Course guides
310424 - 310424 - Energy Efficiency and Renewable Energies

Unit in charge: Barcelona School of Building Construction
Teaching unit: 748 - FIS - Department of Physics.
Degree: MASTER'S DEGREE IN ADVANCED BUILDING CONSTRUCTION (Syllabus 2014). (Optional subject).
Academic year: 2021  ECTS Credits: 5.0  Languages: Spanish

LECTURER
Coordinating lecturer: Rodriguez Cantalapiedra, Inmaculada
Others: Vásquez Paredes, Rodrigo Antonio

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE3. Use the physic principles in the thermic, luminic and acoustic scope.
CE7. Manage the installations, its costs and maintenance.

General:
CG1. Provide to the student the capacity to apply the knowledge acquired in the resolution of complex problems in any sector of the building construction.
CG4. Develop and/or apply ideas with originality in a context of investigation, identifying and formulating hypothesis or innovative ideas and submit them to a objectivity, coherence, and viability test.

Transversal:
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Basic:
CB8. The students must be able to integrate knowledges and front to the complexity to formulate opinions from an information which, being incomplete or limited, includes reflections about the social and ethical responsibilities linked to the application of their knowledges and opinions.
CB7. The students must be able to apply the acquired knowledges and their ability of resolution of problems in new or little known environments inside more wide environments (or multidisciplinary) related with their study field.
CB9. The students must be able to communicate their conclusions and the knowledges and ultimate reasons which support to specialised and non-specialised audiences in a clear mode and without ambiguities.
CB10. The students must possess the learning abilities which allow them to continue studying in a way which should be to a large extent self-directed and autonomous.

TEACHING METHODOLOGY
LEARNING OBJECTIVES OF THE SUBJECT

- Adquisición de conocimientos sobre bajo consumo energético en el contexto del calentamiento global.
- Adquisición de conocimientos sobre las técnicas y principios de diseño en la eficiencia energética en edificios.
- Adquisición de conocimientos sobre la implantación de sistemas energéticos renovables en los edificios.
- Desarrollo de habilidades prácticas que permitan un uso adecuado de programas de simulación para evaluar adecuadamente las mejores soluciones.
- Desarrollo de habilidades prácticas para proyectar una rehabilitación energética y evaluar la opción más adecuada en base a los objetivos iniciales.
- Desarrollo de habilidades prácticas para la evaluación económica de los proyectos de rehabilitación energética de un edificio, identificando y resolviendo problemas derivados de un diseño o uso inadecuado.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>5,0</td>
<td>4.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>72.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>5,0</td>
<td>4.00</td>
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<tr>
<td>Hours large group</td>
<td>15,0</td>
<td>12.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>10,0</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Total learning time: 125 h

CONTENTS

1. Energia, medioambient i clima

Description:
content english

Specific objectives:
Sun Design principles

Related activities:
Sustainable analysis design software.

Related competencies:
CG4. Develop and/or apply ideas with originality in a context of investigation, identifying and formulating hypothesis or innovative ideas and submit them to an objectivity, coherence, and viability test.
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
CB10. The students must possess the learning abilities which allow them to continue studying in a way which should be to a large extent self-directed and autonomous.

Full-or-part-time: 6h
Theory classes: 1h
Practical classes: 5h
2. Energy Efficiency in buildings design

**Description:**
content english

**Related activities:**
Análisis mediante el programa Ce3x de la eficiencia energética de un edificio

**Related competencies:**
CG1. Provide to the student the capacity to apply the knowledge acquired in the resolution of complex problems in any sector of the building construction.
CE3. Use the physic principles in the thermic, luminic and acoustic scope.
CE7. Manage the installations, its costs and maintenance.
CB8. The students must be able to integrate knowledges and front to the complexity to formulate opinions from an information which, being incomplete or limited, includes reflections about the social and ethical responsibilities linked to the application of their knowledges and opinions.
CB10. The students must possess the learning abilities which allow them to continue studying in a way which should be to a large extent self-directed and autonomous.

**Full-or-part-time:** 6h
Practical classes: 6h

3. Renewable energy

**Description:**
content english

**Related competencies:**
06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

**Full-or-part-time:** 13h
Theory classes: 5h
Laboratory classes: 8h

**GRADING SYSTEM**

**BIBLIOGRAPHY**

**Basic:**
RESOURCES

Hyperlink:
- Código Técnico de la Edificación. https://www.codigotecnico.org/