

**1. General information****Course:** ELECTRONICS**Type:** CORE COURSE**Degree:** 354 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING (ALM)**Center:** 106 - SCHOOL OF MINING AND INDUSTRIAL ENGINEERING**Year:** 2**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 56402**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 55**Duration:** C2**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** RAQUEL JURADO MERCHANT - Group(s): 55

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

In order to take this subject, the student must have acquired the knowledge that derives from the competences related to the basic knowledge of the basic knowledge of the structure of materials, the fundamentals of mathematics and the knowledge and use of the principles of circuit theory.

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

This subject covers the competence common to the industrial branch related to the knowledge of the fundamentals of electronics. The student, through this subject, will acquire theoretical knowledge of Electronic Technology, which will be complemented with practical knowledge through exercises and laboratory exercises and practices, where the necessary skills for the assembly of electronic prototypes will be acquired.

4. Degree competences achieved in this course**Course competences**

Code	Description
A01	To understand and have knowledge in an area of study that moves on from the general education attained at secondary level and usually found at a level that, while supported in advanced text books, also includes some aspects that include knowledge found at the cutting edge of the field of study.
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.
A07	Knowledge of Information Technology and Communication (ITC).
A08	Appropriate level of oral and written communication.
C05	Knowledge of the fundamentals of electronics.
CG03	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
CG04	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.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

Ability to analyze basic electronic circuits

Ability to analyze and design combinational and sequential digital circuits

Ability to analyze analogue circuits with operational amplifiers

Ability to analyze analogue and digital circuits using simulation tools

6. Units / Contents**Unit 1: PASSIVE COMPONENTS****Unit 2: SEMICONDUCTOR DEVICES AND APPLICATIONS****Unit 3: AMPLIFICATION BASICS****Unit 4: FUNDAMENTALS OF DIGITAL ELECTRONICS****Unit 5: DESIGN AND IMPLEMENTATION OF PRINTED CIRCUIT BOARDS. INTEGRATED CIRCUIT TECHNOLOGY.****ADDITIONAL COMMENTS, REMARKS**

Practical programme:

Practice 1: Diodes and their applications.

Practice 2: Transistors. Amplification.

Practice 3: Operational amplifier.

Practice 4: Logic gates and combinational circuits.

Practice 5: Sequential circuits.

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	A01 A02 C05 CG03	1.2	30	N	-	Presentation and development of fundamental theoretical concepts.
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	A02 A07 C05 CG03 CG04	0.4	10	N	-	Resolution of exercises by the teacher that illustrate the theoretical contents discussed above.
Formative Assessment [ON-SITE]	Assessment tests	A02 A07 A08 C05 CG03 CG04	0.2	5	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A07 A08 C05 CG03 CG04	3.6	90	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	A02 A07 A08 C05 CG03 CG04	0.6	15	Y	Y	They will consist of practical exercises in the laboratory. They may include practical exercises to be carried out using simulation programmes. It is a compulsory activity and an essential requirement to pass the subject. In the section on assessment criteria, the rules for the assessment and/or recovery of the same are set out.
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	30.00%	30.00%	Students must attend the practical sessions and hand in the required report on each of the practical sessions in due time and form. As this is a compulsory activity, a minimum of 40% of the grade must be achieved in order to pass the course. This activity can only be recovered when, for duly justified reasons, the teaching staff deems it necessary to extend the deadline or to take a practice exam. These recuperations will only be allowed if the student has reached the minimum qualification required in the rest of the assessed activities (mid-term or final exams). The internship grade will be retained for two successive academic years.
Mid-term tests	70.00%	0.00%	They will consist of two tests related to both theoretical aspects and practical application. Passing them will require achieving at least 40% of the maximum mark in each of the mid-term exams. They will be of an eliminatory nature. If the average mark between the mid-term exams passed is equal to or higher than 4 points out of 10, the practical grade will be taken into account and the subject will be passed if the mark obtained is higher than 5 points.
Final test	0.00%	70.00%	It will consist of a test related both to theoretical and practical aspects and practical application, which will be structured as two partial tests. Passing the test will require at least 40% of the maximum mark in each of the parts into which it is divided. If the average mark between the parts passed is equal to or higher than 4 points out of 10, the grade for the practical part will be taken into account and the course will be passed if the grade obtained is higher than 5 points.
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:**

Students will have two mid-term exams which will be eliminatory, i.e. if they pass a mid-term exam, they will not have to sit the final exam.

In order to pass the course in the ordinary exams, a minimum of 40% of the maximum grade must be obtained in each of the mid-term exams and in the practicals, all of which are compulsory activities.

If this requirement is not met, even if the overall grade for the course, after taking the weighted average of all the parts that can be assessed is higher than 5 out of 10, the grade will be Failed (4). In the event that the weighted average does not reach 4, the grade will be that obtained from the weighted average of the weighted average of all the evaluable parts.

The recovery of the partial tests will be possible in the final exam, while the recovery of the practicals will be possible as detailed in the previous description above.

During the partial or final tests it is strictly forbidden to use any kind of electronic device (mobile phones, tablets, smartwatches, etc.), even if they are switched off, are strictly forbidden during the exam.

In case of non-compliance with this rule, the grade will be Fail (0), even if the terminal is switched off. This rule is applicable for all exam sessions.

Non-continuous evaluation:

For non-continuous assessment students, the criteria will be the same as for continuous assessment, except that the part of the assessment corresponding to the mid-term tests will be examined in a single final exam which will be structured as two partial tests and which will be subject to the same criteria as those established for the partial tests of the continuous assessment.

Passing the practicals is also compulsory and is subject to the same criteria as for the continuous assessment.

Specifications for the resit/retake exam:

In the extraordinary exam session, the same criteria will be followed as in the ordinary exam session.

Specifications for the second resit / retake exam:

In the special final exam session, the same criteria will be followed as those indicated for the extraordinary exam session.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	30
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Formative Assessment [PRESENCIAL][Assessment tests]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	15
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	90
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	30
Study and Exam Preparation [AUTÓNOMA][Self-study]	15
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	90
Formative Assessment [PRESENCIAL][Assessment tests]	5
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Floyd, T.L	Fundamentos de sistemas digitales	Pearson Educación		:978-84- 9035-300-4	2016	
Hambley, A.R	Electrónica	Prentice Hall			2001	
J. R. Cogdell	Fundamentos de electrónica	Prentice Hall			2000	
Malik, N.R	Circuitos electrónicos. Análisis, simulación y diseño	Prentice Hall			2003	
Robert L. Boylestad y Louis Nashelsky	Electrónica: teoría de circuitos y dispositivos electrónicos	Pearson Educacion		978-60-744-2292-4	2009	
José Manuel de la Cruz Gómez/Raquel María Jurado Merchán	APUNTES DE LA ASIGNATURA					
Albert Malvino y David J.Bates	Principios de electrónica	McGraw Hill		978-84-481-5619-0	2006	