Teaching Guide				
Identifying Data				2023/24
Subject (*)	Energy Efficiency Certification		Code	730547001d
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	Rodríguez García, Juan de Dios	E-mail	de.dios.rodriguez@udc.es	
Lecturers	Couce Casanova, Antonio Rodríguez García, Juan de Dios	E-mail	antonio.coucec@udc.es de.dios.rodriguez@udc.es	
Web	moodle.udc.es/			
General description	This course presents a practical approach on the procedure for the energetic certification of buildings of different morphologies and types of activity, by using the Lider Calener Unified tool (HULC),CYPETHERM HE Plus, according to the provisions of Real Decreto 235/2013 Energetic Certification for Existing Buildings. During the development of course they are intended to gain knowledge on: Regulatory framework. Methodology for carrying out energy efficiency certification of buildings. HULC energy certification procedure. Energetic rehabilitation.			

Study programme competences	
Code	Study programme competences
A4	CE4 - Apply data analysis methods for the creation of efficient energy systems
A5	CE5 - Analyze energy consumption and its associated costs
A6	CE6 - Prepare energy certifications
B4	CB9 - That students know how to communicate their conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way
B9	CG4 - Extract, interpret and process information, from different sources, for use in the study and analysis
B11	CG6 - Acquire new knowledge and skills related to the professional field of the master's degree
B15	CG10 - Know the current legislation and regulations applicable to the renewable energy and energy efficiency sector
B17	CG12 - Develop the ability to advise and guide on the best way or channel to optimize energy resources in relation to renewable energies
C1	CT1 - Express themselves correctly, both orally and in writing, in the official languages of the autonomous community
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
C5	CT5 - Understand the importance of entrepreneurial culture and know the means available to entrepreneurs
C6	CT6 - Gain life skills and healthy habits, routines, and lifestyles

Learning outcomes			
Learning outcomes	Study programme competences		
Know the regulatory framework for energy rating and certification		BC9 BC15	
Know and apply the procedures for the certification of residential buildings, services and large tertiary	AC5 AC6	BC11	CC3

Know and apply the procedures for the certification of existing buildings	AC5 AC6	BC11	CC3
Analyze the energy efficiency of the facilities and possible measures to save energy	AC4	BC4 BC17	CC1 CC5 CC6

Contents	
Topic	**Sub-topic**
UNIT 1. Legislative framework and energy regulation.	1.1. Purpose, purpose and scope of RD 235/2013 1.2. Content of the energy efficiency certificate 1.3. Certification of energy efficiency in a new building 1.4. Certification of energy efficiency in an existing building 1.5. Sanctions regime
UNIT 2. Energy demand of buildings and its limitation	2.1. Compliance with DB HE0 2.2. Compliance with DB HE1
UNIT 3. Systems and installations in residential buildings, services, and large tertiary	3.1 DHW facilities 3.2 Heating installations 3.3 Refrigeration facilities 3.4 Lighting installations 3.5 Primary air equipment 3.6 Fans 3.7 Pumping equipment 3.8 Cooling towers 3.9 Energy contributions
UNIT 4. Energy certification of residential buildings	4.1. Building Data Collection 4.2. Data processing 4.3. Selection of calculation software 4.4. Calculation and obtaining of the energy certificate 4.5. Proposal for improvement measures 4.6. Documentation generation 4.7. Registration of the certificate before the competent body
UNIT 5. Simplified methods of energy certification	5.1. Energy efficiency certification with CE3x
UNIT 6. Energy certification of high tertiary buildings	6.1 Certification with Cypetherm HE PLUS 6.2 Certification with HULC 6.3 Certification with CE3x
UNIT 7. Energy certification of existing buildings	7.1 Certificación con Cypetherm HE PLUS 7.2 Certificación con HULC 7.3 Certificación con CE3x
UNIT 8. Environmental certificates	8.1. The energy efficiency label

