SUBJECT TEACHING GUIDE

322 - Interconnection Networks

Master's Degree in computing engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Master's Degree in computing engineering		Type and Year	Optional. Year 2
Faculty	Faculty of Sciences			
Discipline	Optional Subjects			
Course unit title and code	322 - Interconnection Networks			
Number of ECTS credits allocated	3	Term	Semester based (1)	
Web				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA
Name of lecturer	MARIA DEL CARMEN MARTINEZ FERNANDEZ
E-mail	carmen.martinez@unican.es
Office	Facultad de Ciencias. Planta: + 1. DESPACHO PROFESOR (1101)
Other lecturers	JULIO RAMON BEIVIDE PALACIO

3.1 LEARNING OUTCOMES
- The student must know several graph families considered in the course. The student has to know how to compute adjacency matrices, minimal paths, diameters, average distances, and dominating sets. Cayley graphs will be deeply studied.
- The student must know the most basic concepts about modern interconnection subsystems. The student has to distinguish between direct and indirect networks and has to know different techniques for switching , routing and flow control in modern networks. In addition, the student will know the different network solutions adopted in the market .

4. OBJECTIVES

Acquiring a sufficient knowledge about Graph Theory and its application to interconnection networks..
Acquiring a sufficient ability to analyze and evaluate different network architectures present in the market.

6. COURSE ORGANIZATION

	CONTENTS
1	Block 1: Graphs and networks. Topologic properties. Graph products. Graphs and fault tolerance.
2	Block 2: Topologies, switching, flow control, routing and arbitration. Network anomalies: deadlock, livelock and starvation. Router architectures. Commercial and research network examples and deployments.
3	Technical work focused on current results and modern interconnection networks and technologies.
4	Written exam.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Formal written informs and public expositions will be required.	Work	No	Yes	50,00
It will be composed of a written exam together with the evaluation of the proposed technical work.	Written exam	Yes	Yes	50,00
TOTAL				100,00

Observations
There is just a unique anual evaluation. If the student cannot pass the subjet through the ordinary activities, there will be an extraordinary opportunity in September.

Observations for part-time students
The students in such a situation will follow the same procedure for examination. Nevertheless, the assigned technical work should be more elaborated and can entail up to 75% of the final mark.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
Computer Architecture: A Quantitative Approach, 5th Edition. John L. Hennessy and David A. Patterson Morgan Kaufmann, 2012 ISBN: 978-0-12-383872-8
Principles and Practices of Interconnection Networks. William Dally and Brian Towles Morgan Kaufmann, 2004 ISBN: 0-12-200751-4
Topological structure and analysis of interconnection networks. Junming Xu. Dordrect : Kluwer Academic, cop. 2001. ISBN: 1-4020-0020-0
Graph theory and interconnection networks. Lih-Hsing Hsu and Cheng-Kuan Lin. Boca Raton, Florida : CRC Press, cop. 2009. ISBN: 978-1-4200-4481-2