machines control and electrical drives and their applications.

**Full-or-part-time:** 10h  
Theory classes: 4h  
Practical classes: 4h  
Laboratory classes: 2h

### (ENG) Tema 3: Màquina síncrona.

**Related competencies:**
CETI7. Capacity to calculate and design electric machines.  
CETI8B. Knowledge on machines control and electrical drives and their applications.

**Full-or-part-time:** 10h  
Theory classes: 4h  
Practical classes: 4h  
Laboratory classes: 2h

### (ENG) Tema 4: Màquina d'inducció.

**Related competencies:**
CETI7. Capacity to calculate and design electric machines.  
CETI8B. Knowledge on machines control and electrical drives and their applications.

**Full-or-part-time:** 10h  
Theory classes: 4h  
Practical classes: 4h  
Laboratory classes: 2h

### (ENG) Tema 5: Altres tipus de màquines.

**Related competencies:**
CETI7. Capacity to calculate and design electric machines.  
CETI8B. Knowledge on machines control and electrical drives and their applications.

**Full-or-part-time:** 6h  
Theory classes: 4h  
Laboratory classes: 2h
(ENG) Tema 6: Convertidors estàtics per a màquines elèctriques.

Related competencies:
CETI8B. Knowledge on machines control and electrical drives and their applications.

Full-or-part-time: 6h
Theory classes: 6h

(ENG) Tema 7: Dimensionament i selecció d’accionaments elèctrics.

Related competencies:
CETI8B. Knowledge on machines control and electrical drives and their applications.

Full-or-part-time: 8h
Theory classes: 4h
Practical classes: 4h

GRADING SYSTEM

In order to have an evaluation of the subject it is mandatory to attend, to carry out and to deliver reports of all laboratory sessions. In case this mandatory condition is not fulfilled, the final mark will be NP. If the mandatory condition is fulfilled then the final mark will be calculated as follows.

Normal evaluation:
Final mark = 0,15*Lab Mark + 0,85*Theo Mark  
Lab Mark = 0,5*Lab type 1 + 0,5*Lab type 2  
Theo Mark = 0,3*Parcial Exam + 0,7*Final exam  
Lab type 1 are individual sessions and Lab type 2 are lab sessions in group

Reevaluation:
Final Mark = Min(Reav1, Reav2)
Where:
Min means "minimum value of"
Reav1 = 5,0
Reav2 = Reavaluation Exam mark

EXAMINATION RULES.

A sheet of paper (collection of formulae) written on only one side, calculator and ballpoint pen are allowed in partial exams.
A sheet of paper (collection of formulae) written on both sides, calculator and ballpoint pen are allowed in final exams.