UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	ELECTRICAL TECHNOLOGY	**Code:**	56312
Type:	CORE COURSE	**ECTS credits:**	6
Degree:	356 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING (CR)	**Academic year:**	2021-22
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: **RAUL FERNANDEZ RODRIGUEZ** - Group(s): **20 21**

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2. Pre-Requisites

Algebra, Calculus I, Calculus II, Physics and Advanced Mathematics courses in the Electrical 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 Electrical 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 Electric 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 both a specialist and non-specialist audience.
A05	To have developed the learning skills necessary to undertake subsequent studies with a greater degree of autonomy.
A07	Knowledge of Information Technology and Communication (ITC).
A08	Appropriate level of oral and written communication.
A13	Ability to take the initiative to solve problems, take decisions, creativity, critical reasoning and ability to communicate and transmit knowledge, skills and abilities in Electrical Engineering.
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 machinery.
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
Knowledge and characterisation of the components of electrical circuits
Application in electrical installations
Knowledge of the general principles of electrical machinery
Know and know how to analyze magnetically coupled circuits
Know and know how to use the procedures employed for the analysis of circuits in sinusoidal regime

6. Units / Contents

Unit 1: Basic laws and concepts
Unit 2: Components
Unit 3: Resistive circuits
Unit 4: Analysis methods
Unit 5: Basic theorems and principles
Unit 6: AC steady-state analysis
- **Unit 6.1** Power and Energy

Unit 7: Three-phase circuits
- **Unit 7.1** Power and Energy

Unit 8: Fundamentals of Electric Machines
- **Unit 8.1** Magnetically coupled circuits

ADDITIONAL COMMENTS, REMARKS

Units 3, 6, 7 and 8 include a variety of applications on electrical installations.

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]	Lectures	A04 A05 A12 A13 C04	1.2	30	N	-	Expository method. Master lesson.
Problem solving and/or case studies [ON-SITE]	Cooperative / Collaborative Learning	A04 A05 A08 A12 A13 C04	0.4	10	N	-	Solving problems and drill exercises
Progress test [ON-SITE]	Assessment tests	A02 A04 A05 A08 A12 A13 A15 C04 CB03	0.12	3	Y	N	Two midterm tests will be held once the corresponding theoretical contents have been explained.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	A05 A07 A08 C04 CB03	0.6	15	Y	Y	After each laboratory session, the student must fill in a form in Campus Virtual, indicating the measurements carried out in the laboratory, as well as the required calculations.
Final test [ON-SITE]	Assessment tests	A02 A04 A05 A08 A13 A15 C04 CB03	0.08	2	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A05 A07 A08 A13 A15 C04 CB03	3.6	90	N	-	Autonomous work. Team work.
		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
Final test	0.00%	100.00%	The final exam may include problems and questions about theoretical or lab concepts. The evaluation will consider not only the correctness of the answer explanations but also the results' consistency.
Practicum and practical activities reports assessment	30.00%	0.00%	Using the Moodle platform, the stundents should submit the 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 measures and the calculated magnitudes as well as the exactness of the calculus. Attendance to lab sessions as well as the submission of the report within the deadlines are mandatory to qualify for continuous evaluation.
Progress Tests	70.00%	0.00%	Two midterm exams will be held throughout the course, covering 70% of the competences.
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 have a minimum score of 4 out of 10 in the evaluation of the report of the laboratory sessions. Furthermore, attendance at all laboratory sessions is compulsory.

Non-continuous evaluation:

The final test will include two parts that cover all the competences of the course:

1. 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 30% of the final mark.

To pass the course it is compulsory to have a minimum score of 4 out of 10 in each of these parts.

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
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	10
Progress test [PRESENCIAL][Assessment tests]	3
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Final test [PRESENCIAL][Assessment tests]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	90

Global activity

Activities	hours
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	10
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Progress test [PRESENCIAL][Assessment tests]	3
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Final test [PRESENCIAL][Assessment tests]	2
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Nilsson, James William	Electric Circuits	Pearson Prentice Hall		978-0133760033	2014	
Johnson, David E.	Electric Circuit Analysis	Wiley		978-0132524797	1997	
A. J. Conejo, A. Clamagirand, J.L. Polo, N. Alguacil	Circuitos eléctricos para la ingeniería	McGraw-Hill		9788448141790	2004	