



COURSE: Audiovisual Services		
DEGREE: Bachelor in Telecommunication Technology Engineering	YEAR: 4th	TERM: 2nd

WEEKLY PLANNING									
W EE	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	PART 1. Introduction <ul style="list-style-type: none"> Presentation of the course: syllabus and rules. Presentation of the practical study case to be done during the course. 	X			NO	<ul style="list-style-type: none"> Read texts associated with session number 3. Solving questions about basic concepts, addressing and management of multicast groups, from the aggregated group preparation brochure. 	1,6	7h
1	2	Introduction to the subject: audiovisual services <ul style="list-style-type: none"> Audiovisual services and distributed multimedia applications. Evolution of formats and coding. 					<ul style="list-style-type: none"> Review the concepts acquired on session 2. Read texts associated with session number 4. Prepare concept map of part 1. Prepare lab exercise of session 4. 	1,6	

		<ul style="list-style-type: none"> Multimedia transmission: network requirements and architectures of protocols. 		X		NO			
2	3	<p>PART 2. Multicast routing service</p> <p>2.1 Basic concepts</p> <ul style="list-style-type: none"> Multiparty delivery: user applications, Unicast VS Multicast, problematic associated with the multicast service. Definition of multicast service, utilization of multicast in multimedia applications. <p>2.2. Addressing</p> <ul style="list-style-type: none"> Multicast addresses, IANA guidelines for multicast address assignments. Scope of multicast session. <p>2.3 Management of multicast groups</p> <ul style="list-style-type: none"> Protocol for multicast group management: IGMP versions 1, 2 and 3. 	X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 3. Read texts associated with session number 5. Solving questions about multicast routing protocols (part I), addressing and management of multicast groups, from the aggregated group preparation brochure. 	1,6	
2	4	<ul style="list-style-type: none"> Study cases: multicast over local area networks (LAN) and ethernet networks. Lab exercise: use of Wireshark and multicast-based multimedia application, capture of multicast packets and IGMP, analysis of operation of the IGMP protocol. Deliverable: concept map (part 1). 		X	4.1B01 or 4.1.B02	YES	<ul style="list-style-type: none"> Review the concepts acquired on session 4. Prepare session 6 study case. 	1,6	7h
3	5	<p>2.4 Multicast routing protocols</p> <ul style="list-style-type: none"> Basic concepts about routing, unicast routing (distance vector, link state). Techniques and protocols for multicast routing 	X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 5. Read texts associated with session number 7. Solving questions about multicast routing protocols (part II), from the aggregated group preparation brochure. 	1,6	7h

		(part I): flooding, spanning trees, Reverse Path Broadcasting.								
3	6	<ul style="list-style-type: none"> Study cases about multicast routing. Deliverable. <u>Evaluation of the lab exercise corresponding to session 4.</u> 		X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 6. Prepare session 8 study cases (from the study case brochure). 	1,6	
4	7	<ul style="list-style-type: none"> Techniques and protocols for multicast routing (part II): Reverse Path Multicasting (DVRMP, PIM-DM), Forward Path Multicasting (MOSPF), shared tree techniques (CBT, PIM-SM). 	X				NO	<ul style="list-style-type: none"> Review the concepts acquired on session 7. Prepare concept map of part 2. Work to be defined depending on course development. Consolidation of acquired knowledge. 	1,6	
4	8	<ul style="list-style-type: none"> Study cases about multicast routing. Deliverable. 		X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 8. Work to be defined depending on course development. Consolidation of acquired knowledge. 	1,6	7h
5	9	Expansion Deliverable: concept map (part 2).	X				NO	<ul style="list-style-type: none"> Read texts associated with session number 11. Solving questions about RTP from the aggregated group preparation brochure. 	1,6	
5	10	<u>Knowledge test</u>		X			NO	<ul style="list-style-type: none"> Self-evaluation: review of the knowledge test and solve of doubts Prepare practical study case of session 12. 	1,6	7h
6	11	PART 3. Multimedia transport protocols over packet networks 3.1 RTP <ul style="list-style-type: none"> Provided services. RTP session. 	X				NO	<ul style="list-style-type: none"> Review the concepts acquired on session 11. Read texts associated with session number 13. Solving questions about RTCP from the aggregated group preparation brochure. 	1,6	7h

		<ul style="list-style-type: none"> • Structure of an RTP packet, sequence Number and timestamp. • Reconstruction of video/audio sequence at the receiver. • Identification of an RTP source. • RTP relays: mixers and translators. • Congestion control. 								
6	12	<ul style="list-style-type: none"> • Practical study case (part 1): RTP. 		X			NO	<ul style="list-style-type: none"> - Review the concepts acquired on session 12. Review the implementation of the practical study case. - Prepare session 14 study cases (from the study case brochure). 	1,6	
7	13	<p>3.2 RTCP</p> <ul style="list-style-type: none"> • Provided services. • Types and structure of RTCP packets: RR (Receiver Report), SR (Sender Report), SDES (Source Description), BYE, APP (Application-Defined). • Jitter and Round Trip Time calculation. • Sending of RTCP packets: compound packet. • RTCP transmission interval. 	X				NO	<ul style="list-style-type: none"> - Review the concepts acquired on session 13. - Read texts associated with session number 15. - Solving questions about services based on multimedia streaming ,from the aggregated group preparation brochure. 	1,6	
7	14	<ul style="list-style-type: none"> • Study cases about RTP/RTCP: provided services, structure of RTP/RTCP packets and RTP relays. • <u>Deliverable.</u> 		X			NO	<ul style="list-style-type: none"> - Review the concepts acquired on session 14. - Prepare practical study case of session 16. 	1,6	7h
8	15	<p>PART 4. Services based on multimedia streaming</p> <ul style="list-style-type: none"> • Alternatives of implementation for streaming stored Audio/Video (web server, streaming server, RTSP, DASH) and IP Television. • Architectures for distribution of multimedia 	X				NO	<ul style="list-style-type: none"> - Review the concepts acquired on session 15. - Prepare concept map of parts 3 and 4. - Work to be defined depending on course development. Consolidation of acquired knowledge. 	1,6	7h

