

**1. General information****Course:** OPERATING SYSTEMS I**Type:** CORE COURSE**Degree:** 405 - DEGREE IN COMPUTER SCIENCE ENGINEERING (TA)**Center:** 15 - FACULTY OF SOCIAL SCIENCES AND INFORMATION TECHNOLOGIES**Year:** 2**Main language:** Spanish**Use of additional languages:****Web site:** Subject's virtual site: <https://campusvirtual.uclm.es>**Code:** 42313**ECTS credits:** 6**Academic year:** 2021-22**Group(s):** 60**Duration:** First semester**Second language:** English**English Friendly:** Y**Bilingual:** N**Lecturer:** IVÁN GONZÁLEZ DÍAZ - Group(s): 60

| Building/Office | Department | Phone number | Email | Office hours |
|-----------------|---------------------------------------|--------------|--------------------|---|
| 2.1 | TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN | 926051583 | ivan.gdiaz@uclm.es | https://www.uclm.es/toledo/fcsociales/gradoinformatica/profesorado-y-tutorias |

2. Pre-Requisites

This subject is based on the skills and knowledge acquired in the subjects:

- Programming Fundamentals I
- Programming Fundamentals II
- Computer Architecture Fundamentals

3. Justification in the curriculum, relation to other subjects and to the profession

An operating system is a program that manages the hardware of a computer and ease the interaction between it and the user. Therefore, it is a low-level software element that acts as an interface between the high-level software and the hardware. In this subject we address how a program can finally run on a physical system (hardware), an critical knowledge for a computer engineer. It can be considered as one of the fundamental subjects of the degree and appears in all curricula, both national and international.

This subject belongs to a degree that complies with that specified in the Resolution of 8 June 2009, of the -Secretaría General de Universidades- that includes recommendations to be established in the University proposals of degrees related to the profession of Technical Engineer in Computer Science, and covering the specific competences common to the branch of computing [CO5] Knowledge, administration and maintenance of computer systems, services and applications, and [CO10] Knowledge of the characteristics, functionalities and structure of the Operating Systems and to design and implement applications based on their services. Therefore, this is a subject that must be taken on a compulsory basis in the curriculum, regardless of the specific technology that the student wants to enroll.

The knowledge acquired in this subject is complemented, not only with those obtained in the subjects mentioned in the section of prerequisites, but also with those of other subjects in the curriculum (Computer Organization, Concurrent Programming and Real Time) as well as with those of higher course subjects (Distributed Systems, Operating Systems II, etc.).

4. Degree competences achieved in this course**Course competences**

| Code | Description |
|-------|---|
| CO05 | Knowledge, administration, and maintenance of systems, services and digital systems. |
| CO10 | Knowledge about the features, functions, and structures of operating systems and the design and implementation of applications based on their services. |
| INS01 | Analysis, synthesis, and assessment skills. |
| INS04 | Problem solving skills by the application of engineering techniques. |
| INS05 | Argumentative skills to logically justify and explain decisions and opinions. |
| PER01 | Team work abilities. |
| PER02 | Ability to work in an international context. |
| PER04 | Interpersonal relationship skills. |
| PER05 | Acknowledgement of human diversity, equal rights, and cultural variety. |
| SIS01 | Critical thinking. |
| SIS03 | Autonomous learning. |

5. Objectives or Learning Outcomes**Course learning outcomes**

Description

Understanding and use operating systems, both at user level and at programming level using its services.

Performance of the basic administration of an operating system.

6. Units / Contents

Unit 1: Introduction to Operating Systems

Unit 2: File System

Unit 3: Process Management

Unit 4: Main Memory Management

Unit 5: Input/Output Management

ADDITIONAL COMMENTS, REMARKS

Lab activities:

