Course guide
270640 - MA - Multiprocessors Architecture

Last modified: 04/02/2025

Unit in charge: Barcelona School of Informatics
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: MASTER'S DEGREE IN INNOVATION AND RESEARCH IN INFORMATICS (Syllabus 2012). (Optional subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: ANTONIO JUAN HORMIGO

Others: Segon quadrimestre:
ANTONIO JUAN HORMIGO - 10

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEE4.1. Capability to analyze, evaluate and design computers and to propose new techniques for improvement in its architecture.

Generical:
CG1. Capability to apply the scientific method to study and analyse of phenomena and systems in any area of Computer Science, and in the conception, design and implementation of innovative and original solutions.

Transversal:
CTR5. APPROPIATE ATTITUDE TOWARDS WORK: Capability to be motivated by professional achievement and to face new challenges, to have a broad vision of the possibilities of a career in the field of informatics engineering. Capability to be motivated by quality and continuous improvement, and to act strictly on professional development. Capability to adapt to technological or organizational changes. Capacity for working in absence of information and/or with time and/or resources constraints.

Basic:
CB9. Possession of the learning skills that enable the students to continue studying in a way that will be mainly self-directed or autonomous.

TEACHING METHODOLOGY

Teaching methodology is described in Activities

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Guided activities	9,0	6.00
Hours small group	9,0	6.00
Hours medium group	9,0	6.00
Self study	96,0	64.00
Hours large group	27,0	18.00

Total learning time: 150 h

CONTENTS

Program

Description:
1. Introduction to multiprocessor architecture
2. MP Software and ISA
3. Cores and micro-architecture support for MPs
4. Memory hierarchy in MPs
5. Coherency and Consistency
6. Interconnection Networks (on and off-die)
7. Client vs Server SMPs
8. CMPs
9. Clusters
10. SIMD systems
11. Massively Parallel MPs
12. Heterogeneous systems
13. GPGPU, FPGAs

GRADING SYSTEM

Not yet translated

BIBLIOGRAPHY

Basic:
- Hennessy, J.L.; Patterson, D.A. Computer architecture: a quantitative approach. 6th ed. Cambridge, MA: Elsevier/Morgan Kaufmann, 2019. ISBN 9780128119051.
- Culler, D.E.; Singh, J.P.; Gupta, A. Parallel computer architecture: a hardware/software approach. San Francisco: Morgan Kaufmann Publishers, 1999. ISBN 1558603433.