

SUBJECT TEACHING GUIDE

G990 - Electrical Engineering

Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	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)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA				
Name of lecturer	ALBERTO ARROYO GUTIERREZ				
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Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2026)				
Other lecturers	PEDRO BENITO GANCEDO CARMELA ORIA ALONSO				

3.1 LEARNING OUTCOMES

- Understanding and analyze the balanced and unbalanced three-phase systems.
- Determining the powers of a three-phase system. Knowing the methods of measurement of a three-phase power system. Improve the power factor of a three-phase network.
- Understanding the operation and applications of passive filters.
- Understanding the concept of quadropole and its applications to the study of electrical and electronic systems. Knowing the forms of association calculating the parameters of the resulting quadropole.
- Resolving transient circuits of first order representing the voltages and currents. Identify and analyze the work regimes of the circuits of second order in the time domain.
- Knowing the general principles of electrical machines and their applications.
- Knowing the basic measuring devices, its constant and connections. Measurement of voltage, current, power and other electrical parameters, applying the tools, methods and techniques.

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. COURSE ORGANIZATION

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. Quadropole concept. Parameters of a quadropole. Association quadropoles.
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: Contents of blocks 1,2 and 3. Written exam: Contents of blocks 4,5 and 6. Attendance to laboratory sessions is mandatory to pass the course	Written exam	No	Yes	50,00
Written exam: Contents of blocks 1,2 and 3. Written exam: Contents of blocks 4,5 and 6.	Written exam	Yes	Yes	50,00
TOTAL				100,00
Observations				
<p>For the purpose of continuous assessment, if exceeded (greater or equal to 4 out of 10) partial test may be performed on the final exam only the second part not assessed, having obtained her average rating of 5 out of 10 as a minimum to pass the course.</p> <p>If the partial test (less than 4 out of 10) is not exceeded, the final exam will be full.</p> <p>The remote evaluation of the works, practical laboratory exercises and written tests is foreseen, in the case of a new health alert by COVID-19 making it impossible to conduct the evaluation in person</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.