SUBJECT TEACHING GUIDE

G1478 - High Performance Heterogeneous Electronic Systems for Multimedia Applications
Degree in Telecommunication Technologies Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Speciality Optional Subjects				
Course unit title and code	G1478 - High Performance Heterogeneous Electronic Systems for Multimedia Applications				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web	http://moodle.unican.es/course/view.php?id=1303				
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
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Other lecturers	JESUS MIGUEL PEREZ LLANO

3.1 LEARNING OUTCOMES
- Participants will learn and know how to use heterogeneous electronic systems. Electronic systems that integrate multiple processing elements : multi-processor systems (many-core , multi-core) and systems using different types of processing elements (GPCPU and GPU).
- Development of audio and video multimedia applications

4. OBJECTIVES
Obtain practical experience with heterogeneous electronic systems
Know how to program heterogeneous systems with OpenMP and OpenCL
To develop multimedia applications
Learn how to develop software in advanced environments that integrate IDEs, code maintenance, verification and performance analysis.

6. COURSE ORGANIZATION	
CONTENTS	
1	Module 1. Fundamentals. Evolution of computing platforms. Laws of parallelism. Fundamentals of parallel programming.
2	Module 2.- Programming in C++. C++ language. Introduction to programming environments (Eclipse). Code maintenance systems (svn/git). Code verification (Google test). Performance analysis. Multimedia libraries (OpenCV).
3	Module 3 - Programming with OpenMP.
4	Module 4 - Programming with OpenCL.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Multimedia application development	Work	Yes	Yes	50,00
Continuous evaluation	Work	No	Yes	50,00
TOTAL				100,00

Observations
The virtual evaluation of works, practical laboratory exercises and written tests is foreseen, in case of a new health alert due to COVID-19 making it impossible to carry out the evaluation in person.
Observations for part-time students
Partial time students will be evaluated through a specific software development project.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
A. Vajda, “Programming Many-Core Chips”, Springer, 2011
Azad, “Computer Vision: Principles and Practices”.Elektron, 2008.