**Course guides**

**310714 - 310714 - Structures Construction**

<table>
<thead>
<tr>
<th>Unit in charge:</th>
<th>Barcelona School of Building Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching unit:</td>
<td>753 - TA - Department of Architectural Technology.</td>
</tr>
<tr>
<td>Degree:</td>
<td>BACHELOR’S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019). (Compulsory subject).</td>
</tr>
<tr>
<td>Academic year:</td>
<td>2021</td>
</tr>
<tr>
<td>ECTS Credits:</td>
<td>4.5</td>
</tr>
<tr>
<td>Languages:</td>
<td>Catalan, Spanish, English</td>
</tr>
</tbody>
</table>

**LECTURER**

Coordinating lecturer: Capellà Llovera, Joaquim

Others: Anguera De Carlos, Enric
        Ruiz Gandullo, Javier

**PRIOR SKILLS**

Basic notions of Construction, materials (concrete - reinforcement - metal profiles), and structures.

**REQUIREMENTS**

Basic notions of Construction, materials (concrete - reinforcement - metal profiles), and structures.

**DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES**

**Specific:**
1. 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.
2. 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.
3. FE-8 Knowledge of specific procedures for the material execution control of the construction.

**Transversal:**
4. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
TEACHING METHODOLOGY

The in-person, directed and autonomous methods will be combined. With the combination of the three methods, the students must achieve the knowledge, comprehension, application, synthesis and evaluation levels.

In the in-person method special attention will be made in the clarity, precision and order aspects by the faculty. These classes will be done by the whole group (big group), and the professor will develop the course topics at class. The students will find all the required documentation in PDF format in ATENEA.

In-person (medium group) the students will do practices at class which will be solved individually. Once finished the practice, the professor will solve the exercise. The delivery will be compulsory and will be graded.

As a group work and in-person there will be done the PUZZLE practice (medium group). Besides achieving the specific objectives of the contents there also will be developed cooperative learning techniques at class.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course, the students should be able to:

- To define the meaning of the construction structural components.
- To explain the process and the stages of construction of the structural components.
- To connect the structural components with the ideal materials for its construction.
- Incorporate formwork and construction equipment in construction.
- Incorporate sustainability into construction.
- To define the properties of the structural components.
- To identify the different construction systems and subsystems of the different structures.
- To use the construction lexical and the awareness of the responsibility of the technicians in the sustainability and environmental respect aspects.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>18,0</td>
<td>16.00</td>
</tr>
<tr>
<td>Self study</td>
<td>67,5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>27,0</td>
<td>24.00</td>
</tr>
</tbody>
</table>

Total learning time: 112.5 h
<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ENG) C1 MASONRY STRUCTURES</td>
</tr>
</tbody>
</table>

**Description:**
In this content the students work:
- Introduction to the masonry and brickwork structures.
- Masonry and brickwork.
- Construction design of masonry and brickwork structures.
- Sustainability.

**Related activities:**
Activity 1 individually, corresponding to the autonomous self-learning.
Activity 2 individually, corresponding to the autonomous self-learning.
Activity 4 in group, corresponding to the medium or small group sessions at class.
Activity 5 individually, corresponding to the autonomous self-learning.

**Full-or-part-time:** 10h
- Theory classes: 3h
- Practical classes: 1h
- Self study : 6h

<table>
<thead>
<tr>
<th>C2 WOOD STRUCTURES</th>
</tr>
</thead>
</table>

**Description:**
In this content the students work:
- Introduction to the wooden structures.
- Wood.
- Construction design of wooden structures.
- Sustainability.

**Related activities:**
Activity 1 individually, corresponding to the autonomous self-learning.
Activity 2 individually, corresponding to the autonomous self-learning.
Activity 4 in group, corresponding to the autonomous self-learning.
Activity 5 individually, corresponding to the autonomous self-learning.

**Full-or-part-time:** 10h
- Theory classes: 3h
- Practical classes: 1h
- Self study : 6h
C3 METALLIC STRUCTURES

Description:
In this content the students work:
· Introduction to the metallic structures.
· Structural steels.
· Construction design of the metallic structures.
· Formwork.
· Construction equipment.
· Sustainability.

