

## SUBJECT TEACHING GUIDE

### G1016 - Design of Control Systems: Applications

#### Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Systems and Automation Engineering Optional Module				
Course unit title and code	G1016 - Design of Control Systems: Applications				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA				
Name of lecturer	LUCIANO ALONSO RENTERIA				
E-mail	luciano.alonso@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO (S2022)				
Other lecturers	MARIA SANDRA ROBLA GOMEZ				

### 3.1 LEARNING OUTCOMES

-Students will be able to design and tune control systems of different nature

### 4. OBJECTIVES

Present the different fields of application of control systems.  
Analyze and discuss different alternatives of control over practical examples.  
Design and implementation of control systems of different nature.

6. SUBJECT PROGRAM	
CONTENTS	
1	DESIGN OF INDUSTRIAL REGULATORS Industrial control systems. Industrial relays. PIDs. Tuning of industrial controllers. Self-tuning regulators (STR and CRM).
2	DESIGN AND APPLICATION OF CONTROL SYSTEMS Electrical / electronic systems DC motors AC motors Stepper motors Incremental and absolute encoders Control by pulse width modulation Frequency variation control Pneumatic systems Hydraulic systems

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
First laboratory practical control	Laboratory evaluation	No	Yes	30,00
First control theory	Written exam	No	Yes	20,00
Laboratory practice final exam	Laboratory evaluation	Yes	Yes	30,00
Theory final exam	Written exam	Yes	Yes	20,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
The remote evaluation of the work, practical laboratory exercises and written tests is foreseen, in the event of a new health alert by COVID-19 making it impossible to carry out the evaluation in person.				
<b>Observations for part-time students</b>				
Final exam with theoretical part (40%) and practical part (60%)				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
<b>BASIC</b>
Landau, I.D. and Zito, G. "Digital control systems. Design, identification and implementation". Springer
Astrom, K.J. and Wittenmark, B. "Computer-controlled: theory and design". Prentice-Hall
Gajic, Z. and Lelic, M. "Modern control systems engineering". Prentice Hall
Creus Solé, A. "Neumática e hidráulica". Marcombo