UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: ELECTRICAL TECHNOLOGY
Code: 56312
Type: CORE COURSE
ECTS credits: 6
Degree: 353 - UNDERGRADUATE DEGREE PROG. IN MECHANICAL ENGINEERING (CR)
Academic year: 2023-24
Center: 602 - E.T.S. INDUSTRIAL ENGINEERING OF C. REAL
Group(s): 20 21
Year: 2
Duration: First semester
Main language: Spanish
Second language: English
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **NATALIA ALGUACIL CONDE** - Group(s): **20 21**

Building/Office	Department	Phone number	Email	Office hours
Edificio Politécnico 2-D05	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	Vía Teams	Natalia.Alguacil@uclm.es	

Lecturer: **GREGORIO MUÑOZ DELGADO** - Group(s): **20 21**

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Lecturer: **ANA MARÍA PECO CHACÓN** - Group(s): **20 21**

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2. Pre-Requisites

Algebra, Calculus I, Calculus II, Physics and Advanced Mathematics courses in the Electronical Engineering study program provide the basic background for the Tecnología Eléctrica course.

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

Tecnología Eléctrica course provides the basic competencies considered in the common block of any engineering degree (according to Orden CIN/351/2009): knowledge and usage of the basic principles of circuit theory and electric machines.

Tecnología Eléctrica course is related to the following courses of the Electronic Engineering degree: Physics, Algebra, Calculus I, Electronic Fundamentals, Electrical Network Analysis, Electric Power Systems and Photovoltaic Systems.

Tecnología Eléctrica course reviews concepts of circuit theory that are the basic requirements for any Electric Engineering study and it provides systematic tools to study any electrical installation. Using circuit theory it is possible to make a precise, prompt and efficient analysis of many different electrical problems without the need of recalling the laws of Electromagnetism. Furthermore, this course introduces the electric machines, which are the key components of any power system. In particular, induction machines are the most usual components in any industrial application. Therefore, Tecnología Eléctrica course is essential for the Mechanic Engineering profession.

4. Degree competences achieved in this course

Course competences

Code	Description
A02	To know how to apply knowledge to work or vocation in a professional manner and possess the competences that are usually demonstrated by the formulation and defence of arguments and the resolution of problems in the field of study.
A04	To be able to transmit information, ideas, problems and solutions to a specialized audience.
A05	To have developed the learning skills necessary to undertake subsequent studies with a greater degree of autonomy.
A12	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
A15	Ability to work to specifications and comply with obligatory rules and regulations.
C04	Knowledge and use of the principles of the theory of circuits and electrical machines.
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.

5. Objectives or Learning Outcomes

Course learning outcomes

Description
Know and know how to analyze circuits magnetically coupled
Application of electrical installations
Knowledge of the general principles of electrical machinery
Knowledge and characterization of the components of electrical circuits
Know and know how to apply the procedures employed in the analysis of circuits in permanent sinusoidal regimen

