Universidad Zaragoza

Academic Year/course: 2024/25

30200 - Introduction to computers

Syllabus Information

Academic year: 2024/25
Subject: 30200 - Introduction to computers
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel
Degree: 439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

This subject belongs to the basic subject of Computers in the Computer Engineering Degree.

Approaches

To present the fundamentals of digital logic design.

Develop the analysis and design of combinational and sequential circuits.

Introduce a large number of elementary combinational and sequential blocks.

To develop at a basic level the design of a simple computer.

Objectives

That the student knows the indicated fundamentals.

That the student is able to describe and design simple digital logic systems.

That the student is able to design a simple computer at a basic level.

That the student exercises in the development of individual and team activities.

2. Learning results

- Understand and manage the concepts of representation, coding and manipulation of natural, integer and real numbers in finite precision support.
- Know the mathematical foundation of digital logic design and know how to apply it to specify synchronous systems.
- Know how to design a simple synchronous digital system with control, transformation and storage parts.
- To know the time limitations of digital circuits and to know how to calculate their maximum operating frequency.
- Understand the basic operation of a processor and the concepts of translation and interpretation.
- To know the basic structure of a processor: data path and control unit.
- Know how to write simple assembly programs.

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

Lectures: 30 hours

Types of problems: 15 hours

At the School of Engineering and Architecture of the Ebro River Campus

Practice classes: 15 hours
Introduction to the use of the simulator and combinational circuits (1 session)
Information Representation and Circuit Encapsulation (1 session)
Logic gates propagation time (1 session)
Combinational components (1 session)
Analysis and design of sequential systems (1 session)
Single Machine (2 sessions)

At the Polytechnic University School of the Teruel Campus
The learning activities offered to the student to help them achieve the expected results include, in addition to the 45 hours of lectures combined with problem classes:
- Practical classes
- Other possible activities, such as tutored assignments, tutored problems, etc.

5. Assessment system

The assessment test of the subject in the first and second call consists of:

- Exam in which problems must be solved and, if necessary, conceptual questions must be answered (max 8.5 points).

- Practical classes (maximum 1.5 points).