UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: HIGH VOLTAGE ELECTRICAL INSTALLATIONS
Code: 56409
Type: CORE COURSE
ECTS credits: 6
Degree: 413 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING
Academic year: 2022-23
Center: 605 - SCHOOL OF INDUSTRIAL ENGINEERS. AB
Group(s): 10
Year: 3
Duration: C2
Main language: Spanish
Second language: English
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **ANDRES HONRUBIA ESCRIBANO** - Group(s): **10**

Building/Office	Department	Phone number	Email	Office hours
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2. Pre-Requisites

In order to take this subject to the maximum advantage, it is recommended that the student has achieved skills related to the analysis of electrical circuits, both in single-phase and three-phase systems, and knowledge of the fundamentals of electrical machines. In a

3. Justification in the curriculum, relation to other subjects and to the profession

This subject provides the student with skills to carry out the professional activity of Industrial Technical Engineer related to the ability to calculate and design high-voltage electrical installations as well as knowledge about electrical power systems. This complements

4. Degree competences achieved in this course

Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CEE04	Ability to calculate and design high-voltage electrical installations.
CEE06	Knowledge of electrical power systems and their applications.
CG01	Ability to draft, sign and develop projects in the field of Industrial Engineering, in accordance with the knowledge acquired under the provisions of Order CIN/351/2009, for the construction, reform, repair, conservation, demolition, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy installations, electrical and electronic installations, industrial installations and plants, and manufacturing and automation processes.
CG03	Knowledge of basic and technological subjects to facilitate learning of new methods and theories, and provide versatility to adapt to new situations.
CG04	Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of industrial engineering.
CG06	Ability to handle specifications, regulations and mandatory standards.
CG07	Ability to analyse and assess the social and environmental impact of technical solutions.
CG11	Knowledge, understanding and ability to apply the necessary legislation necessary when working as an Industrial technical engineer.
CT01	Knowledge of a second language.
CT02	Knowledge and application of information and communication technology.
CT03	Ability to communicate correctly in both spoken and written form.

5. Objectives or Learning Outcomes

Course learning outcomes

Description
Analysis and calculation of faults and disturbances.
Analysis and modelling of electrical power systems.
Ability to design and justify calculation of substations and transformer stations.
Ability to handle and apply the mandatory legislation and regulations governing high-voltage electrical installations.
Ability to select switchgear, machinery and equipment used in high voltage installations.

6. Units / Contents

Unit 1: Analysis and modelling of Electric Power Systems.
Unit 2: Study and analysis of short-circuits in high voltage installations.
Unit 3: Study of medium and high voltage installations, their switchgear and equipment used in the transport and distribution of electrical energy.
Unit 4: Design and sizying of substations and secondary substations.
Unit 5: Carrying out supporting calculations in the projects and reports of medium and high voltage installations in accordance with current legislation.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Combination of methods	CB01 CB02 CB03 CB04 CB05 CEE04 CEE06 CG03 CG04 CG06 CG11 CT01 CT02 CT03	1.2	30	Y	N	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CB01 CB02 CB03 CB04 CB05 CEE04 CEE06 CG03 CG04 CG06 CG11 CT01 CT02 CT03	0.4	10	Y	N	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB01 CB02 CB03 CB04 CB05 CEE04 CEE06 CG03 CG04 CG06 CG11 CT01 CT02 CT03	0.6	15	Y	Y	
Formative Assessment [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CEE04 CEE06 CG03 CG04 CG06 CG11 CT01 CT02 CT03	0.2	5	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CEE04 CEE06 CG03 CG04 CG06 CG11 CT01 CT02 CT03	3.6	90	Y	N	
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4	**Total class time hours: 60**				
		Total credits of out of class work: 3.6	**Total hours of out of class work: 90**				

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Laboratory sessions	15.00%	15.00%	
Projects	15.00%	15.00%	
Final test	70.00%	70.00%	
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	32
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12

Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	10
Formative Assessment [PRESENCIAL][Assessment tests]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	48

Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	32
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	10
Formative Assessment [PRESENCIAL][Assessment tests]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	48
Total horas:	105

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
	Problemas resueltos de sistemas de energía eléctrica	Thomson		978-84-9732-408-3	2007	
	Reglamento de líneas de alta tensión y sus fundamentos técni	Paraninfo		978-84-283-3034-3	2008	
	Sistemas eléctricos de potencia : problemas y ejercicios res	Prentice Hall		84-205-3558-3	2002	
	Tecnología eléctrica	McGraw-Hill		978-84-481-4807-2	2006	
						UNESA. Asociación Española de la Industria Eléctrica
	www.unesa.es					
						Biblioteca de Schneider Electric
	www.schneiderelectric.es					
						SIG Oleícola Español.
	http://w3.mapya.es/dinatierra_v3/					
						SIGPAC (página inicio).
	www.mapa.es/es/sig/pags/sigpac/intro.htm					
						SIGPAC (visor mapa).
	http://sigpac.mapa.es/fega/visor/					
						Colegio Oficial de Ingenieros Técnicos Industriales de Albacete
	www.coitiab.es					
						Fundación para el Fomento de la Innovación Industrial
	www.ffii.es					
						Inael (aparamenta y material diverso). www.inael.comIbérica de Aparellajes (aparamenta y material diverso).
	www.iberapa.es					
						PRYSMIAN Cables y Sistemas
	www.prysmian.es					
						General Cable (cables).
	www.generalcable.es					
						ABB (transformadores, aparamenta eléctrica y equipos)
	www.abb.com/es					
						CIRCUTOR
	www.circutor/es					
						Iberdrola s.a.
	www.iberdrola.es					
						Unión FENOSA
	www.uef.es					
						Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas
	www.ciemat.es					
						AENOR
	www.aenor.es					
						A.F.M.E. Asociación de Fabricantes de Material Eléctrico
	www.afme.es					
- COORDINADOR JUAN ANTONIO MARTÍNEZ VELASCO	Coordinación de Aislamiento en Redes Eléctricas de Alta Tensión	Mc Graw Hill			2008	
Barrero, Fermín	Sistemas de energía eléctrica	Thomson		84-9732-283-5	2004	
Navarro Márquez, José Antonio	Instalaciones eléctricas de alta tensión : sistemas de mani	Paraninfo		84-283-2434-4	1999	
Paulino Montané	Protección en las instalaciones eléctricas. Evolución y perspectivas	Marcombo			1988	
España. Ministerio de Industria, Energía y Turismo	Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión	BOE			2014	Real Decreto 337/2014, de 9 de mayo, por el que se aprueba el Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión y sus Instrucciones Técnicas Complementarias ITC-RAT 01 a 23
	http://www.boe.es/boe/dias/2014/06/09/					
Roeper, Richard	Corrientes de cortocircuito en redes trifásicas	Siemens Aktiengesellschaft Marcombo		84-267-0592-8 (Marco	1985	
Roger Folch, José	Tecnología eléctrica	Síntesis		84-7738-767-2	2002	
A. Gómez-Expósito, A. J. Conejo,C. Cañizares	Electric Energy Systems: Analysis and Operation	CRC Press		9781315221809	2009	