310402 - Advanced Facilities

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 724 - MMT - Department of Heat Engines
753 - TA - Department of Architectural Technology

Academic year: 2018
Degree: MASTER'S DEGREE IN ADVANCED BUILDING CONSTRUCTION (Syllabus 2014). (Teaching unit Compulsory)
ECTS credits: 5

Teaching languages: Spanish

Teaching staff

Coordinator: Alejandro Falcons de Sierra
Others: Justo Hernanz Hernanz
Rafael Ruiz Mansilla
Jordi Cadafalch
Ricard Cònsul Serracanta

Degree competences to which the subject contributes

Basic:
2. Possess and understand knowledge which provide a basis or opportunity to be original in the development and/or application of ideas, usually in a context of research.
3. 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.
4. 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.
5. 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.
1. 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.

Specific:
6. Carry out the modelization of physic processes and the resolution according to numeric methods.
7. Define the characteristics of the sismic action and apply the present regulations to the sismic calculation of structures in building construction.

Generical:
8. 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.
9. Provide to the student the capacity to apply the knowledge acquired in the resolution of complex problems in any sector of the building construction.

Transversal:
10. 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.
11. 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.
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**Teaching methodology**

- MD1 Exposition participatory class.
- MD2 Master class.
- MD3 Practical guidance in the lab.
- MD4 Tutorials and questions.
- MD5 Orientation of works and autonomous practices.
- MD6 Tests.

**Learning objectives of the subject**

- Global knowledge of installations in buildings, whether residential, and commercial, sports, hotels, etc.
- Ability to design the most suitable type of installation based on its use and its ability to save energy.
- Be able to develop draft facilities, pre-sized and evaluating them.
- Be able to send work to implement facilities in new buildings and in rehabilitation and upgrading standards of existing buildings.
- Be able to develop plans for facilities maintenance management - Global Knowledge installations in buildings, whether residential, and commercial, sports, hotels, etc.
- Ability to design the most suitable type of installation based on its use and its ability to save energy.
- Be able to develop draft facilities, pre-sized and evaluating them.
- Be able to send work to implement facilities in new buildings and in rehabilitation and upgrading standards of existing buildings.
- Be able to develop management plans for facilities maintenance

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group:</th>
<th>17h 30m</th>
<th>14.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>5h</td>
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<tr>
<td></td>
<td>Hours small group:</td>
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<td></td>
<td>Guided activities:</td>
<td>7h 30m</td>
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<tr>
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<td>Self study:</td>
<td>90h</td>
<td>72.00%</td>
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<table>
<thead>
<tr>
<th>Title</th>
<th>Learning time:</th>
<th>Description</th>
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</table>
|       | 2h             | **Learning time:** 2h  
Theory classes: 2h |
|       | 8h             | **Learning time:** 8h  
Theory classes: 8h |
|       | 4h             | **Learning time:** 4h  
Theory classes: 4h |
|       | 6h             | **Learning time:** 6h  
Theory classes: 6h |
|       | 6h             | **Learning time:** 6h  
Theory classes: 6h |

### Description:
There will be classified the different types of facilities depending on the use demands of the building, like its functioning reliability, available space, etc. as well as the energetic saving and efficiency.

### Description:
The objective of this topic is to know the main aspects related with the air conditioning of a building. Know which are the technologies in the generation of heat and cold, as well as the distribution of air and water. Know the basic parameters which must be considered in an air conditioning system to be energetically efficient.

### Description:
Know the light typologies according to their energetic efficiency, the calculation of the energetic efficiency value of the facilities system and the control and regulation systems.

### Description:
The objective of this topic is to know the possibilities which the new technologies of low carbon or carbon-zero offer to reduce the emissions associated to the energetic consumption of the building by means of the local generation of energy by renewable sources.

### Description:
In this topic there will be explained how the Energetic Management Systems of Buildings allow to control, monitor and optimize the facilities ans systems of the building like the ventilation, the production of sanitary hot water, the air conditioning, the illumination and the fire protection systems.
### Title

#### English

<table>
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### Description


### Planning of activities

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<table>
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<table>
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<td>Theory classes: 5h</td>
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### Qualification system

- **EV1**: Written exam of knowledge control 25-60%
- **EV2**: Exercises to solve at class or home 10-20%
- **EV4**: Group works, presented in writing or orally 10-20%
- **EV5**: Lab practices reports 10-20%

### Bibliography

- [Title English](#)