

SUBJECT TEACHING GUIDE

M1205 - Integrated Systems for Manufacturing and Process Control

Master's Degree in Industrial Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Master's Degree in Industrial Engineering			Type and Year	Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Integrated Systems for Manufacturing and Process Control Industrial Technologies				
Course unit title and code	M1205 - Integrated Systems for Manufacturing and Process Control				
Number of ECTS credits allocated	5	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	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	LAURA CASTAÑÓN JANO				

3.1 LEARNING OUTCOMES

- Students will know PLCs, Programming and architecture.
Students will handle PLCs for logic automatism and for the implementation of regulation loops.
Students will know SCADA systems.
- Students will know the majority of industrial manufacturing process, their techniques and technologies.
Students will know about the main manufacturing systems and methodologies present in the industry and will be able to evaluate their efficiency.
Students will know the main inspection techniques and their technologies. And students will be qualified to carry out quality controls according to the statistical theory.

4. OBJECTIVES

Knowledge of the structure of a PLC, configurations and basic programming principles.
 Knowledge of the implementation of logic automatism and regulation loops.
 Knowledge of SCADA systems.

Knowledge of the main industrial manufacturing processes, their techniques and technologies.
 Knowledge of the different manufacturing systems used in the industry . Knowledge of cell manufacturing and group technology.
 Knowledge about inspection techniques and their technology. Application to quality control.

6. COURSE ORGANIZATION

CONTENTS

1	PLCs. General concepts. Basic programming.
2	Regulation and control. Architecture
3	SCADA systems. Supervisory control
4	Industrial manufacturing processes.
5	Support technologies for automated manufacturing (CAD-CAM).
6	Technology and procedures applied in the control of quality.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written programming exam of the blocks 1 and 2	Written exam	No	Yes	25,00
Multiple choice exam of the blocks 1, 2 and 3.	Written exam	No	Yes	10,00
Practical assessment of blocks 1, 2 and 3.	Laboratory evaluation	No	No	15,00
Written Exam of the lesson 4	Written exam	No	Yes	15,00
Written Exam of the lessons 5 and 6	Written exam	No	Yes	15,00
Project and practice reports of the lessons 4,5 and 6.	Work	No	No	20,00
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 practical classes and continuous assessment can overcome them by taking a practice exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

"Autómatas Programables", J. Balcells, J.L. Romeral, Ed. Marcombo, 1997

"Autómatas Programables. Entorno y aplicaciones", E. Mandado, J. Marcos, C. Fernández, J.I. Armesto, S. Pérez, Thomson Editores Spain, Paraninfo, 2005

"Automation, Production Systems, and Computer-Integrated Manufacturing". M. P. Groover. Fourth Edition. Pearson, 2016.

"Fundamentals of Modern Manufacturing. Materials, Processes, and Systems", M. P. Groover, Fourth Edition, 2010.