



SUBJECT NAME: ADVANCED MULTIMEDIA SERVICES		
MASTER IN TELECOMMUNICATIONS ENGINEERING	COURSE: 1	SEMESTRE: 1

WEEKLY PLANNING							
WEEK	SESSION	CONTENT DESCRIPTION	Computer room / remote	Session with 2 instructors)	WEEKLY STUDENT HOURS		
					DESCRIPTION	FACE-TO-FACE HOURS	TOTAL STUDENT TIME
1	1	Course presentation: Introduction to multimedia Communications.			Course presentation	1,66	7
	2	Introduction to multimedia communications			Review of the basic concepts in a layered communication network architecture (link, network and transport levels	1,66	
	3	SIP Protocol			Review of RFCs on SIP and protocol use cases. Identification of message sequences. Understanding error situations, timers, and call routing decisions.	1,66	
2	4	SIP Protocol			Review of RFCs on SIP and protocol use cases. Identification of message sequences. Understanding error situations, timers, and call routing decisions.	1,66	7
	5	RTP y RTCP			Installation of course's Virtual Machine	1,66	
	6	Programming services on SIP			Programmatic environments for the development of services in SIP Proxys. Study of the SIP Servlets API.	1,66	
3	7	APIs for parsing XML documents in Java			Programming user services in XML	1,66	7
	8	Implementing a SIP User Agent	Laboratory		Java implementation of a SIP user agent that is capable of sending and receiving certain preselected message sequences and validation through tests. Implementation of the SIP protocol based on an API already programmed for the parsing and composition of SIP messages. Call state machines for both caller and caller. Transactions. Timers. Treatment of packet loss.	1,66	
4	9	C programming review			Read RFC3550.	1,66	7
	10	Programming of multimedia applications: sound card			C programming review.	1,66	

	11	Implementing a SIP User Agent	Laboratory		Java implementation of a SIP user agent that is capable of sending and receiving certain preselected message sequences and validation through tests. Implementation of the SIP protocol based on an API already programmed for the parsing and composition of SIP messages. Call state machines for both caller and caller. Transactions. Timers. Treatment of packet loss.		
5	12	Audio-conference software design			Read RFC3551, RFC4961	1,66	7
	13	Implementing a SIP Proxy with Execute SIP Servlets	Laboratory		Java implementation of a SIP Proxy server that processes the call setup messages. Implementation of protocol, timers and state machines. Loose-routing behavior. User registration and valid user lists.	1,66	
6	14	Programming multimedia applications: processes.			Study programming techniques for multimedia applications.	1,66	7
	15	Implementing a SIP Proxy with Execute SIP Servlets	Laboratory		Java implementation of a SIP Proxy server that processes the call setup messages. Implementation of protocol, timers and state machines. Loose-routing behavior. User registration and valid user lists.	1,66	
7	16	Programming multimedia applications: communications.			Study programming techniques for multimedia applications.	1,66	7
	17	Implementing a SIP Proxy with Execute SIP Servlets	Laboratory		Java implementation of a SIP Proxy server that processes the call setup messages. Implementation of protocol, timers and state machines. Loose-routing behavior. User registration and valid user lists.	1,66	
8	18	Implementing a Configurable SIP Servlet Container Using XML File	Laboratory		Implementation of a SIP Servlet container that will be deployed in the previous Proxy and will process the call establishment messages by using a user service configuration file in XML. The parsing of service files in XML will be implemented according to a simplified grammar that allows lists of valid and prohibited users as well as allowed and forbidden slots.	1,66	7
	19	First contact with the laboratory: tests with the sound card	Laboratory		Preparation of the lab: read the specifications, review the necessary tools, such as the calls used to program the sound card	1,66	
9	20	Implementing a Configurable SIP Servlet Container Using XML File	Laboratory		Implementation of a SIP Servlet container that will be deployed in the previous Proxy and will process the call establishment messages by using a user service configuration file in XML. The parsing of service files in XML will be implemented according to a simplified grammar that allows lists of valid and prohibited users as well as allowed and forbidden slots.	1,66	7
	21	Implementation of RTP-based audio conferencing software	Laboratory		Analysis of the tools available in Aula Global for the development of the lab. Start Encoding: Capture arguments on the command line. Initial communication between participating nodes, sound card configuration, circular buffer configuration.	1,66	
10	22	Implementation of RTP-based audio conferencing software	Laboratory		Initial communication between participating nodes, sound card configuration, circular buffer configuration.	1,66	7

11	23	Implementing a Configurable SIP Servlet Container Using XML File	Laboratory	X	Implementation of a SIP Servlet container that will be deployed in the previous Proxy and will process the call establishment messages by using a user service configuration file in XML. The parsing of service files in XML will be implemented according to a simplified grammar that allows lists of valid and prohibited users as well as allowed and forbidden slots.	1,66	7
	24	Implementation of RTP-based audio conferencing software	Laboratory		Basic functions of the main loop of data reception and circular buffering, extraction of circular buffer data and writing to sound card, recording data from the sound card and sending to the remote node.	1,66	
12	25	Implementation of RTP-based audio conferencing software	Laboratory		Initial communication between participating nodes, sound card configuration, circular buffer configuration.	1,66	7
13	26	Implementation of RTP-based audio conferencing software	Laboratory	X	Processing of RTP headers	1,66	7
14	27	Implementation of RTP-based audio conferencing software Continuous assessment evaluation	Laboratory	X	Treatment of lost and delayed packets	1,66	7
	28	SDP and Integration with SW RTP of the first part of the course Continuous assessment evaluation	Laboratory	X	Introduction of the SDP payload in the SIP messages and use of the RTP SW of the first part of the subject to have a user agent with real communication capacity.	1,66	
SUBTOTAL						46,5 + 51,5 (**)	= 98
15-16		Catch up sessions, tutorials, work delivery, etc.				0	
17-18		Assesment				0	
TOTAL						98 + 7=	105

(**) 105 hours of work per student at most in 14 weeks, assuming 30 hours per ECTS credit.