Universidad Zaragoza

Academic Year/course: 2023/24

39802 - Introduction to computers

Syllabus Information

Academic year: 2023/24
Subject: 39802 - Introduction to computers
Faculty / School: 326 - Escuela Universitaria Politécnica de Teruel
Degree: 634 - Joint Programme in Computer Engineering - Business Administration
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.

It is a subject whose evaluable contents alone do not yet provide the student with direct capabilities for contributing to the achievement of the Sustainable Development Goals, SDGs, of the 2030 Agenda (https://www.un.org/sustainabledevelopment/es/); however, they are essential to base the subsequent knowledge of the rest of the degree that is more directly related to the SDGs and therefore the 2030 Agenda.

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.
- 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

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:

- Written exam in which problems must be solved and, if necessary, conceptual questions must be answered (maximum 8 points).
- Practical work (maximum 2 points).