UNIVERSIDADE DA CORUÑA

Teaching Guide			
Identifying Data			2023/24
Subject (*)	Zero Emission Buildings and Efficient Rehabilitation Strategies	Code	730547016d
Study programme	Máster Universitario en Eficiencia Enerxética e Sustentabilidade (a distancia)		

Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Optional	3

Language	Spanish		
Teaching method	Non-attendance		
Prerequisites			
Department	Construcións e Estruturas Arquitectónicas, Civís e Aeronáuticas		
Coordinador	Raya de Blas, Antonio	E-mail	antonio.raya@udc.es
Lecturers	Pintos Pena, Santiago Raya de Blas, Antonio Redondo Porto, Alberto	E-mail	santiago.pintos.pena@udc.es antonio.raya@udc.es a.redondo@udc.es
Web			
General description	This subject exposes the new European conception of buildings with almost zero emissions from the perspective of demand and consumption. Different unique strategies are presented in constructed buildings. Classes are not taught in English		

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
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
B18	CG13 - Pose and solve problems, interpret a set of data and analyze the results obtained; in the field of energy efficiency and sustainability
C2	CT2 - Master the oral and written expression and comprehension of a foreign language
C5	CT5 - Understand the importance of entrepreneurial culture and know the means available to entrepreneurs

Learning outcomes			
Learning outcomes	Study programme competences / results		
Know the strategies for efficient construction: materials, environment, use of renewable energies, etc.	AC2	BC6 BC11 BC18	CC2 CC5
Know how to analyze the data to project and execute rehabilitation interventions that allow the efficient use of resources and energy	AC2	BC6 BC11 BC18	CC2 CC5
Know the strategies for efficient construction: materials, environment, use of renewable energies, etc.	AC2	BC6 BC11 BC18	CC2 CC5
Know how to analyze the data to project and execute rehabilitation interventions that allow the efficient use of resources and energy	AC2	BC6 BC11 BC18	CC2 CC5

Contents

Topic	Sub-topic
Zero emission buildings. Directives and regulations for almost zero consumption buildings. Optimization of demand in buildings with almost zero energy consumption. Passivhaus standard and bioconstruction. Sustainable urban environments. Efficient rehabilitation strategies. Reduction of energy demand in the rehabilitation of buildings. Environmental evaluation of buildings. Socio-economic considerations for the energy rehabilitation of buildings.	Edificios cero emisións. Directivas e normativas para edificios de consumo casi cero. Optimización da demanda en edificios cun consumo enerxético case nulo. Estándar Passivhaus e bioconstrución. Contornas urbanas sostibles. Estratexias de rehabilitación eficientes. Redución da demanda enerxética na rehabilitación de edificios. Avaliación ambiental dos edificios. Consideracións socioeconómicas para a rehabilitación enerxética dos edificios.
1.- INTRODUCTION	Historical framework of energy housing. Regulatory framework Basic concepts real estate context ecological footprint Environmental and energy certifications
2.- CLIMATE	Climate and construction The environment and the building hygrothermal comfort climategram
3.- PASSIVHAUS	Zero demand: passive and bioclimatic design Passive architecture design criteria
4.- ENERGY ASSESSMENT IN THE BUILDING	Regulatory framework energetic certification Software applied. BIM solutions Practices
5.- ZERO DEMAND REHABILITATION STRATEGIES	Strategies Constructive solutions and architectural examples in different climates Practices
6.- ESTRATEXIAS DE REHABILITACIÓN DE CONSUMO CERO	Estratexias Solucións construtivas e exemplos arquitectónicos en diferentes climas Prácticas

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A2 B6 B11 B18 C2 C5	10	10	20
Case study	A2 B11 B18 C2 C5	6	16	22
Workshop	A2 B6 B11 B18 C2 C5	8	24	32
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

Guest lecture / keynote speech	Exhibition sessions where knowledge related to zero-emission buildings is taught: historical setting, climate, typologies, materials, regulations, conception, design, safety, assessment, prescription, conservation, injuries and repair. All this based on the benefits demanded and in accordance with the architectural project By providing reference documentation that allows the student to equip himself with bibliographic resources with which he can manage comfortably, a rote knowledge of the contents is not sought, but an intelligent knowledge of the subject. Knowledge in which the teaching of the injury and errors committed in different works plays a fundamental aspect, especially when it is possible to accompany them with images that, due to their didactic value, allow the student to assess the importance of the decisions made. It is assessed through an objective test and several multiple-choice tests.
Case study	During the development of the classes, zero-emission buildings of proven architectural quality will be exhibited in which the materialization of architectural ideas, their technical and documentary development can be appreciated, serving as a model for the development of workshop work. It will be evaluated within the Workshop
Workshop	The Workshop is a work and exchange space designed to facilitate the confluence of the contents of the different subjects, guaranteeing the optimization of teaching resources and rationalizing student work. Mandatory partial deliveries will be made

Personalized attention	
Methodologies	**Description**
Workshop	The student must consult the doubts that arise to ensure a better development of the work to be presented as a result of the Workshop.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Workshop	A2 B6 B11 B18 C2 C5	The assessment of the obligatory practice of the workshop is not restricted to the contents, also, the authorship of it is verified There will be no compensation between this evaluation and other qualifications of the subject It will be valued out of 10 and will be averaged with the qualification obtained as an evaluation of the master classes provided that a 5.0 or more is obtained.	60
Case study	A2 B11 B18 C2 C5	In the development of the classes, works of contrasted architectural quality will be exhibited in which the materialization of architectural ideas, their technical and documentary development can be appreciated, serving as a model for the development of workshop work.	20
Guest lecture / keynote speech	A2 B6 B11 B18 C2 C5	The content of the classes is written in PDF in Spanish with complementary documentation in other languages.	20

Assessment comments

After reading the classes, viewing the recorded classes, the student will present -both on the first and second opportunity- a reprint of his master's thesis, which will have the following sections duly completed:
1.-Index, conveniently paginated
2.-Introduction or general approach.It sets out the field of study, the causes and the objectives to be achieved.In this case, it is intended to deepen the learning results of this subject: Integration, Coordination and Problems of Installations in Rehabilitation
3.-State of the matter.Critical summary of the most significant referenced documents and their study methodology.In the case of analysis of buildings, you must provide examples and methodologies that allow you to support the proposal for the building in question.
4.-Development.Exposed by epigraphs, the ideas of the work and its data will be argued.The theoretical-academic foundations that support the work must appear
5.-Conclusions, consistent with the objectives set out in section two
6.-Bibliography.A difference must be made between the cited bibliography and the bibliography used to carry out the work.If the article has a DOI, it must be indicated (especially when referring to a web page)
7.-Annexes.Data tables, general plans, photographs, figures, supporting graphics or any supplementary material

Sources of information	
Basic	BÁSICA: Incorpórase en cada lección
Complementary	AMPLIADA: Incorpórase en cada lección

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

(*)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.