

## 30711 - Construction 1

### Syllabus Information

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**Academic year:** 2024/25

**Subject:** 30711 - Construction 1

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

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

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

#### 1. INTRODUCTION TO CONSTRUCTIVE THINKING

- 1.1. Architectural construction as problematic thinking: What does it mean to build?
- 1.2. Architectural construction as an energy system: Responsibility towards climate change
- 1.3. Systems and Complexity. Contemporary cultural context and critical thinking

#### 2. ARCHITECTURE AS A STRUCTURAL SYSTEM

What is a structural system?

- 2.1. Architecture and structure. Introduction to the Structural System
- 2.2. Theory of structure in architecture: Sandaker, Engel, Deplazes, Paricio
- 2.3. Elementary forces. Stresses. Vertical and horizontal elements
- 2.4. Mechanisms of load transmission and mechanical resistance
- 2.5. Relationship of the structure with other construction systems. Attitudes
- 2.6. Foundations. Definition. Structural and construction characteristics

#### 3. ARCHITECTURE AS AN ENERGY SYSTEM

What is an energy system?

- 3.1. Architecture and energy: Kiel Moe, Iñaki Ábalos, and Renata Stenkiewicz
- 3.2. Buildings as a thermodynamic exchange system
- 3.3. The building as an energy processor: energy sources, flows, and emissions
- 3.4. Energy balances, energy demand, thermal comfort

#### 4. ARCHITECTURE AS AN ENVELOPE SYSTEM

What is an envelope system?

- 4.1. The envelope as a membrane that responds to the environment
- 4.2. System boundary, transmittance, inertia, and thermal bridge
- 4.3. Strategies: insulate vs. accumulate
- 4.4. Systems of transmission and noise protection. What does it mean to build with noise?
- 4.5. Interior distribution systems

### 2. Learning results

- Knowledge of the conventional structural construction systems, and aptitude for their representation, installation, conservation, and methods of measurement and valuation.
- Know and use the technical vocabulary of construction.
- Knowledge and application of basic construction regulations.
- Acquisition of criteria for the correct choice of materials for the construction of structural elements in architecture.
- Ability to understand the tectonic logic of architectural constructions.
- Ability to recognize the architectural repercussions of each construction system and of each material of the structural elements in the structural elements in the architectural project and in the construction site.
- Know how to elaborate construction details and technical prescriptions of the structural elements, which express the architectural fact and its construction.

### 3. Syllabus

#### 1. INTRODUCTION TO CONSTRUCTIVE THINKING

- Architectural construction as problematic thinking: what is building?
- Architectural construction as an energy system: responsibility in the face of climate change
- Systems and Complexity

#### 2. ARCHITECTURE AS A STRUCTURAL SYSTEM

what is a structural system?

- 2.1- Load transmission systems and mechanical strength
- 2.2- Foundations. Definition. Structural and constructive characteristics.
- 2.3- VERTICAL elements
- 2.4- HORIZONTAL elements

### **3. ARCHITECTURE AS AN ENERGY SYSTEM**

what is an energy system?

- 3.1- Energy Exchange System.
- 3.2 Buildings as thermodynamic exchangers
- 3.2- Buildings as a system capable of processing energy and adapting to the environment
- 3.4 Energy balances, energy demand, thermal comfort.

### **4. ARCHITECTURE AS AN ENVELOPE SYSTEM**

what is an envelope system?

- 4.1- Roofs and exterior enclosures. Transmittance.
- 4.3 Noise transmission and protection systems - What is building with noise?
- 4.4 Interior distribution systems.

## **4. Academic activities**

Theoretical classes by means of participative lectures, 20 hours. Theory sessions of development of the subject Problems and cases: 10 h, critical comments on readings from the bibliography on problems posed.

Workshop practices: 30 h, development of the practice of the subject.

Teaching assignments, 30 hours, preparation of work related to the Learning Portfolio and final project

Personal study and reading, 56 h

Evaluation test, 4 h

This subject is English Language Friendly (ELF) in at least one group. The study and class material is available in English and the teachers will attend office hours and prepare and evaluate students in English if they don't speak Spanish

## **5. Assessment system**

1. The student is evaluated through a theoretical exam at the end of the semester and a practical exercise conducted throughout the course. The weighting of each component in the final grade is as follows:

- Written/graphical theoretical exam (including theory and problems): 50%  
(a score > 5 is required in the exam to pass the subject)
- Set of practical exercise submissions: 50%  
(a score > 4 is required in the practical exercises to pass the subject)

The evaluation of the practical exercise will be continuous, and all submissions throughout the semester, both partial and final, will be graded.

If the exam score is below 5, the practical exercise grades will be retained only for the same academic year's calls, provided that their evaluation is above 5. They will not be retained for subsequent academic years.

The faculty may propose the possibility of passing part of the theoretical exam through a voluntary partial exam conducted during the semester. If a score equal to or greater than 7 points is achieved in this partial exam, the examined topics will be considered passed.

2. A series of mandatory readings are assigned throughout the course. These will be evaluated through the submission of a summary and participation in a class debate. If this evaluation exceeds 6 points, the exam can be moderated with a score > 4 points.

3. If a student does not pass the final submission of the practical exercise, or does not complete all submissions and/or public presentations on the agreed dates, they must undertake a comprehensive practical test, in addition to the written/graphical theoretical exam at the end of the semester. The student must notify by email that they will participate in this test for its organization.

4. Students who have followed continuous assessment with all practical exercises submitted and passed may take the final written/graphical theoretical exam with the content of those exercises.

5. Practical exercises must be submitted before the deadline established in the course submission calendar. If a score of less than 5 is obtained in the practical exercise assessment, the student will have a period of 10 calendar days for resubmission of the same exercise, starting from the day after the grades are published.