Universidad Zaragoza

Academic Year/course: 2024/25

60827 - HVAC Heating Ventilating and Air Conditioning

Syllabus Information

Academic year: 2024/25
Subject: 60827 - HVAC Heating Ventilating and Air Conditioning
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 532 - Master's in Industrial Engineering
ECTS: 6.0
Year: 2
Semester: First semester
Subject type: Optional
Module:

1. General information

This subject is part of the optional training block of the Master in Industrial Engineering and enables the student to understand and design HVAC installations.

The educational objectives proposed are:

- To know descriptive and functional aspects of the different usual equipment in air conditioning.
- To achieve the necessary knowledge to design air conditioning installations.
- To achieve the necessary knowledge of energy efficiency, taking into account the specific technologies for energy saving and the use of alternative energies in air conditioning installations.
- To achieve the necessary knowledge to energetically certify a house.
- To acquire the basic knowledge and reasoning schemes for autonomous learning.

These approaches and objectives are aligned with the following SDG of the 2030 Agenda: Goal 7;Objectives: 7.1, 7.2 and 7.3.

2. Learning results

Upon completion of this subject, the student will be able to:

- Know specific regulations on air conditioning installations and their application.
- Know specific regulations on energy certification and its application.
- Calculate the thermal demand of a building.
- Know the basic fundamentals, equipment and systems of air conditioning installations.
- Know the fundamentals of energy efficiency and certification in buildings.
- Choose the most suitable type of air conditioning installation and integrate it correctly into the building.
- Design, pre-dimension and calculate air conditioning installations and carry out their corresponding measurements and project plans.
- Implement and maintain air conditioning installations.
- Draft air conditioning projects.
- Energetically certify buildings.

3. Syllabus

1.- Air conditioning systems

2.- Energy demand in the building

3.- Air conditioning projects

4.- Air conditioners

5.- Calculation and selection of terminal elements

6.- Domestic hot water

7.- Auxiliary systems

8.- Control systems in air conditioning installations

9.- Air diffusion systems

10.- Boiler rooms

11.- Energy efficiency

4. Academic activities

The learning process of this subject is based on encouraging the student's continuous work and participation, and focuses on theoretical-practical aspects in order to understand, analyse and apply the knowledge acquired to the solving of real problems.

- Master classes: the theoretical bases that make up the subject will be developed, and some model problems will be solved.
- Practices (short assignments): they allow to verify the understanding of the subject and at the same time help the student to acquire a more applied point of view and to solve more complex and complete problems.
- Air conditioning project: it encompasses and complements the previous work.

5. Assessment system

The student is evaluated using a progressive system through a theoretical-practical exam at the end of the four month period, the completion of practical exercises (short assignments), and the assessment of a facilities project carried out throughout the four month period.

The weighting of each part in the final grade will be:

- Theoretical-practical written exam: 35%
- Practices (short assignments): 30%
- Project: 35 %

Requirements to pass the subject are:

- To submit the assignments (short works) on the established dates.
- To deliver and defend the project on the scheduled dates.
- To achieve a minimum grade of 5 in the project.
- To achieve a minimum grade of 5 in the exam.
- To achieve a minimum overall grade of 5 in the subject.

If a student does not pass the project part or does not submit and/or defend the project and/or practices on the agreed dates, they must take a comprehensive evaluation test composed of a practical exam (weighing 50%), and a theoretical-practical one (weighing 50%) on the dates set by the centre for each of the two calls.

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

- To achieve a minimum grade of 5 in the practical exam.
- To achieve a minimum grade of 5 in the theoretical-practical exam.
- To obtain at least a grade of 5 overall grade in the subject.

6. Sustainable Development Goals

7 - Affordable and Clean Energy