

**1. General information****Course:** DIGITAL ELECTRONICS I**Type:** CORE COURSE**Degree:** 360 - UNDERGRAD. IN INDUSTRIAL ELECTRONICS AND AUTOMAT. ENGINEERING (TO)**Center:** 303 - E.DE INGENIERÍA INDUSTRIAL Y AEROSPOACIAL DE TOLEDO**Year:** 3**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 56504**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 40**Duration:** First semester**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** JOSE MANUEL GILPEREZ AGUILAR - Group(s): 40

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**2. Pre-Requisites**

In order to take this course to the best advantage, the student must have acquired the knowledge derived from obtaining the skills related to the use and programming of computers, operating systems, databases and computer programs with application in engineering, as well as as with the fundamentals of electronics and the principles of circuit theory.

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

The Digital Electronics I subject allows the student to obtain a basic level of knowledge in digital circuits, providing the necessary skills to face and solve problems related to the analysis and design of digital systems of small and medium complexity. Likewise, it is the foundation of other subjects that will be taught later throughout the degree, such as Digital Electronics II, Industrial Computing, Electronic Instrumentation and Industrial Automation, as well as optional subjects.

**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.
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.
A12	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
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 Industrial Engineering and Automation.
A15	Ability to work to specifications and comply with obligatory rules and regulations.
D03	Knowledge of the fundamentals and applications of digital electronics and microprocessors.
D07	Knowledge and ability for modelling and simulation of systems.

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

Description

Ability to analyze, design, model and simulate combinational and sequential circuits using basic elements, functional blocks and hardware description language (HDL)

**6. Units / Contents****Unit 1: INTRODUCTION TO DIGITAL SYSTEMS****Unit 2: NUMBERING SYSTEMS AND INFORMATION CODING****Unit 3: LOGICAL FAMILIES****Unit 4: COMBINATIONAL LOGIC****Unit 5: SEQUENTIAL LOGIC****Unit 6: PROGRAMMABLE LOGIC DEVICES****Unit 7: MEMORIES**

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	A05 A07 A12 A13 A15 D03 D07	1.2	30	N		Lectures in the classroom according to the contents of the program.
Class Attendance (practical) [ON-SITE]	Problem solving and exercises	A05 A07 A12 A13 A15 D03 D07	0.4	10	N		Exercise classes and problems in the classroom.
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	A02 A05 A07 A08 A12 A13 A15 D03 D07	0.6	15	Y	Y	Laboratory practices.
Formative Assessment [ON-SITE]	Assessment tests	A02 A05 A07 A08 A12 A13 A15 D03 D07	0.2	5	Y	N	Tests of the assimilation of concepts and procedures.
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A05 A07 A08 A12 A13 A15 D03 D07	3.6	90	N		Autonomous work of the student.
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>				<b>Total class time hours: 60</b>			
<b>Total credits of out of class work: 3.6</b>				<b>Total hours of out of class work: 90</b>			

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
Mid-term tests	60.00%	0.00%	Compulsory tests within the continuous assessment to facilitate passing the subject, where in each test a block of subject content is evaluated. Failure to do so causes the student to go to non-continuous mode.
Assessment of problem solving and/or case studies	15.00%	15.00%	Resolution of problems and proposed cases to be delivered on the date indicated within the continuous evaluation.
Laboratory sessions	25.00%	25.00%	The laboratory practices must be delivered in the calendar established with the corresponding report.
Final test	0.00%	60.00%	Assessment of the assimilation of concepts and procedures through the final test within the non-continuous assessment. It includes both the evaluation of the subject blocks of the continuous evaluation and the resolution of problems and cases in the same test.
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

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:

It does not proceed due to extinction of the subject in the old plan.

##### Non-continuous evaluation:

The student must pass the average grade of 5 points, calculated from the final test and the percentages expressed above and the Student Assessment Regulations of the University of Castilla-La Mancha.

#### Specifications for the resit/retake exam:

During the extraordinary call, the evaluation of the student will be guaranteed in all those compulsory and recoverable training activities, according to the tests and percentages expressed previously and the Regulation of Student Evaluation of the University of Castilla-La Mancha in its Article 4, in its points 4, 5, 6 and 7. In this way, the student will be able to carry out all those progress tests or present the laboratory practices that he had not carried out during the ordinary call and present the final practical work in case it was pending.

#### Specifications for the second resit / retake exam:

During the special call for completion, the student will be evaluated on all compulsory and recoverable training activities, according to the tests and percentages expressed above, according to the Student Evaluation Regulations of the University of Castilla-La Mancha in its Article 4. The progress tests will be unified in a single equivalent written test and the practical tests will also be unified in a single laboratory experience that is equivalent in degree and difficulty to the set of tests of the ordinary call.

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

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Nelson, V. P., H. T. Nagle, B. D. Carroll y J. D. Irwin	Análisis y diseño de circuitos lógicos digitales	Prentice Hall		9688807060	1996	
Taub, H. y D. Schilling	Electrónica Digital Integrada	Marcombo Boixareu Editores		9788426703859	1984	
Mandado, E. y Martín, J.L.	Sistemas electrónicos digitales	Marcombo		9788426721983	2015	
Floyd, Thomas L.	Fundamentos de sistemas digitales	Prentice Hall		9788490353004	2016	
Wakerly, J. F.	Diseño digital. Principios y Prácticas	Prentice Hall		9701704045	2001	