

SUBJECT TEACHING GUIDE

G1004 - Industrial Automation and Robotics

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

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Industrial Electronic Engineering and Automatic Control Systems First Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	Compulsory. Year 3 Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Automation and Systems Control Module: Specific Technology				
Course unit title and code	G1004 - Industrial Automation and Robotics				
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.
- Knowledge of general characteristics and applications of industrial robots

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 structures and general characteristics of industrial robots and the world robot market.
 Knowledge of robotic applications and implementation criteria.
 Knowledge of the different types of robot programming languages.

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. Dependability.
4	SCADA systems. Communications.
5	Industrial robotics. Introduction. Structures and general characteristics of industrial robots. Robots world market.
6	Implementation and application of robots.

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
Practical assessment of block 4	Laboratory evaluation	No	No	5,00
Exam of blocks 5 and 6	Written exam	No	Yes	30,00
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 activities of continuous assessment will be evaluated of those activities at the end of the semester.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

"Autómatas Programables. Entorno y aplicaciones", E. Mandado, J. Marcos, C. Fernández, J.I. Armesto, S. Pérez, Thomson Editores Spain, Paraninfo, 2005
 "Autómatas Programables", J. Balcells, J.L. Romeral, Ed. Marcombo, 1997
 "Manuales de programación de SIMATIC TIA Portal, Siemens.
 "Fundamentos de Robótica", A. Barrientos, L.F. Penín, C. Balaguer, R. Aracil. Ed McGraw Hill, 1997
 "Robótica, Control, Detección, Visión e Inteligencia, K.S. Fu, R.C. González, C.S.G. Lee, Ed McGraw Hill, 1988

