Universidad Carlos III de Madrid
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COURSE: Electroacoustic Systems and Sonorization		
DEGREE: Bachelor in Audiovisual System Engineering.	**YEAR: 3er**	**TERM: 2**

La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de ellas. Semanalmente el alumnos tendrá dos sesiones, excepto en un caso que serán tres

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	HOME WORK HOURS (Max. 7h week)
1	1	**Subject presentation.** **<u>Theme 1:</u> Electro-mechanical-acoustical analogies.** - Review about mechanical systems. - Review about acoustic systems. - Impedance analogy and mobility analogy.	X				- Review about mechanical and acoustic systems. - Readings to be determined	1,6	
1	2	Exercises.		X			- Exercises to be determined.	1,6	5

2	3	- Transduction representation: transformers. - Representation of radiation impedance. - Emitter and receptor models..	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
2	4	- Exercises.		X			- Exercises to be determied.	1,6	4.5
3	5	**Theme 2: Physical fundamentals of transducers. Classification.** - Generalities. - Classification depending on the electro-mechanical transducer: - Dynamic transducers. - Electrostatic transducers. - Piezoelectric transducers. - Magnetic transducers. - Magnetostrictive transducers. - Performance.	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
3	6	- Exercises.		X			- Exercises to be determined.	1,6	4.5
4	7	**Theme 3: Microphones. Characteristics. Types. Design parameters.** - Introduction. - Characteristics: - Sensibility. - Frequency response. - Distortion.	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
4	8	- Exercises.		X			- Exercises to be determined.	1,6	5

5	9	- Characteristics: (cont.):
		  - Directivity. Measurement parameters of directivity.
		  - Noise.
		  - Dynamic range.
			X				- Readings to be determined.
							
							- Study of the concepts shown in the theoretical classes.
								1,6	

5	10	- Exercises.		X			- Exercises to be determined.	1,6	6

6	11	- Microphone classification:
		  - Pressure microphones.
		  - Pressure-gradient microphones.
			X				- Readings to be determined.
							
							- Study of the concepts shown in the theoretical classes.
								1,6	

6	12	- Practical exercise: combined microphone. - Exercises.		X			- Exercises to be determined.	1,6	5
7	13	- Microphone classification (cont.): - Special microphones: superdirective, lavalier, wireless, double diaphragm. - Electric interconnection of equipment.	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
7	14	- Exercises.		X			- Exercises to be determined.	1,6	5
8	15	**Theme 4: Loudspeakers and acoustic enclosures. Types of loudspeakers. Design of acoustic enclosures. Thiele-Small parameters** - Types of loudspeakers. - Main parts of a dynamic loudspeaker. - Characteristics of dynamic loudspeakers.	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
8	16	- Exercises.		X			- Exercises to be determined.	1,6	5

9	17	- Direct radiator loudspeakers. Thiele-Small parameters. Close-Box loudspeaker: design parameters of acoustic enclosures	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
9	18	- Exercises.		X			- Exercises to be determined.	1,6	4.5
10	19	**Theme 5: Multiple-driver speaker systems. Bass-Reflex systems.** - Multiple-driver speaker systems: active and passive. - Audio crossover design - Bass-Reflex systems	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
10	20	- Exercises.		X			- Exercises to be determined.	1,6	5
11	21	**Theme 6: Principles of room acoustics.**	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
11	22	- Statistical Theory. - Geometry Theory - Ondulatory Theory		X			- Exercises to be determined.	1,6	6.5
12	23	**Theme 6: Microphones and loudspeakers interaction with the remaining equipment of an electroacoustic system. Sonorization.** - Determining factors in a sonorization - Psychoacoustics: echo perception, intelligibility.	X				- Readings to be determined. - Study of the concepts shown in the theoretical classes.	1,6	
12	24	Lab exercise 1: electroacoustic measurement systems			Laboratory 7.1.J.10		- Complementary Readings to be determined.	1,6	6
13	25	- Level criteria in a sonotization: necessary acoustic gain and potencial acoustic gain.	X					1,6	
13	26	Lab exercise 2: microphones 1			Laboratory 7.1.J.10			1,6	6
14	27	- Clustering, distributed, and mixed sonorization.	X					1,6	3
14	28	Lab exercise 3: microphones 2			Laboratory 7.1.J.10			1,6	3
	29	Lab exercise 3: loudspeakers and crossovers			Laboratory 7.1.J.10			1,6	3
							Subtotal 1	**48,33**	**80**

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

15		Tutorials, handing in, etc							
16		Assessment						3	
17									
18									
							Subtotal 2	**3**	
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*		

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