Universitat de les Illes Balears

Teaching guide

Academic year	2016-17
Subject	21741 - Advanced Architectures
Group	Group 2, 1S, GEIN, GIN2
Teaching guide	C
Language	English

Subject identification

Subject	21741 - Advanced Architectures
Credits	2.4 de presencials (60 hours) 3.6 de no presencials (90 hours) 6 de totals (150 hours).
Group	Group 2, 1S, GEIN, GIN2 (Campus Extens)
Teaching period	First semester
Teaching language	English

Professors

Lecturers	**Horari d'atenció als alumnes**					
	Starting time	**Finishing time**	**Day**	**Start date**	**Finish date**	**Office**
José Juan Antonio Miró Juliá joe.miro@uib.es	08:00	09:00	Monday	23/01/2017	05/08/2017	D-168

Contextualisation

Advanced Architectures is an obligatory subject of thecomputer engineering module in theComputer Science degree. This course is a continuation of the course "Computer Architecture Extension". The main objective is to deepen aspects of computer architecture as:

* Distributed architectures
* Level parallelism processor
* Virtualization
* Memory hierarchy
* Performance and cost of computers
* Power consumption
* Sustainable Design

Requirements

As the contents covered in this course are at an advanced level, it is necessary to have a basic knowledge ofcomputer architecture. Allstudents must have the knowledge acquired in previous courses on this topic, such as *Computer Architecture* and*Expansion on Computer Architecture*.

Essential requirements

Computer Architecture

Expansion on Computer Architecture

Date of publication: 17/06/2016

Skills

Specific

* CI203 Ability to analyze and evaluate computer architectures including parallel and distributed platforms as well as develop and optimize software for them..
* CI207 Ability to analyze, evaluate, select and configure hardware platforms for the development and execution of applications and services.

Transversal

* CTR01 (*) Capacity for analysis and synthesis, organization, planning and decision making..
* CTR02 (**) Ability for critical analysis and proposal and implementation of new solutions.
* CTR03 (*) Ability to acquire new knowledge autonomously..
* CTR04 (**) Ability to find resources and manage information within the field of informatics.
* CTR07 (*) Ability to explain concepts of computing both orally and in writing in different contexts..
* CTR08 (*) Ability to understand, speak and write in English at an intermediate level..

Basic

* You may consult the basic competencies students will have to achieve by the end of the degree at the following address: http://www.uib.eu/study/grau/Basic-Competences-In-Bachelors-Degree-Studies/

Content

Theme content

Unit 1. Distributed Architectures
* Types of architecture
* Communication
* Middleware
* Modeling and evaluation of distributed architectures

Unit 2. Advanced level parallel processing
* Advanced grid architectures
* Advanced clusters architectures

Unit 3. Virtualization on multi-core and multi-processor systems

Unit 4. Memory hierarchy
* Memory technologies
* Memory optimizations to increase performance

Unit 5. Other aspects of computer architecture
* Performance versus cost in designing computers
* Computer power consumption

Date of publication: 17/06/2016

* Sustainable Design

Teaching methodology

This section describes the activities that must be done to assess whether the student has acquired the skills of the course. This activities may take place within or out of the classroom. In the case of the latter, we have incorporated the use of Campus Extens to get a date teaching process more flexible and autonomous.

Given that this is a fourth year subject, there will be little lecturing and there will be more weight given to the autonomous work and learning by the student. The professor will be more of a guide and mentor than an instructor.

To get to the acquisition of all competences of the course, students will have to perform all scheduled activities.

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	The lectures will take place during the course together withother activities such as problem solving and exercises will be done. CI203 and CI207 skills are developed in this point.	35
Practical classes	Problem- and project-based learning	Medium group (M)	Through activities and problems related to the contents of the module, the student will acquire a broader and deeper knowledge of the subject. And through a project the students will use tools related to the course contens and therefore put into practice what they have learned. CI203,CI207, CTR01, CTR02, CTR03, CTR04, CTR07 and CTR08 skills are developed in this point.	22
Assessment	Test	Large group (G)	There will be afinal exam to assess whether students have acquired the knowledge of the subject. Correction criteria is givenwith the test. CI203, CI207, CTR01, CTR02 skills are developed in this point.	3

