



**DENOMINACIÓN ASIGNATURA: ADVANCED TOPICS IN FLUID MECHANICS**

**POSTGRADO: MÁSTER UNIVERSITARIO EN MECÁNICA INDUSTRIAL**  
**Profesor/a: ALEJANDRO SEVILLA SANTIAGO**

**ECTS: 4**

**CUATRIMESTRE: 1**

**CRONOGRAMA DE LA ASIGNATURA (versión detallada)**

ASEMANA	SESIÓN	DESCRIPCIÓN DEL CONTENIDO DE LA SESIÓN	GRUPO (marcar X)		Indicar espacio Necesario distinto aula (aula informática, audiovisual, etc..)	TRABAJO DEL ALUMNO DURANTE LA SEMANA		
			1	2		DESCRIPCIÓN	HORAS PRESENCIALES	HORAS TRABAJO Semana Máximo 7 H
1	1	Introduction. Review of fundamental concepts. Governing equations of fluid mechanics (I).	X			Independent study to reinforce the concepts taught in the classroom	1,5	2
1	2	Governing equations of fluid mechanics (II).	X			Independent study to reinforce the concepts taught in the classroom	1,5	2
2	3	Governing equations of fluid mechanics (III).	X			Problem solving	1,5	6
3	4	Governing equations of fluid mechanics (IV). Examples of exact solutions.	X			Problem solving	1,5	4
4	5	Dimensional analysis, similarity, order-of-magnitude estimations and	X			Independent study to	1,5	3



		nondimensionalization of the governing equations.				reinforce the concepts taught in the classroom		
5	6	Examples of similarity solutions.	X			Problem solving	1,5	3
5	7	Unidirectional and quasi-unidirectional flow (I). General theory.	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
6	8	Unidirectional and quasi-unidirectional flow (II). Problem solving.	X			Problem solving	1,5	3
7	9	Unidirectional and quasi-unidirectional flow (III). Problem solving.	X			Problem solving	1,5	6
8	10	Flows at large Reynolds numbers (I). Ideal flow theory.	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
8	11	Flows at large Reynolds numbers (I). Problem solving.	X			Problem solving	1,5	4
9	12	Boundary layers (I). Theory	X			Independent study to reinforce the concepts taught in the	1,5	3



						classroom		
10	13	Boundary layers (II). Theory	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
11	14	Boundary layers (III). Problem solving	X			Problem solving	1,5	6
11	15	Hydrodynamic stability (I). Theory	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
12	16	Hydrodynamic stability (II). Theory	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
13	17	Hydrodynamic stability (III). Problem solving	X			Problem solving	1,5	6
14	18	Introduction to turbulence.	X			Independent study to reinforce the concepts taught in the classroom	1,5	3
15	19	Tutoring session	X			Review of material and answer to	1,5	3



						student's questions		
15	20	Tutoring session	X			Review of material and answer to student's questions	1,5	3
16	21	Final classroom exam	X			Quiz containing several exercises	4	0
<b>TOTAL HORAS</b>							<b>28</b>	<b>72</b>