310707 - Installations Physics and Energy Efficiency

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 748 - FIS - Department of Physics
Academic year: 2019
Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019). (Teaching unit Compulsory)
ECTS credits: 4,5
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Carlota E. Auguet Sangrá
Others: Blas Echebarria
Inmaculada Rodríguez
Miguel Ángel Gutierrez
Estefanía Blanch
Mercè Ferrando

Degree competences to which the subject contributes

Specific:
1. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.
4. FB-5 Knowledge of the theoretical basis and the basic principles applied to the construction, of the fluid mechanics, the hydraulics, the electricity and electromagnetism, the calorimetry and thermal comfort, and the acoustics.

Transversal:
5. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
6. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
7. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
8. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
9. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

Learning objectives of the subject

The student must be able to acquire and to apply the theoretical bases of the fluid mechanics and transport of energy in building. Also he has to be able to understand and to apply the concepts and methods of hygrothermy and the heat flow...
to the conditioning and isolation in building. Finally, he has to be able to do analysis and evaluations of the energetic requirements of a building that allows determine its energetic efficiency.

<table>
<thead>
<tr>
<th>Study load</th>
<th></th>
<th>Hours large group:</th>
<th>22h 30m</th>
<th>20.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>6h 45m</td>
<td>6.00%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>15h 45m</td>
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<td>Guided activities:</td>
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<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>67h 30m</td>
<td>60.00%</td>
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### Content

<table>
<thead>
<tr>
<th>Title</th>
<th>Learning time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluid dynamics</strong></td>
<td><strong>9h</strong>&lt;br&gt; Theory classes: 4h 30m&lt;br&gt; Practical classes: 4h 30m</td>
<td>content english</td>
</tr>
<tr>
<td><strong>title english</strong></td>
<td><strong>6h</strong>&lt;br&gt; Theory classes: 3h&lt;br&gt; Practical classes: 3h</td>
<td>content english</td>
</tr>
<tr>
<td><strong>title english</strong></td>
<td><strong>12h</strong>&lt;br&gt; Theory classes: 6h&lt;br&gt; Practical classes: 6h</td>
<td>content english</td>
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<td><strong>6h</strong>&lt;br&gt; Theory classes: 3h&lt;br&gt; Practical classes: 3h</td>
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<td>content english</td>
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Qualification system

There will be two practices (PE1 and PE2) and a final exam (ExFin).
The first practice PE1 includes the first half part of the matter. The weight of the practice is a 25% of the final grade. This exercise will be done at the partial exams term.
The second practice PE2 includes the second half part of the matter. The weight of the practice is a 25% of the final grade. This exercise will be done at the end of the period.
The final exam ExFin includes all the contents. The weight of this exam is a 50% of the final grade.

According to Normativa Académica de Estudios de Grado y Máster de la UPC and EPSEB, the final evaluation of the subject will be done as it is described.

The final grade of the subject will be the larger between these two grades:

a) \( m \): Arithmetic mean of the pertinent marks of PE1, PE2 and ExFin.

\[
m = 0.25p + 0.25s + 0.5f
\]

where
\( p \) = PE1 practice mark.
\( s \) = PE2 practice mark.
\( f \) = ExFin final exam mark.

b) \( f \): Final exam mark.

Reappraisal

The student who has failed the subject with a numerical mark between 3.5 and 4.9 will have the opportunity to do an unique reappraisal exam, which will include all the contents of the subject and will be done in a settled term. If the student pass the exam, his final mark of the subject will be 5.0.
The student won't be able to do this reappraisal exam if:
i) The student has already passed the subject.
ii) The student's final mark is less than 3.5 (including NP).
Bibliography

Basic:


Others resources:

Audiovisual Material

· DVD Humitats per capil·laritat
  Rodríguez Cantalapiedra, I.; Lacasta, A; Sarró, P.