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

COURSE: Aerodynamics		
DEGREE: Aerospace Engineering	YEAR: 3rd	TERM: 1st

WEEKLY PLANNING							
			TEACHING (mark X)		**SPECIAL ROOM FOR SESSION** (Computer class room, audio-visual class room)	**WEEKLY PROGRAMMING FOR STUDENT**		
WEEK	**SESSION**	**DESCRIPTION**	**LECTURES**	**SEMINARS**		**DESCRIPTION**	**CLASS HOURS** (1,66=50+50 min)	**HOMEWORK HOURS** (Max. Estim. 6,5h)
1	1	Review of Fluid Mechanics: - Euler equations - Subsonic and supersonic flows - Irrotational flows	x				1,66	6,5
	2	Aerodynamic Forces and Moments Problem Sheet #1		x			1,66	
2	3	Generation of lift in 2D (1/2) - Complex potential - Elementary solutions - Non-lifting flow around a cylinder	x				1,66	6,5
	4	Problem Sheet #2		x			1,66	
3	5	Generation of lift in 2D (2/2) - Flow around a cylinder with circulation - Kutta-Joukowsky theorem - D'Alamberts Paradox - Kutta's condition and the starting vortex	x				1,66	6,5
	6	Problem Sheet #3		x			1,66	
4	7	Incompressible flow over airfoils (1/4) - Sheet of vortices and sheet of sources - Linearization of the boundary conditions QUIZ #1 (50 min)	x				1,66	6,5
	8	LABORATORY #1: Panel method MATLAB		x	online		1,66	
5	9	Incompressible flow over airfoils (2/4) - Asymmetric problem: angle of attack and camber	x				1,66	6,5
	10	Problem Sheet #4		x			1,66	
6	11	Incompressible flow over airfoils (3/4) - Symmetric problem: thickness - Drag and Stall	x				1,66	6,5
	12	Problem Sheet #5		x			1,66	
7	13	Incompressible flow over airfoils (4/4) - High lift devices Incompressible flow over finite wings (1/4) - Biot Savart law	x				1,66	6,5
	14	LABORATORY #2: Panel method XFLR5		x	online		1,66	
8	15	Incompressible flow over finite wings (2/4) - Prandtl's lifting line theory QUIZ #2 (50 min)	x				1,66	6,5
	16	Problem Sheet #6		x			1,66	
9	17	Incompressible flow over finite wings (3/4) -Elliptic lift distribution -General lift distribution	x				1,66	6,5
	18	Problem Sheet #7		x			1,66	
10	19	Incompressible flow over finite wings (4/4) - Initial and unitary lift distribution	x				1,66	6,5
	20	Problem Sheet #8		x			1,66	
11	21	Compressibility effects in 2D airfoils - Linearization of the equations QUIZ #3 (50 min)	x				1,66	6,5
	22	LABORATORY #3: Re-design of the CN212-400 wing		x	online		1,66	
12	23	Linearized theory for subsonic airfoils - Prandtl-Glauertc compressibility correction - Critical Mach number - Supercritical airfoil	x				1,66	6,5
	24	Problem Sheet #9		x			1,66	
13	25	Linearized theory for supersonic airfoils (1/2) - Drag Divergence - Linearized theory for supersonic airfoils	x				1,66	6,5
	26	Problem Sheet #10		x			1,66	
14	27	Linearized theory for supersonic Airfoils (2/2) - Aerodynamic interference in supersonic airfoils - Area Rule	x				1,66	6,5
	28	Problem Sheet #11		x			1,66	
	29	LABORATORY SESSION #4: Wind tunnel		x	online		1,66	3,25
						Subtotal 1	**48**	**94**

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			LECTURES	SEMINARS		DESCRIPTION	CLASS HOURS (1,66=50+50 min)	HOMEWORK HOURS (Max. Estim. 6,5h)
						Total 1 *(Hours of class plus student homework)*		142

15		Tutorials, handing in, etc					3,6	-
16 17 18		Assessment					4	10
						Subtotal 2	8	10
						Total 2 *(Hours of class plus student homework)*		18

TOTAL (*Maximun 160 horas*)	160