uc3m | Universidad Carlos III de Madrid

Vicerrectorado de Estudios
Apoyo a la docencia y Gestión del Grado

DENOMINACIÓN ASIGNATURA: RESISTENCIA DE MATERIALES		
GRADO: INGENIERÍA MECÁNICA	CURSO: 3	CUATRIMESTRE: 2

The laboratory sessions indicate the weeks in which, tentatively, each of the practices will begin. Each practice will be taught in two consecutive weeks until all groups have done it.

WEEKLY PLANNING							
WEEK	SESSION	DESCRIPTION	TEACHING (makK X) LECTURES	TEACHING (makK X) SEMINARS	SPECIAL ROOM FOR SESSION (computer classroom, audio-visual classroom, etc.)	WEEKLY PROGRAMMING FOR STUDENT DESCRIPTION	WEEKLY PROGRAMMING FOR STUDENT CLASS HOURS (1.66=50+50 min)	HOMEWORK HOURS (Max. Estim. 6.5 h)
1	1	**TOPIC 1: STRESSES DUE TO TENSILE, BENDING AND SHEAR. INTERNAL FORCES (I).** Introduction to Strength of Materials. General concepts. Equations of motion in terms of internal forces. Tension/compression – bending.	X			Personal work and acquisition of knowledge related to sesión 1.	1.66	6.5
1	2	Completion of exercises and questions related to session 1.		X		Completion of exercises and questions related to session 1.	1.66	
2	3	**TOPIC 2: STRESSES DUE TO TENSILE, BENDING AND SHEAR. INTERNAL FORCES (II).** Equations of motion in terms of internal forces. Tension/compression – bending - shear	X			Personal work and acquisition of knowledge related to sesión 3.	1.66	6.5
2	4	Completion of exercises and questions related to session 3.		X		Completion of exercises and questions related to session 3.	1.66	

3	5	**TOPIC 2: STRESSES DUE TO TENSILE, BENDING AND SHEAR INTERNAL FORCES (III).** Equations of motion in terms of internal forces. Tension/compression – bending – shear.	X			Personal work and acquisition of knowledge related to sesión 5.	1.66	6.5
3	6	Completion of exercises and questions related to session 5.		X		Completion of exercises and questions related to session 5.	1.66	
4	7	**TOPIC 3: UNIFORM TORSION.** Stresses in solid cross-sections submitted to torsion. Application to circular sections.	X			Personal work and acquisition of knowledge related to sesión 7.	1.66	6.5
4	8	Completion of exercises and questions related to session 7.		X		Completion of exercises and questions related to session 7.	1.66	
5	9	**TOPIC 4: DETERMINATION OF DISPLACEMENTS IN A PRISMATIC ELEMENT (I).** Kinematic hypotheses for Euler-Bernoulli beams. Navier-Bresse equations.	X			Personal work and acquisition of knowledge related to sesión 9.	1.66	6.5
5	10	Completion of exercises and questions related to session 9.		X		Completion of exercises and questions related to session 9.	1.66	
6	11	**TOPIC 5: DETERMINATION OF DISPLACEMENTS IN A PRISMATIC ELEMENT (II).** Mohr theorems.	X			Personal work and acquisition of knowledge related to sesión 11.	1.66	6.5
6	12	Completion of exercises and questions related to session 11.		X		Completion of exercises and questions related to session 11.	1.66	
6		**LAB SESSION 1:** Each small group will split in two, therefore no more than 20 students will attend each laboratory session. Laboratory sessions will be taught by two lecturers, and in a timetable different to that corresponding to lectures and seminars.			Computer classroom	Collaborative work in the laboratory.	1.66	-
7	13	**TOPIC 6: ENERGY THEOREMS.** Deformation energy. Reprocity theorem. Total potential energy. Castigliano theorems.	X			Personal work and acquisition of knowledge related to sesión 13.	1.66	6.5
7	14	Completion of exercises and questions related to session 13.		X		Completion of exercises and questions related to session 13.	1.66	
8	15	**TOPIC 7: FUNDAMENTALS OF THE ANALYSIS OF STRUCTURES.** Kinematic definitions (symmetry and antimetry, translational and non-translational nodes, degree of static indeterminacy).	X			Personal work and acquisition of knowledge related to sesión 15.	1.66	6.5
8	16	Completion of exercises and questions related to session 15.		X		Completion of exercises and questions related to session 15.	1.66	
8		**LAB SESSION 2:** Each small group will split in two, therefore no more than 20 students will attend each laboratory session. Laboratory sessions will be taught by two lecturers, and in a timetable different to that corresponding to lectures and seminars.			Computer classroom	Collaborative work in the laboratory.	1.66	-
9	17	Assessment (Continuous evaluation).	X			Trabajo personal sobre distribución de tensiones en secciones, cálculo de movimientos y teoremas energéticos.	1.66	6.5
9		**LAB SESSION 3:** Each small group will split in two, therefore no more than 20 students will attend each laboratory session. Laboratory sessions will be taught by			Computer classroom	Collaborative work in the laboratory.	1.66	-

Week	Session	Description				Student work	Hours	Total
		two lecturers, and in a timetable different to that corresponding to lectures and seminars.						
10	18	**TOPIC 8: CONTINUOUS BEAMS.** Application to statically indeterminate beams. Continuous beams.	X			Personal work and acquisition of knowledge related to sesión 18.	1.66	6.5
10	19	Completion of exercises and questions related to session 18.		X		Completion of exercises and questions related to session 18.	1.66	
11	20	**TOPIC 9: STATICALLY INDETERMINATE TRUSS STRUCTURES (I).** Application of Castigliano Theorem to calculate displacements. Structures with external/internal degrees of static indeterminacy.	X			Personal work and acquisition of knowledge related to sesión 19.	1.66	6.5
11	21	Completion of exercises and questions related to session 20.		X		Completion of exercises and questions related to session 20.	1.66	6.5
8		**LAB SESSION 4:** Each small group will split in two, therefore no more than 20 students will attend each laboratory session. Laboratory sessions will be taught by two lecturers, and in a timetable different to that corresponding to lectures and seminars.			Computer classroom	Collaborative work in the laboratory. Preparation of a report on the topic of the lab exercise and response to questionnaire (deliverable).	1.66	-
12	22	**TOPIC 10: STATICALLY INDETERMINATE TRUSS STRUCTURES (II).** Thermal loads.	X			Personal work and acquisition of knowledge related to sesión 22.	1.66	6.5
12	23	Completion of exercises and questions related to session 22.		X		Completion of exercises and questions related to session 22.	1.66	
13	24	**TOPIC 11: STATICALLY INDETERMINATE FRAME STRUCTURES.** Application of the equilibrium method.	X			Personal work and acquisition of knowledge related to sesión 24.	1.66	6.5
13	25	Completion of exercises and questions related to session 24.			X	Completion of exercises and questions related to session 24.	1.66	
14								6.5
14								
		Additional Session						3.25

Subtotal 1	48	**94**

Total 1 *(Hours of class plus student homework)*	**142**

15		Tutorials, handing in, etc…				Lab report delivery.	*3.6*	.
16		Assessment			Examination room	Final exam	4	10
17								
18								
						Subtotal 2	8	10

	Total 2 *(Hours of class plus student homework)*	**18**

TOTAL *(Total 1 + Total 2. Maximum 160 hours)*	**160**