



Teaching Guide

Identifying Data					2023/24
Subject (*)	Computer Infrastructure Engineering	Code	614G01059		
Study programme	Grao en Enxeñaría Informática				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	1st four-month period	Fourth	Optional	6	
Language	Galician				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría de Computadores				
Coordinador	Pardo Martínez, Xoán Carlos	E-mail	xoan.pardo@udc.es		
Lecturers	Pardo Martínez, Xoán Carlos	E-mail	xoan.pardo@udc.es		
Web					
General description	Esta materia supón unha continuación da materia de Xestión de Infraestruturas orientada ao estudo de solucións tolerantes a fallas e de alta dispoñibilidade en centros de procesamento de datos (CPD) e unha introdución ao uso de tecnoloxías de virtualización nos CPDs e aos fundamentos da Computación na Nube (Cloud Computing).				

Study programme competences / results

Code	Study programme competences / results
A36	Capacidade para comprender, aplicar e xestionar a garantía e a seguridade dos sistemas informáticos.
A37	Capacidade para analizar, avaliar, seleccionar e configurar plataformas hardware para o desenvolvemento e execución de aplicacións e servizos informáticos.
B1	Capacidade de resolución de problemas
B3	Capacidade de análise e síntese
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben afrontarse.

Learning outcomes

Learning outcomes	Study programme competences / results		
Know the software and hardware systems that allow the implementation of fault tolerant solutions	A36 A37	B1 B3	C3 C6
Coñecer as alternativas tecnolóxicas para implantar solucións de alta dispoñibilidade nos centros de procesamento de datos	A36 A37	B3	C3
Saber configurar solucións de alta dispoñibilidade utilizando as ferramentas informáticas axeitadas	A36 A37	B1	C3
Coñecer os fundamentos da virtualización e as súas aplicacións máis relevantes nos centros de procesamento de datos	A37	B3	C3 C6
Coñecer os fundamentos da computación na nube (Cloud Computing)	A37	B3	C6
Saber utilizar os servizos básicos de provedores cloud públicos	A37	B1	C3

Contents

Topic	Sub-topic
Tolerancia a fallas, redundancia e alta dispoñibilidade	
Servidores e clusters de servidores	



Module I: High Availability Data Center Architectures	1.- Introduction to High Availability (HA) 2.- Architecture of a Data Center 3.- Servers of a Data Center for HA 4.- Clusters of a Data Center for HA
Module II: Virtualization and Cloud Computing	1.- Virtualization technologies 2. Virtualization of the Data Center 3.- Computing in the Cloud (Cloud Computing)
Computación na nube (Cloud Computing)	

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Laboratory practice	A37 B1 B3 C3 C6	20	60	80
Objective test	A36 A37	3	0	3
Guest lecture / keynote speech	A36 A37 C6	21	42	63
Personalized attention		4	0	4

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

Methodologies	
Methodologies	Description
Laboratory practice	Activity that allows students to learn and consolidate the knowledge already acquired through the realization of practical sessions in computers.
Objective test	Test that will be done at the end of the semester, on the contents of the lectures and the laboratory practices.
Guest lecture / keynote speech	Presentation complemented with the use of audiovisual media and the introduction of debate phases with the students. All this in order to transmit knowledge and facilitate learning.

Personalized attention	
Methodologies	Description
Laboratory practice	Personalized attention during the laboratories will be used to guide and verify the work that students are doing according to the instructions given to them, depending on the specific lab. All the lecturers will also propose a tutorial schedule in which the students can solve any doubt. The tutorials are recommended as a fundamental part of the learning support.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Laboratory practice	A37 B1 B3 C3 C6	As prácticas de laboratorio consistirán en diferentes actividades que se proporán ao longo do cuadrimestre relacionadas cos contidos da materia. Ademais poderán realizarse probas complementarias de avaliación continua sobre os contidos específicos tratados nas prácticas.	50
Objective test	A36 A37	A proba obxectiva realizarase ao final do cuadrimestre e estará formada por preguntas relacionadas co temario desenvolvido nas sesións maxistras e nas prácticas.	50

Assessment comments



FIRST OPPORTUNITYThe subject consists of two clearly differentiated modules. Each module will propose practices (laboratory practices and / or supervised work). To pass the practices it will be mandatory to submit all of them.The final mark will be calculated as the weighted average of the practice marks (laboratory practices and / or supervised work) and the objective test mark. To pass it, it will be necessary to reach at least 40% in each one of the marks and 50% in the average.**SECOND OPPORTUNITY**In the second opportunity, the same assessment criteria will be followed. There will be a second submission date for the practices, and the marks of those parts that have reached a minimum of 40% at the first opportunity will be conserved for the second opportunity.**STUDENTS AT PART TIME**The assessment will be the same as that of full-time students.**FRAUD**In the case of detecting any fraud in the evaluation tests, the sanctioning measures provided for in the university regulations will be applied.

Sources of information

Basic	1. Kailash Jayaswal (2006). "Administering Data Centers: Servers, Storage, and Voice over IP". Wiley. ISBN: 978-0-471-77183-8 2. Sander Van Vugt (2014). "Pro Linux high availability clustering".Apress. ISBN:978-1484200803 3. Germán Pacio (2015). "Data Centers Hoy". Marcombo. ISBN: 978-8-42672-156-34. Luís Joyanes Aguilar (2022). "Computación en la Nube: Estrategias de Cloud Computing en las Empresas, 2ed". Marcombo. ISBN: 978-8-42-673436-5
Complementary	1. Hwaiyu Geng (2021). "Data Center Handbook: Plan, Design, Build, and Operations of a Smart Data Center, 2nd Edition". Wiley. DOI:10.1002/97811195975372. Somit Maloo, Iskren Nikolov (2022). "Cisco Data Center Fundamentals". Cisco Press. ISBN: 978-0-13-763824-6 1. Hwaiyu Geng (2021). "Data Center Handbook: Plan, Design, Build, and Operations of a Smart Data Center, 2nd Edition". Wiley. DOI:10.1002/97811195975372. Somit Maloo, Iskren Nikolov (2022). "Cisco Data Center Fundamentals". Cisco Press. ISBN: 978-0-13-763824-6

Recommendations

Subjects that it is recommended to have taken before

Infrastructure Management/614G01025

Computer Architecture/614G01033

Subjects that are recommended to be taken simultaneously

Administration of Infrastructures and Information Systems/614G01113

Subjects that continue the syllabus

Administration of Infrastructures and Information Systems/614G01093

Other comments

For the mention of Information Technology, in which this subject is optional in the 2nd term, it is recommended to attend simultaneously the subject: "Infrastructure Administration and Information Systems - AISI - (614G01113)".

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.