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.
310030 - Construction VI

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>25h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>12h 30m</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<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>
<td></td>
</tr>
<tr>
<td>Self study:</td>
<td>75h</td>
<td>60.00%</td>
<td></td>
</tr>
</tbody>
</table>
## Content

### Content 1: INTRODUCTION

**Description:**
In this content the students work:
Previous concepts and definitions of the intervention in the existing construction.

**Related activities:**
A1. There will be done the individual continous evaluation activity at class during the big group sessions.
A2. Beginning test.
A3. Activity all course long. Writing of specific work in groups of 2 members.

<table>
<thead>
<tr>
<th>Learning time: 22h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td>Guided activities: 3h</td>
</tr>
<tr>
<td>Self study : 12h 30m</td>
</tr>
</tbody>
</table>

### Content 2: STRUCTURAL PATHOLOGICAL PROCESSES

**Description:**
In this content the students work:
Damages related with the different:
Type of soils.
Foundation systems.
Structure systems.

**Related activities:**
A4. There will be done the individual continous evaluation test at class during the big group sessions.
A5. Exam of the basic contents of the module II.
A6. Making of a report in groups of 5 members, contents of Module II.
A7. Exposition in groups of the report of the Module II.
A3. Activity all course long. Writing of specific work in groups of 2 members.

<table>
<thead>
<tr>
<th>Learning time: 41h 30m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td>Practical classes: 4h</td>
</tr>
<tr>
<td>Guided activities: 5h</td>
</tr>
<tr>
<td>Self study : 22h 30m</td>
</tr>
</tbody>
</table>
### Content 3: NON STRUCTURAL PATHOLOGICAL PROCESSES

**Description:**
In this content the students work:
- Damages related with the constructive typologies of enclosures and roofs.
- Interior compartmentalization systems and the finishing 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: TECHNIQUES AND SYSTEMES OF INTERVENTION IN EXISTENT BUILDINGS.

**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>Support materials</th>
<th>Description</th>
<th>Specific objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1. IT WILL BE DONE THE INDIVIDUAL TEST OF CONTINUOUS EVALUATION IN THE CLASS.</strong></td>
<td>1h 30m</td>
<td>Basic Bibliography</td>
<td>Individually the student will do an exam of the knowledge of the thematic block.</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><strong>A2. INICIAL TEST.</strong></td>
<td>2h</td>
<td>Basic bibliography</td>
<td>Individually the student will do a knowledge exam non-evaluable.</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><strong>A3. ACTIVITY THROUGH THE WHOLE COURSE. REDACTION OF AN SPECIFIC PROJECT IN GROUPS OF 2 PERSONS</strong></td>
<td>25h</td>
<td>Basic bibliography, specific bibliography.</td>
<td>Development of a work of a thematic block to choose between 50 specific topics.</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>
</tbody>
</table>

**Support materials:**
- Basic Bibliography
- Specific bibliography

**Descriptions of the assignments due and their relation to the assessment:**
- It worths a 15% 
- It worths a 10%
### 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.

**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.

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

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

**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.

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

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

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

**Support materials:**
Basic bibliography, specific bibliography.

**Hours:** 10h
- Self study: 10h
### A7. PROJECT IN GROUP IN THE CLASS. CARRY OUT A PUZZLE.

**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.

**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.

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

### A8. IT WILL BE DONE THE INDIVIDUAL TEST OF CONTINUOUS EVALUATION

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

**Support materials:**
Basic bibliography.

**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.

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

### A9. TEST OF BASIC CONCEPTS SPECIFICS OF UNIT III.

**Description:**
Individually the student will do a knowledge exam non-evaluable.

**Hours:** 2h  
Theory classes: 2h
A10. REPORT IN GROUPS OF 6 PERSONS, CONTENT UNIT III.

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:
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.
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.

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
ITeC Institute of Construction Technology of Catalonia www.itec.cat
Institute of Construction Sciences Eduardo Torroja www.ietcc.csic.es