310412 - Building and Material Technologies of Low Environmental Impact

**Coordinating unit:** 310 - EPSEB - Barcelona School of Building Construction  
**Teaching unit:** 753 - TA - Department of Architectural Technology  
**Academic year:** 2019  
**Degree:** MASTER’S DEGREE IN ADVANCED BUILDING CONSTRUCTION (Syllabus 2014). (Teaching unit Optional)  
**ECTS credits:** 5  
**Teaching languages:** Spanish

**Coordinator:** Bosch González, Montserrat

**Degree competences to which the subject contributes**

**Specific:**  
- CE8. Elaborate and manage installation projects.

**Generical:**  
- CG5. Analyse, evaluate and synthesise critically, new and difficult ideas of promotion, in academic and professional contexts, scientific advances, technologics, socials or culturals in the society of knowledge.  
- CG2. Prepare to communicate with efficiency, orally but also in written.  
- CG3. Prepare the student in the using of tools that are common in the investigation activities, like the analysis and treatment of data, just like methodology and investigation techniques.  
- 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.  
- CG6. Obtain results that can be transferred to the building construction sector, through the applied investigation, the technological development and the innovation.

**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.  
- 02 SCS. 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.  
- 05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

**Teaching methodology**

MD1 Participatory expositive class.  
MD2 Masterful class.  
MD4 Tutorials and questions.  
MD6 Tests  
MD7 Integrated methodologies (Learning based on problems, teaching portfolio).

**Learning objectives of the subject**

The students learn to value the traditional construction techniques from diverse aspects related with the technological sovereignty, the environmental impact, the revaluation of the cultural heritage, social aspects, etc.  
As well, they will be started in the investigation and searching of scientific documentation which validates the
technological proposals
The students acquire criteria to validate and propose technological improvements in constructive systems of low environmental impact which must accomplish the current habitability requirements, achieving the own regulations of the different places where they are introduced.
The students validate and evaluate architectural projects from construction techniques which may look simple but require technical and conceptual rigour for their application in different situations: climatic, seismic, health standards, availability of raw materials, etc.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group:</th>
<th>15h</th>
<th>12.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>5h</td>
<td>4.00%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>5h</td>
<td>4.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>10h</td>
<td>8.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>72.00%</td>
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Content

<table>
<thead>
<tr>
<th>title english</th>
<th>Learning time: 120h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 30h</td>
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<tr>
<td></td>
<td>Guided activities: 45h</td>
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<tr>
<td></td>
<td>Self study : 45h</td>
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**Description:**
Environmental criteria in the construction; acknowledgement of the territory and the climate; impact of the construction in the territory; the constructed heritage as technological basis; culture, tradition and technology; soak energy and associated emissions; availability of resources.

**Related activities:**
Activity 1. Architecture without architects.
Activity 2. Environmental parameters of the traditional architecture. Techniques and materials.

**Specific objectives:**
Learn to search information related with the contents; know the environmental paremeters which will be used during the course; understand the diverse construction techniques according to the climatic, geographical and cultural determinants.

<table>
<thead>
<tr>
<th>Low environmental impact technologies</th>
<th>Learning time: 15h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
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<tr>
<td></td>
<td>Guided activities: 2h</td>
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<tr>
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<td>Self study : 3h</td>
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**Description:**

**Related activities:**
Activity 4. Stone technology.
Activity 5. Soils technology.
Activity 6. Ceramics technology.
Activity 7. Wood and vegetal frameworks.

**Specific objectives:**
Learn to quantify by means of evaluation tools of the environmental impact of the construction techniques. Identify habitability requirements and validate its compliance. Relate construction techniques with local requirements and conditions. Incorporate new possibilities of the materials and alternative constructive solutions. Recognize the built cultural heritage.
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<table>
<thead>
<tr>
<th><strong>title english</strong></th>
<th><strong>Learning time:</strong> 19h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 14h</td>
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<tr>
<td></td>
<td>Guided activities: 2h</td>
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<tr>
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<td>Self study: 3h</td>
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**Description:**
Projects of realisation in construction. Characterisation of the properties of the materials; adaptation of the traditional materials to the new demands and regulation requirements, development of new materials. Demands of the project: structural, habitability and comfort. Reinterpretation of technologies and alternatives.

**Related activities:**
Activity 8. Introduction to the project.
Activity 9. Project.
Activity 10. Summary.