



COURSE: ELECTROMAGNETIC FIELDS		
DEGREE: AUDIOVISUAL SYSTEM ENGINEERING	YEAR: 2º	TERM: 2º

WEEKLY PLANNING									
WEEK	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	Unit 1: The electromagnetic model - Presentation of the course contents - Revision of Electrostatic and Magnetostatic. - Maxwell equations	x		NO	NO	Revision of electricity and magnetism	1,6	4
1	2	Unit 1: The electromagnetic model - Phasors - Time dependence - Maxweel equations in frequency domain		x	NO	NO	Studying basis of electrodynamics	1,6	
2	3	Unit 2: Electromagnetic propagation in a free medium - Wave equation - Planes waves - Poynting vector	x		NO	NO	Learning the theory seen in the lectures	1,6	5
2	4	Unit 2: Electromagnetic propagation in a free medium		x	NO	NO	Studying of particular cases of normal	1,6	

		<ul style="list-style-type: none"> - Intrinsic impedance - Normal incidence - Oblique incidence 					incidence		
3	5	Unit 2: Electromagnetic propagation in a free medium <ul style="list-style-type: none"> - Standing wave calculation - Power - Resolution of problems 	x		NO	NO	Resolution of proposed problems	1,6	6
3	6	Lab 1: Calculation of the standing wave diagram for a problem with normal incidence. Polarization of plane waves		x	Computers room	YES	To read and to prepare the Laboratory session	1,6	
4	7	Unit 3: Guided waves <ul style="list-style-type: none"> - Introduction to guided waves - Discretization of wave solutions - TE, TM and TEM modes 	x		NO	NO	Revision of the theory seen in the lectures	1,6	6
4	8	Unit 3: Guided waves <ul style="list-style-type: none"> - Rectangular waveguide - Examples and problems 		x	NO	NO		1,6	
5	9	Individual Test (Units 1 and 2)	x		NO	NO	Self-study to prepare for the test	1,6	6
5	10	Unit 3: Guided waves <ul style="list-style-type: none"> - Transmission lines - Examples - Coaxial cable - Problems 		x	NO	NO	Studying transmission line theory. Resolution of proposed problems	1,6	
6	11	Unit 4: Radiation <ul style="list-style-type: none"> - Introduction to electromagnetic radiation - The small dipole 	x		NO	NO	Studying antenna theory. Resolution of proposed problems	1,6	6
6	12	Unit 4: Radiation <ul style="list-style-type: none"> - Antenna parameters - Friis equation 		x	NO	NO	Studying antenna parameters. Resolution of proposed Friis equation problems	1,6	
7	13	Individual Test (Units 3 and 4)	x		NO	NO	Self-study to prepare for the test	1,6	7
7	14	Lab 2: Analysis of modes in a rectangular waveguide. Propagation modes and Brillouin Diagram. Small dipole radiation pattern		x	Computers room	YES	To read and to prepare the Laboratory session	1,6	
8	15	Unit 5: Acoustic signals and systems in the time and frequency domains. <ul style="list-style-type: none"> - Simple harmonic motion (SHM) and damped oscillators. - Mixture of SHMs. 	x		NO	NO	Learning the theory seen in the lectures	1,6	4

		<ul style="list-style-type: none"> - Root mean square (RMS), mean and mean square values of a signal. - Signal level. - Addition of signal levels and RMS values 							
8	16	- Exercises		x	NO	NO	Resolution of proposed problems	1,6	
9	17	Unit 5: Acoustic signals and systems in the time and frequency domains. <ul style="list-style-type: none"> - Spectral level and band level. - Frequency scale. Filters with constant and percent bandwidth. - White noise and pink noise. - Distortion in linear and time invariant acoustic systems (LTI). 	x				Studying acoustic theory	1,6	
9	18	- Exercises		x	NO	NO	Resolution of proposed problems	1,6	5
10	19	Unit 5: Acoustic signals and systems in the time and frequency domains. Methods of analysis of systems LTI: <ul style="list-style-type: none"> - White noise. - Pink noise. - Sweepsine. - Impulsive method. 	x		NO	NO	Learning the theory seen in the lectures	1,6	
10	20	Lab 3: Lab exercise concerning plane waves and acoustic systems		x	Computers room	YES	To read and to prepare the Laboratory session	1,6	5
11	21	Unit 6: Plane waves in the free field. Acoustic intensity. Coherence and incoherence phenomena. <ul style="list-style-type: none"> - Equation of a plane wave. Equations of pressure and velocity. - Specific acoustic impedance. - Acoustic intensity. - Intensity level. - Coherence and incoherence with plane waves. 	x		NO	NO	Learning the theory seen in the lectures	1,6	
11	22	Individual Test (Units 5 and 6) Resolution of test example.		x	NO	NO	Self-study to prepare for the test	1,6	6
12	23	Unit 7: Spherical wave in the free field. Directivity. Simple source. Source composition. <ul style="list-style-type: none"> - Equation of a spherical wave. Equations of pressure and velocity. - Acoustic impedance of the wave. 	x		NO	NO	Learning the theory seen in the lectures	1,6	7

		- Active and reactive intensity. - Simple source and spherical source.							
12	24	- Exercises		x			Resolution of proposed problems	1,6	
13	25	Unit 7: Spherical wave in the free field. Directivity. Simple source. Source composition. - Dipoles. - Directivity pattern. - Acoustic power radiation. - Radiation impedance.	x				Learning the theory seen in the lectures	1,6	
13	26	- Exercises		x			Resolution of proposed problems	1,6	6
14	27	Unit 8: Stationary waves. Acoustic material characterization. - Equation of a stationary wave. Coefficient of a stationary wave. - Amplitude of a stationary wave. - Impedance of a stationary wave. - Normal reflection in the boundary of two media.	x				Learning the theory seen in the lectures	1,6	6
14	28	Individual Test (Units 7 and 8) Resolution of test example.		x	NO	NO	Self-study to prepare for the test	1,6	
	29	Lab 4: Lab exercise concerning spherical and standing waves					To read and to prepare the Laboratory session	1,6	1

Subtotal 1 **48,33** **80**

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

15		Tutorials, handing in, etc						128.33	
16		Assessment						3	7
17									
18									

Subtotal 2 **3** **14**

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

17

TOTAL (Total 1 + Total 2. Maximum 180 hours)	145.33
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