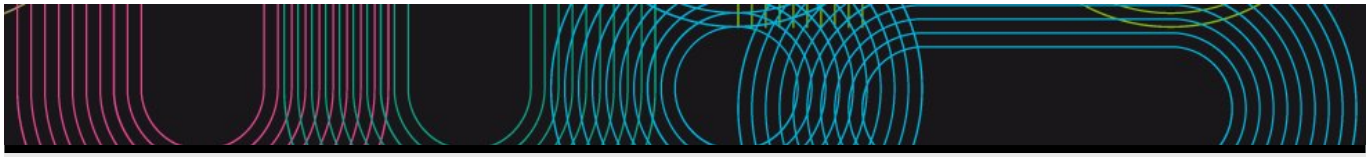
Universidade Vigo

Subject Guide 2016 / 2017



IDENTIFYING DATA				
Application Technologies				
Subject	Application Technologies			
Code	V05M145V01105			
Study programme	Telecommunication Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Mandatory	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Díaz Redondo, Rebeca Pilar			
Lecturers	Díaz Redondo, Rebeca Pilar Fernández Vilas, Ana			
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General description	Students will obtain a global picture of the main technological resources to design telematics applications. Basic problems like distributed computing, interoperability and services discovering will be addressed. These concepts will be study in the framework of the cloud computing paradigm.			

Competencies	
Code	
A5	CB5 Students must have learning skills to allow themselves to continue studying in largely self-directed or autonomous way
B1	CG1 The ability to project, calculate and design products, processes and facilities in telecommunication engineering areas.
B4	CG4 The capacity for mathematical modeling, calculation and simulation in technological centers and engineering companies, particularly in research, development and innovation tasks in all areas related to Telecommunication Engineering and associated multidisciplinary fields.
B8	CG8 The ability to apply acquired knowledge and to solve problems in new or unfamiliar environments within broader and multidiscipline contexts, being able to integrate knowledge.
B12	CG12 To have skills for lifelong, self-directed and autonomous learning.
C4	CE4 The ability to design and plan networks for transporting, broadcasting and distribution of multimedia signals.
C8	CE8 The ability to understand and know how to apply the operation and organization of the Internet, new generation Internet technologies and protocols, component models, middleware and services.
C9	CE9 The ability to solve convergence, interoperability and design of heterogeneous networks with local, access and trunk networks; as well as the integration of telephonic, data, television and interactive services.

Learning outcomes	
Expected results from this subject	Training and Learning Results
Know and apply the different communication techniques for communication and distributed computing	A5 B1 B4 B12 C4
Know and apply the techniques for data sharing to enable interoperability among systems and/or services	A5 B1 B8 B12 C4 C9

Know and apply how to specify and discover software services to be integrated in complex telematic solutions	A5 B1 B4 B8 B12 C4 C9
Know and apply virtualization concepts : cloud computing and content distribution networks.	A5 B1 B12 C4 C8

Contents

Topic	
1. Cloud computing: overview	a. Service models (IaaS, PaaS, SaaS) and deployment models b. Reference architectures for cloud applications: virtualization
2. Cloud Computing: AWS	a. Commercial platforms: AWS b. Data Storage
3. Synchronization in distributed systems	a. Modeling & main problems b. Physical clocks c. Logical time & logical clocks d. Global state
4. Taking decisions in distributed systems	a. Mutual exclusion b. Elections c. Group communication d. Consensus
5. Replication and management of groups.	a. System model for replicated objects b. The role of group communication c. Fault-tolerant systems d. The case of high availability: Gossip
6. Distributed Storage & MapReduce	a. Type of data b. Data storage distributed solutions c. Distributed storage systems d. MapReduce programming model e. The Hadoo environment

Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	13	26	39
Master Session	22	29	51
Practical tests, real task execution and / or simulated.	3	30	33
Short answer tests	2	0	2

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Laboratory practises	Students will design and develop small prototypes and software solutions to reinforce the theoretical concepts explained in master sessions. We will focus on skills EC9, EC8, EC4, CG12, CG8 and CB5.
Master Session	Teachers will combine both concepts explanation and toy examples resolution. Resolution of small situations at class will foster debates, especially if it is done in groups. We will focus on skills CG1, CG4, CG12 and CE8

Personalized attention

Methodologies	Description
Master Session	Teachers will combine both concepts explanation and toy examples resolution. Resolution of small situations at class will foster debates, especially if it is done in groups
Laboratory practises	Students will design and develop small prototypes and software solutions to reinforce the theoretical concepts explained in master sessions.

Assessment

	Description	Qualification	Training and Learning Results		
Practical tests, real task execution and / or simulated.	Students willl design and implement software solutions for different small problems.	40	A5	B1 B8 B12	C4 C8
Short answer tests	Written exam wich combines test and short answer questions. No extra material is allowed.	60	A5	B4 B8 B12	C8 C9

Other comments on the Evaluation

Students can follow up a continuous assessment model or decide to do a final exam. This selection should be done by 7th week. Once a student selects "continuous evaluation" his/her mark will never be "not taken".
1- CONTINUOUS ASSESSMENT
Final mark within this assessment schema will be composed by adding the marks obtained after the assessment of the following assignments:

- Writing exam
  - Dates: official calendar
  - Maximum score = 6 points
  - Minimum score required to pass = 2 points
- 2 intermediate practical assignments
  - Dates: 9th week, 13th week
  - Maximum score = 4 points

2- FINAL EXAM
Final mark within this assessment schema will be composed by adding the marks obtained after the assessment of the following assignments:

- Writing exam
  - Dates: official calendar
  - Maximum score = 6 points
  - Minimum score required to pass = 2 points
- 1 practical assignment
  - Dates: last week
  - Maximum score = 4 points

3- EXTRAORDINARY ASSESSEMENT
Students will be assessed using the "final exam" schema.

If any kind of plagiarism is detected, the final mark will be "failed (0)". This fact will be reported to the academic authorities.

Sources of information

4.1 Basic bibliography

[1] Distributed systems: Concepts and design. George Colouris, Jean Dollimore, Tim Kindberg, Gordon Blair. 2012, Ed. Pearson

[2] Cloud Computing: Theory & Practice.Dan C. Marinescu. 2013, Elsevier.

4.2 Complementarybibliography

[1] "*Cloud computing: principles and paradigms*". Rajkumar Buyya, James Broberg, Andrzej Goscinski. 2014, Wiley.

[2] "*Cloud Application Architectures: Building Applications andInfrastructure in the Cloud*". George Reese. 2009, O'Reilly Media

[3] *Cloud Computing Bible*. Barrie Sosinsky. 2010, John Wiley & Sons

[4] Distributed and Cloud Computing. Kai Hwang, Geoffrey C. Fox andJack J. Dongarra. 2012, Elsevier.

[5] Architecting the cloud . Michael J. Kavis. 2010, Wiley

Recommendations