Universidad Zaragoza

Academic Year/course: 2023/24

67239 - Advanced Digital Systems

Syllabus Information

Academic year: 2023/24
Subject: 67239 - Advanced Digital Systems
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 622 - Master's in Electronic Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The objective of the subject is to train the student in the design methodology of digital electronic systems. It does not only study the basics to implement high-performance digital systems efficiently with FPGAs and ASICs, but also aims to achieve analysis and design capabilities.
These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the Agenda (2030https://www.un.org/sustainabledevelopment/es/) and certain specific targets, so that the acquisition of the learning results of the subject provides training and competence to the student to contribute to some extent to their achievement.

2. Learning results

-To know the design flow and technologies available for the fabrication of an integrated circuit.

-To know and apply the hierarchical design methodology for complex integrated circuits.

-To apply hardware description languages (HDL) in the design of digital blocks and the combination of these in complete functional systems.

- To know the design methodology of digital systems using reconfigurable hardware for prototyping and advanced circuit.

-To know and apply the design methodology for complex electronic systems

3. Syllabus

The contents to be developed are the following:

- Advanced description of digital systems using VHDL.
- High-level synthesis.
- System on Chip (SoC) design.
- ASIC design flow.

4. Academic activities

The program offered to the student to help them achieve the expected results comprises the following activities:

1) Master class (30 classroom hours).
Expository and explanatory sessions of contents. The concepts and fundamentals of digital electronic systems will be presented and illustrated with real examples. Student participation will be encouraged through questions and brief discussions.
2) Laboratory practices (25 classroom hours).
It will consist of the implementation of digital circuits, where the design methodology, the operation of the circuit, the handling of the instruments and the software tools of the laboratory will be evaluated.

5. Assessment system

The student must demonstrate that they has achieved the intended learning results through the following assessment activities:

Laboratory Practice (CL) (50%)
They will be graded by observation of the students' work in the laboratory and by analysis of the previous preparatory work and of the practical reports prepared by the students.
Grading from 0 to 10 points will represent 50% of the student's overall grade.

Theoretical-practical exam (CT) (50%)
Composed of theoretical-practical questions and problems, to be taken on the official calls. The student must obtain a minimum grade of **4 points out of 10** in this test to pass the subject.

If the student has obtained a CT grade greater than or equal to 4 points, the overall grade for the subject will be (0.5*CL+ 0.5 *CT). Otherwise, the overall grade will be: minimum of (4, (0.5 *CL+ 0.5 *CT)).

If the student has not passed any of these activities during the semester, they will be able to pass the subject by means of a global test in the two official calls. It will consist of a theoretical and practical exam (50%, minimum 4) and a laboratory exam (50%, minimum 4).

The subject is passed with an overall grade of 5 out of 10.