### Degree competences to which the subject contributes

#### Transversal:

4. **SELF-DIRECTED LEARNING** - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

3. **EFFECTIVE USE OF INFORMATION RESOURCES** - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

11. **TEAMWORK** - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

#### Teaching methodology

The subject will be structured in two types of classroom sessions:

- Classes of theory and solved examples: theoretical aspects and worked examples will be explained, and the items autonomously learned by the students will be commented.
- Practice sessions: Experiences will be done at the laboratory of electrical machines and simulations with specialised software may also be performed.

The students will do also off-site tasks including individual and teamwork.

#### Learning objectives of the subject

The aim of the course is to enable the student to understand and analyze the different technologies of electric generators.

The specific objectives include:

- Understanding the principles of operation of the various electrical machines, focusing on synchronous and induction...
820323 - GEEEN - Electrical Energy Generation

generators
- Analysing the steady-state and transient regimes of the different electrical machines
- Understanding the operation and control principles of the electric generators connected directly to the network
- Understanding the operation and control principles of the electric generators connected to the network through a converter (wind and PV energy)

### Study load

<table>
<thead>
<tr>
<th></th>
<th>Hours large group:</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time:</td>
<td></td>
<td>150h</td>
</tr>
<tr>
<td></td>
<td>45h</td>
<td>30.00%</td>
</tr>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
# 820323 - GEEEN - Electrical Energy Generation

## Content

### (ENG) Basic principles

**Learning time:** 30h  
Theory classes: 10h 30m  
Laboratory classes: 1h 30m  
Self study: 18h

**Description:**  
Basic principles of conversion of electrical energy. Classification of electric generator technologies.

### (ENG) Technologies of electric generators

**Learning time:** 60h  
Theory classes: 21h  
Laboratory classes: 3h  
Self study: 36h

**Description:**  

### (ENG) Generators directly connected to the electricity grid

**Learning time:** 30h  
Theory classes: 10h 30m  
Laboratory classes: 1h 30m  
Self study: 18h

**Description:**  

### (ENG) Generators connected to the electric grid through a converter (wind and photovoltaic energy)

**Learning time:** 30h  
Theory classes: 10h 30m  
Laboratory classes: 1h 30m  
Self study: 18h

**Description:**  
The final mark will be calculated according to the following equation:

\[ NF = PR \times 0.2 + EP \times 0.25 + TR \times 0.2 + EF \times 0.35 \]

<table>
<thead>
<tr>
<th>TF Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR Practices</td>
</tr>
<tr>
<td>EP Partial Exam</td>
</tr>
<tr>
<td>EF Final Exam</td>
</tr>
</tbody>
</table>

This subject will not have a re-evaluation exam.

The marks associated to the generic competence/s avaluation will be the mean value of the marks of the laboratory practices and the proposed work.

**Bibliography**

**Complementary:**


**Others resources:**

Licensed software

**Hyperlink**

- **Atenea**

  Hi haurà materials disponibles a la web