

Lesson Plan

Name of the Assistant/ Associate Professor... J.A.S. VINDER.....

Class and Section:..... B.Sc. I (1st Sem).....

Subject:..... MECHANICS AND THEORY OF RELATIVITY.....

Week	Date	Topics
1	15-21 July	BASICS OF MECHANICS:- Mechanics of single and system of particles, conservation of
	21-26 July	linear momentum, angular momentum and mechanical energy for a particle and a system of particles, centre of mass
	28-02 Aug.	and equation of motion, constrained motion, work and kinetic energy theorem,
2		conservative and non-conservative forces,
	4-9 Aug.	Potential energy, Energy diagram, stable and unstable equilibrium, Elastic
		Potential energy, force as gradient of potential energy, work and energy
	11-16 Aug.	work done by non-conservative forces, law of conservation of energy.
3		GENERALIZED NOTATIONS:- Degree of
	18-23 Aug.	freedom and Generalised Coordinates, Transformation equations, Generalised
		coordinates [Displacement, velocity,
	25-30 Aug.	Acceleration, momentum, force,
		potential components of velocity and acceleration in cylindrical and spherical
4	1-6 sept	coordinate system, Hamilton's variational principle, Lagrange's eq ⁿ of motion
		from Hamilton's principle. linear
	8-13 sept.	Harmonic Oscillators, Simple pendulum
		Atwood's machine.
		ROTATIONAL DYNAMICS:- Rotation of
5		rigid body, moment of inertia,
	15-20 sept.	torque, angular momentum,
		kinetic energy of rotation. Theorem of

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Name of the Assistant/ Associate Professor..... JASVINDER.....
 Class and Section: B.Sc. I (Ist Sem.)
 Subject: MECHANICS AND THEORY OF RELATIVITY

Week	Date	Topics
1	22-27 Sept	Perpendicular and parallel axis with proof Moment of inertia of Solid sphere, hollow sphere, spherical shell, Solid cylinder, hollow cylinder and Solid bar of rectangular cross-section, Acceleration of a body rolling down on an inclined plane, Kinetic energy of rotation, Motion involving both translation and rotation.
2	29-4 Oct.	Test class / Group discussion SPECIAL THEORY OF RELATIVITY:→ Non-inertial Frame and Fictitious forces, uniformly rotating frames, law of physics in rotation coordinate system. Centrifugal forces coriolis force and its applications, Michelson- Morley experiment and its outcome.
3	13-31 Oct	Postulates of Special Theory of relativity Lorentz Transformation. Simultaneity and Order of event, Lorentz Contraction, Time Dilation, Relativistic Transformation (velocity, frequency, wave number). variation of mass with velocity, Massless particle, Mass - Energy equivalence Relativistic Doppler effect, Relativistic Kinematics, Transformation of energy and momentum, Energy - Momentum four vector.
4	1-8 Nov.	class test & presentation.
5	10-15 Nov	

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Lesson Plan

Name of the Assistant/ Associate Professor: JASVINDER/ PARMJEET
 Class and Section: B.A. (I), MDC
 Subject: PHYSICS FUNDAMENTAL - I

Week	Date	Topics
1	15-21 July	Physics - Nature, Scope and excitement, Major discoveries in physics, major contribution by Indian Physicist. Fundamental physical constants, Physics in relation to other sciences, impact of physics on society.
	21-26 July	System of measuring units - Need for measurement, measuring process, concept of mass, length, time, System of units.
2	28 July	Fundamental and derive units. Concepts of error, types of error, Accuracy, Precision in measurements. Least count.
	02 Aug.	Applications of measuring instruments - Vernier calliper, Screw - gauge. (Presentation)
	4-9 Aug.	Motion of objects in one - dimensional position of the object. Origin/reference point.
3	11-16 Aug.	Frame of reference, Definitions and example of motion in one, two and three dimensions. Scalars, vector quantities.
	18-23 Aug.	Description of motion along a straight line in distance and displacement, uniform motion and non-uniform motion.
4	25-30 Aug.	Average and instantaneous speed, Average and instantaneous velocity, acceleration, Graphical analysis of straight line motion - distance - time graph, velocity - time graph,
	1-6 Sept.	eq ⁿ of motions and their application
5	8-13 Sept.	Causes of motion - Concept of force, Newton's 1st Law of motion, inertia and mass, Newton's 2nd law of motion.

Class Test

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Lesson Plan

Name of the Assistant/ Associate Professor: JASVINDER/ PARMJEET
 Class and Section: B: A: (I) 9, MDC
 Subject:

Week	Date	Topics
1	15-20 sept	momentum and force; 3rd law of motion
	22-27 sept	daily life applications of Newton's laws of motion. universal law of gravitation.
	29-04 sept oct	Acceleration due to gravity (and free-fall of a body; mass and weight of an object on earth and moon, Buoyancy, concept of thrust and pressure, and importance in daily life. Archimedes principle the physics behind floating of objects on water.
2	6-13 oct	
	23-31 oct	work, energy, types of energy-kinetic energy and potential energy. Potential energy of an object at a height; law of conservation of energy and its applications. Conservation of linear and angular momentum. Collision (elastic and inelastic) and conservation laws in collisions - importance in daily life. Concepts of Centre of mass - Physics behind cycling, rock climbing and skating.
3	1-08. Nov.	class test
4	10-15 Nov.	
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Lesson Plan

Name of the Assistant/ Associate Professor..... JASVINDER.....
 Class and Section:..... B.Sc. III (5th Sem.).....
 Subject:..... QUANTUM MECHANICS.....

Week	Date	Topics
1	15 July. 21	Failure of (Classical) F.M. Theory. Quantum theory of Radiation, Photon, Photo-electric effect and Einstein Photo-electric equation, Compton effect.
	26 July. 26	
	28 July. 02 Aug.	De-Broglie Hypothesis. Davisson and Germer experiment, phase velocity and group velocity. Heisenberg's uncertainty principle. Time - Energy and angular momentum, position uncertainty. wave - particle duality.
2	04 Aug. 09 Aug.	
	11 Aug. 16	Gamma-Ray microscope, Electron diffraction from a slit.
		class Test.
	18 Aug.	Derivation of time-dependent and time-independent Schrodinger wave equation, eigen values, eigen functions, wave functions and its significance. Normalization of wave function, concept of observable and operator. Solution of Schrodinger eq ⁿ for harmonic oscillator.
3	23 Aug.	
	25 Aug. 30	
	1-6 Sept.	
	8-13 Sept.	
	15-20 Sept.	
4	22-27 Sept.	Application of Schrodinger equation in the solution of the following one-dimensional problems:- Free Particle in one dimensional box. [Solution of Schrodinger wave eq ⁿ , eigen function, eigen values, nodes, antinodes, zero-point energy].
	29 Sept. 4 Oct.	
	6-13 Oct.	
	23-31 Oct.	
5	01-08 Nov.	i) one-dimensional potential barrier ($E > V_0$)
		ii) one-dimensional potential barrier ($E < V_0$) [Reflection, transmission coefficient, Penetration Depth]
	10-15 Nov	Group discussion.

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