6. Units / Contents

Unit 1: Introduction. Fundamentals.
Unit 2: Components of electric circuits.
Unit 3: Steady state circuit analysis. Analysis methods and theorems.
Unit 4: AC steady state circuits. Power and energy.
Unit 5: Three-phase circuits. Power and energy.
Unit 6: Magnetically coupled circuits.
Unit 7: Fundamentals of electric machines.
Unit 8: Application to electrical installations.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	A04 A05 A12 C04	0.4	10	N	-	Solving drill exercises and problems in the blackboard.
Class Attendance (theory) [ON-SITE]	Combination of methods	A04 A05 A12 C04	1.2	30	N	-	Combination of methods: expository method, master lesson, problem resolution and group tutoring.
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	A05 C04 CB03	0.6	15	Y	N	After each lab session, the student must fill out a form in Campus Virtual indicating the measurements made in the laboratory, as well as the required calculations.
Formative Assessment [ON-SITE]	Assessment tests	A02 A04 A05 A15 C04 CB03	0.2	5	Y	Y	In the continuous evaluation mode, two partial exams will take place once the explanations are finished. Additionally, after the explanation of each topic, a set of drill exercises will be proposed to be solved, being automatically evaluated. In the non-continuous evaluation mode, a final exam will take place covering all the course' contents. Additionally, an online quizz will be proposed with exercises to be solved the day before the ordinary call.
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A05 A15 C04 CB03	3.6	90	N	-	Group study and/or self-study.
		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%	Continuous: The students should submit a lab report including all the magnitudes measured in the lab as well as the corresponding computations. The evaluation of the report will consider the mistmaches between the measurements and the calculated magnitudes as well as the exactness of the calculus. The report will be made on an individual basis and will consist of completing a questionnaire in Campus Virtual before deadlines. The reports' assessment will be posted within 1 month after its submission (the automatic rating posted by Campus Virtual is invalid). Non-continuous: There will be an exam corresponding to lab sessions. In the lab, the student should make different circuit connections and take the corresponding measurements.
			Continuous: Two midterm exams will take place throughout the course. The first exam corresponds to units 1 to 3 with a weight of 21% and the second one corresponds to the rest of the contents with a weight of 49%.

Mid-term tests	70.00%	0.00%	Approximately, in the middle of the course the first exam will take place. If the score obtained is less than 4 out of 10, this exam can be retaken later in the ordinary call, which it will also include the exam corresponding to the rest of the contents. To pass the course it is necessary to obtain a minimum score of 4 out of 10 in each of these exams. Non-continuous: non-applicable.
Final test	0.00%	70.00%	Continuous: Non-applicable. Non-continuous: The final exam may include problems and questions about theoretical or lab concepts. The assessment will not only consider the correctness of the explanations but also the results' consistency.
Assessment of problem solving and/or case studies	15.00%	15.00%	Continuous: The students should upload the solution of selected problems to an online application before deadlines. Non-continuous: The students should answer a online quizz posted in Campus Virtual before the final test.
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).

Evaluation criteria for the final exam:

Continuous assessment:

- To pass the course it is compulsory to have a minimum score of 4 out of 10 in the two midterm tests.
- To pass the course it is compulsory to attend to all laboratory sessions as well as to send the reports after each laboratory session within the deadline.

Non-continuous evaluation:

This assesment will include three parts that cover all the competences of the course:

1. A final exam with theoretical and / or practical questions. This part represents 70% of the final mark.
2. Theoretical and practical examination of the laboratory sessions. This part represents 15% of the final mark.
3. An online quizz available in Campus Virtual. This part represents 15% of the final mark.

To pass the course it is compulsory to have a minimum score of 4 out of 10 in the final exam.

Specifications for the resit/retake exam:

Same criteria applied for the ordinary call.

Specifications for the second resit / retake exam:

Same criteria applied for the ordinary call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	**hours**
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	90
Class Attendance (theory) [PRESENCIAL][Combination of methods]	10
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Formative Assessment [PRESENCIAL][Assessment tests]	30
Study and Exam Preparation [AUTÓNOMA][Self-study]	5

Global activity

Activities	**hours**
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	90
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Class Attendance (theory) [PRESENCIAL][Combination of methods]	10
Formative Assessment [PRESENCIAL][Assessment tests]	30
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Carlson, A. Bruce	Teoría de circuitos: ingeniería, conceptos y análisis de cir	Thomson		978-84-9732-066-5	2004	
A. J. Conejo, A. Clamagirand, J.L. Polo, N. Alguacil	Circuitos eléctricos para la ingeniería /	McGraw-Hill Interamericana		84-481-4179-2	2004	
Fraile Mora, Jesús (1946-)	Circuitos eléctricos /	Ibergarceta		978-84-16228-47-8	2019	
Fraile Mora, Jesús (1946-)	Máquinas eléctricas /	Garceta		978-84-1622-866-9	2016	