UAB
Universitat Autònoma de Barcelona

Fundamentals of Computer Systems

Code: 106398
ECTS Credits: 6

2025/2026

Degree	Type	Year
Business and Information Technology	FB	2

Contact

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Teachers

Vicente José Ivars Camañez

Teaching groups languages

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

Prerequisites

It would be advisable to have previously studied the subjects of Fundamentals of Programming and Introduction to Problem Solving and Design of Algorithms. It is important to have an acceptable level of programming.

Objectives and Contextualisation

The student will be familiar with the basic structure of a computer system and its interconnection systems. The student will learn what is an Operating System and the services it provides to users and applications.

The subject will also introduce issues related to distributed systems, such as servers, virtualization or the cloud, among others.

Learning Outcomes

1. CM27 (Competence) Recommend the best IT solution, considering not only the technical and financial requirements but also the difficulties arising from implementation.
2. KM15 (Knowledge) Specify the basic structure of operating systems, both local and distributed.

Content

0. Course Introduction: Presentation, syllabus, and course regulations.

1. Structure of Computer Systems: Main components of a computer system: Processor, memory systems, and storage systems. Units of measurement for these components. Representation systems. How does a computer system work?, Machine instructions and data. Containers and Virtual Machines.

2. Processes and Threads: Program execution. Definition and characteristics of processes and threads. Creation and management of processes and threads. Introduction to concurrency and its associated problems.

3. Introduction to Operating Systems: What is an Operating System? Basic structure. Scheduling, functions, system calls, and services. Multiprogramming.

4. Interconnection of Computer Systems and Its Role in Decision Support: Main types of networks and interconnection protocols that enable communication between different computer systems.

5. The Future is Already Here: Introduction to Distributed Systems: Definition. Different types of distributed systems: Servers, clusters, cloud, etc. Distributed software. IT solutions.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory	10	0.4	
Problem & practice	10	0.4	
Theory	29.5	1.18	
Type: Supervised			
Tutoring	15	0.6	
Type: Autonomous			
exercices solving	81.5	3.26	

Theory:

The theoretical part of the subject will be explained in the hours reserved for the course and published by the Faculty. The content of each one of the classes is detailed in the planning sheet of the subject (schedule) that will be published on the first day of class, in the Virtual Campus. Any modification of this initial schedule will be notified via Virtual Campus.

Problems:

The hours dedicated to problem classes are indicated, each course, in the timeframe elaborated by the Faculty. The central issue to be addressed in each session of problems is indicated in the timeline. In order for the students to have time to prepare for the problems of each session, they will be published sufficiently in advance.

Practices:

The practices will be done in sessions distributed during the course according to the corresponding timetable published in the Virtual Campus. Practice professors will generate date and time lists. Practice groups must consist of two students. The activation date for the registration of the practice groups will be made public through a news in the Virtual Campus. Until that moment, the hours and dates of the sessions of the different groups can only be consulted.

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
Activities developed in the classroom	10%	0	0	KM15
Laboratory	30%	0	0	
Theory and problems	60%	4	0.16	CM27, KM15

This subject/module does not offer the option for comprehensive evaluation.

The proposed assessment method may be subject to change depending on any restrictions on in-person attendance imposed by health authorities.

The course evaluation is divided into three parts: Theory, Problem-Solving, and Practical Work.

The Theory component represents 70% of the final grade. Within this, Problem-Solving accounts for 30% of the Theory mark.

The remaining 30% of the final grade corresponds to the Practical Work assessment.

The details of how each component will be assessed are as follows:

Theory:

The theory component will be taught during the time slots allocated for lectures in the official course timetable published by the School. The specific content of each session will be detailed in the course schedule (chronogram), which will be published on the Virtual Campus on the first day of class.

Theory will be assessed through two midterm exams. The dates and content of each of these exams will be indicated in the course schedule. The theory grade will be the average of both exams. A minimum mark of 3.5 out of 10 on each exam is required in order to calculate this average.

Please note that the first midterm cannot be retaken on the day of the second midterm.

Some theory classes will include assessable activities which, due to their nature, cannot be rescheduled or repeated. The grade obtained from these exercises will count for 10% of the final course grade.

Problem-Solving:

Problem-solving sessions will take place during the time slots indicated in the official timetable published by the Faculty. If needed, students will be required to register for problem-solving groups via the appropriate tool on the Virtual Campus. Students will be informed at the beginning of the course about whether registration is required and the deadline fordoing so.

The main topic to be addressed in each problem-solving session will be detailed in the course schedule.

Problem-solving will be assessed twice, as part of the two theory midterms, and will account for 30% of the exam grade.

Practical Work:

Practical work will take place in scheduled sessions throughout the semester, according to the timetable published on the Virtual Campus. The practical instructors will create the lists of dates and times. Students will work in pairs for the practical sessions.

The date when registration opens will be announced via a post on the Virtual Campus. Until then, students will only be able to view the available time slots.

Attendance and punctuality are mandatory for all sessions in order to pass the practical component.

