Teaching Guide				
Identifying Data				2022/23
Subject (*)	Electric Mobility		Code	730547010d
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	SpanishGalician			
Teaching method	Non-attendance			
Prerequisites				
Department	Enxeñaría Industrial			
Coordinador	Chouza Gestoso, Jesus Diego	E-mail	jesus.chouza@udc.es	
Lecturers	Chouza Gestoso, Jesus Diego Méndez Sanmartín, Cristian	E-mail	jesus.chouza@udc.es cristian.mendez@udc.es	
Web	cas-saml.udc.es/login?service=https%3A%2F%2Fcampusvirtual.udc.gal%2Flogin%2Findex.php			
General description	The different drive systems used in electric mobility are studied, identifying the advantages and analyzing the necessary control systems. The characteristics and operation of the different types of machines used in wind turbines are studied. You can access the teaching material through the Moodle platform, and attend classes virtually through TEAMS			

Study programme competences	
Code	Study programme competences
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
A5	CE5 - Analyze energy consumption and its associated costs
A13	CE13 - Analyze, apply and optimize energy use systems
A15	CE15 - Develop a project in the scope of the master
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
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
B12	CG7 - Critically analyze your own internship experience
B13	CG8 - Apply theoretical knowledge to practice
B16	CG11 - Evaluate the application of emerging technologies in the field of energy and the environment
B17	CG12 - Develop the ability to advise and guide on the best way or channel to optimize energy resources in relation to renewable energies
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
C4	CT4 - Develop for the exercise of a respectful citizenship with the democratic culture, human rights and the gender perspective
C5	CT5 - Understand the importance of entrepreneurial culture and know the means available to entrepreneurs

Learning outcomes	
Learning outcomes	Study programme competences

Know the different types of electric vehicles	AC1 AC2 AC5 AC16	BC9 BC11 BC12 BC13 BC16 BC17 BC18	CC2 CC4 CC5
Understand and know how to apply systems approaches to problems related to electric vehicles	AC2 AC5	BC12 BC13 BC17 BC18	CC2 CC4 CC5
Analyze and know how to design electric traction/propulsion systems	AC1 AC13 AC16	BC9 BC12	CC4 CC5
Understand the needs of users in the selection of electric traction/propulsion systems	AC2 AC5 AC15 AC16	BC9 BC11 BC12 BC13 BC18	
Know the different processes, products and equipment related to the design of electric traction/propulsion systems	AC1 AC2 AC5 AC16	BC9 BC11 BC12 BC13 BC17 BC18	CC2 CC4 CC5

Contents	
Topic	**Sub-topic**
Introduction to electric mobility. Energy needs, efficiency, advantages and disadvantages of electric drives.	Types of electrical machines used, according to needs, advantages and disadvantages.
Wind energy, types of turbines used	-Turbine type 1 -Turbine type 2 -Turbine type 3 -Turbine type 4

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Online forum	A1 A2 A5 A13 A15 A16 B9 B11 B12 B13 B16 B17 B18 C2 C4 C5	9	20	29
ICT practicals	B9 B11 B12 B13 B18	6	2	8
Problem solving	A1 A5 A13 A15 A16 B9 B11 B12 B13 B16 B18 C5	12	8	20
Practical test:	A1 A2 A5 A13 A15 A16 B9 B11 B12 B13 B16 B17 B18 C2	4	12	16
Personalized attention		2	0	2

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	**Description**
Online forum	Virtual activity through TEAMS, where the fundamental concepts of the subject will be explained through an oral presentation, complemented with audiovisual and multimedia media to facilitate learning
ICT practicals	With the help of multimedia systems. we will analyze the most relevant modes of behavior of electrical machines.
Problem solving	With TEAMS, the most relevant problems are explained and solved in a systematic way, analyzing the difficulties that may arise, solving doubts in order to provide the student with the necessary resources for their subsequent resolution in an autonomous way.
Practical test:	It allows the evaluation of the work, skills and abilities acquired by the students, promoting their autonomous work

Personalized attention	
Methodologies	**Description**
Problem solving	They are very small groups and it is possible to track the work done. Analyze the fundamental points and defend the proposals adopted.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
ICT practicals	B9 B11 B12 B13 B18	They will consist of justifying and analyzing the most relevant modes of behavior of electrical machines.	10
Problem solving	A1 A5 A13 A15 A16 B9 B11 B12 B13 B16 B18 C5	The student must solve and analyze with critical thinking, identifying the needs and looking for the correct solutions, integrating the concepts acquired in the subject, the different proposed problems.	60
Practical test:	A1 A2 A5 A13 A15 A16 B9 B11 B12 B13 B16 B17 B18 C2	It consists of the resolution of different proposals by the teacher or the student, where they must demonstrate their skills, competencies and knowledge acquired.	30

Assessment comments

Sources of information	
Basic	- KRAUSE,P.C. ; WASYNCZUK, O.; SUDHOFF, S.D. (March 5th 2002). Analysis of Electric Machinery and Drive Systems. Wiley-IEEE Press. Piscataway. N.J - KRISHNAN, R. (2001). Electric Motor Drives Modeling, Analysis, And Control. Prentice Hall.Pearson Education. Upper Saddle River. N.J. - Mohamed El-Sharkawi (2018). Fundamentals of Electric Drives. CL Engineering - El-Sharkawi, Mohamed (2017). Wind Energy: An Introduction. Editorial: CRC Press
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.