SUBJECT TEACHING GUIDE

G267 - Introduction to Computers

Degree in Computer Systems Engineering
First Degree in Computer Systems Engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Degree in Computer Systems Engineering First Degree in Computer Systems Engineering		Type and Year	Core. Year 1 Core. Year 1
Faculty	Faculty of Sciences			
Discipline	Subject Area: Fundamentals of Computer Science Basic Training Module			
Course unit title and code	G267 - Introduction to Computers			
Number of ECTS credits allocated	6	Term	Semester based (2)	
Web	https://moodle.unican.es/			
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA
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3.1 LEARNING OUTCOMES
- To know the basic principles of von Neumann architecture
- To understand the methods of representing and processing information in the computers at a low level , both numerical (integer and real) as alphanumeric.
- To know the basic principles that led to the development of the classical model of computer
- To know the main features of the functional units of the computer and its operating principles
- To understand how a computer wprks and the different phases of instruction execution
- To understand how data and instructions are represented in the computer memory
- To understand the relationship between the structure of the computer and the instruction set of low level
- To known the basics of assembly language and their addressing modes
- To know the correspondence that exists between the typical elements of high-level languages ??and assembly language
- To know the correspondence between assembly language and machine language
- To be able to design and implement algorithms and assembly language programs to manage types of numeric and alphanumeric data
- Use the low-level code style of programming.

4. OBJECTIVES
The main objective is to understand the basic principles of Computer Engineering. Students must understand how a modern computer Works. They must programming with some ease different algorithms and applications in assembly language and make a first analysis of the various functional units of a computer.
1. To understand computers, its functional blocks, machine language and assembly language.   2. To know data and instruction representation in the memory of a present -day computer.   3. To know the correspondence between the different levels of languages : high level, assembly and machine languages.   4. To design algorithms and programs involving functions using assembly language .

6. COURSE ORGANIZATION	
CONTENTS	
1	Introduction to computer engineering. Compile, link, load and execute. Von Neumann machine. RISC processor.
2	Representation of the information in a computer. - Natural numbers, integers, floats. - Characters - Overflow
3	Architecture of ARM processor - Assembly language - Machine language - Compiling, assembling and loading
4	ARM Assembly programming
5	Modular assembly programming
6	Microarchitecture ARM processor - Performance analysis - Single-cycle datapath and control

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Exams and workshops.	Others	No	Yes	50,00
Exams along the semester	Written exam	No	Yes	50,00
TOTAL				100,00

Observations

The califications obtained in the sections 'Evaluación teórico-práctica' and 'Evaluación laboratorio' can be repeated in july.

Observations for part-time students

Part-time students can choose between following the usual evaluation of the subject or doing a single exam. This must be communicated to the responsible of the course at the beginning of the semester.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Digital design and computer architecture. Sarah L. Harris, David Money Harris. Waltham, Massachusetts : Morgan Kaufmann, cop. 2016. ISBN: 978-0-12-800056-4

Modern assembly language programming with the ARM processor. Larry D. Pyeatt. Kidlington (UK) ; Cambridge (USA) : Newness/Elsevier, cop, 2016. ISBN: 978-0-12-803698-3