

## **CIIC 4050 - Course Syllabus**

### **1. General Information:**

Alpha-numeric codification: CIIC 4050  
Course Title: Operating Systems  
Number of credits: 4  
Contact Period: 3 hours of lecture and 3 hours of laboratory per week

Equivalent Course: ICOM 5007

### **2. Course Description:**

**English:** Study of operating systems, multiprogramming, multiprocessing, batch, partitioned, and real time processing; organization and processing of file systems; queuing theory and information flow control.

**Spanish:** Estudio de sistemas operativos, multiprogramación, multiprocesamiento, procesamiento por lotes, por tiempo compartido y por tiempo real; organización y manejo de sistemas de archivo; teoría de colas y control de flujo de información.

### **3. Pre/Co-requisites and other requirements:**

Prerequisites: (CIIC 4020 or ICOM 4035) and (CIIC 4082 or INEL 4206)

### **4. Course Objectives:**

Students will gain an understanding of the various modules in an operating system, and their relationship with the underlying computer architecture. In addition, students will design and implement various software modules for a simple operating system.

### **5. Instructional Strategies:**

conference discussion computation laboratory  
seminar with formal presentation seminar without formal presentation workshop  
art workshop practice trip thesis special problems tutoring  
research other, please specify:

### **6. Minimum or Required Resources Available:**

Students will use the Departmental computer laboratories to complete course projects.

### **7. Course time frame and thematic outline**

Outline	Contact Hours
Introduction: operating systems structures and functions	1.5
Processes, threads, and concurrency	9
Memory management and virtual memory	4.5
CPU Scheduling	7
I/O management and disk block caches	5
File Systems	3
Distributed processing and network implementation	5
Security	3
Project in-class reports	4
Exams	3
Laboratory Sessions	45
<b>Total hours: (equivalent to contact period)</b>	<b>90</b>

**8. Grading System**

Quantifiable (letters)  Not Quantifiable

**9. Evaluation Strategies**

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	3	45%
<input checked="" type="checkbox"/> Final Exam	1	15%
<input type="checkbox"/> Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	1	25%
<input type="checkbox"/> Journals		
<input checked="" type="checkbox"/> Other, specify: Laboratory	10	15%
<b>TOTAL:</b>		<b>100%</b>
<input checked="" type="checkbox"/> Exams	3	45%

**10. Bibliography:**

1. Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, *Operating System Concepts*, 9th ed., John Wiley, 2012.
2. William Stallings, *Operating Systems: Internals and Design Principles*, 7th ed., Prentice Hall, 2012.
3. Thomas W. Doeppner, *Operating Systems In Depth: Design and Programming*, John Wiley, 2010.
4. Andrew S Tanenbaum, Albert S Woodhull, *Operating Systems Design and Implementation*, 3rd ed., Prentice Hall, 2006. [Classic Book]

**11. Course Outcomes**

Upon completion of this course the student will be able to:	Program Outcomes
1. explain the functionality of a modern operating system	6
2. design, apply and experiment with alternative process and thread management strategies to maximize resource utilization	6, 7
3. explain the principles of protection and security and how are they addressed by modern OS	4
4. design, apply and experiment with alternative memory organization and management strategies	6, 7
5. explain file management strategies and file system organization techniques in a modern OS	8
6. apply low-level I/O operations to access and manage hardware devices	6

**12. According to Law 51**

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Office #4) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

**13. Academic Integrity**

-The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.—