

Curricular Unit Form (FUC)

Course:	FIRST CYCLE IN MECHANICAL ENGINEERING					
Curricular Unit (UC)	Air Conditioning Equipment Technologies				Mandatory	
					Optional	X
Scientific Area:	Termofluids and Energy					
Year: 3 rd	Semester: 2 nd	ECTS: 4,0		Total Hours: 108		
Contact Hours:	T:	TP: 45	PL:	S:	OT:	TT: 45
Professor in charge		Academic Degree /Title		Position		
Cláudia S. Séneca L. Casaca		Doctor of Philosophy		Assistant Professor		

T- Theoretical ; TP – Theory and practice ; PL – Laboratory ; S – Seminar ; OT –Tutorial ; TT – Total of contact hours

Entry into Force	Semester: Winter	Academic Year: 2019/2020
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Objectives of the curricular unit and competences (max. 1000 characters)

Objectives:

Select systems and equipment for air conditioning installations.

Specific Skills:

Provide the nomenclature usually used in the classification of HVAC systems and their components.

Provide to knowledge that permits selection amount several available alternatives not only for systems but also for equipment.

Syllabus (max. 1000 characters)

1. Fundamental concepts

Properties of wet air as a mixture of perfect gases. Psychrometric and Mollier chart for wet air.

Vapor-Compression Refrigeration Systems

2. Equipment Classification

Air-Air Equipment.

Water-Air Equipment.

Air-Water Equipment.

Water-Water Equipment.

Terminal and Additional units.

3. Equipment Selection

Air-Air Equipment.

Water-Air Equipment.

4. Exploitation costs - COP, EER

COP (Coefficient of performance), e EER (Energy Efficiency Ratio)

5. Systems classification

All air systems, All water systems.

Individual systems.

Central systems.

VAV solutions.

VRF solutions.

6. Diffusion Equipment selection

Diffusion Types.

Grids and diffusers selection.

7. Program of the Practical Works

To articulate the knowledge acquired in classes with systems Water-Air and Water-Water or perform theoretical development work about a topic, to be assigned to students, for later presentation in class.

Demonstration of the syllabus coherence with curricular unit's objectives (max. 1000 characters)

Since this is the first curricular unit in which students are confronted with the diversity of systems and equipment on the market, it is necessary to frame the knowledge of HVAC systems more usual, their catalogues and characteristics of its components. The aim is to provide students with knowledge that will lead to the choice of the most appropriate system to the local or building in question, selecting, from the technical catalogues of manufacturers, equipment determining their characteristics and energy efficiency

Teaching methodologies (including evaluation) (max. 1000 characters)

The Curricular Unit is theoretical-practical.

Followed teaching methodology pretends to be transversal considering the existing of classes with expositions with practical exercises where acquainted knowledge of acquired know-how is present. Live and written presentation of generated work by the students on experimental application of acquired knowledge.

The assessment is carried out by means of a Final Test or Exam (80%) and 2 practical works. (20%).

Demonstration of the teaching methodologies coherence with the curricular unit's objectives

(max. 3000 characters)

The teaching methodology enables students to acquire knowledge they have provided an easy integration into the labour market, in design, installation and distribution equipment, as has been evidenced by the preference of enterprises in the area of HVAC.

Main Bibliography (max. 1000 characters)

Sheets of the Curricular Unit - Climatização Geral, João Frade / Francisco Severo.

Technical Equipment Catalogues (Carrier, Trane, Daikin, Trox, etc.).

ASHRAE Handbook – HVAC Systems and Equipment. ASHRAE Research Edition

Manual de Aire Acondicionado. Carrier International Limited. Editora Marcombo.

António José da Anunciada Santos. AVAC, Um Manual de Apoio: Fundamentos. Engebook.

António José da Anunciada Santos. AVAC, Um Manual de Apoio: Complementos. Engebook.

Víctor Monteiro. Ventilação na Restauração e Hotelaria. ETEP -Edições Técnicas e Profissionais.
LIDEL

António José da Anunciada Santos. Refrigeração I – Fundamentos. Manual de apoio ao ensino e à profissão - Complementos. Engebook.

António José da Anunciada Santos. Refrigeração II – Complementos. Manual de apoio ao ensino e à profissão - Complementos. Engebook.