



COURSE: PHYSICS I

DEGREE: AEROSPACE ENGINEERING

YEAR: 1st

TERM: 1st

WEEKLY PROGRAMMING

WEEK	SESSION	DESCRIPTION	GROUPS		LABORATORY	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURE	SEMINAR	4.SB01 4.SB02 4.SB03	DESCRIPTION	CLASS HOURS	HOMEWORK HOURS Maximum 7 H
1	1	Kinematics of a particle. Position, velocity, and acceleration vectors. Trajectory equation. Intrinsic coordinates. Tangential and normal components.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
1	2			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
2	3	Kinetics of a particle. Newton's Laws of motion. Inertial frame of reference. Free-body diagrams. Examples of forces: weight, elastic force, normal force, centripetal force, string tension, friction force.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	6
2	4			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
3	5	Kinetics of a particle. Work of a force. Principle of work and energy. Conservative forces and potential energy. Conservation of mechanical energy.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
3	6			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
4	7	Kinetics of a particle. Principle of linear impulse and momentum. Angular momentum and moment of a force.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
4	8			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
5	9	Kinetics of a system of particles. External and internal forces. Generalized Newton's second Law. Energy, linear momentum, and angular momentum. Conservation of energy and momentum. Collisions. Direct central impact. Coefficient of restitution. Oblique central impact.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	6
5	10			X		- Solve the proposed exercises.	1.66	

						- Participation in discussions and activities.		
6	11	Planar kinematics of a rigid body. Translation. Rotation about a fixed axis. Relative velocity in plane motion. General plane motion	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
6	12			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
7	13	Planar kinematics of a rigid body. Instantaneous centre of zero velocity. Absolute and relative acceleration.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
7	14			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
8	15	Relative motion. Motion relative to rotating axes. Coriolis acceleration.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
8	16			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
9	17	Planar kinetics of a rigid body. Moment of a force. Moment of a couple. Reduction of a system of forces. Equations of motion of a rigid body.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
9	18			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
10	19	Planar kinetics of a rigid body. Plane motion equations: Translation, fixed-axis rotation, general plane motion. Moment of inertia. Rolling motion.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	6
10	20			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
11	21	Planar kinetics of a rigid body. Work and energy. Impulse and momentum.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
11	22			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
12	23	Oscillations. Harmonic motion. Undamped and damped free oscillations. Forced oscillations. Resonances. Small oscillations around equilibrium. Vibration of rigid bodies.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
12	24			X		- Solve the proposed exercises. - Participation in discussions and activities.	1.66	
13	25	Waves Normal modes. Transversal and longitudinal oscillations. Wave equation. Normal modes of a rope. Harmonic waves. Phase and group velocities.	X			- Reading in advance of the corresponding book chapters. - Study and personal work on the lecture.	1.66	5
13	26	Errors and uncertainty in Physics measurements. (*)			X	- Reading of the guideline document. - Analysis of results. - Preparation of the report.	1.66	3
14	27	Mechanics phenomena. (*)			X	- Reading of the guideline document. - Data acquisition. - Analysis of results.	1.66	3

						- Preparation of the report.		
14	28	Mechanics phenomena. (*)			X	- Reading of the guideline document. - Data acquisition. - Analysis of results. - Preparation of the report.	1.66	3
	29	Oscillations and waves. (*)			X	- Reading of the guideline document. - Data acquisition. - Analysis of results. - Preparation of the report.	1.66	3
SUBTOTAL							48.33 + 80 = 128	
15		Tutorials, Handing in, etc					2	2
16-18		Assessment					3	15
TOTAL								150

(*) The schedule of laboratory sessions is tentative and will be confirmed by the course coordinator.