310030 - Construction VI

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 Compulsory)
BACHELOR’S DEGREE IN BUILDING CONSTRUCTION SCIENCE AND TECHNOLOGY (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 5
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: MANUEL BORBON SANLLORENTE
Others: MANUEL AGUSTIÑO OTERO - JOAN OLONA CASAS - MIREIA BOSCH PRAT

Degree competences to which the subject contributes

Specific:
1. FE-9 Ability to rule about the causes and symptoms of the damages in the buildings, propose solutions to prevent or repair the diseases, and analyse the useful life cycle of the constructive elements and systems.
2. FE-10 Aptitude to intervene in the refurbishment of buildings and the restoration and preservation of the built heritage.

Transversal:
3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
5. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
6. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology

There will be combined the in-person, directed and autonomous methods. With the combination of the three methods the students will acquire the levels of knowledge, comprehension and application.

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.

Learning objectives of the subject

General learning objectives of the subject.
Ability to develop constructive details in the existing buildings or historic and/or hereditary buildings.
Understand the pathological processes of the construction.
Identify the typology of damages and analyze the causes.
Plan intervention techniques in all the construction sub-systems in the existing buildings.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 25h</th>
<th>20.00%</th>
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</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>12h 30m</td>
<td>10.00%</td>
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<tr>
<td>Hours small group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>12h 30m</td>
<td>10.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>75h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>Content 1: INTRODUCTION</th>
<th>Learning time: 22h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td></td>
</tr>
<tr>
<td>In this content the students work:</td>
<td></td>
</tr>
<tr>
<td>Previous concepts and definitions of the intervention in the existing construction.</td>
<td></td>
</tr>
<tr>
<td><strong>Related activities:</strong></td>
<td></td>
</tr>
<tr>
<td>A1. There will be done the individual continuous evaluation activity at class during the big group sessions.</td>
<td></td>
</tr>
<tr>
<td>A2. Beginning test.</td>
<td></td>
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<tr>
<td>A3. Activity all course long. Writing of specific work in groups of 2 members.</td>
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</table>

<table>
<thead>
<tr>
<th>Content 2: STRUCTURAL PATHOLOGICAL PROCESSES</th>
<th>Learning time: 41h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td></td>
</tr>
<tr>
<td>In this content the students work:</td>
<td></td>
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<tr>
<td>Damages related with the different:</td>
<td></td>
</tr>
<tr>
<td>Type of soils.</td>
<td></td>
</tr>
<tr>
<td>Foundation systems.</td>
<td></td>
</tr>
<tr>
<td>Structure systems.</td>
<td></td>
</tr>
<tr>
<td><strong>Related activities:</strong></td>
<td></td>
</tr>
<tr>
<td>A4. There will be done the individual continuous evaluation test at class during the big group sessions.</td>
<td></td>
</tr>
<tr>
<td>A5. Exam of the basic contents of the module II.</td>
<td></td>
</tr>
<tr>
<td>A6. Making of a report in groups of 5 members, contents of Module II.</td>
<td></td>
</tr>
<tr>
<td>A7. Exposition in groups of the report of the Module II.</td>
<td></td>
</tr>
<tr>
<td>A3. Activity all course long. Writing of specific work in groups of 2 members.</td>
<td></td>
</tr>
</tbody>
</table>
## Content 3: NON STRUCTURAL PATHOLOGICAL PROCESSES

**Learning time:** 41h 30m  
- Theory classes: 10h  
- Practical classes: 4h  
- Guided activities: 5h  
- Self study: 22h 30m

### Description:
In this content the students work:
- Damages related with the constructive typologies of enclosures and roofs.  
- Interior compartmentalization systems and the finishes materials.

### Related activities:
- A8. There will be done the individual continuous evaluation test at class during the big group sessions.  
- A9. Exam of the basic contents of the module III.  
- A10. Making of a report in groups of 5 members, contents of Module III.  
- A11. Exposition in groups of the report of the Module III.  
- A3. Activity all course long. Writing of specific work in groups of 2 members.

## Content 4: TECNIQUES AND SYSTEMES OF INTERVENTION IN EXISTENT BUILDINGS.

**Learning time:** 19h 30m  
- Theory classes: 4h  
- Practical classes: 1h  
- Guided activities: 2h  
- Self study: 12h 30m

### Description:
In this content the students work:
- Identify, go in depth and apply the different intervention techniques in existing construction in the different constructive systems.

### Related activities:
- A3. Activity all course long. Writing of specific work in groups of 2 members.  
- A12. Exposition of the specific work in groups of 2 members.
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Description</th>
<th>Support materials</th>
<th>Specific objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. IT WILL BE DONE THE INDIVIDUAL TEST OF CONTINUOUS EVALUATION IN THE CLASS.</td>
<td>1h 30m</td>
<td>Individually the student will so an exam of the knowledge of the thematic block.</td>
<td>Basic Bibliography.</td>
<td>Define the basic concepts about the pathological process and the intervention ways in existing construction. Identify the damages and analyze the causes. Understand and apply the concept of global safety of a building. Plan the general intervention method. Understand and value the application of the Regulations in the field of the existing construction.</td>
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<td></td>
<td>It worths a 15%</td>
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<tr>
<td>A2. INICIAL TEST.</td>
<td>2h</td>
<td>Individually the student will do a knowledge exam non-evaluable.</td>
<td>Basic bibliography.</td>
<td>Define the basic concepts about the pathological process and the intervention ways in existing construction. Identify the damages and analyze the causes. Understand and apply the concept of global safety of a building. Plan the general intervention method. Understand and value the application of the Regulations in the field of the existing construction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non-evaluable activity for the improvement of the basic knowledge.</td>
</tr>
<tr>
<td>A3. ACTIVITY THROUGH THE WHOLE COURSE. REDACTION OF AN SPECIFIC PROJECT IN GROUPS OF 2 PERSONS</td>
<td>25h</td>
<td>Development of a work of a thematic block to choose between 50 specific topics.</td>
<td>Basic bibliography, specific bibliography.</td>
<td>Define the basic concepts about the pathological process and the intervention ways in existing construction. Identify the damages and analyze the causes. Understand and apply the concept of global safety of a building. Plan the general intervention method. Understand and value the application of the Regulations in the field of the existing construction.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>It worths a 10%.</td>
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</tbody>
</table>

