

SUBJECT TEACHING GUIDE

G999 - Digital Electronics

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 2 Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Industrial Electronics Module: Specific Technology				
Course unit title and code	G999 - Digital Electronics				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA				
Name of lecturer	CHRISTIAN BRAÑAS REYES				
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Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO ASOCIADOS GIC 1 (S3022)				
Other lecturers	ALEJANDRO NAVARRO CRESPIÑ				

3.1 LEARNING OUTCOMES

- Ability to analyze and design digital circuits, both combinational and sequential.
- Ability to design, perform experiments, analyze and understand results.

4. OBJECTIVES

Ability to apply the main concepts of Digital Electronics to solve practical problems and work autonomously.

Capacity for the Analysis and Synthesis of Combinational and Sequential Circuits.

Manage the necessary instrumentation in a Digital Electronics laboratory and interpret the obtained results

To know the existing CAD tools for the resolution of more complex problems using FPGAs.

Know the basic blocks and the operation of the microcontrollers.

6. SUBJECT PROGRAM

CONTENTS

1	Basic concepts: - Boole's Algebra - Numerical systems - Implementation of CMOS logic gates - Programmable devices
2	Combinational Design: - Logical minimization - Synthesis of combinational circuits - Combination design based on HDLs - Arithmetic circuits
3	Sequential design: - Latches and flip-flops - Design of sequential circuits - Registers and counters - Optimization of finite state machines - Sequential design based on HDLs
4	Blocks of digital systems: - RTL description - Memories - Control unit and "data path"

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final Exam	Written exam	Yes	Yes	40,00
Continuous evaluation	Others	No	No	30,00
Laboratory practices	Laboratory evaluation	Yes	Yes	30,00
TOTAL				100,00
Observations				
Given the uncertain situation that the social distancing measures established by the health authorities do not allow the development of some teaching activity in the classroom for all enrolled students, a mixed teaching modality will be adopted that combines this classroom teaching with distance teaching. In the same way, tutorials may be replaced by remote tutoring using telematic means.				
Observations for part-time students				
The evaluation criteria for part-time students are the same as for full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

R. H. Katz. Contemporary Logic Design. 2º Edi. Ed. Pearson Education.2005.