		content: CDN and P2P.							
8	16	Practical study case (part 2): RTSP.		X	4.1.B01 or 4.1.B02	NO	- Review the concepts acquired on session 16. Review the implementation of the practical study case. - Work to be defined depending on course development. Consolidation of acquired knowledge.	1,6	
9	17	Expansion Deliverable: concept map (parts 3 and 4).	X			NO	- Read texts associated with session number 19. - Solving questions about services, identification, and elements in SIP, from the aggregated group preparation brochure.	1,6	
9	18	Knowledge test		X		NO	- Self-evaluation: review of the knowledge test and solve of doubts - Prepare lab exercise of sessions 20 and 22.	1,6	7h
10	19	PART 5. Signaling of multimedia services over packet networks 5.1 Introduction <ul style="list-style-type: none"> • Signaling architectures of the voice service in circuit-switched networks (SS7 Signaling System) and packets networks (H.323 and SIP). 5.2 SIP <ul style="list-style-type: none"> • Provided services. • User identification. • SIP elements: User Agents (UA), servers (Registrar, Redirect, Proxy) and B2BUA. 	X			NO	- Review the concepts acquired on session 19. - Read texts associated with session number 21. - Solving questions about messages and registration in SIP, from the aggregated group preparation brochure.	1,6	
10	20	<ul style="list-style-type: none"> • Lab exercise: configuration and analysis of operation of a SIP-based VoIP service (part 1). 		X	4.1B01 or	YES	- Review the concepts acquired on session 20. - Prepare lab exercise of sessions 20 and 22.	1,6	7h

					4.1.B02				
11	21	<ul style="list-style-type: none"> SIP messages: format, requests and responses. SIP messages: header fields. SIP messages: message body. SIP signaling: registration. 	X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 21. Read texts associated with session number 23. Solving questions about SIP session establishment, modification, and termination, as well as about SDP, from the aggregated group preparation brochure. 	1,6	7h
11	22	<ul style="list-style-type: none"> Lab exercise: configuration and analysis of operation of a SIP-based VoIP service (part 2). Evaluation of the lab exercise corresponding to sessions 20 and 22. 		X	4.1B01 or 4.1.B02	YES	<ul style="list-style-type: none"> Review the concepts acquired on session 22. Prepare practical study case of sessions 24 and 29. 	1,6	
12	23	<ul style="list-style-type: none"> SIP signaling: session establishment. SIP signaling: session termination. SIP signaling: session modification. <p>5.3 SDP</p> <ul style="list-style-type: none"> Provided services. SDP session description: analysis of examples. Offer/Answer model of SDP. 	X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 23. Read texts associated with session number 25. Solving questions about SIP extensions, SIP conference and H.323 from the aggregated group preparation brochure. 	1,6	7h
12	24	<ul style="list-style-type: none"> Practical study case (part 3): SIP. 		X	4.1B01 or 4.1.B02	YES	<ul style="list-style-type: none"> Review the concepts acquired on session 24. Review the implementation of the practical study case. Prepare session 26 study cases (from the study case brochure). 	1,6	
13	25	<ul style="list-style-type: none"> SIP extensions. Conference service in SIP. <p>5.4 H.323</p> <ul style="list-style-type: none"> Provided services. H.323 architecture and elements. Protocols: RAS signaling and call signaling 	X			NO	<ul style="list-style-type: none"> Review the concepts acquired on session 25. Prepare concept map of part 5. Work to be defined depending on course development. Consolidation of acquired knowledge. 	1,6	7h

		(H.225.0), control signaling (H.245). • Examples of operation.							
13	26	• Study cases about signaling of multimedia services over packet networks: SIP and H.323. • <u>Deliverable.</u>		X			NO	- Review the concepts acquired on session 26. - Work to be defined depending on course development. Consolidation of acquired knowledge.	1,6
14	27	Expansion <u>Deliverable:</u> concept map (part 5)	X				NO		1,6
14	28	<u>Knowledge test</u>		X			NO	- Self-evaluation: review of the knowledge test and solve of doubts	1,6
12	29	• Practical study case (part 4): integration tests and extensions.		X	4.1.B01 or 4.1.B02		NO	- Review the concepts acquired on session 29. Review the implementation of the practical study case.	1,6

Subtotal 1 **46,67** **93**

Total 1 (Hours of class plus student homework hours between weeks 1-14)

15		Tutorials, handing in, etc							
16		Assessment							
17								0	
18									

Subtotal 2 **0**

Total 2 (Hours of class plus student homework hours between weeks 15-18)

0

TOTAL (<i>Total 1 + Total 2. Maximum 180 hours</i>)	139,67
--	---------------