Related activities:
Activity 1 individually, corresponding to the autonomous self-learning.
Activity 2 individually, corresponding to the autonomous self-learning.
Activity 4 in group, corresponding to the medium or small group sessions at class.
Activity 5 individually, corresponding to the autonomous self-learning.

Full-or-part-time: 16h
Theory classes: 4h 30m
Practical classes: 2h
Self study : 9h 30m

C4 REINFORCED CONCRETE STRUCTURES (I)

Description:
In this content the students work:
· Introduction to the reinforced concrete structures.
· Columns and beams.
· One-way spanning slab.
· Construction design of reinforced concrete structures (columns, beams and one-way spanning slabs).
· Formwork.
· Construction equipment.
· Sustainability.

Related activities:
Activity 2 individually, corresponding to the autonomous self-learning.
Activity 4 in group, corresponding to the autonomous self-learning.
Activity 5 individually, corresponding to the autonomous self-learning.

Full-or-part-time: 30h 15m
Theory classes: 9h
Practical classes: 3h
Self study : 18h 15m
C5 REINFORCED CONCRETE STRUCTURES (II)

Description:
In this content the students work:
- Two-way spanning slabs.
- Reinforced slabs.
- Construction design of reinforced concrete structures (two-way spanning slabs and reinforced slabs).
  - Formwork.
  - Construction equipment.
  - Sustainability.

Related activities:
Activity 3 individually, corresponding to the autonomous self-learning.
Activity 4 in group, corresponding to the autonomous self-learning.
Activity 5 individually, corresponding to the autonomous self-learning.

Full-or-part-time: 30h 15m
Theory classes: 9h
Practical classes: 3h
Self study: 18h 15m

C6 PRESTRESSED AND POSTSTRESSED STRUCTURES

Description:
In this content the students work:
- Introduction to the prestressed and poststressed structures.
- Pre-tensioning.
- Post-tensioning.
- Construction design of prestressed and poststressed structures.
  - Formwork.
  - Construction equipment.
  - Sustainability.

Related activities:
Activity 5 individually, corresponding to the autonomous self-learning.

Full-or-part-time: 16h
Theory classes: 4h 30m
Practical classes: 2h
Self study: 9h 30m
GRADING SYSTEM

The students will be evaluated individually by a graphic and written exam. This exam worths the 17% in the contents 1 to 3 (activity 1).

The students will be evaluated individually by a graphic and written exam. This exam worths the 30% in the contents 1 to 4 (activity 2).

The students will be evaluated individually by a graphic and written exam. This exam worths the 17% in the content 5 (activity 3).

The group practice at class will be evaluated by its presentation. The practice worths the 6%, divided into the contents 1 to 5 (activity 4).

It will be evaluated individually a graphic and written exam which will be a general application of the subject and will worth the 30%. This evaluable exam will be done the last day of class (activity 5).

The evaluable exam consist on the one hand in questions about associated concepts to the learning objectives of the subject regarding to the knowledge or the comprehension, and a group of application exercises. The students have approximately 2 hours for solving the exam. The continous evaluation consist on doing different activities, both individual and in group, with accumulative and educational nature, done during the course (in of class).

Reevaluación

El estudiante que haya obtenido una calificación final de suspenso con una nota numérica comprendida entre 3.5 i 4.9 tendrá la opción de presentarse a una prueba única de reevaluación, que incluirá la totalidad de los Contenidos y se realizará en el periodo establecido al efecto. Si supera esta prueba, la calificación final de la asignatura pasará a ser aprobado (5.0) No podrá realizar la prueba de reevaluación el estudiante que cumpla alguna de las siguientes condiciones:

i) ya ha aprobado la asignatura.

ii) su calificación final está por debajo de 3.5 (incluye el caso NP, que és 0 NP).

EXAMINATION RULES.

. If some of the continous evaluation activities is not done, it will be considered as non-marked.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Audiovisual material:
- Guia Virtual
- Diccionario visual de la construcción
- La gestión de los Residuos

**Hyperlink:**
- Biblioteca: http://bibliotecas.upc.es/
- Diapoteca: http://bibliotecas.upc.es/diapoteca/

**Other resources:**
Files of the topics presented in class and posted on the Virtual Campus.
Web Link