To pass the practical work, students must:

Attend all sessions

Ensure their work functions correctly

Obtain validation from the instructor

Answer individual questions from the instructor

Submit a written report including:

Objectives of the practical

Description and design (flowchart, pseudocode)

Problems encountered during implementation

Conclusions drawn from the work

Source code of the program

Compilation instructions, including options that allow the instructor to generate the executable

An individual practical exam may be held in the last session for students the instructor deems necessary.

Except for the Problem-Solving component, a minimum mark of 5 out of 10 is required in both the Theory and Practical Work components to pass the course. For example, scoring an 8 in theory and a 4 in practical work (or vice versa) does not result in a pass. The problem-solving grade will only be added if both the theory and practical parts are passed.

Students who do notmeet the minimum grade of 5 in any of the components but have an average course grade between 5 and 6 will receive afinal course grade of 4, and they will be eligible for remedial assessment, as described below.

Important:

Since the course uses a continuous assessment model, submitting any assessable evidence (exercises, exams, practicals, etc.) will be considered an intention to complete the course and will result in a grade being assigned. A "Not Assessed" (NA) grade is only possible if no assessable evidence has been submitted during the entire semester.

Correct formal expression, both written and spoken, is essential at the university level and will therefore be part of the assessment criteria. In all submitted documents, up to 20% of the grade for each assessable item may be deducted for spelling mistakes, grammatical errors, or poor presentation, according to the instructor's criteria.

Assessment Schedule

The dates for the various assessment activities (midterms, exercises, assignments, etc.) will be announced sufficiently in advance during the semester.

The final exam date is published in the Faculty's official exam calendar.

"The scheduling of assessment activities may not be altered, except in exceptional and duly justified circumstances that prevent a particular assessment from taking place. In such cases, the persons responsible for the programme, after consulting the instructors and affected students, will propose a new date within the corresponding teaching period."

Article 115.1 - Assessment Activities Calendar (UAB Academic Regulations)

Students at the Faculty of Economics and Business who need to request a change of exam date must complete the form at:

https://eformularis.uab.cat/group/deganat_feie/solicitud-reprogramacion-de-pruebas

Review of Grades

The date and method of publication of final gradeswill be announced along with the final exam. The procedure, time, and place for reviewing grades will also becommunicated, in accordance with university regulations.

Remedial Assessment (Resit)

"To be eligible for remedial assessment, students must have been assessed on a set of activities representing at least two-thirds of the total grade for the subject or module."

Article 112 ter.3 - Remedial Assessment (UAB Academic Regulations)

To take part in remedial assessment, students must have obtained a final average grade between 3.5 and 4.9.

The date of the resit is included in the Faculty's official exam calendar. Students who pass the resit will receive a final grade of 5. If they fail, their original grade will remain unchanged.

The resit will consist of two parts: one for Theory/Problem-Solving and another for Practical Work.

Theory/Problems: Students must pass a written exam covering the entire course. This will include theoretical questions and complex problems involving various topics.

Practical Work: Students who attended all practical sessions but failed this component may resit by submitting individual recovery assignments and taking an individual written exam.

Irregularities in Assessment Activities

In addition to any applicable disciplinary measures, the following will apply in cases of academic dishonesty:

"If a student commits any irregularity that could significantly affect the grade of an assessment activity, that activity will be graded with a zero, regardless of any disciplinary process that may be initiated. If multiple irregularities occur in the same course, the final grade will be zero."

Article 116.10 - Assessment Results (UAB Academic Regulations)

Restricted Use of Artificial Intelligence:

In this course, the use of Artificial Intelligence (AI) tools is permitted only for non-assessable activities or for take-home assignments,such as information retrieval, spell-checking, or code review.

AI tools are strictly prohibited in all in-class assessment activities, including exams, quizzes, and in-class exercises.

Students must clearly indicate which parts of any assignment were generated using AI tools, specify the tools used, and include a brief critical reflection on how these tools contributed to the process and final result.

Lack of transparency in the use of AI will be considered academic dishonesty and may lead to partial or full penalties on the assignment, or more serious disciplinary actions, depending on the severity.

Bibliography

Basic bibliography

Theory:

- "Concepts of Computing" Alberto Prieto and Beatriz Prieto. Schaum (Mc Graw Hill) 2005 Operating Systems ". Silberschatz, Galvin and Cagne. 7th Edition. 2006 "
- "Operación Sistemas, Una visión aplicada". Jesús Carretero, Pedro DeMiguel, Félix Gracía, Fernando Costa, Mc Graw Hill 2003
- "Operating Systems". William Stallings, 5th Prentice Hall 2005 Edition

Practices:

- The programming environment Unix, R. Pike & Brian Kernighan, Ed. Mc. Graw-Hill
- Advanced Unix programming, Rockind M. Ed. Prentice-Hall

The Virtual Campus will also publish information that is considered useful for the development of the subject

Software

- Visual Studio Community 2019
- C compiler for Linux
- Windows Subsystem for Linux (WSL), for running Linux environments on Windows
- Docker, for creating and running containers with preconfigured development environments

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	201	Spanish	first semester	morning-mixed
(PAUL) Classroom practices	202	Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	201	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	202	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	203	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	20	Spanish	first semester	morning-mixed