

SUBJECT TEACHING GUIDE

G649 - COMPUTER STRUCTURES

Degree in Computer Systems Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Computer Systems Engineering			Type and Year	Compulsory. Year 2
Faculty	Faculty of Sciences				
Discipline	Subject Area: Computer Structures Compulsory Module				
Course unit title and code	G649 - COMPUTER STRUCTURES				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

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3.1 LEARNING OUTCOMES

- Knowing the basic principles of the von Neumann architecture which governs current computers.
- Understanding the structure and operation of a simple computer, and be able to make their own designs.
- Understand which factors influence the performance of computers and hardware and software aspects involved in these factors.
- Initiated in the techniques and performance evaluation models of computers that allow them to analyze, understand and compare different models and computer architectures.
- Understand the concept of memory hierarchy to minimize the effects of the growing distance between the location of the data and instructions and processor.
- Understanding the design and operation of the system I / O and peripherals are connected as the rest of the computer.
- Being able to program the functions Input / Output low level according to different techniques.
- Knowing the characteristics and components of existing computer systems.
- Be able to solve problems with initiative, decision making and creativity.
- Being able to interpret technical documents related to Computer Engineering.
- Learning to acquire knowledge independently, to work in groups and acquire leadership skills.
- Being able to communicate effectively, both in writing and orally knowledge, techniques, results and ideas related to the content of the subject studied.

4. OBJECTIVES

The main objective is that students know and understand the basic principles of Computer Engineering, especially those related to Computer Structure. You must be able to design a simple computer based on its basic components and analyze the performance of the various component parts.

6. COURSE ORGANIZATION

CONTENTS

1	Input-output systems. I/O Devices ; Mass storage devices; drivers; I/O Performance ; I/O Management phases
2	Input/Output management. Polling I/O: programming model; Interrupt-driven I/O: interrupt concept, interrupts management, interrupt controllers & programming model; Direct Memory Access; DMA concept, DMA controller, & programming model.
3	Drivers and True Devices Examples. Programming Drivers; Au1500 microprocessor interruptions; The interrupt controller; Serial communication; Timers.
4	Interconnection devices: buses. Introduction: computer components; Bus structure; Single bus architecture; Bus hierarchy; Design elements of a bus; The PCI bus: Time diagrams. Other interconnects: APB bus, PCI Express.
5	Memory Unit. basics: memory kinds, memory map and performance measures; Memory hierarchy; Main memory: organization and connection; Introduction to the cache.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Theory evaluation	Written exam	No	Yes	30,00
Global exercises evaluation	Written exam	No	Yes	40,00
Laboratory exercises	Laboratory evaluation	No	Yes	30,00
Additional evaluation tests that increase the mark	Work	No	No	0,00
TOTAL				100,00
Observations				
<p>Recovery period (Extraordinary Call): The recovery will be made only from those assessment sections that have not exceeded the minimum required grade, and must be submitted to all the subject included in the different tests carried out during the course . The recovery of the theory and problems sections will consist of a single exam that will be carried out on the date of the extraordinary call set by the center. In the Laboratory section, it will be mandatory to have delivered 50% of the proposed practices to be able to take the recovery test. The recovery test will consist of the development of a practice similar to those carried out during the course. The exam will be held in the laboratory after the Extraordinary Call, on a date set by the teacher.</p>				
Observations for part-time students				
<p>The part-time student in the ordinary call, may choose to follow the continuous evaluation of theory, problems and laboratory tests or perform only as described in the call for recovery.</p>				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

"Digital design and computer architecture. ARM Edition". S.L. Harris, D.M. Harris. Morgan Kaufmann, cop. 2016

"Computer Organization and Design: the hardware/software interface. ARM Edition". D. Patterson, J. Hennessy, Morgan Kaufmann 2017

"Organización y Arquitectura de Computadores". W. Stallings. 7ª Edición. Prentice-Hall, 2006