1. The UNIX Working Environment
2. C Programming
3. File Management
4. Process Management

7. Activities, Units/Modules and Methodology

| Training Activity | Methodology | Related Competences (only degrees before RD 822/2021) | ECTS | Hours | As | Com | Description |
|--|----------------------------------|---|---|------------|----|-----|--|
| Class Attendance (theory) [ON-SITE] | Lectures | CO05 CO10 | 0.72 | 18 | N | - | Teaching of the subject matter by lecturer (MAG) |
| Individual tutoring sessions [ON-SITE] | | CO05 CO10 | 0.18 | 4.5 | N | - | Individual or small group tutoring in lecturer's office, classroom or laboratory (TUT) |
| Study and Exam Preparation [OFF-SITE] | Self-study | CO05 CO10 INS01 SIS01 SIS03 | 2.1 | 52.5 | N | - | Self-study (EST) |
| Other off-site activity [OFF-SITE] | Practical or hands-on activities | CO05 CO10 INS01 INS04 PER01 PER02 PER04 SIS03 | 0.6 | 15 | N | - | Lab Activities Preparation (PLAB) |
| Problem solving and/or case studies [ON-SITE] | Problem solving and exercises | CO05 CO10 INS04 INS05 PER02 PER04 PER05 | 0.6 | 15 | Y | N | Worked example problems and cases resolution by the lecturer and the students (PRO) |
| Writing of reports or projects [OFF-SITE] | Self-study | CO05 CO10 INS01 INS04 INS05 PER01 PER02 PER04 PER05 SIS03 | 0.9 | 22.5 | Y | N | Preparation of essays on topics proposed by lecturer (RES) |
| Laboratory practice or sessions [ON-SITE] | Practical or hands-on activities | CO05 CO10 INS01 INS04 INS05 PER02 PER04 PER05 | 0.6 | 15 | Y | Y | Realization of practicals in laboratory/computing room (LAB) |
| Final test [ON-SITE] | Assessment tests | CO05 CO10 INS01 INS04 INS05 PER01 | 0.3 | 7.5 | Y | Y | Final test of the complete syllabus of the subject (EVA) |
| Total: | | | 6 | 150 | | | |
| Total credits of in-class work: 2.4 | | | Total class time hours: 60 | | | | |
| Total credits of out of class work: 3.6 | | | Total hours of out of class work: 90 | | | | |

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

| Evaluation System | Continuous assessment | Non-continuous evaluation* | Description |
|------------------------------------|-----------------------|----------------------------|---|
| Assessment of active participation | 10.00% | 10.00% | Non-compulsory activity that can be retaken, to be carried out during the theory/lab sessions for the students of the continuous assessment. The students with non-continuous assessment will be evaluated of this activity through an alternative system in the final exam call (convocatoria ordinaria) |
| Final test | 50.00% | 50.00% | Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria) |
| Theoretical papers assessment | 15.00% | 15.00% | Non-compulsory activity that can be retaken. To be carried out before end of teaching period |
| Laboratory sessions | 25.00% | 25.00% | Compulsory activity that can be retaken. To be carried out during lab sessions |
| Total: | 100.00% | 100.00% | |

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:**Continuous assessment:**

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The final exam will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students who are unable to attend training activities on a regular basis may apply at the beginning of the semester for the non-continuous assessment mode. Similarly, if a student who is undergoing continuous assessment incurs any circumstance that prevents her/him from regularly attending the classroom-based training activities, she/he may renounce the accumulated mark in continuous assessment and apply for the non-continuous assessment mode. In this case, a notification by the student must be given before the date scheduled for the tests in the ordinary call, in accordance with a deadline that will be informed at the beginning of the semester.

In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous assessment mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous assessment".

In the "non-continuous assessment" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call

9. Assignments, course calendar and important dates**Not related to the syllabus/contents**

| Hours | hours |
|-------|-------|
|-------|-------|

General comments about the planning: The subject is taught in 3 x 1,5 hour sessions per week.

10. Bibliography and Sources

| Author(s) | Title/Link | Publishing house | Citv | ISBN | Year | Description |
|-----------------------|----------------------------|-------------------|------|-------------------|------|-------------|
| Kernighan, Brian W. | The C Programming Language | Pearson Educación | | 0-13-110370-9 | 1988 | |
| Silberschatz, Abraham | Operating Systems Concepts | McGraw-Hill | | 978-1-118-06333-0 | 2013 | |