Teaching Guide				
Identifying Data				2022/23
Subject (*)	Smart and Sustainable Facilities and Buildings		Code	730547006d
Study programme	Máster Universitario en Eficiencia Enerxética e Sustentabilidade (a distancia)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Obligatory	4.5
Language	SpanishGalician			
Teaching method	Non-attendance			
Prerequisites				
Department	Enxeñaría Industrial			
Coordinador	Casteleiro Roca, José Luis	E-mail	jose.luis.casteleiro@udc.es	
Lecturers	Casteleiro Roca, José Luis	E-mail	jose.luis.casteleiro@udc.es	
Web				
General description	This subject aims to provide students with knowledge about the different systems used in buildings to increase their efficiency and make us more sustainable and respectful of the environment. The application of home automation systems will be studied to understand how to make the facilities improve their efficiency.			

Study programme competences / results	
Code	Study programme competences / results
A2	CE2 - Analyze and implement energy saving and efficiency measures in the industrial, tertiary and residential sectors
A4	CE4 - Apply data analysis methods for the creation of efficient energy systems
A9	CE9 - Make decisions in a technological environment where materials are used in efficiency applications
A16	CE16 - Search, analyze, identify and apply new sources of electrical energy or new electricity management techniques under criteria such as efficiency, sustainability or cooperation, as well as the use of these on new applications
A17	CE17 - Apply the BIM methodology for sustainability and energy efficiency
B1	CB6 - Possess and understand knowledge that provides a foundation or opportunity to be original in the development and/or application of ideas, often in a research context
B3	CB8 - That students are able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments
B6	CG1 - Search and select alternatives considering the best possible solutions
B11	CG6 - Acquire new knowledge and skills related to the professional field of the master's degree
B16	CG11 - Evaluate the application of emerging technologies in the field of energy and the environment
B18	CG13 - Pose and solve problems, interpret a set of data and analyze the results obtained; in the field of energy efficiency and sustainability
C3	CT3 - Use the basic tools of information and communication technologies (ICT) necessary for the exercise of their profession and for learning throughout their lives
C6	CT6 - Gain life skills and healthy habits, routines, and lifestyles
C7	CT7 - Develop the ability to work in interdisciplinary or transdisciplinary teams, to offer proposals that contribute to sustainable environmental, economic, political and social development
C8	CT8 - Value the importance of research, innovation and technological development in the socioeconomic and cultural progress of society

Learning outcomes			
Learning outcomes	Study programme competences / results		
Analyze and know how to design self-consumption systems with renewable energies	AC2 AC9	BC1 BC6 BC16	CC3 CC7

Analyze and know how to design home and building automation systems	AC4 AC16 AC17	BC3 BC11	CC3 CC8
Analyze and know how to apply the concepts of a sustainable building/installation	AC4 AC9	BC6 BC18	CC6 CC7

Contents	
Topic	**Sub-topic**
Sustainable buildings	
Self-consumption with renewable energies	
Thermal isolation	
Home automation and new technologies	
Circle architecture	
Biophilic design	
Emerging techniques and devices	

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Workshop	A2 A9 A16 B1 B6 B16 B18 C3 C6	1	25	26
Problem solving	A4 C8	20	25	45
Mixed objective/subjective test	A4 A17 B11	2	12	14
Workbook	A4 B3 B16 C7	14	25	39
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Workshop	Realization of an individual work of a specific subject of the subject and sharing in a group to share knowledge. Later the works will be joined in a common one that will be presented in class by groups.
Problem solving	Solving exercises and specific problems in the classroom, from the knowledge explained.
Mixed objective/subjective test	It consists in carrying out an objective test of approximately 3 hours, in which the acquired knowledge will be evaluated.
Workbook	Keynote speech complemented with the use of audiovisual media and the introduction of some questions to students, in order to transmit knowledge and facilitate learning. The order of the topics covered will not have to be the one described in the teaching guide. In addition, there will be topics that can be seen together on the development of others, and the division between them may not be strict.

Personalized attention	
Methodologies	**Description**
Workshop	The student has the relevant meetings of personalized tutorials, to resolve the concerns arising from the matter.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Workshop	A2 A9 A16 B1 B6 B16 B18 C3 C6	Accomplishment of an individual and group work, as well as its exhibition in class	35

Problem solving	A4 C8	Some tasks established in the subject, within the framework of this methodology	5
Mixed objective/subjective test	A4 A17 B11	Exam type objective test	60

Assessment comments
As part of the "Laboratory practice" may include aspects such as attendance, personal work, attitude, etc., to help to pass the subject. The "Mixed test" will be divided into a multiple choice and some questions. It is necessary to exceed 15% of the score in the "Mixed test" to pass, as well as to approve the works proposed in "Workshop". Students with recognition of part-time dedication and academic waiver of attendance exemption, second establishes the "NORMA QUE REGULA O RÉXIME DE DEDICACIÓN AO ESTUDO DOS ESTUDANTES DE GRAO NA UDC (Arts. 2.3; 3.b e 4.5) (29/5/212)", will be evaluated in the same way, allowing one more week of margin in the assignments. For the second opportunity, there will be no second deadline for assignments, and the evaluation will be done in a similar way to the first opportunity. The evaluation criteria of the early December call will be the same as those of the second opportunity of the previous year.

Sources of information	
Basic	
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments
To help achieve an immediate sustainable environment and meet the objective of action number 5: "Healthy and sustainable environmental and social teaching and research" of the "Green Campus Ferrol Action Plan":1. The delivery of the documentary works that are made in this matter: 1.1. They will be requested in virtual format and / or computer support   1.2. They will be made through Moodle, in digital format without the need to print them

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.