UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2022/23
Subject (*)	Infrastructure Management		Code	614G01025
Study programme	Grao en Enxeñaría Informática			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Third	Obligatory	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Computación e Tecnoloxías da InformaciónComputaciónEnxeñaría de Computadores			
Coordinador	Carneiro Diaz, Victor Manuel	E-mail	victor.carneiro@udc.es	
Lecturers	Carneiro Diaz, Victor Manuel Dafonte Vazquez, Jose Carlos Dapena Janeiro, Adriana Gonzalez Lopez, Miguel Iglesia Iglesias, Daniel Ismael López Rivas, Antonio Daniel Martinez Perez, Maria Montoto Castelao, Paula	E-mail	victor.carneiro@udc.es carlos.dafonte@udc.es adriana.dapena@udc.es miguel.gonzalez.lopez@udc.es daniel.iglesia@udc.es daniel.lopez@udc.es maria.martinez@udc.es paula.montoto@udc.es	
Web	campusvirtual.udc.gal			
General description	This subject consists of two different modules. In the first part of the subject or module I, the fundamentals of wired and wireless network transmission, such as bandwidth, frequency response, modulation, etc. are presented. Also, some aspects of the physical and MAC layer of the IEEE 802.11 wireless transmission standard are explained. In the second part or module II, it introduces the student to the basic concepts of design, deployment, operation and maintenance of a data processing center (CPD). It includes the fundamentals of physical space design for its location, tools and techniques for wiring design, power supply systems, air conditioning, access control, and surveillance systems. Virtualization of the CPD infrastructure, both server and client, is also addressed. The traditional organization and operation of a CPD is studied. Finally, the study of the regulations that affect this instalations.			

Study programme competences	
Code	Study programme competences
A7	Capacidade para deseñar, desenvolver, seleccionar e avaliar aplicacións e sistemas informáticos que aseguren a súa fiabilidade, seguranza e calidade, conforme a principios éticos e á lexislación e normativa vixente.
A10	Capacidade para elaborar o prego de condicións técnicas dunha instalación informática que cumpra os estándares e as normativas vixentes.
A11	Coñecemento, administración e mantemento de sistemas, servizos e aplicacións informáticas.
A24	Coñecemento da normativa e a regulación da informática nos ámbitos nacional, europeo e internacional.
A37	Capacidade para analizar, avaliar, seleccionar e configurar plataformas hárdware para o desenvolvemento e execución de aplicacións e servizos informáticos.
A38	Capacidade para deseñar, despregar, administrar e xestionar redes de computadores.
A47	Capacidade para determinar os requisitos dos sistemas de información e comunicación dunha organización de acordo cos aspectos de seguridade e cumprimento da normativa e a lexislación vixente.
A48	Capacidade para participar activamente na especificación, deseño, implementación e mantemento dos sistemas de información e comunicación.
A53	Capacidade para seleccionar, deseñar, despregar, integrar, avaliar, construír, xestionar, explotar e manter as tecnoloxías de hárdware, sóftware 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
C2	Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.
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 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		
Know and be able to apply the regulations and legislation in force regarding computer systems. Preparation of administrative and technical specifications for the acquisition of computer equipment.	A7 A10 A24 A37 A38 A47 A48 A53 A55	B1 B3	C2 C3 C6 C8
Administration, maintenance and operation of communication systems and networks.	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55	B1 B3	C2 C3 C6 C8
Design and dimensioning of the necessary hardware and equipment in a data processing center.	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55	B1 B3	C2 C3 C6 C8

Contents	
Topic	Sub-topic
MODULE I: Signal transmission fundamentals	Signals Mean power and energy Transmission impairments Multipath
MODULE I: Frequency analysis fundamentals	Fourier transform Fourier transform of basic signals Properties of the Fourier Transform

MODULE I: Wireless communications - PHY layer	IEEE 802.11 standard OFDM/MMO Forward Error Correction (FEC)
MODULE I: Wireless communications - MAC layer	Wireless medium access problems CSMA/CA. IEEE 802.11 DCF
MODULE II: Information Security Management System	Information security audit Information Security Management System (ISMS) ISO 27001 ISO 27002
MODULE II: Customer infrastructure management	Customer equipment management: centralized / distributed Remote boot: standards and transmission methods Cloning techniques through the data network
MODULE II: Organization and operation of the CPD	Organization CPD Functions and competencies of the staff Internal and external incident management (ITIL) Documentation Computer waste treatment
MODULE II: Design and implementation of a data processing center	Design of a CDP (ANSI / TIA 942). Local area network (LAN) technologies Storage Networks (SAN)

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
ICT practicals	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55 B1 B3 C2 C3 C6 C8	30	40	70
Objective test	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55 B1 B3 C2 C3 C6 C8	3	0	3
Guest lecture / keynote speech	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55 B1 B3 C2 C3 C6 C8	30	40	70
Personalized attention		7	0	7
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
ICT practicals	In which the student will see the operation in practice of some of the theoretical content seen in the master classes. In these practices the student will use different tools proposed by the teacher that will allow them to deepen and consolidate their knowledge on different aspects of infrastructure management. The practices will be planned in a way that facilitates their semi-face-to-face realization for those students who cannot attend the face-to-face sessions. In addition to the basic practices that all students will have to do, additional practices are proposed that interested students can optionally do.
Objective test	Test at the end of the semester.

