Lecture Plan							
Name of the college: Government College of Arts, Science and Commerce, Sanquelim – Goa.							
Name of Faculty: Ms. Anushka Panjikar	Subject: Physics						
Paper code: PHY 204 Classical Mechanics - I	Program: SY BSc	Division: -					
Academic year: 2024- 2025	Semester: IV	Total Lectures: 45L + 30P					
Course Objectives: This course provides a found bodies in different scenarios. They emphasize bo applications in physics and engineering.	Course Objectives: This course provides a foundation for understanding classical mechanics and the motion of particles and rigid bodies in different scenarios. They emphasize both theoretical knowledge and problem-solving skills, preparing students for various applications in physics and engineering.						
Expected Course Outcome: Student will be able to 1. Understand the basic principles of kinematics and dynamics for motion in one and two dimensions. 2. Demonstrate a thorough understanding of projectile motion concepts. 3. Understand the concept of central forces and their implications on the motion of particles. 4. Comprehend the concept of a moving coordinate system and its advantages in problem-solving. 5. Understand the principles of rotational motion and dynamics of rigid bodies.							
Student Learning Outcome: Students will gain a comprehensive understanding of the dynamics of particles and rigid bodies, including the principles governing their motion in one, and two dimensions under various forces and coordinate systems, enabling them to analyze complex physical systems and apply fundamental mechanics concepts to real-world scenarios							

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignmen t	ICT Tools	Reference books
December	16-12-24	21-12-24	3L+2P	Introduction to Physics Practicals : Introduction to Physics Laboratory	Group discussion	Powerpoint presentation Google classroom	 A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
December	23/12/24	31/12/24	0	Christmas vacation			

January	06/01/25	11/01/25	3L + 2P	 Introduction Motion of a Particle in One and in Two dimensions: Dependence of force in general on position, velocity and time. The equation of motion of particle along straight line. Motion under a constant force with illustrations - 	MCQ Quiz	Powerpoint	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P.
January	06/01/25	11/01/25	3L + 2P	 equation of motion of particle along straight line. 3. Motion under a constant force with illustrations - Atwood's machine, free fall near the surface of the earth 	MCQ Quiz	Powerpoint presentation Google classroom	K. R. Symon, Mechanics, 3rd edition, Pearson (2016).R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
				Practicals : 1.Bar pendulum			

				 Motion along a rough inclined plane. 			
				2. Motion under a force which depends on time- general approach to the solution. Illustration using force of the type F =Fosin($\omega t + \varphi$)			 A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016).
January	13/01/25	18/01/25	3L + 2P	 3. Motion of a particle subjected to a resistive force: Resistive force proportional to first power of velocity Practicals : 2. Y by Koenig's method 	MCQ Quiz	Powerpoint presentation Google classroom	R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
January	20/01/25	25/01/25	2L + 2P	 ISA 1, Motion of a particle falling under gravity near the surface of the earth 	Powerpoint presentation	Powerpoint presentation	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd

				 2. Projectile Motion Momentum and energy theorem Practicals : 3. Determination of terminal velocity of a body - Stokes method 			edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
January/Feb ruary	27/01/25	01/02/25	3L + 2P	 Projectile motion in non-resistive and resistive medium (force proportional to first power of velocity, no derivation). Motion under a central force Central Force, motion in terms of eccentricity (nature of orbits) equivalent one body problem Practicals : 4. Kater's Pendulum	MCQ Quiz	Powerpoint presentation Google classroom	 A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
February	03/02/25	08/02/25	3L + 2P	1. General features of motion in an arbitrary potential field.	MCQ Quiz	Powerpoint presentation Google classroom	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics

				 Motion in an inverse –square law force field. Equation of the orbit. Kepler's Laws of planetary motion, elliptical orbits. Practicals: 5. Investigation of the motion of coupled oscillators			K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
February	10/02/25	15/02/25	3L + 2P	 Moving coordinate system Inertial and non- inertial coordinate frames, rotating coordinate systems laws of motion on the rotating earth, Coriolis force Foucault's pendulum (no derivation), and Larmor's theorem Practicals : 6. Verification of parallel & perpendicular axis	MCQ Quiz	Powerpoint presentation Google classroom	 A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics

				theorem – using Moment of Inertia			
February	17/02/25	22/02/25	3L + 2P	 Rigid bodies Translation and Rotational motion of a rigid body Compound pendulum, Location of center of mass relative to the two different origins theorems to locate the center of mass, Parallel axis and Perpendicular axis theorems. 	MCQ Quiz	Powerpoint presentation	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016).
				Acceleration due to gravity by Resonance Pendulum		Google classroom	R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
February/M arch	24/02/25	01/03/25	3L + 2P	 ISA 2 : Written test Rotation of a rigid body about an axis, Expression for angular 	MCQ Quiz Written Test	Powerpoint presentation Google classroom	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd

				momentum of a rigid body 3. moment of inertia tensor Practicals: 8. Laws of Gyroscope			edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
March	03/03/25	08/03/25	3L + 2P	 Euler's equations of motion of a rigid body Euler's equation for torque free motion. Problem solving Practicals : Revision 	MCQ Quiz	Powerpoint presentation Google classroom	 A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics K. R. Symon, Mechanics, 3rd edition, Pearson (2016). R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
March	10/03/25	15/03/25	3L + 2P	 Problem solving Problem solving Problem solving Problem solving Practicals : Revision	MCQ Quiz	Powerpoint presentation Google classroom	

March	17/03/25	22/03/25	3L + 2P	 ISA 3 : MCQ test Revision Revision 	MCQ Quiz	Powerpoint presentation	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics
						Google classroom	K. R. Symon, Mechanics, 3rd edition, Pearson (2016).
				Practicals : Revision			R. G. Takawale and P. S. Puranik, Introduction to Classical Mechanics
				1. Revision		Demonstrat	
			3L + 2P	2. Revision 3. Revision		presentation	
March	24/03/25	29/03/25				presentation	
				Practicals : Revision	MCQ Quiz	Google classroom	
March/April	31/03/25	05/04/25	3L + 2P	 Revision Revision Revision 	MCQ Quiz Test	Powerpoint presentation Google classroom	A.V. Namjoshi, J. A. Rao, Classical Mechanics Thermal and Statistical Physics
							K. R. Symon, Mechanics, 3rd edition, Pearson (2016)
				Practicals: Revision			(2010).
							R. G. Takawale and P. S. Puranik,

						Introduction to Classical Mechanics,
April	07/04/25	11/04/25	3L	 Revision Revision Revision 		
				Practicals : Exam	Test	

Assessment Rubrics

Component	Max Marks
ISA 1 Assignment	7.5
ISA 2 Written Test	7.5
ISA 3 Presentation	7.5
Practical	25
Semester End Exam	60