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:** 2018
**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>Total learning time: 150h</th>
<th>Hours large group: 45h 30.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h 0.00%</td>
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<td></td>
<td>Hours small group: 15h 10.00%</td>
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<td>Guided activities: 0h 0.00%</td>
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<td>Self study: 90h 60.00%</td>
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Content

**Integrated technologies.**

**Learning time:** 3h
- Theory classes: 3h

**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.**

**Learning time:** 14h
- Theory classes: 14h

**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.**

**Learning time:** 14h
- Theory classes: 14h

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

**Distributed systems.**

**Learning time:** 14h
- Theory classes: 14h

**Description:**
Determination of the optimal management of distributed systems.
Qualification system

The final grade will be obtained from the following equation:
\[ NF = 0.25 \times 0.25 \times P_1 + P_2 + P_3 + 0.25 \times 0.25 \times PR \]

\( P_1, P_2, P_3 \) : 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