

**1. General information****Course:** COMPUTER ARCHITECTURE**Type:** ELECTIVE**Degree:** 359 - UNDERGRAD. IN INDUSTRIAL ELECTRONICS AND AUTOMAT. ENGINEERING (CR)**Center:** 602 - E.T.S. INDUSTRIAL ENGINEERING OF C. REAL**Year:** 4**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 56518**ECTS credits:** 6**Academic year:** 2020-21**Group(s):** 20**Duration:** First semester**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** NOELIA VALLEZ ENANO - Group(s): 20

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Edificio Politécnico, 2-C01	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	Vía Teams	Noelia.Vallez@uclm.es	

**Lecturer:** ANDRES SALOMON VAZQUEZ FERNANDEZ PACHECO - Group(s): 20

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**2. Pre-Requisites**

Not established

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

Not established

**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.
A07	Knowledge of Information Technology and Communication (ITC).
A08	Appropriate level of oral and written communication.
A09	Ethical and professional commitment.
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 Electronic Engineering and Automation.
E01	Knowledge of advanced technologies that prepare for the development of high performance automatization projects.
E02	Knowledge of technologies that enable processes of automatization and complex systems to be dealt with.
E07	Ability to design electronic instruments. Knowledge of buses and networks in instrumentation. Ability to design and develop using virtual instrumentation.
E08	Knowledge of hardware and software necessary for the development of specialized computer systems used in automatized and robotic systems.

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

Description

Ability to select and programme microcontrollers in the design of built-in control systems

Ability to design and implement discrete systems for processing signals on a computer

Knowledge and use of design flows and synthesis relating to programmable and configurable devices.

**6. Units / Contents****Unit 1: Introduction****Unit 2: The microprocessor****Unit 3: Use of microprocessor-based systems (Raspberry Pi)****Unit 4: Input/Output Systems****Unit 5: Advanced Architectures****Unit 6: The microcontroller**

## Unit 7: Prototyping of microcontroller based systems (Arduino)

### 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	A12 E01 E02 E07 E08	1	25	N	-	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	A02 A05 A07 A12 A13 E01 E02 E07 E08	1	25	Y	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	1.2	30	Y	N	
Writing of reports or projects [OFF-SITE]	Self-study	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	1.2	30	Y	N	
Other on-site activities [ON-SITE]	Case Studies	E01 E02 E08	0.12	3	N	-	
Writing of reports or projects [OFF-SITE]	Guided or supervised work	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	0.4	10	Y	N	
Final test [ON-SITE]	Assessment tests	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	0.12	3	Y	N	
Project or Topic Presentations [ON-SITE]	Assessment tests	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	0.16	4	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A04 A05 A07 A08 A09 A12 A13 E01 E02 E07 E08	0.8	20	N	-	
<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
Assessment of activities done in the computer labs	25.00%	0.00%	
Laboratory sessions	20.00%	0.00%	
Oral presentations assessment	10.00%	0.00%	
Final test	45.00%	100.00%	
<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).

### 9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	hours
<b>Unit 1 (de 7): Introduction</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Final test [PRESENCIAL][Assessment tests]	.25
Project or Topic Presentations [PRESENCIAL][Assessment tests]	.25
<b>Unit 2 (de 7): The microprocessor</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	2
Writing of reports or projects [AUTÓNOMA][Self-study]	5
Other on-site activities [PRESENCIAL][Case Studies]	1
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	2
Final test [PRESENCIAL][Assessment tests]	.25
Project or Topic Presentations [PRESENCIAL][Assessment tests]	.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
<b>Unit 3 (de 7): Use of microprocessor-based systems (Raspberry Pi)</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	9
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	6
Writing of reports or projects [AUTÓNOMA][Self-study]	5
Final test [PRESENCIAL][Assessment tests]	.4

Project or Topic Presentations [PRESENCIAL][Assessment tests]	.4
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
<b>Unit 4 (de 7): Input/Output Systems</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	5
Writing of reports or projects [AUTÓNOMA][Self-study]	5
Other on-site activities [PRESENCIAL][Case Studies]	.75
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	.75
Final test [PRESENCIAL][Assessment tests]	.4
Project or Topic Presentations [PRESENCIAL][Assessment tests]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
<b>Unit 5 (de 7): Advanced Architectures</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	4
Writing of reports or projects [AUTÓNOMA][Self-study]	4
Other on-site activities [PRESENCIAL][Case Studies]	.5
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	3
Final test [PRESENCIAL][Assessment tests]	.5
Project or Topic Presentations [PRESENCIAL][Assessment tests]	.6
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
<b>Unit 6 (de 7): The microcontroller</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	4
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	6
Writing of reports or projects [AUTÓNOMA][Self-study]	6
Final test [PRESENCIAL][Assessment tests]	.6
Project or Topic Presentations [PRESENCIAL][Assessment tests]	.8
Study and Exam Preparation [AUTÓNOMA][Self-study]	2
<b>Unit 7 (de 7): Prototyping of microcontroller based systems (Arduino)</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	4.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	7
Writing of reports or projects [AUTÓNOMA][Self-study]	5
Other on-site activities [PRESENCIAL][Case Studies]	.75
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	4.25
Final test [PRESENCIAL][Assessment tests]	.6
Project or Topic Presentations [PRESENCIAL][Assessment tests]	.7
<b>Global activity</b>	
<b>Activities</b>	<b>hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	25
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	25
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	30
Writing of reports or projects [AUTÓNOMA][Self-study]	30
Other on-site activities [PRESENCIAL][Case Studies]	3
Writing of reports or projects [AUTÓNOMA][Guided or supervised work]	10
Final test [PRESENCIAL][Assessment tests]	3
Project or Topic Presentations [PRESENCIAL][Assessment tests]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	20
<b>Total horas: 150</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Andrés García	El Control Automático en la Industria	Ediciones de la Universidad de Castilla-La Mancha		84-8427-405-5	2005	
Christopher T. Kilian	Modern Control Technology: Components and Systems	Delmar Thomson Learning		978-0766823587	2000	2nd edition
Hennessy, J. L. y D. A. Patterson	Computer Architecture. A Quantitative Approach	Quantitative Approach Morgan Kaufmann				4th edition
Ortega, J., Anguita, M. y A. Prieto	Arquitectura de computadores	Thomson	Madrid			
Stallings, W.	Organización y Arquitectura de Computadores	Prentice Hall			2006	

