# Computer Organization

**Academic Year: ( 2019 / 2020 )** **Review date: 20-04-2020**

**Department assigned to the subject: Systems Engineering and Automation Department**

**Coordinating teacher: MORENO LORENTE, LUIS ENRIQUE**

**Type: Compulsory ECTS Credits : 6.0**

**Year : 3 Semester : 2**

**Branch of knowledge: Engineering and Architecture**

## DESCRIPTION OF CONTENTS: PROGRAMME

The program is composed by the following items:

1. Introduction to computation in parallel. Concept of parallelism and historic evolution.
2. General organization of a computer.
3. Conditions for the parallelism and analysis of the abilities. Analysis of dependencies. Levels of parallelism process and size of the grain. Characteristics of the performance. Theory performance models.
4. Segmentation fundaments. Basic concepts about segmentation.
Structures for controlling functional segmented units.
5. Segmented processors. Basic stages of a segmented processor with a static instructions planning. Types of risks and their possible solutions. Multicicle performance. Dynamic instructions planning. Dynamic jumps prediction.
6. Superscalar structures, supersegmented and VLIW. Superscalar and supersegmented processor concept. Uses of a superscalar processor and of supersegmented ones. VLIW processors.

## LEARNING ACTIVITIES AND METHODOLOGY

The activities carried out in teaching the subject are:

¿ Theoretical classes and exercises: 1,66 ECTS. (PO: a, b, e, f, g, h, i, k) will target specific cognitive skills of the subject. Students will receive lecture notes and have key reference texts.
Activities:
¿ Theoretical concepts included in the program, importance of matter, critical view of current architectures and importance of the aspects of the same benefits. Awareness of the need to learn new concepts throughout the life.
¿ Design and troubleshooting of computer architectures. Dependency analysis, simulation of execution on certain architectures, analysis of results, and proposals for improvement in the solution.
¿ Examples to make the student aware of the impact on the business of the election machine architecture or another.
¿ Improved communication skills through reading materials and written examinations.

¿ Practical sessions: 4 laboratory practices, an estimated three hours of student work at home to prepare and write memory, 0.75 ECTS. (PO: a, b, c, d, e, g, k)¿They will develop specific competencies and also transverse ones, such as teamwork, ability to apply knowledge to practice, planning and organize and analysis and synthesis. also aim to develop specific skills attitude.
This will imply:
¿ Developping more group practices over the course applying principles of computer systems to the field of computer engineering and partial support from the teacher.
¿ Making design problems based on initial specifications, students should study the specifications and propose and implement a solution.
¿ Students should use simulation tools to analyze and improve solutions to the problems posed.
¿ They will be developped working collaboratively, thereby increasing the ability to expand theoretical concepts and to demonstrate that the group is able to develop an experiment to fulfill requirements in time constraint conditions.
¿ Improve communication skills through written reports of practices.

¿ Conducting academic activities with the presence of the teacher: 1 ECTS. (RB: b, d, e, g, k)
¿ Resolution of exercises, case studies and experiments in participatory exercise class. Students should study cases and draw conclusions from them, both individually and collaboratively.

¿ Personal work. 1.5 ECTS. (PO: a, b, c, d, e, f, g, h, i, k)
¿ Self-Study of concepts and their implementation. Group work to end practices. Acquisition of extra information, the importance of OS in the profession and need for learning.

¿ Exams. 0.25 ECTS. (PO: a, b, c)

## ASSESSMENT SYSTEM

The course evaluation is based on a continuous model. The student mark will take into consideration the activities in the course. The course have a theoretical and a practical part.

The continuous evaluation of the theoretical and practical parts will be done through two partial exams.
* If the student pass both exams and the practical parts are done the course will be passed. If any of the practical parts are not done for any reason the student will contact with his/her professor to recover it.
* If one of the exams is not passed the student will have a recovery exam for the failed part.
The mark in the course will be the media between the passed exams (if both are passed) or between the passed and recovery exams. If the mark is gret or equal 5 the student will pass the course.

The practical sessions are required to pass the course.

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| **% end-of-term-examination:** | 0 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 100 |