Universidad Zaragoza

Academic Year/course: 2024/25

30371 - Introduction to computers

Syllabus Information

Academic year: 2024/25
Subject: 30371 - Introduction to computers
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 581 - Bachelor's Degree in Telecommunications Technology and Services Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

Context:

The subject is taught in the second semester of the first year.

Goals:

This subject deals with the construction of a simple computer through a bottom-up modular design. Using the Boolean algebra and its properties, we start by representing information and transforming it. Work continues on the analysis and design of combinational circuits. Subsequent sequential circuits are then analyzed and designed. Finally, proposes the design of a general purpose programmable machine, i.e. a simple computer.

2. Learning results

- Know the fundamentals of digital logic design.
- Cover the operation of a large number of elementary combinational and sequential blocks.
- Be able to describe and design simple digital logic systems.
- Be capable of designing a simple computer at a basic level.

3. Syllabus

Introduction and mathematical fundamentals
Boolean Algebra
Logic gates
Technological restrictions

Numerical representation
Representation of natural numbers
Representation of integers
Basic arithmetic operations with integers
Representation of real numbers

Combinational systems
Analysis
Design
Combinational blocks

Sequential systems
Analysis
Design
Memory elements
Critical path and cycle time
Sequential blocks

Introduction to the digital computer: Single Machine

Structure and operation

Machine language architecture

Processing unit

Control unit

4. Academic activities

Face-to-face activities

- Type A01 activity (lectures): 30 hours
- Type A02 activity (problem classes): 15 hours
- Type A03 activity (practical classes): 15 hours
- Activity type A06 (job shadowing): 20 minutes

Non-face-to-face activities

- Activity type A05 (work performance): 04 hours
- Activity type A07 (preparation of practices): 08 hours
- Type A07 activity (self-study): 68 hours

Final assessment activity:

- Type A08 activity (written test): 04 hours
- Type A08 activity (practice tests): 06 hours

5. Assessment system

For all the tests, the correct development of the answers will be assessed, with a level of demand equal to that required during the classes.

The best option for each case will be considered.

Option A (including activities during the term):

- Written exam (open questions and/or exercises): 80%
- Quizzes and delivery of laboratory practices: 15%
- Work: 5%

Option B (not including activities during the term):

- Written exam (open questions and/or exercises): 95%
- Work: 5%

6. Sustainable Development Goals

8 - Decent Work and Economic Growth
12 - Responsible Production and Consumption