

SUBJECT TEACHING GUIDE

G1004 - Industrial Automation and Robotics

Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	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

- To know the structure of a PLC and its basic programming languages, programming principles and their settings
- Using the PLC as a basic element for on/off control system control and implementation of control loops.
- Knowledge of SCADA systems.
- Introduction to industrial robotics.

4. OBJECTIVES

Knowledge of the PLC as an element of automation and control systems and to know their architecture.
Programming PLCs using standard languages
Knowledge of PLC configurations and topologies as well as being able to make the selection of a PLC for a particular application.
Knowledge of the SCADA systems
Control with PLCs.
Knowledge of structures and general characteristics of industrial robots.
Knowledge of the sensors and actuators used in robotics.
Knowledge of the different types of robot programming languages.
Knowledge of robotic applications and implementation criteria.

6. COURSE ORGANIZATION

CONTENTS	
1	PLCs. Introduction.
2	PLC programming. Programmable logic and logical automatisms.
3	PLCs architecture.
4	PLCs advanced programming Control with PLCs.
5	SCADAs. Supervisory Control and Data Acquisition
6	Industrial robotics. Structures and general characteristics. Sensors and actuators used in robotics.
7	Robot programming.
8	Implementation and application of robots. Robots world market.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Continuous assessment activities and practices.	Laboratory evaluation	No	No	20,00
Section 1-5 Exam	Written exam	No	Yes	60,00
Section 6-8 Exam	Written exam	No	Yes	20,00
TOTAL				100,00
Observations				
Observations for part-time students				
Part-time students who can not attend the activities of continuous assessment and practices will be evaluated of those activities at the end of the semester through a practical test in the laboratory.				

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