

## SUBJECT TEACHING GUIDE

G267 - Introduction to Computers

Degree in Computer Systems Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Computer Systems Engineering			Type and Year	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	<a href="https://moodle.unican.es/">https://moodle.unican.es/</a>				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA				
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Other lecturers	JESUS GUTIERREZ PRECIADO MARIANO BENITO HOZ				

### 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 works 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 know 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 program 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