Universidad Carlos III de Madrid

SUBJECT NAME: DESIGN AND OPERATION OF COMMUNICATION NETWORKS / DISEÑO Y OPERACIÓN DE REDES DE COMUNICACIONES		
MASTER IN TELECOMMUNICATIONS ENGINEERING	COURSE: 1º	CUATRIMESTER: 1º

SESSION	CONTENT DESCRIPTION	TYPE				WEEKLY STUDENT HOURS		
		THEORY	PRACTICAL	LABORATORY	Lab room	DESCRIPTION	FACE-TO-FACE HOURS	TOTAL STUDENT TIME
1	Course presentation. Review: layer model, identifiers, relations between layers.	X				IPv4 Review.	2	5
2	Routing. Distance vector/link state protocols. Routing in Ethernet. IP routing.	X				Do 'IPv4 review' practice with CORE emulation environment	2	
3	Interdomain routing: introduction to BGP	X				Do 'FRR introduction' practice with CORE emulation environment. Read [BGP], pags. 6-19, y 61-74. (reference [BGP] = 'BGP', Iljitsch van Beijnum, O'Reilly)	2	7
4	Interdomain connectivity, business model Conectividad Interdominio, tarificación y modelo de negocio in the Internet	X				Read 'The Art of Peering - The Peering Playbook'. William Norton.	2	
5	Business model in the Internet	X				Do 'BGP without relationships' practice with CORE emulation environment.	2	7
6	BGP router model. Attributes and route selection in BGP	X				Read [BGP], pages 36-60	2	
7	Route selection in BGP	X				Read [BGP], pages 23-26. Read ['Practical BGP', White, McPherson], pages 15-26	2	7
8	Route selection in BGP	X				Solve problems from the proposed problem set	2	
9	Route selection problem resolution		X			Solve problems from the proposed problem set	2	7
10	Introduction to MPLS	X				Review MPLS	2	

#	Activity					Task / Reading		
11	MPLS	X				Review MPLS	2	7
12	Introduction to Traffic Engineering. Traffic Engineering in interdomain routing	X				Read ['Practical BGP', White, McPherson], chapter 10	2	
13	BGP router configuration in FRR	X				Execute FRR commands presented in class in CORE.	2	7
14	**Laboratory**: configuration of provider/customer and peer/peer relationships in BGP with FRR		X			Review BGP and BGP router configuration in FRR	2	
15	Traffic Engineering in interdomain routing. VPNs and BGP	X				Read "An overview of routing optimization for Internet traffic engineering". Wang, N, Ho, KH, Pavlou, G and Howarth, M	2	7
16	**Laboratory**: configuration of Traffic Engineering in BGP with FRR		X			Review BGP and BGP router configuration in FRR	2	
17	Analysis of the current Internet: prevalence of multimedia traffic. Roles and strategies of the actors involved in the provision of Internet connectivity	X				Read "The state of the Internet", Akamai.	2	7
18	**Exam**: BGP and MPLS		X			Prepare exam	2	
19	Network design: Architectures, scalability, fault tolerance	X				Read "Good Practices for Resilient Internet Interconnections", ENISA 2012	2	7
20	Methodologies for network design, Exercises for network design		X			Read "Comprehensive Topology and Traffic Model of a Nationwide Telecommunication Network"	2	
21	Cabling. Residential deployments. Common Telecomunication Infrastructures	X					2	7
22	Security in network protocols	X				Study chapter 8, "Computer Networking", Kurose, Ross.	2	
23	Security in network protocols: case study	X				Study chapter 8, "Computer Networking", Kurose, Ross	2	7
24	Security in network protocols: case study		X			Review presented case study	2	
25	Security in network protocols: case study		X			Review presented case study	2	7
26	**Exam**: network design and security in network protocols		X			Prepare exam	2	
27	Network management. Network management for BGP	X				Review network management	2	7
28	Network management protocols and technologies	X				Review network management	2	

56 + 42 = 98								
		Prepare for evaluation, and evaluation itself					7	
105								