

# SUBJECT TEACHING GUIDE

## G822 - Energy and Telecommunication

### Degree in Telecommunication Technologies Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Energy and Telecommunications Module in Common with the Telecommunications Branch				
Course unit title and code	G822 - Energy and Telecommunication				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	<a href="https://aulavirtual.unican.es/">https://aulavirtual.unican.es/</a>				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA
Name of lecturer	MARIO MAÑANA CANTELI
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Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2055)
Other lecturers	JESUS MARIA MIRAPEIX SERRANO ALBERTO LASO PEREZ

3.1 LEARNING OUTCOMES
- To be able to design power supply systems for their application in the telecommunication industry.
- To know the different ways of generation and distribution of electrical energy.
- To be able to design electrical installations for the generation , distribution and storage of electrical energy using both classical and modern technologies. Renewable energies like solar PV and wind energy has to be also considered.
- To know the applications of solar energy in the residential, commercial and industry sectors.
- To gain the basic skills related to the design of low-voltage networks according the Spanish regulations.

#### 4. OBJECTIVES

To gain a global understanding of the components that can be found in a generation , transmission and distribution system and the Spanish Regulation Framework in the context of the 2030 Agenda for Sustainable Development and the SDG 7 defined by United Nations.

The student will know the basic concepts related with the use of different sources of energy in the telecommunication industry . The student has to be able to select and to operate both the power supply systems and the energy storage elements.

The student will know the fundamentals of renewable energies and the problems related with their grid integration. Solar and wind energy will be studied in detail. .

#### 6. COURSE ORGANIZATION

CONTENTS	
1	Introduction
2	AC circuit theory
3	Magnetic circuits and electrical machines.
4	Low-voltage electrical instalation. Spanish regulation framework of low-voltage networks.
5	Fundamentals of power electronics.
6	Renewable energies and energy storage systems.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Continuous assessment.	Activity evaluation with Virtual Media	No	No	10,00
Evaluation Part I	Written exam	No	Yes	30,00
Evaluation Part II	Written exam	No	Yes	30,00
Evaluation Part III	Written exam	No	Yes	30,00
TOTAL				100,00
Observations				
The University of Cantabria has an approved set of documents describing the assessment procedure.				
The assessment will be carried out in a continuous way during the semester.				
The remote evaluation of the works, practical laboratory exercises and written exams is foreseen, in the case of a new health alert by COVID-19 making it impossible to carry out the evaluation in a face to face way.				
Observations for part-time students				
Partial-time students have the same assessment rules that full-time students.				

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

##### BASIC

Mañana, M. y Mirapeix, J.M.; Apuntes de la asignatura.

Hart, D.; Electrónica de potencia. Pearson Educación. 2001.  
IND Básica E12 21

Reglamento electrotécnico para baja tensión e instrucciones técnicas complementarias.

