UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2016/17
Subject (*)	Network Design		Code	614G01082
Study programme	Grao en Enxeñaría Informática			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Fourth	Obligatoria	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Electrónica e Sistemas			
Coordinador	Gonzalez Lopez, Miguel	E-mail	miguel.gonzalez.lopez@udc.es	
Lecturers	Gonzalez Lopez, Miguel Vazquez Araujo, Francisco Javier	E-mail	miguel.gonzalez.lopez@udc.es francisco.vazquez@udc.es	
Web	campusvirtual.udc.es/moodle/course/view.php?id=64043			
General description	The goal of the subject is to introduce the most recent schemes in IP networks and Mobile Ad-hoc NETworks (MANETs). It covers topics like IPv6, virtual private networks (VPNs), Mobile IP / IPv6, MANETs, classical routing algorithms both static and dynamic, as well as their particularization to the case of MANETs.			

Study programme competences	
Code	Study programme competences
A17	Coñecemento e aplicación das características, funcionalidades e estrutura dos sistemas distribuídos, as redes de computadores e internet, e deseñar e implementar aplicacións baseadas nelas.
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.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.

Learning outcomes			
Learning outcomes	Study programme competences		
Coñecer en profundidade os distintos elementos cos que se pode construir unha rede de comunicacións. Capacidade de analizar as vantaxes e inconvintes de cada topoloxía e protocolo de rede. Coñecer os algoritmos que incorporan os protocolos, e os seus contornos de aplicabilidade.	A17 A55	B1 B3	C3 C6

Contents	
Topic	Sub-topic
1. Analisys, design and addressing in IP networks. Advanced IP networks (IPv6)	1.1 Introduction to IP mobility. 1.2 IPv6: motivation, differences to IPv4, IPv6 extension headers, route aggregation vs multihoming, automatic address assignment, fragmentation, Neighbour Discovery (ND) protocol.
2. Virtual Private Networks (VPNs). IPsec.	2.1 VPNs: purpose, types, Level-2 VPNs (PPP) vs Level-3 VPNs (IPsec). 2.2 IPsec: fundamentals, authentication (AH), Encapsulated Security Payload (ESP), key exchange mechanisms: the case of IKE.

3. Mobile IP / IPv6	3.1 Binding Cache management. 3.2 Return Routability procedure. 3.3 Security management. 3.4. Care-of Address (CoA) packet delivery. 3.5. Home Agent discovering. 3.6. Movement detection and link establishment. 3.7 Fast Handover. 3.8 Examples of application scenarios.
4. MANETs: Mobile Ad Hoc Networks	4.1 Motivation and fundamentals. 4.2 Medium Access Control (MAC). 4.3 Static and dynamic routing algorithms: general case and particularization to MANETs. 4.4 Transport issues in MANETs.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A5 A17 A31 A34 A38 A55 B3 C6	30	45	75
ICT practicals	A5 A31 A34 B1 B3 C3	28	45	73
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	Sesións expositivas de teoría en aula, así como de exemplos ilustrativos da materia.
ICT practicals	Explicación e seguimento de prácticas TIC sobre os contidos da asignatura.

Personalized attention	
Methodologies	Description
ICT practicals	Resolución de dúbidas sobre as prácticas da asignatura.

Assessment			
Methodologies	Competencies	Description	Qualification
Guest lecture / keynote speech	A5 A17 A31 A34 A38 A55 B3 C6	Evaluarase mediante exame escrito.	50
ICT practicals	A5 A31 A34 B1 B3 C3	Evaluarase mediante a memoria de traballo sobre as prácticas realizada polo alumno.	50

Assessment comments
A avaliación realizarase sobre o exame final e sobre a memoria escrita sobre as prácticas. En xullo só se avaliará o exame de teoría. Avaliación no caso de alumnos a tempo parcial: igual que no caso xeral.

Sources of information	
Basic	- R. S. Koodli, C. E. Perkins (2007). Mobile Inter-networking with IPv6: Concepts, Principles and Practices. Wiley
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Network Administration/614G01048
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Communications Software/614G01034 Administration of Infrastructures and Information Systems/614G01216
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.