220128 - Energy Efficiency Systems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering
Academic year: 2017
Degree: BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 3  Teaching languages: English

Teaching staff
Coordinator: Joan Carles Fernández Vallés

Teaching methodology
The course is divided into parts:
Theory classes
Practical classes
Self-study for doing exercises and activities.
In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.
In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.
Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.
The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject
To introduce the student into a new way to analyze different systems taking into consideration the energetic point of view. Public buildings, transport and industries examples will be analyzed in order to reach improvements in their energetic costs.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>40.00%</th>
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<tbody>
<tr>
<td></td>
<td>Self study:</td>
<td>45h</td>
<td>60.00%</td>
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## Content

<table>
<thead>
<tr>
<th>Module 1: Energy Audits</th>
<th>Learning time: 14h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
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<tr>
<td></td>
<td>Self study : 8h</td>
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**Description:**
1. Definitions
2. Basic Energy concepts
3. Units
4. Introduction to the bills comprehension
5. Energy audits (Steps, scope)

<table>
<thead>
<tr>
<th>Module 2: Building Energy Audit</th>
<th>Learning time: 14h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
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<tr>
<td></td>
<td>Self study : 8h</td>
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**Description:**
1. Introduction
2. Building concepts
3. Lighting concepts
4. Heating and cooling
5. First exercise definition

<table>
<thead>
<tr>
<th>Module 3: Energetic improvements in Transport.</th>
<th>Learning time: 14h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study : 8h</td>
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**Description:**
1. First exercise presentation
2. Introduction to the energetic consumption in the transport
3. Aeronautics energetic improvements
4. Railway energetic improvements
5. Automotive energetic improvements
**Module 4: Industrial energetic assessment**

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>1. Introduction</td>
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<tr>
<td>2. Electrical energy management</td>
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<tr>
<td>3. Energetic improvements in the industry</td>
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<tr>
<td>4. Second exercise definition</td>
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**Learning time:** 14h

- Theory classes: 6h
- Self study: 8h

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**Module 5: Second exercise presentation**

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<th>Description:</th>
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<tr>
<td>1. Presentations</td>
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**Learning time:** 19h

- Theory classes: 6h
- Self study: 13h

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**Qualification system**

The final grade will be calculated based on:

\[ NT = 0.4 \times N_1 + 0.5 \times N_2 + 0.1 \times NC \]

**Bibliography**

**Basic:**


**Complementary:**


**Others resources:**

Class notes