UNIVERSIDADE DA CORUÑA

Teaching Guide					
Identifying Data					2013/14
Subject (*)	Codiseño Hardware/software			Code	614G01031
Study programme	Grao en Enxeñaría Informática				
Descriptors					
Cycle	Period	Year		Type	Credits
Graduate	2nd four-month period	Third		Obligatoria	6
Language	SpanishGalicianEnglish				
Prerequisites					
Department	Electrónica e Sistemas				
Coordinador	Rodriguez Osorio, Roberto		E-mail	roberto.osorio@udc.es	
Lecturers	Rodriguez Osorio, Roberto		E-mail	roberto.osorio@udc.es	
Web					
General description	A meirande parte dos sistemas informáticos actuais son sistemas embarcados nos que o deseño do hardware e do software son inseparables. Nestes sistemas, o conxunto é maior que a suma das partes e, do mesmo xeito, o proceso de deseño e comprobación non está restrinxido aos seus compoñentes hardware e software, senón que tamén inclúen a interface entre os dous. Esta materia aborda o mundo do codeseño centrándose en aspectos tales como: computación reconfigurable; modelado de sistemas; e procesadores de aplicación específica.				

Study programme competences	
Code	Study programme competences
A15	Capacidade de coñecer, comprender e avaliar a estrutura e a arquitectura dos computadores, así como os compoñentes básicos que os conforman.
A31	Capacidade de deseñar e construír sistemas dixitais, incluíndo computadores, sistemas baseados en microprocesador e sistemas de comunicacións.
A32	Capacidade de desenvolver procesadores específicos e sistemas embarcados, así como desenvolver e optimizar o sóftware dos ditos sistemas.
B1	Capacidade de resolución de problemas
B3	Capacidade de análise e síntese
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.

Learning outcomes			
Subject competencies (Learning outcomes)	Study programme competences		
	A31 A32	B1 B3	C1 C3
	A15		
			C7

Contents	
Topic	Sub-topic
Fundamentals and Platforms for hardware/software codesign	Definition of codesign Application-specific hardware and reconfigurable hardware
Data-flow and control-flow modelling	Data -flow modelling and implementation Analysis of Control Flow and Data Flow Transaction-level modelling

Analisys of the design space	Application-specific architectures Application-specific instruction-set processors Accelerators and coprocessors Systems on a chip (SoC)
Hardware/Software interfaces	Buses Interfaces

Planning			
Methodologies / tests	Ordinary class hours	Student?s personal work hours	Total hours
Laboratory practice	14	33.6	47.6
Problem solving	2	4.4	6.4
Supervised projects	5	21	26
Objective test	3	0	3
Guest lecture / keynote speech	21	42	63
Personalized attention	4	0	4
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
Methodologies	Description
Laboratory practice	Labs: A set of guided lab tasks will be assigned to the students. The aim is practicing the basic procedures of the subject and reflecting on them. The topic of the labs is linked to the guided projects.
Problem solving	Pen and paper exercises: Students must solve a set of exercises in an autonomous way. A selection of those problems will be discussed during the seminars. This selection must be agreed among the students.
Supervised projects	Guided projects: Students must work in small groups to complete hardware/software codesign projects. During the seminars, project coordination will be carried out, where the progress of each project will be assessed. However, most of the work must be done by the students in an autonomous way.
Objective test	Final test: A written test, lasting up to 3 hours, must be passed by the end of the course.
Guest lecture / keynote speech	Lectures: They will be focused on the different topics of the subject. The progress of the lectures will define the scheduling of the labs and seminars.

Personalized attention	
Methodologies	Description
Laboratory practice Problem solving Supervised projects	Personalized attention is crucial for guiding the students when doing exercises, performing the labs, and working on projects. Moreover, it will also serve to validate and grade their work.

Assessment		
Methodologies	Description	Qualification
Laboratory practice	Labs: Grading will take into account both attending the sessions and fulfilling the tasks. It must be remarked that the labs are fundamental for accomplishing the objectives of the guided projects.	40
Problem solving	Pen and pencil exercises: Participation in the sessions will be assessed.	5
Supervised projects	Guided projects: The quality of the obtained results will chiefly define the mark. However, participating in the discussions about the different projects will be also assessed.	15
Objective test	Test: At the end of the course, a written test will be evaluated the level of knowledge on the contents of the subject.	40

Assessment comments

Sources of information	
Basic	- Patrick R. Schaumont (2010). A Practical Introduction to Hardware/Software Codesign. Springer - David C. Black e Jack Donovan (2004). SystemC: From the ground up . Kluwer Academic Publishers - Peter J. Ashenden e Jim Lewis (2008). The Designer's Guide to VHDL, Third Edition (Systems on Silicon). Morgan Kaufmann
Complementary	- Jayaram Bhasker (1999). A VHDL Primer . Prentice Hall - Wayne Wolf (). Computers as Components, 2nd edition. Principles of Embedded Computing System Design. Morgan Kaufmann

Recommendations
Subjects that it is recommended to have taken before
Sistemas Empotrados/614G01060
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Fundamentos dos Computadores/614G01007
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.