



COURSE: Telecommunication Systems		
DEGREE: Bachelor in Audiovisual System Engineering	YEAR: 4th	SEMESTER: 1st.

WEEK	SESSIO N	DSESSIO N CONTENT	Class Method (marcar X)		Indicate if teaching takes place outside the classroom (Computer Lab)	STUDENT WORK		
			Lectur e	Exercis e		DESCRIPTION	Class Hours	Student Workloa d
1	1	<ul style="list-style-type: none"> - Course Introduction - Unit 1: <ul style="list-style-type: none"> o Communication Systems and Networks o Telecommunication Services o Normative and Standards 	X			Revise: <ul style="list-style-type: none"> * Medium Access Control * Multiplexing * Networks Assimilate Course Content during class	1,66	3
1	2	Unit 2: Linear Modulations <ul style="list-style-type: none"> • Baseband Pulse Amplitude Modulations (PAM) • Signal Constellations and Pulse Shping Filters • Spectrum • Transmission over Gaussian Channels • InterSymbol Interference (ISI) 		X		<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	
2	3	Unit 2: Linear Modulations <ul style="list-style-type: none"> • Pulse Shaping: raised cosine filter • Transmission over linear channels • Noise at the receiver • Error Probability 	X			<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	

2	4	Unit 2: Linear Modulations <ul style="list-style-type: none"> • Passband PAM: AM, QAM • Signal Constellations • Spectrum • Transmission over Gaussian Channels • InterSymbol Interference (ISI) 				<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	
3	5	Unit 2: Linear Modulations <ul style="list-style-type: none"> • Exercises 	x			<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	5
3	6	Unit 2: Linear Modulations <ul style="list-style-type: none"> • Exercises 		x		<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	
4	7	Unit 3: Phase and Frequency Modulations <ul style="list-style-type: none"> • Phase Modulations: PSK, QPSK and OQPSK • Differential Phase Modulations • Continuous Phase Frequency Shift Keying CPFSK • Minimum Shift Keying MSK 	x			<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	5
4	8	Lab Session 1		x	LAB	- Lab session preparation	1,66	
5	9	Unit 4: Multipulse Modulations <ul style="list-style-type: none"> • Multicarrier and Frequency Division Modulations FDM • Continuous-time Orthogonal FDM • Discrete-Time OFDM • Transmitters and Receivers for OFDM • Discrete Equivalent Channels. Effects of ISI. Cyclic Prefix. • Spread Spectrum Modulations. 	x			<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	5
5	10	Unit 5: Channel Coding <ul style="list-style-type: none"> • Introduction to Channel Coding • Linear Block Codes. • Optimum soft and hard decision estimators 		x		<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	
6	11	Unit 5: Channel Coding <ul style="list-style-type: none"> • Linear Block Codes. Generator Matrix • Parity Check Matrix • Syndrome Decoding Table • Examples 	x			<ul style="list-style-type: none"> - Assimilate Course Content during class - Exercises and case studies 	1,66	5
6	12	Unit 5: Channel Coding <ul style="list-style-type: none"> • Convolutional Codes • Trellis. 		x		- Assimilate Course Content during class	1,66	

		<ul style="list-style-type: none"> Decoding: Viterbi algorithm 				- Exercises and case studies		
7	13	Unit 5: Channel Coding <ul style="list-style-type: none"> Exercises 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	7
7	14	Lab Session 2		X	LAB	- Lab session preparation	1,66	
8	15	First Mid-term Exam	X			- Revise the first part of the course for exam preparation.	1,66	5
8	16	Unit 6: Telecommunication Systems over guided Media Digital Subscriber Loop xDSL <ul style="list-style-type: none"> Standards: <ul style="list-style-type: none"> ADSL, ADSL2+, HDSL, VDSL Architecture and Elements <ul style="list-style-type: none"> ATU, DSLAM, BRAS Physical Layer <ul style="list-style-type: none"> Crosstalk, attenuation, ISI Multicarrier Modulations <ul style="list-style-type: none"> Optimizing the Physical Layer: waterfilling, bit swapping 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	
9	17	Cable Networks <ul style="list-style-type: none"> Architecture and Network Elements Physical Layer <ul style="list-style-type: none"> Attenuation, Noise and Interferences: RF Ingress, Common Path Distortion 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	5
9	18	Fiber Optics <ul style="list-style-type: none"> Passive (PON) and active Optical Networks PON Architecture and Elements <ul style="list-style-type: none"> OLT, ONU, ODN Physical Layer <ul style="list-style-type: none"> Attenuation, dispersion, thermal and quantum noise. Emitters (FP, DFP, EAM), Detectors (PiN, APD) Link Budget 		X		- Assimilate Course Content during class - Exercises and case studies	1,66	
10	19	Unit 6: Radio Telecommunication Systems <ul style="list-style-type: none"> Exercises Case Studies Problem Design 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	5
10	20	Unit 6: Radio Telecommunication Systems	X			- Assimilate Course Content	1,66	

		<ul style="list-style-type: none"> ○ Exercises ○ Case Studies ○ Problem Design 				during class - Exercises and case studies		
11	21	Unit 7: Radio Telecommunication Systems Modeling the transmission media <ul style="list-style-type: none"> • Large Scale Propagation Models <ul style="list-style-type: none"> ○ Free Space ○ Log-distance: Okumura Hata ○ Log-normal ○ Cellular Model <ul style="list-style-type: none"> ▪ Inteference ○ Deployment 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	5
11	22	Unit 7: Radio Telecommunication Systems <ul style="list-style-type: none"> • Large Scale Propagation Models <ul style="list-style-type: none"> ○ Exercises 		X		- Assimilate Course Content during class - Exercises and case studies	1,66	
12	23	Unit 7: Radio Telecommunication Systems <ul style="list-style-type: none"> ○ Physical Layer GSM ○ 2.5G: GPRS/EDGE 		X		- Assimilate Course Content during class - Exercises and case studies	1,66	5
12	24	<ul style="list-style-type: none"> • Unit 7: Radio Telecommunication Systems <ul style="list-style-type: none"> ○ 3G: UMTS ○ 4G: LTE 	X			- Assimilate Course Content during class - Exercises and case studies	1,66	5
13	25	Lab Session 3: : Link Budget	X		LAB	- Lab session preparation	1,66	5
13	26	Unit 7: Radio Telecommunication Systems <ul style="list-style-type: none"> • Small Scale Propagation Models <ul style="list-style-type: none"> ○ Fading, Doppler ○ Discrete Models for Channels ○ Channel Coding Design for fading Channels 		X		- Assimilate Course Content during class - Exercises and case studies	1,66	
14	27	Units 8 and 9: Telecommunication Systems Standards <ul style="list-style-type: none"> • DVB-S/S2 • DVB-T • DVB-C 		X		- Assimilate Course Content during class - Exercises and case studies	1,66	5
14	28	Lab Session 4: Slow Flat Fading simulation. Discrete Models for Communication Channels		X	LAB	- Lab session preparation - Project preparation	1,66	7
	29	Second Mid-term Exam	X			- Revise the second part of the course	1,66	5

						for exam preparation.			
							Subtotal 1	48,18	64

112,18

15		Supervision, Project Report submission, etc							
16		Exam Preparation				Course study and review	3	50	
17									
18									
							Subtotal 2	3	

165,18

