



## Teaching Guide

Identifying Data					2023/24
Subject (*)	Network Administration		Code	614G01048	
Study programme	Grao en Enxeñaría Informática				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	2nd four-month period	Third	Optional	6	
Language	SpanishGalician				
Teaching method	Face-to-face				
Prerequisites					
Department	Ciencias da Computación e Tecnoloxías da InformaciónComputación				
Coordinador	Nóvoa Manuel, Francisco Javier	E-mail	francisco.javier.novoa@udc.es		
Lecturers	Nóvoa Manuel, Francisco Javier Soler García, David	E-mail	francisco.javier.novoa@udc.es david.soler@udc.es		
Web	moodle.udc.es/course/view.php?id=29132				
General description	<p>This subject introduces the student to the problems associated with the design and operation of a computer network. It covers all aspects related to basic network services, monitoring, high availability and traffic control mechanisms.</p> <p>From a case of use, the different elements that make up a network will be shelled, as well as the problem of scalability and related security mechanisms.</p>				

## Study programme competences / results

Code	Study programme competences / results
A53	Capacidade para seleccionar, deseñar, despregar, integrar, avaliar, construír, xestionar, explotar e manter as tecnoloxías de hardware, software e redes dentro dos parámetros de custo e calidade adecuados.
A55	Capacidade para seleccionar, deseñar, despregar, integrar e xestionar redes e infraestruturas de comunicacións nunha organización.
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.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

## Learning outcomes

Learning outcomes	Study programme competences / results		
Know aspects related to the design, administration and management of computer equipment in the network, as well as their involvement in the implementation of systems and network services.	A53		
Capability for analysis and synthesis. The student will be able to analyze communication project requirements and propose solutions, performing works where they will synthesize the knowledge acquired during the course		B3	
Ability to select, design, deploy, integrate and manage communications networks and infrastructures in an organization.	A55		
Ability to solve problems. Critically assess the knowledge, technology and information available to solve the problems they must face.		B1	C6
Develop for the exercise of an open, cultured, critical, committed, democratic and supportive citizenship, capable of analyzing reality, diagnosing problems, formulating and implementing solutions based on knowledge and oriented to the common good.			C4
Critically assess the knowledge, technology and information available to solve the problems they must face.			C6



Assess the importance of research, innovation and technological development in the socio-economic and cultural progress of society			C8
Use the basic tools of information and communication technologies (ICT) necessary for the exercise of their profession and for learning throughout their lives. They will learn to use their own tools of network administration. know to do.			C3

Contents	
Topic	Sub-topic
Network Design	Network design models Structured cabling
Network technologies fundamentals	Routing Switching First hop redundancy
Network Management	Management plane Syslog SNMP Netflow
Network Security	Firewalls Network addresses translation Security Policy
Network automation	NetDevOps Software defined networks

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A55 A53 C4 C6 C8	21	48	69
ICT practicals	B1 B3 C3	21	56	77
Objective test	B3 C6	2	0	2
Personalized attention		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	
Methodologies	Description
Guest lecture / keynote speech	In which the theoretical content of the syllabus will be exposed, including illustrative examples and with the support of audiovisual media. The student will have the support material (notes, copies of the slides, articles, etc.) beforehand and the teacher will promote an active attitude, recommending the previous reading of the topics to be discussed each day in class, as well as asking questions that allow to clarify concrete aspects and leaving open questions for the reflection of the student. The magisterial ideas will be complemented with the realization of conferences in which an external expert will be brought to discuss some topic in greater depth.
ICT practicals	In which the student will see the operation in practice of some of the theoretical contents seen in the lectures. In these practices, the student will use different tools (network simulators, monitoring tools, etc.) proposed by the professor, which will allow them to deepen and consolidate their knowledge about different aspects of network management. The practices will be presented in a way that facilitates their semi-face-to-face realization to those students who can not attend the face-to-face sessions. In addition to the basic practices that all students will have to do, additional practices that interested students can do optionally will be proposed.
Objective test	At the end of the exposition of the subject, a test type will be carried out that will allow to assess the theoretical knowledge and practical skills acquired during the evolution of the course

