Universidad Carlos III de Madrid
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COURSE: FLUID INSTALLATIONS AND HYDRAULIC MACHINERY		
DEGREE: ENGINEERING IN INDUSTRIAL TECHONOLOGIES	**YEAR: 4**	**TERM: 1**

La asignatura tiene 29 sesiones que se distribuyen a lo largo de 14 semanas. Los laboratorios pueden situarse en cualquiera de ellas. Semanalmente el alumno 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	HOMEWORK HOURS (Max. 7h week)
1	1	Presentation and basic facts about the subject. Introduction and review of the fundamental concepts: primary pressure losses, correlations for the friction factor in ducts, Moody chart, secondary pressure losses	x			NO		1,6	
1	2	Pipe networks (1/2). Ducts in series and in parallel. Branched networks. Solution of the three-reservoir problem (1: trial and error)		x		NO		1,6	3
2	3	Solution of the three-reservoir problem (2: linearization and matrix method)	x			NO		1,6	
2	4	Solution to problems on branched networks		x		NO		1,6	6
3	5	Pipe networks (2/2). The matrix method for solving	x			NO		1,6	6

		complex pipe networks							
3	6	**Lab 1**: Introduction to MATLAB programming. Numerical solution of the three-reservoir problem with the matrix method.		x	Computer class room	YES		1,6	
4	7	Theory of incompressible transient flow in ducts. Example.	x			NO		1,6	
4	8	**Lab 2**: Programming of the network proposed for evaluation		x	Computer class room	YES		1,6	6
5	9	Application of the incompressible transient theory: surge tanks	x			NO		1,6	
5	10	**Lab 3**: Programming of the network proposed for evaluation		x	Computer class room	YES		1,6	4
6	11	Theory of the water hammer (1/2). Basic equations.	x			NO		1,6	
6	12	Solution to problems of incompressible transient flow		x		NO		1,6	4
6	13	**Lab 4**: Programming of the network proposed for evaluation		x	Computer class room	YES			
7	14	Theory of the water hammer (2/2). Sudden closure of a valve at the end of a pipe. Sudden opening of a valve at the end of a pipe: the phenomenon of cavitation	x			NO		1,6	
7	15	Solution of transient flow problems		x		NO		1,6	6
8	16	Solution of transient flow problems	x			NO		1,6	
8	17	Solution of transient flow problems		x		NO		1,6	6
9	18	**FIRST PARTIAL EXAM**	x			NO		1,6	
9	19	Solution of the first partial exam		x		NO		1,6	6
10	20	Introduction to turbomachinery (1/2). Classification of fluid machinery. Hydraulic pumps and turbines. Types and basic characteristics. Hydraulic turbomachines.	x			NO		1,6	
10	21	Introduction to turbomachinery (2/2). Cavitation and NPSH. Similarity in pumps and turbines (1/2)		x		NO		1,6	3
11	22	Similarity in pumps and turbines (2/2). Specific speed and specific diameter. Cordier's chart.	x			NO		1,6	
11	23	Coupling of turbomachines to pipe networks. Optimal selection. Example.		x		NO		1,6	5
12	24	Solution to problems on turbomachines.	x			NO		1,6	
12	25	Solution to problems on turbomachines.		x		NO		1,6	5

13	26	Solution to problems on turbomachines.	x			NO		1,6	
13	27	Solution to problems on turbomachines.		x		NO		1,6	6
14	28	Solution to problems on turbomachines.	x			NO		1,6	6
14	29	**SECOND PARTIAL EXAM**	x			NO		1,6	6
								1,6	
							Subtotal 1	**48,33**	**78**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	126,33	

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

TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	**126,33**