340229 - GSEP-E7P09 - Management of Electric Power Systems and Energy Saving Methods

Degree competences to which the subject contributes

Specific:
1. CE24. Knowledge of electrical power systems and its applications.

Transversal:
2. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
3. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Teaching methodology

- In the lectures will be presented and developed the theoretical foundations of programmed materials. Consist of theoretical explanations complemented by activities to encourage participation, discussion and critical analysis by students.
- In the kinds of problems were raised and solved exercises for the areas covered. Students have to solve, individually or in groups, indicating problems.
- It will realised group work or individual work during the year related to a specific topic of the course.

Learning objectives of the subject

On this subject the pricing of electricity, energy conservation, energy efficiency, energy audits and energy certification is. In power systems programming is generating.
### Study load

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time:</td>
<td>150h</td>
<td>30.00%</td>
</tr>
<tr>
<td>Hours large group:</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>
### Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time: 25h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 7h 30m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h 30m</td>
</tr>
<tr>
<td></td>
<td>Self study : 15h</td>
</tr>
</tbody>
</table>

#### -1: Pricing of electricity.

**Description:**
1. General billing on electricity. Liberalisation of the electricity sector.
2. Billing energy.
3. Practical considerations about the compensation of the reactive power.
4. Types of compensation: Global, partial and individual.
5. Determination practical battery capacitors for reactive power compensation of a facility? Setup.

#### -2: Energy savings.

**Description:**
7. Introduction
8. Primary sources of energy.
9. Units of energy.
10. Current energy situation.
11. Efficiency and energy saving.
13. Legislative Framework. Basic Document HE. RITE
15. CO2 Emissions

#### -3 Energy audit.

**Description:**
16. Introduction.
18. Data Collection.
19. Accounting energy.
21. Energy services companies.
22. Rating investment: NPV, IRR...

**Description:**
23. Introduction.
24. Regulations.
26. Software certification.
27. Examples

**Learning time:** 25h
- Theory classes: 7h 30m
- Laboratory classes: 2h 30m
- Self study: 15h

### -2: Energy efficiency in facilities and equipment.

**Description:**
28. Air.
29. Ventilation.
30. Lighting.
32. Electrical installation.
33. Systems of regulation and control.
34. Maintenance.
35. Efficient water management.
38. Section economic and ecological cables in LV.

**Learning time:** 25h
- Theory classes: 7h 30m
- Laboratory classes: 2h 30m
- Self study: 15h

### -4: Scheduling generation

**Description:**
40. Programming Time static.
41. Startup and Shutdown "unit Commitment."
42. Hydrothermal Office.
43. Optimization methods

**Learning time:** 25h
- Theory classes: 7h 30m
- Laboratory classes: 2h 30m
- Self study: 15h
340229 - GSEP-E7P09 - Management of Electric Power Systems and Energy Saving Methods

**PRACTICES**

**Learning time:** 0h

Guided activities: 0h

**Description:**
1. Power measurement: The meter and the network analyzer.
2. Energy audit of a building.
3. Energy certification of a building

---

**Qualification system**

60 % theory.
40 % practices.

**REEVALUATION:**
If the EPSEVG establishes reevaluation for this subject, it will be done according to its regulations. The re-evaluable part would correspond to the exams (60%).

**Regulations for carrying out activities**

- The written tests are classroom and individual.

**Bibliography**

**Basic:**


