uc3m | Universidad **Carlos III** de Madrid
Vicerrectorado de Estudios
Apoyo a la docencia y gestión del grado

COURSE:		
DEGREE:	**YEAR:**	**TERM:**

WEEKLY PLANNING								

W E E K	**S E S S I O N**	**DESCRIPTION**	**TEACHING (mark X)**		**SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)**	**WEEKLY PROGRAMMING FOR STUDENT**		
			L E C T U R E S	**S E M I N A R S**		**DESCRIPTION**	**CLASS HOURS (1,66=50+50 min)**	**HOMEWORK HOURS (Max. Estim. 3,25h)**

1	1	Course Presentation
		
		Contents Block 1.- Introduction.
		
		  1.1 Definition of Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR).
		  1.2 Playback devices.
						Readings to be determined.
						Study of the concepts shown in the theoretical classes.
						Exercises to be determined.
							1,66	3,25

2	2	1.3 Fundamentals of human auditory system. 1.4 Immersive spatial audio.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25

3	3	Contents Block 2.- Binaural 3D audio for virtual reality.
		
		2.1 3D audio reproduction formats.
		  - Channel-based audio.
		  - Object-based audio.
		  - Scene-based audio.
						Readings to be determined.
						Study of the concepts shown in the theoretical classes.
						Exercises to be determined.
							1,66	3,25

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4	4	Ambisonics. Practical cases.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
5	5	2.2 Binaural Rendering: - Introduction. Auralization concept. - Sound source modelling: I - Sound power and directivity. - Acoustic propagation modelling. I- Reverberation time and room impulse response.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
6	6	II - Acoustic theories for indoor acoustic propagation: a) Statistical theory. Acoustic absorption.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
7	7	b) Geometric theory. Echogram.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
8	8	c) Undulatory theory. Room modes.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
9	9	III -Acoustic Environment Rendering Techniques . IV - Simulation software.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	TEACHING (mark X) LECTURES	TEACHING (mark X) SEMINARS	SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	WEEKLY PROGRAMMING FOR STUDENT DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 3,25h)

10	10	- Receiver modelling:
		    I - HRTF (head-related transfer function).
		    II - Individualized Binaural Rendering.
		    III - Movement tracking.
						Readings to be determined.
						Study of the concepts shown in the theoretical classes.
						Exercises to be determined.
							1,66	3,25

11	11	2.3. 3D Audio reproduction systems: examples of systems and their equalization.				Readings to be determined. Study of the concepts shown in the theoretical classes. Exercises to be determined.	1,66	3,25
12	12	Lab 1: Binaural room impulse response measurement			7.1.J10	Write a report including main issues of the lab exercise.	1,66	3,25
13	13	Lab 2: Project: Room simulation of a specific room and desing of an auralization			4.0.B.01	Continue with the project desing.	1,66	3,25
14	14	Lab 3: Project: Room simulation of a specific room and desing of an auralization (cont.)			4.0.B.01	Continue with the project desing.	1,66	3,25
	15	Lab 4: Project: Room simulation of a specific room and desing of an auralization (cont.)			4.0.B.01	Continue with the project desing and write a final report.	1,66	3,25
						Subtotal 1	**25**	**49**
						Total 1 *(Hours of class plus student homework)*	**74**	

WEEK	SESSION	DESCRIPTION	LECTURES	SEMINARS	SPECIAL ROOM	DESCRIPTION	CLASS HOURS	HOMEWORK HOURS
15		Tutorials, handing in, etc					1,8	-
16		Assessment					4	4
17								
18								
						Subtotal 2	**6**	**4**
						Total 2 *(Hours of class plus student homework)*	**10**	

TOTAL (*Maximun 83 horas*)	**83**

WEEKLY PLANNING								
			TEACHING (mark X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual class room)	**WEEKLY PROGRAMMING FOR STUDENT**		
W E E K	S E S S I O N	**DESCRIPTION**	L E C T U R E S	S E M I N A R S		DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 3,25h)