220043 - Greening the Built Environment

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 VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: English

Coordinator: MARTA GANGOLELLS SOLANELLAS

Degree competences to which the subject contributes

Specific:
2. A basic understanding of, and ability to apply, environmental technologies and sustainability principles

Transversal:
1. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

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

The aim of this subject is to provide basic knowledge on the analysis of the energy consumption and energy saving measures in the built environment. The course will be mainly concerned with the limitation of buildings' energy demand and the energy performance certification of buildings. Energy saving measures applied to the built environment will also be described and discussed. Some real experiences on the integration of smart technologies (energy metering and
sensor-actuator networks) in residential and tertiary buildings will be also described.

### Study load

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

**Energy certification and energy saving measures applied to the built environment**

#### Description:
- Introduction to energy consumption in the built environment
- Introduction to the legal framework related to the energy efficiency in buildings
- Limitation of buildings' energy demand. Software LIDER.
- Energy certification of buildings. Software CALENER.
- Energy saving measures
- Real experiences on the integration of smart technologies (energy metering and sensor-actuator networks) in residential and tertiary buildings.

#### Related activities:
- Project developed in small groups related to an energy certification and proposal of energy performance improvements. Each group will choose the building object of analysis.
- During some sessions, small exercises will be conducted in the class individually or in small groups and some others will be virtual.

### Qualification system

The final grade depends on the following assessment criteria:
- Project (part 1), weight: 35 %
- Project (part 2), weight: 35 %
- Class activities, weight: 30 %

### Bibliography

**Others resources:**