

SUBJECT TEACHING GUIDE

G990 - Electrical Engineering

First Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	First Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Electrotechnics Module in Common with the Industrial Branch				
Course unit title and code	G990 - Electrical Engineering				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Knowledge Field	Industrial engineering, mechanical engineering, automation engineering, industrial organization engineering and navigation engineering				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA				
Name of lecturer	ALBERTO LASO PEREZ				
E-mail	alberto.laso@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2029)				
Other lecturers	LUIS DAVID HIGUERA VERDEJO				

4. OBJECTIVES	
Providing students with a set of analytical techniques that allow easy understanding, resolution and use of electrical systems.	
Providing a set of concepts sufficiently flexible to be used in other subjects of the specialty.	
Develop and exercise analytical skills	

6. SUBJECT PROGRAM	
CONTENTS	
1	THREE-PHASE SYSTEMS: previous definitions. Study and analysis of phase systems to three and four-wire, balanced and unbalanced. Powers and measures of active and reactive power in three-phase systems. Power factor improvement.
2	INTRODUCTION TO SYNTHESIS OF CIRCUITS: Introduction. Scale. Passive filters: low pass, high pass, bandpass, bandstop. Overview of active filters.
3	QUADRUPOLE: Introduction. Quadrupole concept. Parameters of a quadrupole. Association quadrupoles.
4	TRANSIENT CIRCUITS: Introduction. Transients in circuits of first order with one energy storage element and both DC and AC excitation. Transients in circuits of first order with several energy storage elements. Transients in circuits of second order without excitement nor external sources. Transient response in multi-mesh circuits .
5	INTRODUCTION TO ELECTRICAL MACHINES: Introduction to electrical machines. Types of electrical machines. Applications of electric machines.
6	Labs in the course.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Written exam: first part of the subject Written exam: second part of the subject	Written exam	No	Yes	50,00
Written exam: first part of the subject Written exam: second part of the subject	Written exam	Yes	Yes	50,00
TOTAL				100,00
Observations				
<p>For the purposes of the continuous evaluation, if the partial test has been passed (higher or equal to 4 points out of 10), then it is possible to do only the second part in the final exam, and the average grade of at least 5 points out of 10 (considering both parts) must be obtained in order to pass the course. In addition, a minimum of 4 points out of 10 will be necessary in the second part.</p> <p>If the partial exam has not been passed (less than 4 points out of 10), the final exam will be taken in its entirety. This exam will consist of two parts, being necessary a minimum of 4 points out of 10 in each of the parts to pass the course as well as an average of 5 points out of 10 between both of them.</p> <p>In the extraordinary exam it will not be necessary to repeat any part in which more than 4 points out of 10 have been obtained. Both parts will be graded out of 10 points and the class exercises of continuous evaluation will not be taken into account. An average of 5 points out of 10 (between the two parts) will be necessary to pass the exam.</p>				
Observations for part-time students				
The evaluation will be conducted with the same criteria as full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

SÁNCHEZ, P.; CAVIA, M.A.; ORTIZ, A.; MAÑANA, M.; EGUÍLUZ, L.I.; LAVANDERO, J.C. "Teoría de circuitos: problemas y pruebas objetivas orientadas al aprendizaje". Pearson Educación. 2007.

EGUÍLUZ, L.I.; SÁNCHEZ, P.; CAVIA, M.A.; LAVANDERO, J.C. "Pruebas Objetivas de Circuitos Eléctricos". EUNSA.

PASTOR, A.; ORTEGA, J.; PARRA, V.; PÉREZ, A. "Circuitos Eléctricos". Volumen I. UNED.

PASTOR, A.; ORTEGA, J. "Circuitos Eléctricos". Volumen II. UNED.

FRAILE, J. "Circuitos Eléctricos". Pearson Educación. 2012

FRAILE, J. "Máquinas Eléctricas". McGraw-Hill.

Materiales teórico-prácticos de la asignatura proporcionados por el profesor.