

## 30729 - Structures 3

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 30729 - Structures 3

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 470 - Bachelor's Degree in Architecture Studies

**ECTS:** 6.0

**Year:** 4

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The main objective of the Structures 3 course is that the student acquires the necessary knowledge for the design and analysis of steel and timber structures and the verification of steel and timber structures, discussing the Spanish and European regulations applicable to this type of structures.

The aim is to give the student a general vision of the steel and timber structure and its applications in building, as well as to deepen in the conceptual aspects of the design of structures built with these materials.

### 2. Learning results

- Ability to design and analyse steel and timber structures.
- Detailed knowledge of the resistant mechanisms in steel and timber structures under different types of stresses.
- Detailed knowledge of the concepts related to structural safety.
- Ability to define singular construction details.
- Fluency in the handling of national and European regulations on steel and timber structures, with full knowledge of their application limits.

### 3. Syllabus

1. Design bases for steel and timber structures
2. Design and analysis of truss structures
3. Design and analysis of steel beams
4. Design and analysis of timber beams
5. Design and analysis of supports and frames
6. Joints in steel structures
7. Joints in timber structures

### 4. Academic activities

Theory classes (T1). Exposition of the theoretical concepts of the subject, illustrated with examples that help to understand them: 30 hours.

Problem classes (T2). Performance of selected problems to cover all relevant aspects of the subject: 15 hours.

Practices (T3): They are organized to familiarize students with the computational means of structural analysis and to make them able to interpret and apply the regulations on steel and timber structures: 15 hours.

Subject work (T6). Calculation of the main structural elements of a real building: 20 hours.

Personal study (T7): 67 hours.

Evaluation tests (T8): 3 hours.

### 5. Assessment system

A continuous assessment of the subject is proposed, consisting of the following activities:

*Subject work* (Weighting: 35%)

- It will consist of the design and testing of the structure of a building. A calculation program for structures will be used and various analytical calculations will be performed.

*Practices* (Weighting: 20%)

- Six practical sessions will be carried out in which different structural calculation programs will be used and regulations on steel and timber structures will be applied.
- Some sessions will require the presentation of certain preparatory calculations before beginning.

*Examination* (Weighting: 45%)

- The complete content of the subject will be evaluated. It may consist of short theoretical-practical questions and problems of longer development.

In order to pass the subject, a minimum of 4 points out of 10 must be obtained in each of the activities.

Alternatively, a global assessment is also proposed:

*Examination* (Weighting: 80%)

- The complete content of the subject will be evaluated. It may consist of short theoretical-practical questions and problems of longer development.
- A minimum of 4.5 out of 10 points must be obtained.

*Practice Exam* (Weighting: 20%)

- If the student has satisfactorily completed the internship throughout the subject, they will be exempted from taking this practical exam.

## **6. Sustainable Development Goals**

9 - Industry, Innovation and Infrastructure