

UPR Mayaguez
Department of Computer Science and Engineering
Department of Electrical and Computer Engineering
Syllabus for CIIC 4050 / ICOM 5007 – Operating Systems – Fall 2022

Faculty

Professor: Carlos J. Vélez-Rivera
 Email: c.velez@upr.edu
 Office: OF-331 (tentative)
 Office hours¹: T, Th: 1:30-3:30PM

Location	CIIC-096/ICOM5007-096	T/Th 3:30PM – 4:45PM	S-113
Laboratory	CIIC/ICOM 010L	W, 7:30AM – 10:20AM	S-121
	CIIC/ICOM 011L	W, 7:30AM – 10:20AM	S-114a
	CIIC/ICOM 040L	W, 10:30AM – 1:20PM	S-121
	CIIC/ICOM 041L	W, 10:30AM – 1:20PM	S-114a
Teaching Assistants:	Ruth M. Huaman	Iván Conde	
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General Description

The goal in this course is for students to learn the fundamental principles of operating systems, which are essential to understand the problems addressed by such systems and study the strategies and fundamental algorithms or schemes followed to solve them. We will also have hands-on experience with implementation of some parts of an operating system; in particular, the course activities include some programming assignments using the educational-oriented operating system known as MINIX 3, Linux. The particular topics to cover include:

- General operating system concepts
- Processes and scheduling
- Memory management
- File systems
- Management of input/output
- Deadlocks
- Protection and security
- Distributed processing

Throughout the course we may use examples from real modern operating systems to illustrate concepts covered in class and how they are addressed in particular systems. The course counts for 4 credits.

Pre-requisites

ICOM4035 (or equivalent) and INEL4206. Students must also have sufficient computer programming skills and basic knowledge of Linux-like OS. Most of the programming to be done in this course will

¹ To meet at an hour different from the ones listed here you need to make an appointment.

be using C language (and perhaps C++) language and Java. Some general discussion about C language will be offered during lab hours. It is expected that experience with other programming languages (such as Java) and in software development in general allow you to quickly grasp the essentials of that language. Most of the code examples to be discussed are written in C/C++.

Time, Place and Instruction Modality

The course will follow a flipped classroom strategy. Online lectures will be made available on the course website, at <https://online.upr.edu>, in advance of the corresponding classroom meeting. This allows for closer and more active engagement of lecture topics with students in the classroom. In the event that in-person classes are not allowed, classes will meet synchronously via Teams, using the following [join link](#) (ID: 232 816 524 543), which is also available on the course website. The professor will be available to discuss course material and course and laboratory logistics at office hours as well as in regular class hours upon request by students.

Laboratory activities will be provided on the same online platform as course material. As with the regular instruction modality, the final grade on any activity is assigned by the professor after reviewing the student's attempt. This means that ***any partial grade assigned by the platform during the evaluation is subject to revision and adjustment by the professor.***

Textbook and References

Required:

Title	Operating Systems Concepts (9 th Edition)
Authors	Abraham Silberschatz, Peter Galvin, Greg Gagne
Publisher	Wiley,
ISBN	978-1-118-12938-8

Recommended References:

- Operating System Design and Implementation (3rd Edition), Andrew Tanenbaum, Albert S. Woodhull, Pearson, 2006.
- Modern Operating Systems (3rd Edition), Andrew S. Tanenbaum, Pearson / Prentice Hall, 2008.
- Linux Kernel Development (3rd Edition), Robert Love, Addison Wesley, 2010.
- Get used to surf the Web to look for tutorials about each of the topics covered. For example, use Google to search for OS topics such as “minix 3” or “virtual memory tutorial” and you will get access to online resources and tutorials about them. These are excellent resources to complement what is seen in class, in the laboratory or in the textbook.
- In addition, you can rely on other web sources, such as YouTube, to watch lectures on any of the topics of the course.
- Access the Web page for the textbook. You will find the necessary information in the book itself.

Grading

Your grade will be based **exclusively** on the scores that you obtain in the class quizzes, exams, laboratory assignments, and attendance. The curve to be used to assign a grade to your final grade is the following:

<u>Final Score</u>	<u>Grade</u>
100 – 90	A
89 – 80	B
79 – 70	C
69 – 60	D
59 – 0	F

Your final score will be computed as a weighted average of your individual scores in: class attendance, programming projects, exams, and laboratory activities. The weights assigned to each of these categories are as follows:

Activity	Percent of Total Grade	Collaborative Work	Individual Work
Classroom Quizzes	25%		X
Three Partial Exams	50%		X
Laboratory Work	20%	X	
Laboratory Peer Evaluations	5%	X	
Totals	100%	25%	75%

In addition, students must meet the following criteria to get a passing grade in the course and laboratory:

- 1) ***A final score of 50% or more in total laboratory activities and peer evaluations.***
- 2) ***No missed laboratory or exam.***
- 3) ***Class attendance of 80% or more (no more than 6 missed class periods).***

A final exam might be offered to students that request it by a deadline to be set by the professor. The grade obtained can be used to substitute that of one partial exam. This does not preclude the student from having to take all partial exams.

Attending a classroom (or virtual) meeting means arriving (or connecting) on time and remaining so for its entire duration, as published in the official course schedule or until the professor has indicated the meeting is adjourned, whatever happens first.

In fairness to all students that meet all requirements of the course, there will be no special project, no special homework, no special exam, nor any other kind of “*special work*” to improve grades. However, each exam might have an extra credit problem that you can use to help improve your score on that category.

Under no circumstance, an excuse to be absent from a correctly scheduled course or laboratory activity will be accepted in order to take an exam or to comply with some requirement from another course. Course instructors cannot force students to miss another class, or activity officially scheduled in advance. Students must report any course activities in conflict with scheduled classroom or laboratory activities of this course immediately, so that appropriate administrative action can be taken.

