UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	COMPUTER CONTROLLED SYSTEMAS	**Code:**	56412
Type:	CORE COURSE	**ECTS credits:**	6
Degree:	354 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING (ALM)	**Academic year:**	2023-24
Center:	106 - SCHOOL OF MINING AND INDUSTRIAL ENGINEERING	**Group(s):**	55
Year:	3	**Duration:**	C2
Main language:	Spanish	**Second language:**	English
Use of additional languages:		**English Friendly:**	Y
Web site:		**Bilingual:**	N

Lecturer: **JAVIER DE LAS MORENAS DE LA FLOR** - Group(s): **55**

Building/Office	Department	Phone number	Email	Office hours
Edificio Störr, 3º planta, Dpto. IEEAC	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	+34 926 05 22 69	javier.delasmorenas@uclm.es	To be indicated at the beginning of the semester

2. Pre-Requisites

In order to take this subject to the best advantage, the student must have acquired the knowledge derived from obtaining the competences related to the basic subjects and common to the industrial branch of mathematics, physics, computer science, electrical and electronic technology and feedback control.

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

The subject of digital control allows students to acquire knowledge of automatic regulation and control techniques and their application to industrial automation which, complemented by those acquired in other specific subjects, will facilitate the application of their skills in the world of work and, in the end, will help the engineer to face the problems that will arise throughout the exercise of the profession.

4. Degree competences achieved in this course

Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
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.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
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.
CG06	Ability to work to specifications and comply with obligatory rules and regulations.
D08	Knowledge of the principles of automatic regulation and its application to industrial automatization.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Master the design techniques of discrete control systems through the discretization of continuous regulators and through the functions of transfer in z

Ability to reconstruct continuous signals from sample signals

Use the main information support tools

Analyze the dynamic and static response of a discrete system

Be able to make and simplify block diagrams in variable z

Know and correctly interpret the statbility criteria of discrete systems

6. Units / Contents

Unit 1: Introduction

Unit 2: Discrete systems and signals

Unit 3: Analysis of discrete systems

Unit 4: Analysis of close-loop discrete systems

Unit 5: Design of digital controllers

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	CB01 CB02 CB03 CB04 CB05 CG03 CG04 CG06 D08	1.2	30	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CB01 CB02 CB03 CB04 CB05 CG03 CG04 CG06 D08	0.4	10	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB01 CB02 CB03 CB04 CB05 CG03 CG04 CG06 D08	0.6	15	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CG03 CG04 CG06 D08	3.6	90	N	-	
Formative Assessment [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CG03 CG04 CG06 D08	0.2	5	Y	Y	
		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%	
Mid-term tests	70.00%	0.00%	
Final test	0.00%	70.00%	
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).

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][Problem solving and exercises]	10
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Formative Assessment [PRESENCIAL][Assessment tests]	5

Global activity

Activities	hours
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Formative Assessment [PRESENCIAL][Assessment tests]	5
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
4 Fadali, M.	Digital Control Engineering	Academic Press			2009	Bibliografía complementaria
3 Ogata, K.	Sistemas de Control en Tiempo Discreto	Prentice Hall			1996	Bibliografía básica
5.	Control Tutorials for Matlab & Simulink http://ctms.engin.umich.edu/CTMS				2012	Bibliografía complementaria
6. Pinto Bermúdez, E.	Fundamentos de Control con Matlab	Prentice Hall			2010	Bibliografía complementaria
7. The Math Works, Inc.	La Edición de Estudiante de Simulink	Prentice Hall			1998	Bibliografía complementaria
8 Reinoso, O., Sebastián, J.M,						Bibliografía

	Aracil, R., Torres, F.	Control de sistemas discretos	Mc Graw Hill		2004	complementaria
1	Valdivia Miranda, C.	Sistemas de control continuos y discretos	Paraninfo	978-84-283-0744-4 (R	2012	Bibliografía básica
2	Aracil Santonja, R.	Sistemas discretos de control : (representacion externa)	Universidad Politecnica, Escuela Tecnica Superi	84-7484-014-7	1993	Bibliografía básica