

SUBJECT TEACHING GUIDE

1091 - Embedded Electronic Systems

Master's Degree in Telecommunication Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in Telecommunication Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Industrial Engineering and Telecommunications				
Discipline					
Course unit title and code	1091 - Embedded Electronic Systems				
Number of ECTS credits allocated	5	Term	Semester based (1)		
Web	http://moodle.unican.es/moodle27/course/view.php?id=1355				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA				
Name of lecturer	PABLO PEDRO SANCHEZ ESPESO				
E-mail	pablo.sanchez@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO PROFESOR (S3002)				
Other lecturers	VICTOR MANUEL FERNANDEZ SOLORZANO HECTOR POSADAS COBO				

3.1 LEARNING OUTCOMES
- To know the technological development to date and be able to evaluate its future development
- To acquire the necessary knowledge about the architectures that support the design of embedded systems and their future evolution
- To know languages and tools used to specify, simulate and design embedded electronic systems
- To apply the acquired knowledge to the implementation of an embedded electronic system
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4. OBJECTIVES	
Knowledge of the specification and co-design methodologies of complex embedded systems from high level languages	
To be able to develop and optimize embedded SW in mono and multi-processor systems	
Capability for HW synthesis from high level languages and design of HW/SW communications	
Verification and debugging of HW/SW systems	

6. SUBJECT PROGRAM	
CONTENTS	
1	Introduction to Technological Evolution
2	High-Level languages
3	Embedded SW development
4	High-Level synthesis. HW/SW integration.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Evaluation exercises (50%) in Ordinary Evaluation Written Exam (50%) in Extraordinary Evaluation	Work	No	Yes	50,00
Laboratory practices (50%)	Laboratory evaluation	Yes	No	50,00
TOTAL				100,00
Observations				
<p>In Continuous Assessment, two parts must be passed separately: Class Exercises and Laboratory Practices. The Laboratory Practices will consist of a set of partial practicals and a final project. The final mark will be the average of the mark of the Class Exercises (50%) and of the Laboratory Practices (50%). If the student fails the Continuous Assessment, he/she may pass the subject with a Written Exam. The final grade in that case will be decided based on the grade obtained in the Laboratory Practical during Continuous Assessment (50%) and in the Final Exam (50%).</p> <p>Exercises in class Students will be given different exercises on specific aspects of the subject and in any case at the end of each thematic block .</p> <p>Laboratory practices Each practice will be evaluated in its aspects of quality of the proposed solution, systemic thinking and ability to solve the problem.</p> <p>-----</p> <p>The remote evaluation of these same works, practical laboratory exercises and written tests is foreseen, in the event of a new health alert by COVID-19 making it impossible to carry out the evaluation in person.</p>				
Observations for part-time students				
For students who prove their part-time participation, dates will be sought in which they can perform the assessable exercises proposed in class as well as the laboratory practices				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

D.C. Black, J. Donovan, B. Bunton & A. Keist: "SystemC: From the Ground Up", Springer, 2nd Edition, 2010

R. Kamal: "Embedded Systems: Architecture, Programming and Design", McGraw-Hill, 2nd Edition, 2008

P. Marwedel: "Embedded System Design", Springer, 2006

D. Gajski, S. Abdi, A. Gerstlauer & G. Schirner : "Embedded System Design: Modeling, Synthesis and Verification", Springer, 2009