<b>Personalized attention</b>
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Methodologies	Description
ICT practicals	<p>The personalized attention during the practices will serve to guide and verify the work that the students are doing according to the indications that are provided to them, depending on the concrete practice in question.</p> <p>To carry out the supervised works, the teachers will provide the necessary initial indications, bibliography for consultation and will monitor the progress made by the student, in order to offer the relevant guidelines in each case, in order to ensure the quality of the works according to the criteria that are indicated.</p> <p>All the teachers of the subject will also propose a tutorial schedule in which the students will be able to answer any questions related to the development of the same. Students will be advised to attend tutorials as a fundamental part of learning support.</p> <p>It will facilitate the completion of practices and attention in the tutoring of work to students who, because they are enrolled part-time can not attend practical sessions or officially established tutoring sessions.</p>

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Objective test	B3 C6	At the end of the exposition of the subject, an objective test type test will be carried out on the treated contents, both in the theoretical sessions and in the practical ones.	50
ICT practicals	B1 B3 C3	The practices of the subject will consist of different activities related to Network Management. An exam of the practices will be carried out to assess the level of understanding and the work developed by the student	50

Assessment comments
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It will be necessary to obtain at least 50% of the grade to pass the subject. In addition to pass the subject, it will be necessary (at any opportunity) that the student obtains a minimum of 40% of the final mark in the objective test, essay questions and in the practices (ICT lab sessions and report).

Otherwise, the maximum grade that can be obtained is 4.5.

### FIRST CALL - ORDINARY CALL

The evaluation of the laboratory practices will be carried out by means of the realization of four practical reports related to the laboratory exercises and will have a total weight of 20% of the final mark. There will also be a practical exam that will have a weight of 30% on the final grade. It will be necessary to obtain a minimum of 40% in practices (ICT lab sessions and exam) to pass the subject.

40% of the grade of the first call can be achieved by conducting an objective test (exam), which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

10% of the remaining grade of the first call can be achieved by conducting an essay questions, which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

### SECOND CALL - EXTRAORDINARY CALL

The students may retain the mark obtained in the practices or the objective test of the first opportunity provided they have obtained an assessment equal to or greater than 50% of their weight in the final grade.

The evaluation of the practices in the second call will be carried out by means of the practical test in the laboratory.

40% of the grade of the first call can be achieved by conducting an objective test (exam), which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

10% of the remaining grade of the first call can be achieved by conducting an essay questions, which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

### END-OF-PROGRAM CALL

The evaluation of the practices will be carried out by means of a practical exam in the laboratory, at the end of the objective test of the extraordinary call.

40% of the grade of the first call can be achieved by conducting an objective test (exam), which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

10% of the remaining grade of the first call can be achieved by conducting an essay questions, which may contain questions related to the concepts developed in theory classes, practices, tutorials and basic bibliographic materials.

**STUDENTS WITH PARTIAL REGISTRATION OR WITH ACADEMIC DISPENSE OF TEACHING EXEMPTION:** They should contact professors of the subject to enable the completion of tasks outside the usual organization of the subject.

The fraudulent execution of tests or assessment activities, once proven, will directly involve the qualification of "fail" in the call in which it is committed: the student will be qualified with "fail" (numerical grade 0) in the corresponding call of the academic year, both if the offense is committed in the first opportunity as in the second. For this, your qualification will be modified in the first opportunity report, if necessary

### Sources of information

<b>Basic</b>	<ul style="list-style-type: none"> <li>- Jason Edelman; Scott S. Lowe; Matt Oswalt (2018). Network Programmability and Automation. O'Reilly</li> <li>- William Stallings (1999). SNMP, SNMPv2, SNMPv3 and RMON1 and 2. Prentice Hall Engineering</li> <li>- Anthony Bruno; Steve Jordan (2020). CCNP Enterprise Design ENSLD 300-420 Official Cert Guide: Designing Cisco Enterprise Networks. Cisco Press</li> <li>- Wendell Odom (2019). CCNA 200-301 Official Cert Guide Library. Cisco Press</li> </ul>
<b>Complementary</b>	

### Recommendations

#### Subjects that it is recommended to have taken before

Internet and Distributed Systems/614G01023

Infrastructure Management/614G01025

#### Subjects that are recommended to be taken simultaneously

Administration of Infrastructures and Information Systems/614G01093

Operating Systems Administration/614G01212

#### Subjects that continue the syllabus

Network Design/614G01082

### Other comments



(\*)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.