OTHER IMPORTANT RULES TO FOLLOW:

- No use of cellular phones is allowed inside the room during the lectures. Turn-off your phone before entering the room, or set it to vibrating or silent mode.
- Any recordings of the class are unauthorized unless it is performed under the authorization of the instructor.
- No use of computers of any kind will be allowed inside the classroom.

Violation of any these provisions, as ruled by the instructor, might result on the dismissal of the student from the classroom or virtual meeting, counting automatically as an absence for the corresponding meeting period.

Exams

In this course, (if no major event disrupts the calendar) there will be (up to four) term exams. Unless otherwise indicated, all exams will be taken with closed books and closed notes. The exams will be administered outside the regular class time, during the lab hours. The scheduled date and time for each term exam will be as follows:

Exam Number	Date	Time	Room
I	Wednesday, Sep 14, 2022	Lab hours	Lab Room
II	Wednesday, Oct 12, 2022	Lab hours	Lab Room
III	Wednesday, Nov 16, 2022	Lab hours	Lab Room

If an exam for some other course, or some other official academic activity, has already been scheduled in one of the dates and hours given, you must notify it immediately, so that such exam can be rescheduled for you, the same day at an earlier hour. **No excuse about conflicts will be accepted from a student if reported after the day of his or her first officially scheduled class or laboratory meeting.** Each exam lasts around 2 hours, although additional time might be provided at the instructor's discretion.

Exams are offered out of regular hours of lectures in order for you to be able to have more time available to work on them. **If for any reason (storm, bad weather conditions, etc.) we cannot offer a particular exam on the given date, unless otherwise established, that particular exam will be automatically rescheduled for the next laboratory period after that given date.** The final exam will be administered in accordance with the schedule specified by the Registrar of the University of Puerto Rico, Mayaguez Campus.

Exam Reposition Policy: There shall be no repositions for missed midterm exams unless a reasonable² excuse is notified in advance (not later than the day of the exam) and it is accepted as such.

Laboratory and Programming Projects

This course includes a weekly 3-hour laboratory session in which concepts discussed in class are put in practice. In each session, some practical activities will be specified, and you are expected to develop programming code to comply with the specifications given. In addition to the coding activities, there might be others requiring you to answer questions based upon experimentation with code that is provided or developed during these sessions. Laboratory activities are based upon, although not limited to, fundamental topics that must have been previously discussed in lectures.

Each laboratory is divided in two periods of instruction. One portion of the activities are to be completed during laboratory hours, while the other can be completed asynchronously, before the next laboratory meeting date, unless otherwise specified. Students will have access to documentation explaining the tasks to be completed and if they need to be completed working individually or collaboratively. When working individually students might discuss with their peers general aspects about the project and/or programming environment. However, they cannot share their code with any other student, nor use code written by someone else, unless explicitly allowed by the project's specifications. Failure to comply with this requirement will be considered as an act of academic dishonesty and they may receive a grade of F in the class (**read section below titled Academic Integrity**).

² What is "reasonable" will be decided based on the instructor's judgment, based on the particular evidence produced by the student.

In some cases, students may have access to a set of files containing **partial** implementations of the particular programming project. **Students might be required to extend the given code that executes the tasks these methods are designed to perform.**

The **grading process** consists of compiling the project that you submit and executing it to verify that it complies with specifications. If your program is not submitted as specified, or does not compile, you will receive a score of zero (0). On those cases, no further check of your code will be done. In general, we verify: compilation, complying with specifications, program documentation, and clarity of your code. Again, you will receive further instructions on how to submit your project electronically.

Late Project Policy:

Each project will have a due date composed of an hour, month and day (such as 11:59 PM-September 12). A project will be considered late if it is submitted for grading one minute after its due date. For example, if the due date for a project is 11:59 PM-September 12, then a project submitted at 12:00 AM-PM-October 13 is considered as one day late. Any late project will receive a penalty **as established in the specifications document for the particular project**. Usually, two dates are established as deadlines to submit a working implementation. The first date established is the “no penalty deadline”, the real deadline. The second date, which is usually two or three days after the first one, establishes a grace period during which you can submit your (late) working project but with a penalty (your maximum score will be 75 out of 100). Any project submitted after the second deadline is considered as not submitted.

Any project that is not submitted for grading on time according to its submission rules will automatically receive a score of 0.

Academic Integrity

Each student is expected to work individually on exams and laboratory assignments. They may not share their answers to the laboratory assignments that require individual work. They may not use code from another student, or code that found on the Internet or any similar resources (unless explicitly allowed). Failure to comply with these requirements will result in a grade of F in the course for the student(s) violating these rules. Unauthorized group efforts, particularly during exams, will be considered academic dishonesty and the students involved will receive an F in the course. Students are encouraged to read the “Reglamento General de Estudiantes de la Universidad de Puerto Rico” to learn more about the possible sanctions that you might experience if caught in an act of academic dishonesty.

Sexual Harassment Certification 130-2014-2015 states:

Sexual harassment in the workplace and in the study environment is an illegal and discriminatory act and is against the best interests of the University of Puerto Rico. All persons who understand they have been subject to acts of sexual harassment at the University of Puerto Rico may file a complaint and request that the institution investigate, where necessary, and assume the corresponding action by the university authorities. If the complainant is a student, he or she must refer his or her complaint to the Office of the Student Ombudsperson or that of the Dean of Students.

List of Topics

Refer to the agenda, posted on the course website, for a comprehensive itinerary of lecture and laboratory topics.

This syllabus is a guide for the instruction of the course during this semester; it is subject to

*changes that will be notified by the instructor in regular class hours or by other means.
Changes should be available online at the course website in UPR Portal.*