**Theory classes:** 1h 30m

**Self study:** 25h
### Specific objectives:
Identify damages and causes on the structural elements from its organoleptic perception to the scientific methods.
Develop the relation symptom-cause of structural nature.
Identify damages and causes in the non-structural elements from its organoleptic perception to the scientific methods.
Develop the relation symptom-cause of non-structural nature.
Apply the different techniques of intervention in structural and non-structural elements and finishes.

### A4. IT WILL BE DONE THE INDIVIDUAL TEST OF CONTINUOUS EVALUATION IN THE CLASS.

**Hours:** 1h 30m  
**Theory classes:** 1h 30m

**Description:**
Individually the student will do a knowledge exam of the thematic block.

**Support materials:**
Basic bibliography.

**Descriptions of the assignments due and their relation to the assessment:**
It worths a 30%

**Specific objectives:**
Identify damages and causes in the structural elements form its organoleptic perception to the scientific methods.  
Develop the relation symptom-cause of structural nature.

### A5. TEST OF BASIC CONCEPTS SPECIFICS OF UNIT II.

**Hours:** 2h  
**Theory classes:** 2h

**Description:**
Individually the student will do a basic knowledge exam of the module II, which won't be evaluable.

**Support materials:**
Basic bibliography.

**Descriptions of the assignments due and their relation to the assessment:**
Non-evaluable exam for the improvement of the basic knowledge.

**Specific objectives:**
Identify damages and causes in the structural elements from its organoleptic perception to the scientific methods. 
Develop the relation symptom-cause of structural nature.

### A6. REPORT IN GROUPS OF 6 PERSONS, CONTENT UNIT II.

**Hours:** 10h  
**Self study:** 10h

**Description:**
Development of a ruling related with structural damages in groups of 6 members.

**Support materials:**
Basic bibliography, specific bibliography.
### A7. Project in Group in the Class. Carry Out a Puzzle.

**Hours:** 2h 30m  
**Theory classes:** 2h 30m

**Description:**  
In groups of 4 students.  
The groups will move between them to make a correct diagnosis of 4 pathological processes.

**Support materials:**  
Notes of the content available in ATENEA.

**Descriptions of the assignments due and their relation to the assessment:**  
Evaluable activity. It represents a part of the continuous evaluation. (5%).

**Specific objectives:**  
Identify damages and causes in the structural elements from its organoleptic perception to the scientific methods.  
Develop the relation symptom-cause of structural nature.

### A8. It Will Be Done the Individual Test of Continuous Evaluation

**Hours:** 1h 30m  
**Theory classes:** 1h 30m

**Description:**  
Individually the student will do a knowledge exam of the thematic block.

**Support materials:**  
Basic bibliography.

**Descriptions of the assignments due and their relation to the assessment:**  
It represents a 30%.

**Specific objectives:**  
Identify damages and causes in the constructive elements from its organoleptic perception to the scientific methods.  
Develop the relation symptom-cause of structural nature.

### A9. Test of Basic Concepts Specifics of Unit III.

**Hours:** 2h  
**Theory classes:** 2h

**Description:**  
Individually the student will do a knowledge exam non-evaluable.
Support materials:  
Basic bibliography.

Descriptions of the assignments due and their relation to the assessment:  
Non-evaluable exam for the improvement of the basic knowledge.

Specific objectives:  
Identify damages and causes in the non-structural elements from its organoleptic perception to the scientific methods.  
Develop the relation symptom-cause of non-structural nature.

A10. REPORT IN GROUPS OF 6 PERSONS, CONTENT UNIT III.  

| Hours: 2h 30m |
| Theory classes: 2h 30m |

Description:  
Development of a ruling related with structural damages in groups of 6 members.

Support materials:  
Basic bibliography, specific bibliography.

Descriptions of the assignments due and their relation to the assessment:  
It represents a 5%  

Specific objectives:  
Identify damages and causes in the structural elements from its organoleptic perception to the scientific methods.  
Develop the relation symptom-cause of structural nature.  
Develop the relation symptom-cause of non-structural nature.

Qualification system

Activity 1. (A1) 15%  
Activity 3. (A3) 10%  
Activity 4. (A4) 30%  
Activity 6. (A6) 5%  
Activity 7. (A7) 5%  
Activity 8. (A8) 30%  
Activity 10. (A10) 5%

Regulations for carrying out activities

If any of the activities A3, A6, A7 and A10 is not done, it will be considered as non-marked.

In any case the students can bring any type of formulary during the questionnaires or exams.
Bibliography

Basic:


Complementary:


Others resources:

Audiovisual material
Practical examples of real problems.
Informatics material
Notes uploaded at the campus atenea

Web pages
Links to official technic webpages
IITEC Institute of Construction Technology of Catalonia www.itec.cat
Institute of Construction Sciences Eduardo Torroja www.ietcc.csic.es