

## SUBJECT TEACHING GUIDE

G876 - Automatic Control Systems II

Degree in Electrical Engineering

Academic year 2022-2023

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				
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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  
 Knowledge of techniques for discrete implementation of regulators

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	Programmable logic controllers (PLCs). General concepts. Design and programming of logic functions.
2	Advanced programming. PLC-based process control. PLCs Architecture.
3	SCADA systems
4	General concepts of discrete systems. Z transform. Discrete transfer functions. Sampling and reconstruction.
5	Stability, steady state error and time response. Digital controller implementation.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Exam of Blocks 1, 2 and 3	Written exam	No	Yes	50,00
Exam of Blocks 4 and 5	Written exam	No	Yes	25,00
Practical assessment	Laboratory evaluation	No	No	25,00
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 and practices will be evaluated at the end of the semester through a practical test in the laboratory.

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

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

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.