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

Distance education work activities

Date of publication: 17/06/2016

Modality	Name	Description	Hours
Group or individual self-study	Knowledge extension	Students mustautonomously reserarch, search and gather information, thus extending the knowledge acquired through the professor. The student will show what he has donethrough reports or presentations CI203, CI207, CTR01, CTR02, CTR04, CTR07 and CTR08 skills are developed in this point.	45
Group or individual self-study	Study and broadening of knowledge	Each student must spend time to search, evaluate, acquire and deepen knowledge autonomously, both individually and in groups. CI203, CI207, CTR01, CTR02, CTR03, CTR04, CTR07 and CTR08skills are developed in this point.	45

Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

The activities have been designed to assess student skills. The table bellow shows the characteristics of each activity. All the activities have to be delivered and pass with a minimum grade, otherwise the student will fail the course.

The only recoverable activity is the test.

The final grade will be "no show" when the student have presented at most a third part of the assessment activities planned in the teaching guide.

Test

Modality	Assessment
Technique	Extended-response, discursive examinations **(retrievable)**
Description	There will be afinal exam to assess whether students have acquired the knowledge of the subject. Correction criteria is givenwith the test. CI203, CI207, CTR01, CTR02 skills are developed in this point.
Assessment criteria	Students must pass an examination to assess whether theyhaveacquired the necessary knowledge. CI203, CI207, CTR01, CTR02 skills will be evaluated.

Final grade percentage: 25% with minimum grade 3.5

Knowledge extension

Modality	Group or individual self-study
Technique	Papers and projects **(non-retrievable)**
Description	Students mustautonomously reserarch, search and gather information, thus extending the knowledge acquired through the professor. The student will show what he has donethrough reports or presentations CI203, CI207, CTR01, CTR02, CTR04, CTR07 and CTR08 skills are developed in this point.
Assessment criteria	Students must submit activities, assignments and projects in each of the units.

Date of publication: 17/06/2016

CI203, CI207, CTR01, CTR02, CTR03, CTR04, CTR07, CTR08 skills will be evaluated.

Final grade percentage: 75%

Resources, bibliography and additional documentation

Basic bibliography

HENNESSY, J., PATTERSON, D.: Computer Architecture : A quantitative Approach. Morgan Kaufmann Publishers, 2007, quarta edició.
SIMA, D., FOUNTAIN, T., KACSUK, P.: Advanced Computer Architectures : A Design Space Approach. Addison Wesley, 1997.

Complementary bibliography

ORTEGA, J., ANGUITA, M., PRIETO, A.: Arquitectura de Computadores. Thomsom, 2005

Other resources

The Critical Thinking Community: http://www.criticalthinking.org/
Brooke N. Moore, Richard Parker. Critical Thinking. McGraw-Hill, 2009, 9th edition. ISBN: 978-0-07-338667-6.
Héfer Bembenutty. Self-Regulated Learning. New Directions for Teaching and Learning. Wiley, 2011. ISBN: 978-1-1180-9163-0, 978-1-1181-5914-9 (eMobi), 978-1-1181-5915-6 (ePDF), 978-1-1181-5916-3 (ePUB).
Myron H. Dembo, Helena Seli. Motivation and Learning Strategies for College Success. A Focus on Self-Regulated Learning. Taylor & Francis, 2013, 4th edition. ISBN: 978-0-415-89419-7 (hbk), 978-0-415-89420-3 (pbk), 978-0-203-81383-6 (ebk).
Barry J. Zimmerman. Becoming a self-regulated learner: an overview. Theory into Practice, 41 (2), pp. 64-70. ISSN: 0040-5841.
José Antonio Marina, María de la Valgoma. La Magia de Escribir. DEBOLSILLO, 2014. ISBN: 9788490626481.
C. Michael Levy, Sarah Ransdell (eds). The Science of Writing: Theories, Methods, Individual Differences and Applications. Lawrence Erlbaum Associates, 1996. ISBN: 0-8058-2108-2 (c), 0-8058-2109-0 (p), 978-1-136-68678-8 (ebk).

Date of publication: 17/06/2016