UNIVERSIDADE DA CORUÑA

Teaching Guide			
Identifying Data			2022/23
Subject (*)	Distributed Generation, Polygeneration and Micropower-Nets. Smartgrid	Code	730547011
Study programme	Máster Universitario en Eficiencia Enerxética e Sustentabilidade		

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

Language	SpanishGalician		
Teaching method	Face-to-face		
Prerequisites			
Department	Enxeñaría Industrial		
Coordinador	Masdias y Bonome, Antonio	E-mail	antonio.masdias@udc.es
Lecturers	Masdias y Bonome, Antonio	E-mail	antonio.masdias@udc.es
Web	pcmasdias.cdf.udc.es		
General description			

Study programme competences / results	
Code	Study programme competences / results
A1	CE1 - Apply methodologies and regulations for efficient energy management
A2	CE2 - Analyze and implement energy saving and efficiency measures in the industrial, tertiary and residential sectors
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
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
B2	CB7 - That students know how to apply the knowledge acquired and their ability to solve problems in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study
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
B5	CB10 - That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous
B10	CG5 - Boost creativity
B15	CG10 - Know the current legislation and regulations applicable to the renewable energy and energy efficiency sector
C2	CT2 - Master the oral and written expression and comprehension of a foreign language
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
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

Learning outcomes			
Learning outcomes	Study programme competences / results		
You will learn concepts and terms of generation, cogeneration and polygeneration, as well as the different elements in electrical networks and micro-grids	AC1 AC2 AC16	BC1 BC2 BC3 BC5 BC10 BC15	CC2 CC3 CC5 CC7

Will have knowledge about elements used in micro-grids, generation elements with or without renewable energy, as well as energy storage elements and elements of energy consumption or supply to specific loads	AC1 AC2 AC16	BC2 BC5 BC15	CC3 CC7
Know the basic methods and processes related to the elements that are part of micro-grids that are notable from an energy efficiency point of view	AC1 AC2 AC16		
Have knowledge to understand the fundamentals of intelligent micro-grids, as well as the management of the interconnection between micro-grids within an energy efficient analysis	AC1 AC2 AC16	BC5 BC10 BC15	CC2 CC3 CC5 CC7

Contents	
Topic	**Sub-topic**
Distributed generation, opportunity and development needs. Regulatory Framework Integration of Generation (Self-consumption and Net balance) Deployment of Meters and Network Management Teams Participation of Clients in the Electricity Market. Polygeneration, New Technologies of generation, storage and distribution. Management of Smart Grid and Smart Metering Energy Networks. Infrastructure and Control Technologies Smart Network Devices Advanced Metering Infrastructure (AMI) Application and management of Distributed Energy Resources (DER) Advanced Network Management. (DMS). EMS systems (Energy Management System).	

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
ICT practicals	A1 A2 A16 B1 B2 B3 B5 B10 B15 C2 C3 C5 C7	13	0	13
Case study	A1 A2 A16 B1 B3 B5 B10 B15 C2 C3 C5 C7	0	47	47
Objective test	A1 A2 A16 B1 B2 B3 B5 B10 B15 C2 C3 C5 C7	1	0	1
Guest lecture / keynote speech	A1 A2 A16 B1 B2 B3 B5 B10 B15 C2 C3 C5 C7	13	0	13
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**
ICT practicals	
Case study	

Objective test	
Guest lecture / keynote speech	

Personalized attention	
Methodologies	**Description**
Case study	

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
ICT practicals	A1 A2 A16 B1 B2 B3 B5 B10 B15 C2 C3 C5 C7	Comprende la elaboración de practicas tanto asistidas como de laboratorio que podrán realizarse con datos obtenidos tanto con instrumentación real como virtual.	25
Case study	A1 A2 A16 B1 B3 B5 B10 B15 C2 C3 C5 C7	Mediante el estudio de casos se analizarán diferentes casos prácticos que serán evaluados por el profesor.	25
Objective test	A1 A2 A16 B1 B2 B3 B5 B10 B15 C2 C3 C5 C7	Prueba teorico-práctica que deberá ser superada por el alumno y que tiene por objetivo cuantificar los conocimientos y habilidades adquiridas.	50

Assessment comments

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

(*)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.