

SUBJECT TEACHING GUIDE

G1674 - Medium and Low Voltage Electrical Installations

Degree in Electrical Engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Degree in Electrical Engineering		Type and Year	Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications			
Discipline	Subject Area: Energy Generation, Transport and Distribution. Module: Electrical Technology			
Course unit title and code	G1674 - Medium and Low Voltage Electrical Installations			
Number of ECTS credits allocated	6	Term	Semester based (1)	
Web				
Language of instruction	English	Mode of delivery	Face-to-face	

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA		
Name of lecturer	CARMELA ORIA ALONSO		
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Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO PROFESORES (S3066)		
Other lecturers			

3.1 LEARNING OUTCOMES

- The students will be able to design industrial, commercial or residential electrical installations. They will be able to provide solutions to problems that could occur during the operation of electrical systems. They will interpret and apply the legislation regarding electrical installations. Besides, they will have sufficient resources to manage the implementation of an electrical installation with full safety guarantee for the users.

4. OBJECTIVES

To introduce students to the design, calculation and execution of industrial, commercial or residential electrical installations. Knowledge of the most important aspects of the legislation applicable to electrical installations. The most common wiring diagrams and dimensioning of the power conductors will be studied. The most common electrical switchgear is also described, with emphasis on safety purposes. Major issues, such as reactive power compensation in electrical installations, will be also treated. Finally, the basics of power quality will be explained, given its importance in the current facilities.

Regarding the development of transversal skills, teamwork will be encouraged for the development of projects, which will be valued as part of the continuous assessment of the subject. An evaluation will be made of the students' improvement in competences in the English language (acquisition of technical vocabulary, improvement in reading comprehension capacity, written expression and oral expression in English).

6. COURSE ORGANIZATION

CONTENTS

1	Introduction to the Distribution of electrical energy and to the electrical installations in medium and low voltage: Regulations and standards.
2	Electric switchgear in medium and low voltage.
3	Design and calculation of electrical installations in medium and low voltage. Protection of feeders.
4	Medium - Low voltage selectivity.
5	Calculation of short-circuit current.
6	MV-LV transformer substations.
7	Protection of human beings in electrical installations.
8	Electric rates and reactive power compensation in medium and low voltage and Electric power quality.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Assessment 1	Written exam	No	Yes	35,00
Assessment 2	Written exam	No	Yes	35,00
Assessment 3	Work	No	No	30,00
TOTAL				100,00
Observations				
<p>Students may pass the course in two ways:</p> <p>1. CONTINUOUS ASSESSMENT</p> <p>The students who attend to, at least, the 80% of the presential activities will be assessed with continuous assessment. For positive assessment of students' assistance, the following aspects will be considered: attitude and participation in class (questions, answers, ...), resolution of exercises and delivery of tasks on time, etc.</p> <p>Moreover, the students must obtain an average grade of 5/10 in assessments 1, 2 and 3.</p> <ul style="list-style-type: none"> - Assessment 1 will cover lessons 1 to 4 (end of October). The minimum grade that will be considered for compensation with the rest of results is 4/10. - Assessment 2 will cover lessons 5 to 8 (December). The minimum grade that will be considered for compensation with the rest of results is 4/10. <p>Assessments 1 and 2 can be independently reassessed in the ordinary or extraordinary sessions.</p> <ul style="list-style-type: none"> - Assessment 3 will consist of assignments (projects, exercises, laboratory practice reports) and an oral presentation performed individually or in groups. The proposed activities will be in accordance with the subject planning, and their purpose will be that the students actively participate in the presential activities of the subject. Due to this fact, these activities cannot be reassessed. <p>2. FINAL ASSESSMENT</p> <p>Students who have not attended to at least 80% of the activities, will have to pass the final assessment, which will cover all the lessons. Each part of the subject, Assessments 1 and 2, will have a weight in the final grade of 50%. To pass the subject, a minimum grade of 4/10 in each assessment, as well as a minimum average grade of 5/10 are required.</p> <p>This final assessment will take place in the ordinary and extraordinary sessions.</p> <p>Online evaluation of assignments, practical laboratory exercises and written assessments are foreseen given the situation that the presential evaluation is not possible due to a new health alert caused by COVID-19.</p>				
Observations for part-time students				
Part-time students will be assessed on the same basis as full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS**BASIC**

- Overvoltage protection of low voltage systems / Peter Hasse.
- Analysis and design of low-voltage power systems : an engineer's field guide / Ismail Kasikci.
- High-voltage engineering : theory and practice / edited by M. Khalifa.
- Conejo, Antonio. Instalaciones Eléctricas. ED. McGraw Hill, 2007.
- Martín Sánchez, Franco. Instalaciones Eléctricas en la Edificación. Ed. A. Madrid Vicente, 1997.
- Guerrero Fernández A. Instalaciones Eléctricas en las Edificaciones. Ed. McGraw-Hill, 1996.
- Reglamento electrotécnico para baja tensión.
- Esquemas eléctricos y electrónicos : lectura e interpretación / Francisco Ruiz Vassallo 2005.
- Colección de normas UNE.