820140 - EDEE - Electric Drives

**Coordinating unit:** 295 - EEBE - Barcelona East School of Engineering  
**Teaching unit:** 709 - EE - Department of Electrical Engineering  
**Academic year:** 2018  
**Degree:** BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
**ECTS credits:** 6  
**Teaching languages:** Catalan

**Teaching staff**

**Coordinator:** Fillet Castella, Sergi

**Degree competences to which the subject contributes**

**Specific:**
CEELE-20. Understand machine control and electric drives and their applications.
CEELE-26. Understand automatic regulation and control techniques and their application to industrial automation.

**Transversal:**
1. 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 master classes by 45%, individual work by 25%, work in groups (cooperative or not) by 30%.

**Learning objectives of the subject**

Understanding the behaviour of the variable-speed electric drives, under the point of view of a whole set made up of power electronics, electric machines and mechanical loads.

**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>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
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<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
<tr>
<td>Chapter</td>
<td>Learning time</td>
<td>Description</td>
<td>Specific objectives</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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<td>-----------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1. POWER ELECTRÒNICS AND DRIVES.</td>
<td>15h</td>
<td></td>
<td>Classification and basic characteristics of electrical drives.</td>
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</tbody>
</table>
## 4. Dynamic Modelling of AC Machines

**Description:**
Dynamic models of AC machines.

**Specific objectives:**
- Introduction of space-phasors
- Three-phase to two-phase transformation
- Power balance and electromechanical torque
- Deduction of steady state equivalent circuit
- Applications

**Learning time:**
- Theory classes: 9h
- Laboratory classes: 1h
- Self study: 13h 20m

## 5. Non Vectorial Control of AC Machines

**Description:**
Control techniques for AC machines.

**Specific objectives:**
- Classification of control techniques
- Scalar control
- Vector control
- Applications for the asynchronous and synchronous machines

**Learning time:**
- Theory classes: 3h
- Laboratory classes: 1h
- Self study: 8h 20m

## 6. Vectorial Control on Altern Current Machines

**Description:**
- Content English

## 7. Non Conventional Electric Machines

**Description:**
- Content English

**Learning time:**
- Theory classes: 5h
- Self study: 3h 30m
**Qualification system**

The evaluation will be conducted through the assessment by the teacher, with the following weights assigned to evaluated activities:
- Team Work: 40%
- Laboratory practice: 20%
- Final exam: 40%

**Bibliography**

**Basic:**