



## Teaching Guide

Identifying Data					2022/23
Subject (*)	Quality of the Electric Service	Code	770523014		
Study programme	Mestrado Universitario en Eficiencia e Aproveitamento Enerxético				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Optional	3	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Industrial				
Coordinador		E-mail			
Lecturers		E-mail			
Web	<a href="https://moodle.udc.es/">https://moodle.udc.es/</a>				
General description	In this subject studies the quality of the electrical service from the point of view of the legislation and rule at present valid.				

## Study programme competences / results

Code	Study programme competences / results
A1	Análise e aplicación de metodoloxías e normativa para unha xestión eficiente da enerxía.
B9	Extraer, interpretar y procesar información, procedente de diferentes fuentes, para su empleo en el estudio y análisis.
B13	Aplicar los conocimientos teóricos a la práctica
B15	Conocer la legislación vigente y reglamentación aplicable al sector de las energías renovables y de la eficiencia energética.
C1	Adquirir la terminología y nomenclatura científico-técnica para exponer argumentos y fundamentar conclusiones.

## Learning outcomes

Learning outcomes	Study programme competences / results		
Know the legislation and the at present valid rule on quality of the electrical service.	AJ1	BC9 BC15	
Know the main types of perturbations and events that affect to the quality of the electrical service, as well as his causes, effects and measures of correction.		BC13	CC1
Know the main characteristic of an analyser of power to select the most suitable.		BC9	

## Contents

Topic	Sub-topic
Introduction	Presentation of the subject Previous knowledges
Continuity of the supply	Definition Types of interruptions TIEPI NIEPI



Quality of the product	<p>Frequency</p> <p>Overtages/Undervoltages</p> <p>Flicker</p> <p>Voltage unbalance</p> <p>Harmonic distortion</p> <p>Interharmonics</p> <p>Noise</p> <p>Interruptions</p> <p>Sags (dips)/Swells</p> <p>Transients</p>
Quality of the attention to the consumer	<p>Definition</p> <p>Indexes of individual quality</p>
ANNEXES	<p>Basic regulations</p> <p>Electromagnetic compatibility.</p> <p>Measurement of the quality of supply.</p> <p>The Spanish electricity market.</p> <p>Contracting of the electricity supply.</p> <p>Measurement and billing of electric power.</p> <p>Claims.</p> <p>Connection systems for the neutral and the earth ground.</p> <p>Electrotechnical regulations.</p> <p>NOTE: The annexes are not subject of examination.</p>

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Guest lecture / keynote speech	A1 B15 C1	9	18	27
Laboratory practice	B13	12	6	18
Supervised projects	B9 C1	0	12	12
Objective test	A1 B13 B15 C1	3	12	15
Personalized attention		3	0	3

(\*)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	<p>Oral exhibition complemented with the use of audiovisual means and the introduction of motivating questions headed to the students, with the purpose to transmit knowledges and facilitate the learning.</p> <p>It corresponds to the class of theory, in big group (GG).</p>
Laboratory practice	<p>Methodology that allows that the students apply the knowledges purchased, through the realisation of activities of practical character.</p> <p>It corresponds to the practices of workshop, in small group (GP).</p>



Supervised projects	<p>Methodology designed to promote the autonomous learning of the students, under the tutela of the professor and in a professional stage. It is referred prioritariamente to the learning of the "cómo do the things". It constitutes an option based in the assumption by the students of the responsibility by his own learning.</p> <p>This system of education bases in two basic elements: the independent learning of the students and the follow-up of this learning by the professor.</p> <p>With this methodology pretends that the student can know the characteristics of the analysers of power to be able to select the most adapted of between the commercial offer that offers the market.</p> <p>It is a complementary activity of the practices of workshop, in small group (GP).</p>
Objective test	<p>Proof written used for the evaluation of the learning.</p> <p>With the end to value with greater rigour the achievement of the aims, the proof consists of two parts differentiated: questions of multiple answer (items) and resolution of problems.</p> <p>Questions of multiple answer (items): it constitutes an instrument of measure, whose distinctive shot is that it allows to describe the answers given like correct or no; in addition to valuing the knowledges purchased.</p> <p>Resolution of problems: part in which it pretends evaluate conceptual contents, procedimentales and actitudinales.</p> <p>It corresponds to the examination of theory and problems.</p>

### Personalized attention

Methodologies	Description
Laboratory practice Supervised projects Objective test	Tutorials of review of examinations.

### Assessment

Methodologies	Competencies / Results	Description	Qualification
Laboratory practice	B13	<p>The practical are compulsory, and is necessary to have them realised to be able to surpass the asignatura.</p> <p>The practices represent 30% of the final note of the matter, and added to the note obtained in the theoretical proof whenever this was upper to 3.0 points on 10.0 points.</p>	30
Supervised projects	B9 C1	<p>Will be able to realise to varied cape works tutelados along the course, being his compulsory delivery and that treated on problems or practical suppositions related with the matter.</p> <p>The works tutelados, are 30% of the final note of the matter, that will be added to the note obtained in the objective proof, whenever this was described with at least 3.0 points on 10.0 points.</p>	30
Objective test	A1 B13 B15 C1	<p>In the dates fixed officially by the centre, realised this final proof.</p> <p>The proof can alternate ask type problem or theoretical questions, and represents 40% of the final note of the matter.</p>	40

