

30724 - Structures 2

Syllabus Information

Academic year: 2023/24

Subject: 30724 - Structures 2

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 470 - Bachelor's Degree in Architecture Studies

ECTS: 6.0

Year: 3

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The subject consists of two distinct but closely related parts: the design and calculation of structures. It includes a first part dedicated to Graphic Statics and its influence on the design of structures. The second part describes the two families of structural design methods: the flexibility and stiffness methods and, within the latter, the finite element method, which will be studied briefly.

It is understood that an exposition to the student of the fundamental elements of the Theory of Elasticity is unavoidable, since from it derive, by means of the adoption of certain kinematic and dynamic hypotheses, the kinematic and dynamic models the most common models of Strength of Materials in professional practice.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement:

- Goal 3: Health and wellness;
- Goal 4: Quality Education.
- Goal 5: Gender Equality.
- Goal 9: Industry, innovation and infrastructure;
- Goal 11: Sustainable cities and communities;

2. Learning results

To pass the subject, the student must demonstrate that they have acquired the following learning results: Adequate knowledge of the basic laws governing the Mechanics of Continuous Media and, more specifically, the Theory of Elasticity.

Ability to identify different structural typologies and the way in which they resist the stresses to which they are subjected.

To understand the strength performance of the most common structures and the design and calculation methods available.

Perform simple dimensioning of structures.

3. Syllabus

1. Structural design
 1. Static Graphics
 2. Computational Graphic Statics
2. Structural Calculation
 1. Flexibility methods
 2. Stiffness methods
 3. The finite element method

4. Academic activities

The program offered to the student to help them achieve the expected results includes the following activities...

1. Structural design: graphic statics and computational graphic statics
2. Structural calculations. Stiffness and flexibility methods.

5. Assessment system

The student must demonstrate that he/she has achieved the expected learning results by means of the following continuous assessment activities

- Final evaluation written test consisting of a theoretical and a practical part. The grade will be from 0 to 10 and this grade will represent 40% of the student's final grade, and can never be less than 4 to pass the subject.
- Practice reports: will account for 20% of the final grade.
- Subject work: the students will develop, in groups of a size to be determined according to the complexity of the work, a small project of design and calculation of a singular structure.

The student, as is mandatory, will be entitled to a final evaluation consisting of:

- Final evaluation written test consisting of a theoretical and a practical part. The grade will be from 0 to 10 and this grade will represent 60% of the student's final grade, and can never be less than 4 to pass the subject.
- Practical exam, which will account for 40% of the final grade.