



Universitat de Lleida

DEGREE CURRICULUM  
**ARQUITECTURA DE  
COMPUTADORS**

Academic year 2013-14

## Subject's general information

<b>Subject name</b>	ARQUITECTURA DE COMPUTADORS
<b>Code</b>	102014
<b>Semester</b>	2n Q Avaluació Continuada
<b>Typology</b>	Obligatòria
<b>ECTS credits</b>	6
<b>Theoretical credits</b>	0
<b>Practical credits</b>	0
<b>Department</b>	Informàtica i Enginyeria Industrial
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.
<b>Language</b>	Catalan

CONCEPCIÓ ROIG MATEU

## Learning objectives

See competences

## Competences

Degree-specific competences

- Knowledge of the structure, organization, workings and inter-connexion of computer systems, the basis of their programming, and their applications in the resolution of engineering problems.

Goals

- Learning the organization of the information in the memory system in order to have efficiency in the acces.
- Understanding the steps involved in complex operations solved in the arithmetic unit.
  
- Ability to know, understand and evaluate computer structures and architecture, as well as the basic components which constitute them.

Goals

- Studying the global operation and the levels of the memory hierarchie in the computer.
- Studying the processes and the algorithms to carry out basic and complex operations in the arithmetic unit.
- Studying the pipeline mechanism to execute instructions inside the processor.

Degree-transversal competences

- Ability for abstraction and critical, logical and logical reasoning.

Goals

- Analyzing different solutions in terms of efficiency and cost. Being able to find which design solutions provide the best tradeoff.

## Subject contents

### 1. Arithmetic processing

#### 1.1. Adder circuits.

Half-adder, full-adder, parallel adder.

Carry-look-ahead.

#### 1.2. Binary multiplication algorithms.

#### 1.3. Binary division algorithms

#### 1.5. Floating point arithmetic

Floating point format

approximate representation: rank and precision

Add and subtract operations

Multiplications and division operations

## 2. Memory hierarchie

### 2.1. Introduction

- General concepts

- Principle of locality

### 2.2. *Cache memory*

- Cache memory configurations

- Mapping and identification of blocs

- Bloc replacing algorithms

- Writting policies

- Data consistency

- Cache performance

### 2.3. Main memory

- Organization for improving performace

- Alternative technologies

### 2.4. Virtual memory

- Elements of virtual memory

- Page table

- TLB (Transaction Look-aside Buffer).

## 3. Pipeline processing

### 3.1. Basic concepts

### 3.2. Hazard management

- Estructural hazards

- Data hazards

- Control hazards

### 3.3. Influcny of instrucion set

## 3.4. Superescalar execution

### Evaluation

N\_P1: nota primer parcial

N\_P2: nota segon parcial

N\_Pr: nota de pràctiques

La nota de l'assignatura es calcula aplicant els següents percentatges:

$$\text{NOTA\_FINAL} = 30\% \text{ N\_P1} + 50\% \text{ N\_p2} + 20\% \text{ N\_Pr}$$

Per tenir superada l'assignatura cal que NOTA\_FINAL sigui major o igual que 5.

En cas de no haver superat l'assignatura, es pot anar a l'examen de recuperació. En aquest cas la nota es calcularà de la següent manera:

N\_rec: nota de l'examen de recuperació

$$\text{NOTA\_FINAL} = 80\% \text{ N\_rec} + 20\% \text{ N\_Pr}$$

### Bibliography

Stallings W., *Organización y arquitectura de computadores*. (7 edición) Prentice-Hall.

Hamacher C., Vranesic Z., Zaky S. *Organización de computadores* (5ª edición). McGraw-Hill.

Ortega J., Anguita M., Prieto A. *Arquitectura de computadores*. Thomson.

Hennessy J. L., Patterson D. A. *Computer Architecture. A Quantitative Approach*. Morgan Kaufmann.