240161 - Electrical Machines

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 709 - EE - Department of Electrical Engineering
Academic year: 2019
Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: SAMUEL GALCERAN ARELLANO

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>Total learning time: 150h</th>
<th>Hours large group: 50h</th>
<th>33.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 10h</td>
<td>6.67%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>Tema</th>
<th>Description</th>
<th>Learning time</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Laboratory classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ENG) Tema 1: Materials elèctrics i magnètics. Circuits electromagnètics.</td>
<td></td>
<td>10h</td>
<td>4h</td>
<td>4h</td>
<td>2h</td>
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<tr>
<td>(ENG) Tema 2: Màquina de corrent continu.</td>
<td></td>
<td>10h</td>
<td>4h</td>
<td>4h</td>
<td>2h</td>
</tr>
<tr>
<td>(ENG) Tema 3: Màquina síncrona.</td>
<td></td>
<td>10h</td>
<td>4h</td>
<td>4h</td>
<td>2h</td>
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<tr>
<td>(ENG) Tema 4: Màquina d'inducció.</td>
<td></td>
<td>10h</td>
<td>4h</td>
<td>4h</td>
<td>2h</td>
</tr>
<tr>
<td>(ENG) Tema 5: Altres tipus de màquines.</td>
<td></td>
<td>6h</td>
<td>4h</td>
<td></td>
<td>2h</td>
</tr>
<tr>
<td>(ENG) Tema 6: Convertidors estàtics per a màquines elèctriques.</td>
<td></td>
<td>6h</td>
<td></td>
<td></td>
<td>6h</td>
</tr>
</tbody>
</table>
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 = 0.1*Lab Mark + 0.9*Theo Mark
- Lab Mark = 0.5*Lab type 1 + 0.5*Lab type 2
- Theo Mark = 0.35*Parcial Exam + 0.65*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 = Revaluation Exam mark

**Qualification system**

**Regulations for carrying out activities**

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

**Bibliography**

**Others resources:**

(ENG) Tema 7: Dimensionament i selecció d'accionamnets elèctrics.