System Software

Code: 104385
ECTS Credits: 6

2024/2025

Degree	Type	Year
2503740 Computational Mathematics and Data Analytics	FB	1

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

This is a first year and first semester subject, therefore, there are no prerequisites required.

Objectives and Contextualisation

The objective of this subject is to offer the students an overview of a computer system showing the different levels involved in the system software and the tools used for the development and maintenance of applications

Learning Outcomes

1. CM06 (Competence) Develop effective algorithmic solutions to computational problems in accordance with the established requirements.
2. CM06 (Competence) Develop effective algorithmic solutions to computational problems in accordance with the established requirements.
3. CM07 (Competence) Analyse the computational complexity of the algorithmic solutions to develop and implement the one that guarantees the best performance.
4. CM07 (Competence) Analyse the computational complexity of the algorithmic solutions to develop and implement the one that guarantees the best performance.
5. CM08 (Competence) Ensure the correct functioning of an algorithmic solution in accordance with the requirements of the problem to be solved.
6. KM06 (Knowledge) Recognise the basic concepts of computer logic, structure and programming.
7. KM07 (Knowledge) Describe the basic functioning of computer systems.
8. KM08 (Knowledge) Recognise the methods, systems and technologies specific to computation.
9. SM07 (Skill) Use operating systems and software commonly used in various fields.
10. SM07 (Skill) Use operating systems and software commonly used in various fields.
11. SM08 (Skill) Use algorithmic and data representation structures suitable for problem-solving.

Content

1.- Interface User-Operating System (shell scripts)

2.- Advanced tools (awk, version control tools)

3.- Program compiling and debugging tools (make, gdb, IDEs).

4.- Basic introduction to Operating Systems

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practice	10	0.4	
Problems	10	0.4	
Theory	23	0.92	
Type: Autonomous			
Study of the subject, preparation and implementation of problems and practices	101	4.04	

Theory: The theory part of the subject combines sessions where the theoretical concepts of the subject will be introduced with hands-on sessions when the syllabus allows it. The detailed content of each session will be detailed in the planning of the subject that will be published on the first day of class in the Virtual Campus.

Problems: The problem part consists of analyzing and solving exercises in the classroom. The sessions dedicated to this teaching typology, as well as the content of each session, will be detailed in the planning of the subject that will be published on the first day of class in the Virtual Campus

Practices: The practical activity consists of solving practical projects in groups. These practical assignments will include different theoretical concepts introduced and worked on in theory and problem sessions. The sessions dedicated to practices and its content will be published in the Virtual Campus of the subject.

Transversal Competences

In this subject, the transversal competences are:

- T01.00 - To evaluate in a critical way and with quality criteria the work developed,
- T02.00 - To work cooperatively in a multidisciplinary context assuming and respecting the role of the different members of the team
- T04.00 - To efficiently use the bibliography and electronic resources to obtain information,

These competences will be evaluated, mainly, in the sections of Problems and Practices. The objectives of these activities are to pose problems of a certain complexity, which the students have to solve autonomously, interrelating different concepts explained in Theory. The proposed solutions will have to be argued, explaining how the proposed solution has been reached.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practices	40	2	0.08	CM06, CM07, CM08, KM06, KM07, KM08, SM07, SM08
Theory/Problems Control 1	30	2	0.08	CM06, CM07, CM08, KM06, KM07, KM08, SM07, SM08
Theory/Problems Control 2	30	2	0.08	CM06, CM07, CM08, KM06, KM07, KM08, SM07, SM08

a) Training activities

Theory / Problems Control 1: 30% of the final grade;

Theory / Problems Control 2: 30% of the final grade;

Practices: 40% of the final grade;

The weighted average of the three type of training activities must be at least a grade of 5 in order to pass the subject. In addition, a minimum grade of 5 is required in the average of the two controls and a minimum grade of 5 is also required in the Practices.

