

**COURSE DATA****Data Subject**

|                      |                                 |
|----------------------|---------------------------------|
| <b>Code</b>          | 42602                           |
| <b>Name</b>          | Computers and operating systems |
| <b>Cycle</b>         | Master's degree                 |
| <b>ECTS Credits</b>  | 6.0                             |
| <b>Academic year</b> | 2021 - 2022                     |

**Study (s)**

| <b>Degree</b>                            | <b>Center</b>         | <b>Acad. Period</b> |
|--|-----------------------|---------------------|
| 2116 - Master's Degree in Bioinformatics | School of Engineering | 1 First term        |

**Subject-matter**

| <b>Degree</b>                            | <b>Subject-matter</b>                | <b>Character</b> |
|--|--------------------------------------|------------------|
| 2116 - Master's Degree in Bioinformatics | 17 - Computers and operating systems | Optional         |

**Coordination**

| <b>Name</b>             | <b>Department</b>      |
|-------------------------|------------------------|
| ARNAU LLOMBART, VICENTE | 240 - Computer Science |

**SUMMARY**

In this course we will see the basic concepts of computer architecture. Analyze how information is represented in a computer and how to manage. Study of computer operating systems and give the basics of file system. Interconnection networks of computers and their use will be important to understand how the current computer systems. Analyze the execution of processes on a computer and finally we will see advanced concepts of high performance computing (HPC).

**PREVIOUS KNOWLEDGE****Relationship to other subjects of the same degree**



There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

None

## COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

### 2116 - Master's Degree in Bioinformatics

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.

## LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

We will dominate the basics of how computers work and function.

Know, understand and evaluate the structure and architecture of computers and the basic components that comprise them. Understand the binary representation of the information and how different types of data are stored on the computer. Understand the fundamentals of operating systems and use them to know.

Solve data management using a computer system. Understand and master the operation of the file system and how information is managed by the operating systems. Understand the concept of program.

## DESCRIPTION OF CONTENTS

### 1. Introduction to computer science.

Introduction to Computer Science. The computer as a tool for problem solving.



## **2. Representation of the information**

Representation of information in the computer. The binary system.

## **3. Computer Architecture**

We analyze the components of a Computer. Memory, arithmetic unit, disk, peripherals, etc..

## **4. Architecture of an operating system**

Operating systems controlling the operation of computers. See its structure and functioning.

## **5. Programs and processes**

We study the characteristics and differences between programs and processes.

## **6. Networks**

Concept, protocols, applications, common applications (file sharing, shared storage, web, XHTML and XML). Basic security.

## **7. Windows.**

We will study and manage the environment of windows operating systems.

## **8. Filesystems**

We will study the various file systems can use a computer to store information.

## **9. Process Management**

In computers for scientific computing is important a good process management. We will discuss how to launch and control processes.

**WORKLOAD**

| ACTIVITY                                     | Hours         | % To be attended |
|--|---------------|------------------|
| Theory classes                               | 18,00         | 100              |
| Laboratory practices                         | 12,00         | 100              |
| Development of group work                    | 5,00          | 0                |
| Development of individual work               | 15,00         | 0                |
| Study and independent work                   | 25,00         | 0                |
| Readings supplementary material              | 20,00         | 0                |
| Preparation of evaluation activities         | 15,00         | 0                |
| Preparing lectures                           | 10,00         | 0                |
| Preparation of practical classes and problem | 15,00         | 0                |
| Resolution of case studies                   | 10,00         | 0                |
| Resolution of online questionnaires          | 5,00          | 0                |
| <b>TOTAL</b>                                 | <b>150,00</b> |                  |

**TEACHING METHODOLOGY**

MD1 - Task training of the teaching-learning environment interaction in the classroom through expository sessions. Previous assignments include preparation (information search, reading texts supplied by teachers), teaching sessions themselves and the later work of deepening. MD2 - Learning through problem solving and case studies, through which it is acquiring skills on different aspects of materials and subjects. MD3 - Hands-on lab. Include preparation, implementation of practices to monitor and teacher support, independent work online and reporting practices. MD4 - Cross-disciplinary skills. Include attendance at courses, conferences or round tables organized by the CEC of the Master and / or conduct of a bibliographic work on issues that contribute to the integral. It produces a report of activities.

**EVALUATION**

In the two calls:

SE1 Continuous assessment: minimum 5 and maximum 15.

SE2 Activities: minimum 10 and maximum 20.

SE3 Laboratory: minimum 25 and maximum 75.

SE4 Exams: minimum 10 and maximum 40.



## REFERENCES

### Basic

- Referencia b1: INTRODUCCIÓN A LA INFORMÁTICA (Cuarta Edición). Alberto Prieto, Antonio Lloris, Juan Carlos Torres. Ed. McGraw-Hill. 2006.
- Referencia b2: FUNDAMENTOS DE SISTEMAS OPERATIVOS. SANTIAGO CANDELA, EDICIONES PARANINFO, S.A., 2007. ISBN 9788497325479

### Additional

- Referencia c1: INTRODUCCION A LA INFORMATICA (ED. 2012). ANA MARTOS RUBIO, ANAYA MULTIMEDIA, 2011. ISBN 9788441529410
- Referencia c2: LINUX. V.V. A.A. Ed. ANAYA MULTIMEDIA. 2010. ISBN 9788441527256

## ADDENDUM COVID-19

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

**English version is not available**