Guest lecture / keynote speech	In which the theoretical content of the agenda will be exposed, including illustrative examples and with the support of audiovisual media. The student will have the support material (notes, copies of the transparencies, articles, etc.) in advance and the teacher will promote an active attitude, recommending the prior reading of the agenda items to be dealt with in each class, as well as asking questions that allow clarifying specific aspects and leaving questions open for student reflection.

Personalized attention	
Methodologies	**Description**
Guest lecture / keynote speech ICT practicals	Students will be recommended to attend tutoring as a fundamental part of learning support. 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, depending on the specific practice in question. As telematic tools for personalized online attention, those provided by the University of A Coruña will be used. Email, e-learning tool (moodle) and video conferencing and teamwork tool (Teams).

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
ICT practicals	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55 B1 B3 C2 C3 C6 C8	[Module I] The ICT will be evaluated through sport written exams (1 point) in practice sessions and in the last master session. In the second opportunity, the date will be evaluated in the date fixed on the exam calendar. [Module II] The compulsory module II practices will add 1 point and will be evaluated before the theoretical exam, by defending the work done in front of the practical teacher either in person or online. At the second opportunity, the defense date may not be later than the theory exam and the form of defense will be the same as for the first opportunity.	20
Objective test	A7 A10 A11 A24 A37 A38 A47 A48 A53 A55 B1 B3 C2 C3 C6 C8	[Module I] The master sessions will be evaluated by means of a written test on the date set in the exam calendar. It will have a weight of 4 points. [Module II] The evaluation of topics will also be carried out through a written test, which will be held together with that of [Module I]. In addition to the contents developed in the magisterial sessions, within this test questions about the practices may be included. This exam will add 4 points.	80

Assessment comments

The qualification of each module is the result of the sum of the qualifications of all the evaluations (there is no minimum in the section of practices through ICT or in the objective test). To pass the subject, it is necessary to have a grade equal to or greater than 2 points (out of 5 points) in each module and greater than or equal to 5 points (out of 10 points) in the final grade. In case of not reaching 2 points in any of the two modules, the maximum grade that will be reflected in the minutes is 4 points. Both in the first opportunity and in the second, the student will be able to take an exam in any of the theoretical or practical sections of each one of the modules (or both). In the second opportunity, the students who obtained SUSPENSE qualification in the first opportunity will be able to present themselves. The following considerations will be taken into account: Extraordinary calls: Examination of theoretical, practical and problem content: 10 points Part-time students: Students with part-time enrollment do not require attendance and the evaluation of the theoretical content can be done with a single attendance to take the objective test on the date indicated in the exam calendar. The practices will be presented and defended on the same dates as the rest of the students of the subject.

Sources of information	
Basic	- A. V. Oppenheim, A. S. Willsky (1997). Signals and Systems. Prentice-Hall - J. Kurose, K. Ross (2017). Computer Networking: A Top-Down Approach. Pearson Education Limited - Maurizio Portolani (2003). Data Center Fundamentals. CiscoPress - Charles E. Spurgeon (2000). Ethernet: The Definitive Guide. O'Reilly - Christian F Nissen (2012). Passing Your ITIL Foundation Exam. The Stationery Office - Brady Orand (2009). Foundations of IT Service management with ITIL 2011. CreateSpace Independent Publishing Platform - Varios (2011). IT Infrastructure Library (serie de 5 libros). The Stationery Office - Luis Gómez, Ana Andrés (2012). Guía de aplicación de la Norma UNE-ISO/IEC 27001 sobre seguridad en sistemas de información para pymes. AENOR - C. M. Fernández, M. Piattini (2012). Modelo para el gobierno de las TIC basado en las normas ISO. AENOR - Nextel S.A. (2012). ISO/IEC 20000 para pymes. Cómo implantar un sistema de gestión de los servicios de tecnologías de la información. AENOR
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Electronics Technology/614G01005 Databases/614G01013 Operating Systems/614G01016 Networks/614G01017
Subjects that are recommended to be taken simultaneously
Internet and Distributed Systems/614G01023 Computer Security and Legislation/614G01024
Subjects that continue the syllabus
Hardware Devices and Interfaces/614G01032 Communications Software/614G01034 Digital Information Processing/614G01035 Mobile and Wireless Networks/614G01061 Network Design/614G01082 Network Administration/614G01213
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.