Regarding controls, reassessments and any evaluable activity, no student will be allowed to enter after 5 minutes from the start of the test/activity. Mobile phones cannot be used in the evaluative tests.

b) Training activities schedule

The scheduling of the evaluation activities will be given on the first day of the subject and will be made public through the Virtual Campus. These dates may be subject to programming changes for reasons of adaptation to possible incidents; these changes will always be informed through the virtual campus since it is understood that this is the usual mechanism of exchanging information between lecturer and students.

c) Retake Process:

Those students who, having done the continuous assessment, have not achieved the minimum necessary to pass the subject, will have the option to retake the entire Theory / Problems part in a single exam. The maximummark that can be obtained in this exam is a 7, therefore, this will be the maximum mark that can be obtained in the Theory/Problems part of the retake process. The part of Practices, given its nature, cannot be retaken.

d) Procedure for qualifications review

For each evaluation activity, a place, date and time will be indicated allowing students to review the activity with the lecturer. If students do not take part in this review, no further opportunity will be made available.

e) Qualifications

In order to pass the course with honours, the final grade must be a 9.0 or higher taking into account the number of students enrolled in the course and bearing in mind the regulation of UAB.

Given that evaluation methodology is continuous assessment, the fact of presenting any training activity (exercises, tests, problems, control, practices ...) is interpreted as the intention of being evaluated on that subject and, therefore, the grade will be different than *Not Avaluable* (NA). An NA grade can only be obtained by not delivering evaluable evidences throughout the course

f) Irregularities by the student, copy and plagiarism

Notwithstanding other disciplinary measures deemed appropriate, and in accordance with the academic regulations in force, assessment activities will receive a zero whenever a student commits academic irregularities that may alter such assessment. Assessment activities graded in this way and by this procedure will not be re-assessable. If passing the assessment activity or activities in question is required to pass the subject, the awarding of a zero for disciplinary measures will also entail a direct fail for the subject, with no opportunity to re-assess this in the same academic year. Irregularities contemplated in this procedure include, among others:

• the total or partial copying of a practical exercise, report, or any other evaluation activity;

• allowing others to copy;

• presenting group work that has not been done entirely by the members of the group;

• the unauthorized use of AI (for example Copilot, ChatGPT or equivalent) to solve exercises, practices and/or any other evaluable activity;

• presenting any materials prepared by a third party as one's own work, even if these materials are translations or adaptations, including work that is not original or exclusively that of the student;

• having communication devices (such as mobile phones, smart watches, etc.) accessible during theoretical-practical assessment tests (individual exams).

In summary: copy, let copy or plagiarize (or attempt) in any of the evaluation activities, is equivalent to grade NO PASS, not compensable and without validation of parts of the subject in subsequent courses.

h) Single evaluation

This course does not contemplate the single evaluation system.

Bibliography

"Bash Guide for Beginners". Machtelt Garrels. eBook disponible a https://tecmint.tradepub.com/free/w_mach02/

"Pro Git". Scott Chacon, Ben Straub. Apress 2014. eBook disponible a https://git-scm.com/book/es/v2

"Advanced Bash-Scripting Guide". Mendel Cooper. eBook disponible a https://tecmint.tradepub.com/free/w_advb01/

"Autotools: A Practioner's Guide to GNU Autoconf, Automake, and Libtool". John Calcote. No Startch Press, San Francisco, 2010.

"Eclipse IDE Pocket Guide". Burnette, Ed. Sebastopol, CA : O'Reilly Media. 2005. [eBook]

"Sistemas operativos : una visión aplicada". Jesús Carretero Pérez [et al.]. McGraw Hill 2001.

"Introduction to Linux - A Hands on Guide". Machtelt Garrels. eBook disponible a https://linuxquestions.tradepub.com/free/w_mach01/

"Getting started with Ubuntu 16.04". The Ubuntu Manual Team 2016. Disponible a http://arbas.assam.gov.in/resources/pdf/ubuntu_16.04.pdf

Software

VirtualBox (virtualbox.org)

Ubuntu (ubuntu.com)

Git (https://git-scm.com/)

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	2	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed