SUBJECT TEACHING GUIDE

G1006 - Design of Digital Electronic Systems

Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2022-2023

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: Further Digital Electronics Module: Further Specific Technology				
Course unit title and code	G1006 - Design of Digital Electronic Systems				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web	https://moodle.unican.es/course/view.php?idnumber=G1006_1819				
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	EUGENIO VILLAR BONET
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Other lecturers	IÑIGO UGARTE OLANO

3.1 LEARNING OUTCOMES
- Ability to describe the desired behavior of digital electronic systems, simulate the description, implement the system and prepare the test.
- Capacity to manage existing CAD tools to solve complex problems using FPGAs.
- Ability to operate the necessary instrumentation in an advanced digital electronics laboratory and critically interpret the results.
- Ability to design and apply digital test and analyze and interpret results.

4. OBJECTIVES

To provide students with ability to apply the concepts of digital electronics to solve practical problems and work independently.

To provide students the knowledge and skills required to develop industrial applications based on digital electronic systems using FPGA's design environments.

Ability to operate laboratory equipment to verify the performance of the digital system designed and critically interpret the results.

6. COURSE ORGANIZATION

CONTENTS	
1	Introduction to the design of digital systems Aproaches to the design of electronic systems Design process
2	Hardware Description Languages at Register-Transfer level Introduction to the VHDL language: CAD tools. Basic elements of the language: structural description, data flow description and behavior description. Design units and VHDL statements. description of Digital Electronic Systems. Management of memories, multipliers and IP blocks.
3	Verification of Digital Systems Introduction to the Testing of Digital Systems Design for Testability. Reliability of Digital Systems.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Continuous assessment	Others	No	Yes	20,00
Lab practices	Laboratory evaluation	No	Yes	50,00
Final exam	Written exam	Yes	Yes	30,00
TOTAL				100,00

Observations

If the student can not participate in an activity of continuous assessment , the corresponding percentage is added to the percentage of the final exam.
In the case that the health criteria make it necessary, the evaluation tests will be carried out following the mixed teaching format: classroom and non-classroom classes. In the most extreme case that students and teachers cannot go to the classroom, the assessment tests will be carried out using telematic tools. In these cases, the content of the tests, although similar to the face-to-face case, would be totally or partially individualized for each student.

Observations for part-time students

The percentage for the continuous assessment activities is added to the percentage of the final exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Lluís Terés, Yago Torroja, Serafín Olcoz, Eugenio Villar: "VHDL Lenguaje estándar de diseño Electrónico". Mc. Graw Hill

Pong P. Chu: "FPGA Proyotyping by VHDL examples". Wiley Interscience.