Degree competences to which the subject contributes

Specific:
1. Carry out calculations for the design of electrical machines.

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

Expositive methodology for theory classes.
PBL for exercices classes.
Normalized test on laboratory classes.

Learning objectives of the subject

Electromagnetic laws application to electromechanical conversion and coupled circuit analysis applied to industrial power transformer and rotating electrical machines.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
# Content

## Power Transformer introduction

**Learning time:** 14h  
Theory classes: 5h  
Laboratory classes: 2h  
Self study: 7h

**Description:**  

**Related activities:**  
Heating test for a transformer

## Three phase transformers

**Learning time:** 23h  
Theory classes: 7h  
Laboratory classes: 5h  
Guided activities: 11h

**Description:**  
Three phase transformer construction. Three limbs transformers. Rotation of phases.

**Related activities:**  
Normalized test of single phase transformer.  
Tests on three phase transformers. Rotation angle determination

## Special Transformers

**Learning time:** 8h  
Theory classes: 3h  
Self study: 5h

**Description:**  

## Electromechanical energy conversion.

**Learning time:** 10h  
Theory classes: 4h  
Self study: 6h

**Description:**  
**Qualification system**

Final test: 20%
Laboratory: 20%
Homework exercicis+classe exercises: 20%
middle term exam: 20% + 20%

### AC machines: fundamentals.

**Learning time:** 25h  
- Theory classes: 7h  
- Self study: 18h

**Description:**  

### Asynchronous machine: motor

**Learning time:** 42h  
- Theory classes: 13h  
- Laboratory classes: 4h  
- Self study: 25h

**Description:**  

**Related activities:**  

### Asynchronous machine: special applications.

**Learning time:** 28h  
- Theory classes: 6h  
- Laboratory classes: 4h  
- Self study: 18h

**Description:**  

**Related activities:**  
820127 - ME1EE - Electrical Machines I

### Regulations for carrying out activities

Scientific calculator  
1 sheet with expressions.  
Continuous evaluation, no final reexam.

### Bibliography

#### Basic:


#### Complementary: