310071 - Installations Designs

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 753 - TA - Department of Architectural Technology
Academic year: 2017
Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2015). (Teaching unit Optional)
BACHELOR'S DEGREE IN BUILDING CONSTRUCTION SCIENCE AND TECHNOLOGY (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: JUSTO HERNANZ HERNANZ
Others: ENRIQUE CAPDEVILA GASENI - ALEJANDRO FALCONES DE SIERRA

Degree competences to which the subject contributes

Specific:
1. 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.
2. FE-1 Ability to understand and make the graphical documentation of a project, to do data gathering, surveying of plans and geometric control of construction units.
3. 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. FE-5 Ability to adapt the construction materials to the typology and use of the building, manage and run the receipt and quality control of the materials, its implementation in the construction, the control of execution of the construction units and the realization of trials and final tests.
5. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.
6. FE-8 Knowledge of specific procedures for the material execution control of the construction.
7. FE-17 Ability to schedule and organise the constructive processes, the construction teams, the technical and human means for its execution and maintenance.
8. FE-18 Knowledge of the law of the construction and the contractual relations which occur in the different phases of the construction process, as well as the specific legislation, rules and regulations of the prevention and coordination in matters of safety and occupational health in construction.
9. FE-20 Ability for the management of the quality control in the building constructions, the writing, application, implementation and updating of manuals and quality plans, realisation of audits of management of the quality in the companies, as well as for the writing of the Building Log Book.
10. FE-21 Aptitude to analyse, design and execute solutions which facilitate the universal accessibility to the buildings and their environment.
11. FE-25 Ability to analyse and fulfil projects of evacuation in buildings.
12. FE-26 Knowledge of the framework of regulation of the management and the urban discipline.
13. FE-29 Aptitude to write documents which are part of execution projects made in a multidisciplinary form
14. FE-30 Ability of analysis of the execution projects and their transfer to the execution in constructions.
15. FE-31 Knowledge of the functions and responsibilities of the agents which intervene in the construction and their
At the end of the subject, the students should be able to:

Transversal:
16. 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.
17. 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.
18. 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
The directed learning hours consist on the one hand in teaching theoretical classes (big group) where the faculty does a brief exposition to introduce the general learning objectives related with the basic concepts of the subject. Subsequently and by practical exercises, the professor tries to motivate and involve the students so that they can participate actively in their own learning. It is used support material in detailed teaching plan, by ATENEA: learning objectives by contents, concepts, examples, evaluation and directed learning activities schedules and bibliography. On the other hand, these hours also consist on doing problem classes (medium group) where the students work, generally, in groups of 3 or 4 members, by the resolution of exercises related with the specific learning objectives of each one of the subject contents.
Therefore cooperative learning techniques are developed at class. Generally, after each session out of class tasks are proposed, which must be worked individually or in groups and which are the base of the directed activities. There also have to be considered the other autonomous learning hours like the ones dedicated to the oriented readings, the resolution of the proposed problems or the self-learning questionnaires of the different contents by virtual campus ATENEA.

Learning objectives of the subject
At the end of the subject, the students should be able to:

The subject expects to provide a general view related with the facilities in buildings as well as the design and calculation of the networks, its future maintenance and the management tools necessary for the finalisation of the service which the facilities must supply to the buildings.
Regarding to the writing process of a facilities project, it is pretended that the student acquires a methodology to develop efficiently the specific technical documentation for its development, which musts incorporate apart from the technical criteria, the organisation criteria of the works and economic and technical aspects.

Study load

<table>
<thead>
<tr>
<th></th>
<th>Total learning time: 75h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group:</td>
<td>12h</td>
</tr>
<tr>
<td>Hours medium group:</td>
<td>9h</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>9h</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>0h</td>
</tr>
<tr>
<td>Self study:</td>
<td>45h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>16.00%</th>
<th>12.00%</th>
<th>12.00%</th>
<th>0.00%</th>
<th>60.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours medium group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours small group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guided activities:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self study:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Content

## C1 Methodology

**Learning time:** 25h  
Theory classes: 6h  
Practical classes: 2h  
Guided activities: 2h  
Self study : 15h

**Description:**  
In this content the students work:  
From the existing regulations and the specific use of the different type of buildings there will be developed the required contents of a project.

**Related activities:**  
Theoretical explanation class.  
Activity 1: Questionnaire of basic concepts.

## C2 Project

**Learning time:** 25h  
Theory classes: 6h  
Practical classes: 2h  
Guided activities: 2h  
Self study : 15h

**Description:**  
In this content the students work:  
There will be done a tour in the different basic techniques of development of projects, refering to the minimum necessary documentation and its criteria of execution and final control.

2.1 Basic documentation of the project.  
2.2 Execution. Applicable regulations.  
2.3 Trials and quality control.

**Related activities:**  
Theoretical explanation class.  
Activity 2. From a real project make its documentary audit.
### C3 Legalization and final of the building construction

**Learning time:** 25h
- Theory classes: 6h
- Practical classes: 2h
- Guided activities: 2h
- Self study: 15h

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this content the students work:</td>
</tr>
</tbody>
</table>

There will be studied the different type of building projects in buildings where there will be applied the final requirements of legalisation and end of construction. Management and documentation.

3.1 Final documentation of construction.
3.2 DOGC, LMA, final connections.
3.3 Maintenance plan.

<table>
<thead>
<tr>
<th>Related activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical explanation class.</td>
</tr>
<tr>
<td>Activity 3. From the plans given by the faculty. Document the final process of the construction.</td>
</tr>
</tbody>
</table>
## Planning of activities

### A1 GROUP TEST OF CONTINUOUS EVALUATION

<table>
<thead>
<tr>
<th>Description:</th>
<th>Hours: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realisation of a questionnaire of basic concepts.</td>
<td>Guided activities: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Support materials:**
- Questionnaire of fixed answers, by ATENEA. Series of self-learning tests with multiple choice and notes of the topic available in ATENEA.
- Bibliography.

**Descriptions of the assignments due and their relation to the assessment:**
- Questionnaire in ATENEA.
- It represents a part of the continous evaluation (10%).

**Specific objectives:**
At the end of the practice the students should be able to:

- Evaluate the acceptance criteria of a facilities project.
- Corroborate the different solutions and its implication in the building.
- Organise the real compatibilities of the intervention.

### A2 GROUP PROJECT OF AUTONOMOUS LEARNING (CONTENT 2)

<table>
<thead>
<tr>
<th>Description:</th>
<th>Hours: 15h</th>
</tr>
</thead>
<tbody>
<tr>
<td>From a real project do its documentary audit.</td>
<td>Practical classes: 3h</td>
</tr>
<tr>
<td></td>
<td>Self study: 12h</td>
</tr>
</tbody>
</table>

**Support materials:**
- Notes of the topic available (PowerPoint) in ATENEA.
- Bibliography.
- Paper, pencil, photographic camera.

**Descriptions of the assignments due and their relation to the assessment:**
- The students must do the practical work IN PowerPoint format (6-8 slides). They must present and explain the PowerPoint made at class. Random Nº of presentations.
- The rest of students at class must do questions to the presentating team.
- Registration by the faculty of the verification of the Directed Learning of the students.
- There will be given to the professor a document with the work.
- It represents a part of the continous evaluation (15%).

**Specific objectives:**
At the end of the activity the students should be able to:

- Understand the methodology of implementation of the facilities.
- Determine the acceptance of the construction execution.
- Analyze the influence of the measuring in the distribution and final design of the construction.
### A3 GROUP PROJECT OF AUTONOMOUS LEARNING (CONTENT 3)

**Description:**
In groups of two members, the students will do an exercise from the plans given by the faculty. Document the final process of construction.

**Support materials:**
- Notes of the topic available (PowerPoint) in ATENEA.
- Bibliography.
- Regulations.

**Descriptions of the assignments due and their relation to the assessment:**
- A file with the work.
- It represents a part of the continuous evaluation (10%).

**Specific objectives:**
- At the end of the activity, the students should be able to:
  - Know the elements and the facilities networks.
  - Recognise the compatibility or incompatibility of the networks and its construction process.

### A4 FINAL EXAM

**Description:**
Final exam about the given material of the subject.

**Support materials:**
- Bibliography.
- Theoretical classes.

**Descriptions of the assignments due and their relation to the assessment:**
- Resolution of the exam. It represents the 30% of the final mark of the subject.

**Specific objectives:**
- At the end of the exam, the students should be able to:
  - The subject pretends to provide the students with a general view related with the facilities projects in constructions, as well as in the urbanisation design, the behaviour and the processes of intervention on them, comprising the aspects of requirements of the different construction types and their uses, as starting tools for develop a definitive intervention project.
  - Corresponding to the writing process of a facilities project, it is pretended that the student acquires a methodology to develop efficiently the specific technical documentation for its development, which must incorporate apart from the technical criteria, organisation criteria of the works and economic aspects.
The final mark is the addition of these partial marks:
Activity-1 10%
Activity-2 20%
Activity-3 40%
Activity-4 30%

The continuous evaluation consists on doing different activities, individually or in group, with summative or educational nature, during the course (in and out of class).

It is a necessary requirement to pass the final exam to do the average with the rest of marks. If some of the lab or continuous evaluation activities is not done, it will be considered as non-marked. In any case it is possible to bring any formulary to the learning tests or exams.

**Bibliography**

**Basic:**

**Complementary:**