Teaching guide

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**
Carlos Guerrero Tomé carlos.guerrero@uib.es	11:30	12:30	Friday	14/09/2015	31/01/2016	132
	16:30	17:30	Tuesday	14/09/2015	31/01/2016	132
Judit Jiménez Noceda judit.jimenez@uib.es	17:30	18:30	Wednesday	01/09/2015	31/07/2016	Lab 130

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

So as the contents covered in the course are advanced level, it is necessary to have a basic knowledge in the field of computer architecture, so it is essential that students have the knowledge acquired in previous courses on this topic, as are: Expansion of Computer Architecture and Computer Architecture.

Essential requirements

Expansion of Computer Architecture

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Computer Architecture

Skills

Specific

* CI203 Ability to analyze and evaluate computer architectures including parallel and distributed platforms as well as develop and optimize software for that..
* 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 get new knowledge autonomously..
* CTR04 (**) Ability to find resources and information management in the field of information.
* CTR07 (*) Ability to explain concepts of computing both oral and written in different contexts..
* CTR08 (*) Ability to understand, speak and write in English in 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

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* 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 are classroom and autonomous character. In the case of the latter, we have incorporated the use of Extended Campus to get a date teaching process more flexible and autonomous. The activities are also divided into individual and group work. All management of the course will take place from the Campus Extens platform which will take place communication, delivery of activities, publishing content, etc.

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 and will be 1 or 2 hours. During the lectures other activities such as problem solving and exercises will be done. CI203 and CI207 skills are developed in this point.	35
Practical classes	Problem-based learning	Medium group (M)	By doing the activities and problems related to the contents of the module, the student will acquire a broader and deeper knowledge of the subject. To perform this activity, students will be organized in groups or pairs. Workshop sessions and advanced troubleshooting will be 1 hour. CI203, CI207, CTR01, CTR02, CTR03 and CTR07 skills are developed in this point.	15
Laboratory classes	Projects	Medium group (M)	The projects are to make laboratory practices, these practices presume that students use Supplied tools related to the contents of the course to implement the knowledge acquired. CI203, CI07, CTR01, CR02, CTR04 and CTR08 skills are developed in this point.	7
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

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Modality	Name	Description	Hours
Individual self-study	Estudy	Each student mustspend some personal time to assimilate the theoretical contents taught by the teacher in lectures, and solve the exercises and problems proposed in theunits. Part of these exercises / problems will be solved by the teacher or by the students during the lessons. CI203, CI207, CTR03 skills are developed in this point.	40
Group or individual self-study	Delivery of activities	Students must perform some problems and activities autonomouslyat home. The evaluation criteria is given with the activities. CI203, CI207, CTR01, CTR02, CTR03 skills are developed in this point.	20
Group or individual self-study	Extension of contents	Students should make research tasks autonomously, collecting and finding information, and extension of contents. For each of these activities, the student must submit reports, papers or make oral presentations to the class. CI203, CI207, CTR01, CTR02, CTR04, CTR07skills are developed in this point.	30

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

Some 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.

All activities will be evaluated with a mark of 0-10, and a weighting will be applied to calculate the final average mark. The evaluation of the course consists of three parts: exams, delivery of exercises, and projects.

The only recoverable activity is the test, the date will be published in the exam schedule.

The fact of copying a work, activity, exercise, etc. to a partner or from any content on the web, book, etc. will automatically fail the module and can not recover any part of it.

In order to pass the subject is required to overcome a minimum grade in each of the activities. This minimum mark is 4.5. The final weighted average mark must always be greater than 5 to consider that the student has passed. If the mark is less than 5, the student will fail and the mark will be the weighted average mark. In the case that the weighted average mark is greater than 5 but the student has not passed some of the individual minimum marks, the final mark will be 4.5.

If the student has to do the retest in July, the average weighted will be calculated with the marks of the activities performed during the course and the grade obtained in the test of July.

The final grade will be "no show" when the student have made a third part (or less) of the evaluation activities planned in the teaching guide.

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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: 50%

Delivery of activities

Modality	Group or individual self-study
Technique	Papers and projects **(non-retrievable)**
Description	Students must perform some problems and activities autonomouslyat home. The evaluation criteria is given with the activities. CI203, CI207, CTR01, CTR02, CTR03 skills are developed in this point.
Assessment criteria	Students must submit activities, assignments and projects in each of the units. CI203, CI207, CTR01, CTR02, CTR04, CTR07, CTR08 skills will be evaluated.

Final grade percentage: 25%

Extension of contents

Modality	Group or individual self-study
Technique	Extended-response, discursive examinations **(non-retrievable)**
Description	Students should make research tasks autonomously, collecting and finding information, and extension of contents. For each of these activities, the student must submit reports, papers or make oral presentations to the class. CI203, CI207, CTR01, CTR02, CTR04, CTR07skills are developed in this point.
Assessment criteria	For each of theunits, students will have todeliver a set of exercises and problems. CI203, CI207, CTR01, CTR02, CTR03 skills will be evaluated.

Final grade percentage: 25%

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/

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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).