# 240601 - Buildings Rehabilitation and Energy Efficiency

## Coordinating unit
240 - ETSEIB - Barcelona School of Industrial Engineering

## Teaching unit
758 - EPC - Department of Project and Construction Engineering

## Academic year
2018

## Degree
- BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
- BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
- BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2010). (Teaching unit Optional)

## ECTS credits
4,5

## Teaching languages
Catalan, Spanish

### Teaching staff
- **Coordinator:** Carla Planas Rodríguez
- **Others:** Carla Planas Rodríguez
  Eva Cuerva Contreras

### Opening hours
- **Timetable:** By email to:
  carla.planas@upc.edu

### Prior skills
Basic knowledge of heat transfer. Basic knowledge of the elements and systems that form the building: building types and facilities. Basic knowledge of constructive language. Identification of construction plans at basic level

### Degree competences to which the subject contributes

#### Specific:
- 4. Understanding and dominion of basic concepts on mechanics, thermodynamics, fields and waves and electromagnetism laws and their application to solve engineering problems.
- 5. Knowledge on applied thermodynamics and heat transfer. Basic principles and their application to solve engineering problems.
- 6. Basic knowledge applied to environmental and sustainability technologies.

#### Transversal:
- 1. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
- 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. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

### Teaching methodology
- Theory classes, lectures and participatory.
- Conducting individual and group projects.
240601 - Buildings Rehabilitation and Energy Efficiency

Learning objectives of the subject

The main objective of the course is to introduce students to the new energy certification procedures that open a range of business opportunities related to the concept of Rehabilitation and Energy Certification.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group:</th>
<th>0h</th>
<th>0.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>45h</td>
<td>40.00%</td>
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<tr>
<td>Hours small group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Self study:</td>
<td>67h 30m</td>
<td>60.00%</td>
<td></td>
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</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>topic</th>
<th>Learning time</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Guided activities</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>6h</td>
<td>3h</td>
<td></td>
<td>3h</td>
<td></td>
</tr>
<tr>
<td>Thermal envelope and building systems</td>
<td>23h</td>
<td>6h</td>
<td>3h</td>
<td>4h</td>
<td>10h</td>
</tr>
<tr>
<td>Related activities:</td>
<td></td>
<td></td>
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<tr>
<td>Specific objectives:</td>
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<tr>
<td>Energy efficiency in the facilities</td>
<td>19h 30m</td>
<td>7h 30m</td>
<td></td>
<td>4h</td>
<td>8h</td>
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<tr>
<td>Energy certification in Existing Buildings</td>
<td>42h</td>
<td>3h</td>
<td>12h</td>
<td>12h</td>
<td>15h</td>
</tr>
<tr>
<td>Energy certification in New Construction Buildings</td>
<td>22h</td>
<td>4h</td>
<td>3h</td>
<td>5h</td>
<td>10h</td>
</tr>
</tbody>
</table>
Qualification system

\[ NF = 0.3 \times NTR + 0.3 \times NTA + 0.05 \times NAC + 0.35 \times NEF \]

NF: Final Note
NTR: Project 1
NTA: Project 2
NAC: Note continuous assessment (attendance and participation in class)
NEF: Note final exam

Regulations for carrying out activities

There will be a written test of knowledge control (EF). Students may not have any support material during this test.

Bibliography

Others resources: