UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

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1. General information

Course: COMPUTER TECHNOLOGY

Type: BASIC

Degree: 347 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING (CR)

Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL

Year: 1

Main language: English

Use of additional languages: Utilización del inglés como lengua principal de impartición en el grupo bilingüe y español en el resto de grupos

Web site:

Code: 42303

ECTS credits: 6

Academic year: 2022-23

Group(s): 20 21 22 23

Duration: First semester

Second language: Spanish

English Friendly: N

Bilingual: Y

Lecturer: ANTONIO ADAN OLIVER - Group(s): 20 22

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/A 1.6	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	3737	antonio.adan@uclm.es	Available at https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: JESUS SALIDO TERCERO - Group(s): 21 22

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/2.18	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	3745	jesus.salido@uclm.es	Available at https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: INOCENTE SANCHEZ CIUDAD - Group(s): 21 22 23

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/A 1.9	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	6490	inocente.sanchez@uclm.es	Available at https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

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2. Pre-Requisites

No prior knowledge on the subject is required.

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

The main objective of this subject is to provide the technological base of the structure and operation of a computer. The contents are focused on the number systems, the Boolean circuits, the fundamental concepts of logical circuits and the analysis/design of digital circuits.

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4. Degree competences achieved in this course

Course competences

Code	Description
BA02	Understanding and knowledge of basic terms about fields, waves and electromagnetism, theory of electric circuits, electronic circuits, physical principles of semiconductors and logic families, electronic and photonic devices and their use to solve engineering problems.
BA03	Ability to understand basic concepts about discrete mathematics, logic, algorithms, computational complexity, and their applications to solve engineering problems.
CO09	Ability to know, understand, and assess the structure and architecture of computers, and their basic components.
INS01	Analysis, synthesis, and assessment skills.
INS04	Problem solving skills by the application of engineering techniques.
INS05	Argumentative skills to logically justify and explain decisions and opinions.
PER02	Ability to work in multidisciplinary teams.
PER04	Interpersonal relationship skills.
PER05	Acknowledgement of human diversity, equal rights, and cultural variety.

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5. Objectives or Learning Outcomes

Course learning outcomes

Description

Understanding of the behaviour of basic digital devices.

Understanding and knowledge about how to apply the basic procedures of analysis and design of circuits and digital systems.

Additional outcomes

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6. Units / Contents

Unit 1: Introduction to Digital Circuits

Unit 2: Number systems and Representation of Information
Unit 3: Logic Functions and Boolean Algebra
Unit 4: Combinational Circuits I. Gates
Unit 5: Combinational Circuits II. Modules & Modular Networks
Unit 6: Sequential Circuits I: Flip-flops
Unit 7: Sequential Circuits II: Analysis and Synthesis. Registers and counters.
Unit 8: Combinational circuits III: Arithmetic & Logic Circuits

ADDITIONAL COMMENTS, REMARKS

Lab sessions.

1.- Logic Gates.

2.- Combinational Modules I.

3.- Combinational Modules II.

4.- Flip-Flops.

5.- Sequential Systems.

6.- Registers and Counters.

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	BA02 BA03 CO09	0.9	22.5	N	-	Teaching of the subject matter by lecturer (MAG)
Class Attendance (theory) [ON-SITE]	Problem solving and exercises	BA02 BA03 CO09 INS04 PER02 PER04 PER05	0.48	12	N	-	Worked example problems and cases resolution by the lecturer and the students (PRO)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA02 BA03 CO09 INS04 PER02 PER04 PER05	0.54	13.5	Y	Y	Lab practical preparation (PLAB)
Individual tutoring sessions [ON-SITE]	Guided or supervised work	BA02 BA03 CO09	0.18	4.5	N	-	Individual or small group tutoring in lecturer¿s office, classroom or laboratory (TUT)
Study and Exam Preparation [OFF-SITE]	Self-study	BA02 BA03 CO09	1.8	45	N	-	Self-study (EST)
Final test [ON-SITE]	Assessment tests	BA02 BA03 CO09 INS01 INS04 INS05 PER02	0.3	7.5	Y	Y	Final test of the complete syllabus of the subject (EVA)
Writing of reports or projects [OFF-SITE]	Self-study	BA02 BA03 CO09 INS01 INS04 PER02 PER04 PER05	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA02 BA03 CO09 INS01 INS04 PER02 PER04 PER05	0.9	22.5	Y	Y	Lab practical preparation (PLAB)
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	50.00%	50.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria).
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period.
Laboratory sessions	25.00%	25.00%	Compulsory activity that can be retaken. Ordinary call: - Continuous evaluation: to be carried out during the lab sessions. - Non continuous evaluation: to be carried out within the planned exam dates of the final exam call (in January). Extraordinary call: Lab exam within the planned exam dates (in June)
			Non-compulsory activity that can be retaken. Ordinary call: - Continuous evaluation: to be carried out at the end of the

			semester during the theory/lab sessions.
Oral presentations assessment	10.00%	10.00%	- Non continuous evaluation: to be carried out within the planned exam dates of the final exam call (in January) using an alternative method. Extraordinary call: to be carried out within the planned exam dates of the final exam call (in January) using an alternative method.
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:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The progress tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the progress tests will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	**hours**
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	13.5
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	45
Final test [PRESENCIAL][Assessment tests]	7.5
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	22.5
Unit 1 (de 8): Introduction to Digital Circuits	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Unit 2 (de 8): Number systems and Representation of Information	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Unit 3 (de 8): Logic Functions and Boolean Algebra	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4.5
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	3.5
Unit 4 (de 8): Combinational Circuits I. Gates	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	2
Unit 5 (de 8): Combinational Circuits II. Modules & Modular Networks	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.5
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	2.5
Unit 6 (de 8): Sequential Circuits I: Flip-flops	

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2

Unit 7 (de 8): Sequential Circuits II: Analysis and Synthesis. Registers and counters.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	2

Unit 8 (de 8): Combinational circuits III: Arithmetic & Logic Circuits	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	2

Global activity	
Activities	hours
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	45
Final test [PRESENCIAL][Assessment tests]	7.5
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	22.5
Class Attendance (theory) [PRESENCIAL][Problem solving and exercises]	12
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	13.5
Class Attendance (theory) [PRESENCIAL][Lectures]	22.5
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Thomas L. Floyd	Digital Fundamentals: A Systems Approach	Pearson		978-0-13-293395-7	2014	
A. Adán. I. Sánchez, B. Quintana	Circuitos Digitales: Problemas y Ejercicios Resueltos http://www.ra-ma.es/libros/CIRCUITOS-DIGITALES/99718/978-84-9964-761-6	RaMa		978-84-9964-761-6	2018	
Thomas L. Floyd	Fundamentos de Sistemas Digitales (11 Ed.)	Prentice Hall		978-84-9035-300-4	2016	