



SUBJECT SUBJECT: Design of Electronic Circuits for Communications

MASTER: Telecommunications Engineering

COURSE:2019-2020

QUARTER:1

CRONOGRAMA ASIGNATURA

WEEK	SESSION	DESCRIPCIÓN DEL CONTENIDO DE LA SESIÓN			STUDENT WORK DURING THE WEEK		
					DESCRIPTION	HOURS PRESENTIALS	HOURS WORK Week (Maximum 7,5 H)
1	1	T1: Signal processing chain in a line and wireless communications equipment			Study of several examples of communications chain, reading bibliography	1,6	5
	2	T2: Continuous Time Filters			Study of the various synthesis circuits of active filters. Realization of problems of synthesis of filters proposed in class	1,6	
2	3	Example of design and simulation of an active filter with different embodiments.				1,6	5
	4	T3: Sampling and retention circuits. Multiplexers and dimmers with digital control			Review of the MOS transistor as a switch. Performing exercises to see the influence of opening uncertainty and load injection error on an MOS switch	1,6	
3	5	Practical example of analysis of the influence of load injection and sampling jitter				1,6	5
	6	T4: Switched Capacities Circuits			Estudio de un integrador de capacidades conmutadas. Realización de ejercicios propuestos en clase sobre circuitos de cap. conmutadas	1,6	
4	7	Examples of calculation of transfer functions with switched capacity circuits				1,6	5
	8	Block I exam			Exam Preparation	1,6	
5	9	T5: Analog front end circuits for communications, automatic gain control, tuned amplifiers, mixers, intermediate frequency amplifiers			Study of the topics of this chapter	1,6	7,5
	10	Calculo practico de un amplificador sintonizado. Análisis de un circuito de CAG logarítmico			Analysis of a double balanced mixer. Analysis of differential and unbalanced tuned circuits	1,6	

6	11	T6: Noise in electronic circuits. Analysis and simulation of circuits with noise. Spectral density and equivalent noise bandwidth				1,6	3,5
	12	SPICE simulation of an active filter and a sampling and retention circuit	Aula informática	SI		1,6	
7	13	T6: Noise in electronic circuits. Noise factor Phase noise and jitter.				1,6	7,5
	14	E6: Exercises on noise in ctos. of communications			Problems calculating the minimum input capacity to an A / D converter. Calculation of the noise factor of an amplifier chain. Jitter calculation of an oscillator	1,6	
8	15	T7: Introduction to the conversion of A / D and D / A data. Balance between thermal and quantification noise in an A / D converter.				1,6	6
	16	Practice I: Double balanced mixer circuit	Laboratorio	Si		1,6	
9	17	T7: D / A conversion architectures without oversampling. Resistive, capacitive and current D / A converters				1,6	4
	18	T8 :. Integration A / D converters, successive approximations and flash.				1,6	
10	19	E8: Resolution of case study problems on applications of A / D converters. Troubleshooting basic D / A converters			Problems about basic A / D and D / A converters	1,6	4
	20	Block II Exam			Exam Preparation	1,6	
11	21	T10: Oversampling techniques			Study of a first and second order sigma delta modulator in the bibliography	1,6	7,5
	22	Simulation of a sigma delta modulator in MATLAB. Numerical estimation of the signal to noise ratio	Aula Informatica	SI		1,6	
12	23	T11: Synthesis of frequency. Generation of reference frequencies. Review of the PLL.			Analysis of a phase control loop and a double module synthesizer. Troubleshooting the calculation of the loop filter.	1,6	7,5
	24	T11: Frequency synthesis. Basic Synthesizer Dual module synthesizer. Synthesizer with sigma-delta modulator. DDS synthesizer				1,6	
13	25	Problems about frequency synthesis				1,6	6
	26	Practice II: Assembling a PLL				1,6	
SUBTOTAL						42 + 105(**) = 147	
15-16		Recoveries, tutorials, work delivery, etc.			Preparation of the block III exam and the final exam		20
17-18		Exam				3	
TOTAL						180	

(*) The number of sessions with 2 professors or experimental laboratories in groups of 20 students will be between a minimum of 2 and a maximum of 6. In addition, at least 2 of these sessions will be held outside the regular schedule, for which you must fill in the table below EXPERIMENTAL LABORATORY SCHEDULE.

EXPERIMENTAL LABORATORY SCHEDULE (OR SESSIONS WITH 2 TEACHERS) OUTSIDE THE REGULAR SCHEDULE *						
SE- SIÓN	WEEK	DESCRIPTION OF THE CONTENT OF THE SESSION (The group is subdivided into two or the session is taught with two teachers outside the regular schedule).	LABORATORY IN WHICH THE SESSIONS ARE REALIZED	STUDENT WORK DURING THE WEEK		
				DESCRIPTION	HOURS	WORK/week
1	5	Active filter		Lab preparation	1,5	4
2	8	Balanced mixer		Lab preparation		
3	13	PLL circuit		Lab preparation	1,5	4
TOTAL					3	