

SUBJECT TEACHING GUIDE

326 - Real-time operative systems

Master's Degree in computing engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Master's Degree in computing engineering			Type and Year	Optional. Year 1
Faculty	Faculty of Sciences				
Discipline	Optional Subjects				
Course unit title and code	326 - Real-time operative systems				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA				
Name of lecturer	MARIO ALDEA RIVAS				
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Other lecturers					

3.1 LEARNING OUTCOMES
- Be able to implement a real-time computer system on a Real-time POSIX Operating System.
- Understanding of the internal architecture of a real-time operating system.

4. OBJECTIVES	
Understanding of the basic characteristics of the real-time operating systems	
Understanding of the basics of the real-time operating systems architecture and its implementation techniques.	
Understanding of the real-time POSIX interface.	
Know some extensions to the POSIX interface that are interesting for the real-time systems.	
Know how to write device drivers for real-time systems.	
Know how to use all the concepts learned in the course in order to build systems with predictable response times.	

6. SUBJECT PROGRAM	
CONTENTS	
1	Introduction to POSIX standard
2	Real-time operating systems.
3	Threads
4	Time management
5	Threads scheduling
6	Synchronization
7	Signals
8	Timers and execution-time clocks
9	I/O device drivers

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Practical exercises carried out throughout the course (40% of the final course grade). The grade is based on: - Presentation of practicals: during the course, the teacher will require the student to present the completed practicals. - Practical reports: t	Laboratory evaluation	No	Yes	40,00
Laboratory exam (60% of the final course grade)	Laboratory evaluation	No	Yes	60,00
TOTAL				100,00
Observations				
Observations for part-time students				
Partial-time students will have some flexibility in the delivery deadlines of their exercises.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

The Single UNIX® Specification (Estándar POSIX). Accesible en <http://www.unix.org/online.html> y (parcialmente) en las páginas de manual de Linux.

A. Burns y A. Wellings: "Real-time Systems and their Programming Languages". Pearson Education Canada; 4 edition (March 30, 2009)

Giorgio C. Buttazzo. "Hard Real-Time Computing Systems: Predictable Scheduling Algorithms and Applications". Springer; 3rd ed. 2011 edition (September 15, 2011)