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A5 B15 C5 C3	7	14	21
Supervised projects	A4 A6 B4 B9 B11 B17 C1 C6	21	42	63
Practical test:	A6	2	12	14
Objective test	A5	1.5	12	13.5
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	The subject will be conducted in theoretical and practical modules of 1.5 hours. Prior to the day when the subject is imparted, the ratio of the background needed and the summary of the concepts that will work is indicated, providing correspondente bibliographic information. Each topic will begin with the teacher's presentation, which will help the student to extract the most relevant concepts, marking the objectives pursued. The essential theoretical aspects will be introduced to support the practical content.
Supervised projects	The student will face a series of practical cases that will present the teacher, in order to become proficient with the software tool and gain experience in applying it to different types of thermal installations and envelopes.
Practical test:	Driving test of the certification procedures worked in class
Objective test	Technical documentation and regulatory management exam

Personalized attention	
Methodologies	**Description**
Supervised projects	It is provided personalized attention in tutoring schedules of the subject to answer questions about the topics covered in this matter

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Guest lecture / keynote speech	A5 B15 C5 C3	Assistance to class will be scored	10
Practical test:	A6	Proba de manexo dos procedimentos de certificación traballados na clase	25
Objective test	A5	Probas escritas obxectivas: exame de manexo da regulamentación e exame de manexo dos softwares de certificación enerxética empregados ao longo da asignatura	25
Supervised projects	A4 A6 B4 B9 B11 B17 C1 C6	Assistance to class will be scored	40

Assessment comments
Work delivered after the established deadline will be penalized with up to 25% of the grade. It should be noted that the commission of plagiarism and academic fraud implies, according to the Student Disciplinary Regulations of the UDC, "the qualification of suspension in the call in which the offense is committed and regarding the matter in which it was committed: the student will be qualified with "suspension" (numerical grade 0) in the corresponding call of the academic year, whether the offense is committed on the first opportunity or on the second" Students who take advantage of the academic exemption will not have the right to qualify for participation in classes: in all calls, 100% of their grade will correspond to Tutored Works and Practical Test. Students who take advantage of the academic exemption must face the assessment tests in face-to-face mode Regarding the second chance exam, it will be necessary to deliver a new set of practices and also pass the corresponding exam. Regarding the extraordinary chance exam, it will be necessary to deliver a new set of practices and also pass the corresponding exam.

Sources of information

Basic	- (2013). Respuestas a preguntas frecuentes sobre el RD 235/2013. Ministerio Industria, Energía y Turismo - (2007). Reglamento de Instalaciones Térmicas en los Edificios, . Ministerio Industria, Energía y Turismo - (2013). Real Decreto 235/2013, de 5 de abril, por el que se aprueba el procedimiento básico para la certificación de la eficiencia energética de los edificios.. Ministerio Industria, Energía y Turismo - (2013). Código Técnico de la Edificación. Documento Básico HE. Ahorro de Energía. Ministerio de Fomento - CYPE (2018). https://energia.gob.es/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/02%20CYPETHERM/CYPETHERM%20HE%20Plus%20-%20Manual%20del%20Usuario.pdf. Manual CYPETHERM HE PLUS Apuntes e material didáctico da asignatura disponibles na plataforma Moodle
Complementary	- (2012). Manual de fundamentos técnicos de calificación energética de edificios existentes CE3X. IDAE - (). http://www.inega.es/eficienciaenerxetica/RGEE/. INEGA - (). http://www.sedecatastro.gob.es/. - (2015). Manual de usuario de calificación energética de edificios existentes CE3X. IDAE - (). http://www.minetur.gob.es/energia/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/Paginas/procedimientos-certificacion-proyecto-terminados.aspx. Ministerio Industria, Energía y Turismo - (2017). Manual Herramienta unificada Lider Calener - HULC. Ministerio de Fomento - (). .

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Solar Systems/730547002 Cogeneration and Biomass Systems/730547003 Energy Storing Systems/730547018 Efficiency Lighting Systems/730547008
Subjects that continue the syllabus
Other comments
It would be very convenient to bring previous training or knowledge about graphic modeling tools and thermal installations in buildings.In line with the Green Campus objectives, the delivery of the documentary work carried out in this matter will be carried out through Moodle, in digital format without the need to print them. The full integration of students who, for physical, sensory, mental or sociocultural reasons, experience difficulties in adequate, equal and beneficial access to university life will be facilitated.