295301 - IGSE - Integration and Management of Energy Systems

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 709 - EE - Department of Electrical Engineering
Academic year: 2017
Degree: BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Martin Cañadas, Maria Elena
Others: Martin Cañadas, Maria Elena
Mata Dumenjo, Montserrat

Prior skills

Basic knowledge of storing and generating heat and power systems

Degree competences to which the subject contributes

Specific:
CEENE-40. Tackle energy saving problems systematically by integrating processes and technologies.

Transversal:
05 TEQ N3. 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.
06 URI N3. 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.
07 AAT N3. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology

The teaching methodology will be project based learning.

Learning objectives of the subject

? Review and model the main electricity and heat generation and storage integrated technologies.
? Learning systematic methods of thermal systems analysis and design of heat exchanger networks.
? Learning systematic analysis methods of combined thermal and electrical systems.
? Employ tools and systematic identification procedures of opportunities for energy savings and reuse.
## Study load

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group</th>
<th>Hours medium group</th>
<th>Hours small group</th>
<th>Guided activities</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong> 150h</td>
<td>45h</td>
<td>0h</td>
<td>15h</td>
<td>0h</td>
<td>90h</td>
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<tr>
<td><strong>Learning time:</strong> 3h</td>
<td><strong>Learning time:</strong> 14h</td>
<td><strong>Learning time:</strong> 14h</td>
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<td><strong>Learning time:</strong> 14h</td>
<td><strong>Learning time:</strong> 14h</td>
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<tr>
<td><strong>Theory classes:</strong> 3h</td>
<td><strong>Theory classes:</strong> 14h</td>
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## Content

### Integrated technologies.

**Description:**
Description and modeling of the main generation and storage technologies that will be part of the integrated energy systems.

### Systematic methods for the analysis of thermal systems and design of heat exchangers networks.

**Description:**
Exposition of methods for the analysis and design of thermal systems and heat exchangers networks.

### Systematic analysis methods of combined thermal and electrical systems.

**Description:**
Exhibition of systematic methods to perform analysis of combined systems of thermal and electric type.

### Distributed systems.

**Description:**
Determination of the optimal management of distributed systems.
The final grade will be obtained from the following equation:
NF = 0.25 * 0.25 * P1 + P2 + P3 + 0.25 * 0.25 * PR

P1, P2, P3: Projects 1, 2 and 3
PR: Practices

50% of the mark of each project will result from its oral defense and the remaining 50% of the valuation of the written report.
This course will not have a re-evaluation exam.

**Bibliography**

**Basic:**


**Others resources:**

**Hyperlink**

Revistes electròniques Elsevier, IEEE
Electronic journals Elsevier, IEEE