Universidad Carlos III de Madrid
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COURSE: Mechanics applied to Aerospace Engineering (251-14165)		
DEGREE: Aerospace Engineering	**YEAR: 2nd**	**TERM: 1st**

WEEKLY PLANNING

WEEK	SESSION	DESCRIPTION	GROUPS (mark X)		SPECIAL ROOM FOR SESSION	Indicate YES/NO If the session needs 2 teachers	WEEKLY PROGRAMMING FOR STUDENTS		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h week)
1	1	Introduction. Newton's laws. Scalar and vector quantities. Vector calculus. Kinematics of material points or particles- Reference frames. Position velocity and acceleration. Tangential and normal components. Polar coordinates.	X				Study class materials and solve proposed problems	1,6	
1	2	Exercises on Kinematics of point particles		X			Study class materials and solve proposed problems	1,6	5
2	3	Relative motion - Vector transformations. Rotations. Relations between position, velocity and acceleration using translating and rotating axes.	X				Study class materials and solve proposed problems	1,6	5

2	4	Exercises on Relative Motion		X			Study class materials and solve proposed problems	1,6	
3	5	Particle Dynamics 1 - Force and momentum. Impulse and momentum. Work and energy. Rectilinear motion.	X				Study class materials and solve proposed problems	1,6	
3	6	Exercises on Particle Dynamics		X			Study class materials and solve proposed problems	1,6	7
4	7	Particle dynamics 2 - Motion of a particle without constraints. Motion of a particle with constraints: a) Particle over a curve. b) Particle over a surface. Relative dynamics.	X				Study class materials and solve proposed problems	1,6	
4	8	Exercises on particle dynamics		X			Study class materials and solve proposed problems	1,6	5
5	9	Particle Dynamics 3 - Angular momentum. Central forces. Kepler's problem. Elliptical trajectories	X				Study class materials and solve proposed problems	1,6	
5	10	Exercises on particle dynamics		X			Study class materials and solve proposed problems	1,6	5
6	11	Kinematics of a rigid body - Velocity field. Properties. The Euler angles. **Quiz 1**	X				Study class materials and solve proposed problems	1,6	
6	12	Laboratory 2			X		Prepare lab report	1,6	7
7	13	Geometry of masses - Center of mass. Moments of inertia. Moment of inertia tensor. Steiner's theorem. Principal axes.	X				Study class materials and solve proposed problems	1,6	
7	14	Exercises on kinematics of the rigid body and geometry of masses		X			Study class materials and solve proposed problems	1,6	5
8	15	Rigid body: - Linear momentum. Angular momentum. Kinetic energy.	X				Study class materials and solve proposed problems	1,6	
8	16	Exercises		X			Study class materials and solve proposed problems	1,6	5
9	17	Dynamics of the rigid body General equations for a system of particles. General equations for the rigid body	X				Study class materials and solve proposed problems	1,6	
9	18	Exercises		X			Study class materials and solve proposed problems	1,6	5

10	19	Dynamics of the rigid body 2. Rate of change of angular momentum. Solving the equations of motion.	X				Study class materials and solve proposed problems	1,6	
10	20	Laboratory 3			X		Prepare lab report	1,6	7
11	21	Equilibrium of the rigid body. Work and energy principles.	X				Study class materials and solve proposed problems	1,6	
11	22	Exercises		X			Study class materials and solve proposed problems	1,6	5
12	23	Constraints and linkages. Quiz 2	X				Study class materials and solve proposed problems	1,6	
12	24	Laboratory 4			X		Prepare lab report	1,6	7
13	25	General equations for a system of rigid bodies	X				Study class materials and solve proposed problems	1,6	
13	26	Exercises		X			Study class materials and solve proposed problems	1,6	7
14	27	The airplane as a rigid body. Forces on the airplane. - Lift, drag, aerodynamic moments. Straight and level flight. Gliding flight. Climbing flight.	X				Study class materials and solve proposed problems	1,6	
14	28	Exercises		X			Study class materials and solve proposed problems	1,6	7
*	29	Laboratory 1			X		Prepare lab report	1,6	
							Subtotal 1	**48,33**	**82**
							Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	130.33	

15		Tutorials, handing in, etc						7	
16		Assessment						3	19.66
17									
18									
							Subtotal 2	**3**	**26.66**
							Total 2 *(Hours of class plus student homework hours between weeks 15-18)*	29.66	

TOTAL *(Total 1 + Total 2. Maximum 180 hours)*	**160**