Universidad Carlos III de Madrid
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COURSE: COMPUTATIONAL FLUID DYNAMICS		
DEGREE: INDUSTRIAL TECHNOLOGIES	**YEAR: 3-4**	**TERM: 2**

29 sessions over 14 weeks.

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	General equations of fluid dynamics: integral and differential forms	X			NO	Individual study and work on assignments	1,6	3
1	2	General equations of fluid dynamics: levels of approximation		X		NO		1,6	
2	3	Practical example (part 1/3)	X			NO	Individual study and work on assignments	1,6	3
2	4	Discretization techniques: finite differences and finite volumes		X		NO		1,6	
3	5	Practical example (2/3)	X		Computer classroom	NO	Individual study and work on assignments	1,6	3
3	6	Finite differences for parabolic pde's Convergence, consistency and stability		X		NO		1,6	
4	7	Practical example (3/3)	X		Computer classroom	NO	Individual study and work on assignments	1,6	3
4	8	Finite differences for hyperbolic linear pde's		X		NO		1,6	

5	9	Burguers equation	X			NO	Individual study and work on assignments	1,6	3
5	10	Practical example		X	Computer classroom	NO		1,6	
6	11	Finite differences for the Navier Stokes equations	X			NO	Individual study and work on assignments	1,6	3
6	12	Finite differences for the Navier Stokes equations		X		NO		1,6	
7	13	Proposal of the programming project	X			NO	Individual study and work on assignments	1,6	3
7	14	Work on the programming project		X	Computer classroom	NO		1,6	
8	15	Finite volumes for the Navier Stokes equations Computational meshes	X			NO	Individual study and work on assignments	1,6	3
8	16	Finite volumes for the Navier Stokes equations		X		NO		1,6	
9	17	Turbulent flows	X			NO	Individual study and work on assignments	1,6	3
9	18	Turbulence modeling RANS equations		X		NO		1,6	
10	19	Turbulence modeling	X			NO	Individual study and work on assignments	1,6	3
10	20	Wall treatment in turbulence modeling		X		NO		1,6	
11	21	ANSYS FLUENT presentation	X		Computer classroom	NO	Individual study and work on assignments	1,6	3
11	22	Lab 1 with ANSYS FLUENT		X	Computer classroom	NO		1,6	
12	23	Proposal of ANSYS FLUENT project	X			NO	Individual study and work on assignments	1,6	3
12	24	Lab 2 with ANSYS FLUENT		X	Computer classroom	NO		1,6	
13	25	Solution of typical exam problems	X			NO	Individual study and work on assignments	1,6	3
13	26	Lab 3 with ANSYS FLUENT		X	Computer classroom	NO		1,6	
14	27	Solution of typical exam problems	X			NO	Individual study and work on assignments	1,6	3
14	28	Work on ANSYS FLUENT project		X	Computer classroom	NO		1,6	3
	29	Solution of typical exam problems				NO	Individual study and work on assignments	1,6	3
							Subtotal 1	**48,33**	

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)*	