

SUBJECT TEACHING GUIDE

G876 - Automatic Control Systems II

Degree in Electrical Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Electrical Engineering			Type and Year	Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Further Automation Module: Electrical Technology				
Course unit title and code	G876 - Automatic Control Systems II				
Number of ECTS credits allocated	6	Term	Semester based (2)		
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	ESTHER GONZALEZ SARABIA				
E-mail	esther.gonzalezs@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2021)				
Other lecturers	ELENA HOYOS VILLANUEVA				

3.1 LEARNING OUTCOMES

- Ability to work with PLCs at the level of design of logical automations and at the level of regulation and control.
- Ability to design SCADA systems.
- Ability to work with discrete control systems to perform their analysis and to implement discrete regulators.

4. OBJECTIVES

- Knowledge of the different ways of performing logical automation
- Use of the PLC in process control.
- Knowledge of the PLC architecture.
- Knowledge of the SCADA systems
- Knowledge of discrete systems, its transient response, errors and stability

6. SUBJECT PROGRAM	
CONTENTS	
1	Programmable logic controllers (PLCs). General concepts. Design and programming of logic functions.
2	Mathematical operations. PLC-based process control. Structured programming.
3	PLCs Architecture and operation.
4	SCADA systems
5	General concepts of discrete systems. Z transform. Discrete transfer functions. Sampling and reconstruction.
6	Stability, steady state error and time response.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Programming exam of Blocks 1, 2,3 and 4	Laboratory evaluation	No	Yes	35,00
Multiple choice exam of Blocks 1, 2, 3 and 4	Activity evaluation with Virtual Media	No	Yes	30,00
Exam of blocks 5 and 6	Written exam	No	Yes	30,00
Practical assessment of blocks 5 and 6	Laboratory evaluation	No	No	5,00
TOTAL				100,00
Observations				
In case of a new health alert by COVID-19 makes impossible the evaluation in person, remote evaluation of the works (practical laboratory exercises and written tests) would be carried out.				
Observations for part-time students				
Part-time students who can not attend the continuous assessment activities will be evaluated of this activities at the end of the semester.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
E. Mandado, J. Marcos, C. Fernández, I. Armesto, J.L. Rivas, J.M. Núñez "Sistemas de Automatización y autómatas Programables", Marcombo, 2018
J. Balcells, J.L. Romeral "Autómatas Programables", Ed. Marcombo, 1997
Manuales Siemens TIA Portal
J.R. Llata García, E. González Sarabia, D. Fernández Pérez, "Problemas de Ingeniería de Sistemas: Sistemas Discretos", Ediciones TGD 1999,.
K. Ogata, "Sistemas de Control en Tiempo Discreto", Prentice Hall, 1996.
J.M. Pérez Oria, Santiago Arnaltes Gómez, "Introducción a los Sistemas de Control con Computador", Editorial Ciencia 3, 1993.