

## 30720 - Conditioning and Services 1

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 30720 - Conditioning and Services 1

**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

Conditioning and Services 1 deals with conditioning of indoor environments by natural systems in architecture. The objective of the subject is that students learn to relate and assess the impact of passive conditioning on the environmental performance, habitability and comfort of the building, as well as on the health of its inhabitants. It also prepares students in the definition of passive energy strategies for buildings, necessary for them to become nearly zero energy buildings (EECN), as required by the Technical Building Code (Código Técnico de la Edificación).

This subject is the first of the field Conditioning and Services, which is made up of 3 subjects, each of them with 6 ECTS, so it also serves as an introduction to the subject.

Previous knowledge of physics, graphic expression, architectural projects and construction is recommended. This knowledge is covered in the subjects Physics 2, Graphic Expression 1, Projects 1, Projects 2, Projects 3, Construction 1 and Construction 2 of the Degree in Architectural Studies at the University of Zaragoza.

### 2. Learning results

The learning results are:

- To know the environmental parameters that affect human comfort inside buildings.
- To know how to relate the repercussion that the way of designing and constructing has on the behavior of buildings in relation to the lighting, thermal and acoustic environment.
- Know the basics of natural ventilation, sunlighting, daylighting and architectural acoustics.
- To know how to basically quantify the behavior of buildings in relation to the lighting, thermal and acoustic environment.
- To know conditioning, lighting and acoustic control techniques by natural means, and the ability to develop them in an integrated way in the project process.

### 3. Syllabus

The subject syllabus consists of the following blocks and topics.

**BLOCK 1: Sustainable Indoor Environment Conditioning Strategies**

Topic 1.1. Introduction to Sustainable Indoor Environment Conditioning

Topic 1.2. Natural climate conditioning strategies

Topic 1.3. Visual and Olfactory comfort Strategies

Topic 1.4. Strategies for acoustic conditioning and isolation

Topic 1.5. Circularity strategies of indoor environment conditioning

**BLOCK 2: Deepening of natural climate conditioning strategies**

Topic 2.1. Climatic comfort

Topic 2.2. Thermal gain and solar protection

Topic 2.3. Thermal insulation and thermal bridges

Topic 2.4. Air permeability control

### 4. Academic activities

- Lectures (sessions with the teaching staff in which the subject syllabus will be explained): 30 hours
- Computerized practices (sessions of critical review of the development of the work of the subject using programs of

- drawing and simulation): 30 hours
- Study, teaching and other activities: 84 hours
- Assessment tests. 6 hours
- 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 do not speak Spanish.

## 5. Assessment system

Students are evaluated by means of a **theoretical test** at the end of the semester and a **practical exercise** carried out throughout the subject. The first pre-delivery of the subject and the final delivery of the exercise will be graded. The assessment of each part in the final grade will be:

Theoretical test: 50 %

Initial pre-delivery of the practical exercise: 5 %

Final delivery of the practical exercise: 45 %

Requirements to pass the subject are:

- Make all pre-deliveries, delivery and public exhibition of the practical exercises on the announced dates.
- Obtain at least a 5 on the final submission of the practical exercise.
- Obtain at least a 5 in the theoretical test.
- Obtain at least a 5 overall grade in the course. The grade will be calculated from the following equation:  $A = 0.5 \cdot Pt + 0.45 \cdot EpF + 0.05 \cdot Epl$

Where: **A** is the grade in minutes out of 10 (or overall grade in the subject)

**Pt** is the score of the theoretical test out of 10

**EpF** is the grade for the final delivery of the practical exercise out of 10

**Epl** is the grade of the initial delivery of the practical exercise out of 10

If the grade of A is lower than 5, the grades of EpF and Epl will be kept for the exams of the same academic year.

Students will be offered the possibility to reduce the final theory test by taking a partial exam. The date of the midterm will be agreed upon by the faculty and the students. The theoretical part of the subject will still be worth 50% of the final grade. In order to be able to reduce the final theory test, it will be necessary to obtain at least a 5 in the partial theory exam.

Students will also be offered the possibility of raising their theoretical test grade by taking mini-tests at the beginning of some classes on what was previously taught. The maximum score that can be obtained with all the mini-tests will be 1 point.

If a student does not pass the final delivery of the practical exercise or does not complete all the deliveries, pre-deliveries and/or public presentations on the agreed dates, they must take a practical test in addition to the theoretical test at the end of the semester.

In this case, the requirements to pass the subject are:

- Obtain at least a 5 in the practical test.
- Obtain at least a 5 in the theoretical test.
- Obtain at least a 5 overall grade in the subject. The grade will be calculated from the following equation:  $A = 0.5 \cdot Pt + 0.5 \cdot Pp$

Where: **A** is the grade in minutes out of 10 (or overall grade in the subject)

**Pt** is the score of the theoretical test out of 10

**Pp** is the grade of the practical test out of 10

Examination notes are not saved for subsequent exam sessions.

## 6. Sustainable Development Goals

3 - Good Health & Well-Being

11 - Sustainable Cities and Communities