SUBJECT TEACHING GUIDE

1042 - Integrated Systems for Manufacturing and Process Control

Master's Degree in Industrial Engineering
Master's Degree in Industrial Engineering

Academic year 2023-2024

1. IDENTIFYING DATA

Degree	Master's Degree in Industrial Engineering Master's Degree in Industrial Engineering	Type and Year	Compulsory. Year 1 Compulsory. Year 1
Faculty	School of Industrial Engineering and Telecommunications		
Discipline	Integrated Systems for Manufacturing and Process Control Industrial Technology Industrial Technologies		
Course unit title and code	1042 - 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 CASTAÑON 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 wiill 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	%
Programming exam of the blocks 1, 2 and 3	Laboratory evaluation	No	Yes	30,00
Multiple choice exam of blocks 1, 2 and 3.	Written exam	No	Yes	20,00
Written Exam of blocks 4, 5 and 6	Written exam	No	Yes	30,00
Project and practice reports of the lessons 4,5 and 6.	Work	No	No	10,00
Practical assessment of blocks 4, 5 and 6.	Laboratory evaluation	No	No	10,00
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 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.