

## SUBJECT TEACHING GUIDE

### 1091 - Embedded Electronic Systems

#### Master's Degree in Telecommunication Engineering

Academic year 2023-2024

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	<a href="http://moodle.unican.es/moodle27/course/view.php?id=1355">http://moodle.unican.es/moodle27/course/view.php?id=1355</a>				
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	EUGENIO VILLAR BONET				
E-mail	eugenio.villarb@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO PROFESOR (S3098)				
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 currently and their future evolution
- To know the languages and tools used to specify, simulate and design embedded electronic systems
- To apply the knowledge acquired to the implementation of an embedded electronic system

#### 4. OBJECTIVES

Pro-active attitude regarding the technological development
Knowledge of the specification and co-design methodologies of complex embedded systems from high level languages
Skills for the development and optimization of the 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. COURSE ORGANIZATION

CONTENTS	
1	High-Level languages: SystemC
2	Embedded SW development
3	High-Level synthesis of HW
4	Introduction to Technological Evolution

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Classroom 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
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<p>To pass the subject in Continuous Assessment, two parts must be passed separately: Class Exercises and Laboratory Practices.</p> <p>The Laboratory Practices will consist of a set of partial practicals and a final project.</p> <p>The final mark will be the average of the mark of the Class Exercises (50%) and of the Laboratory Practices (50%).</p> <p>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 Practicals during Continuous Assessment (50%) and in the Final Exam (50%).</p> <p><b>Exercises in class</b></p> <p>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><b>Laboratory practices</b></p> <p>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>				
<b>Observations for part-time students</b>				
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