

# **COURSE STRUCTURE**

## **CLASS-XI Theory (042)**

### **Three Hours**

Unit I	Physical World and Measurement	03
Unit II	Kinematics	10
Unit III	Law of Motion	10
Unit IV	Work Energy & Power	06
Unit V	Motion of System of Particles and Rigid Body	06
Unit VI	Gravitation	05
Unit VII	Properties of Bulk Matter	10
Unit VIII	Thermodynamics	05
Unit IX	Behaviour of Perfect Gas and Kinetic Theory of Gases	05
Unit X	Oscillation Sand Waves	10
	Total	----- 70 -----

Month	Date	Day	Topics
July	1-4	04 days	Unit 1 : Physical World and Measurement Physic-Scope and excitement : nature of physical law & : Physics, technology and society. Need for measurement : system of units, SI Unit, Fundamental and derived units length mass and time measurement : accuracy and precision of measuring instruments.
July	6-11	05	Errors in Measurement, Significant figures, Dimensions of physical quantities, dimensional analysis and i ts application.
July	13-18	06	Unit 2 : Kinematics : Frame of reference Motion in a straight line : Position time graph, speed and velocity, uniform and nonuniform motion, average speed and instantaneous velocity, uniformly accelerated motion velocity time, position time graphs, relations for uniformly accelerated motion (graphical treatment)
July	20-25	06	Elementary concepts of differentiation and integration for describing motion, scalar and vector quantities, position and displacement vectors general vectors and notation, equality of vectors, multiplication of vectors by area number, addition and subtraction of vectors Relative Velocity.
July Aug	27-31 and 1	05	Unit Vector, Resolution of Vector in a plane, Rectangular components, Motion in a plane cases of uniform velocity and uniform acceleration projective motion, uniform circular motion.

Aug	3-8 8 Second Saturday	05	Unit –III Laws of Motion Intuitive concept of force, inertia, Newton’s first law of motion, momentum and Newton’s second law of motion, impulse, Newton’s third law of motion.
Aug	10-15 14-15 Holiday	04	Law of conservation of linear momentum and its applications, equilibrium of co-current forces, static and kinetic friction, law of friction rolling friction.
Aug	17-22	06	Dynamics of Uniform circular motion, centripetal force example of circular motion (vehicles on level circular road, vehicle on banked roads)
Aug	24-31 31 Last Working day	06	Unit IV : Work energy and power scalar product of vectors, work done by a constant force and a variable force, kinetic energy work energy theorem, power, mutation of potential energy, potential energy of a spring.
Sep	01-05 4 1 <sup>st</sup> CCEP Exam	04	Conservative force, conservation of mechanical energy kinetic and potential energy, Non conservative forces.
Sep	7-9	03	Elastic and inelastic collisions in one and two dimensions Revision for 1 <sup>st</sup> Term Exam.
Sep	10-18	-	1 <sup>st</sup> Terminal Exam
Sep	19-28		Autumn Break

Sep	29-03 30 last working day 02-Holiday	03	Unit –V Motion of System of particles and Rigidbody – centre of mass of a two particle system, Momentum conservation and centre of mass motion, centre of Mass of rigid body, centre of mass of a uniform rod, vector product of vectors, Moment of forces, torque, angular Momentum. Conservation of angular momentum with some examples
Oct	5-10	06	Equilibrium of rigid bodies, Rigid body rotation and equations of rotational motion, Comparison of Liner and rotational motions.
	12-17	5	Moment of inertia, radius of gyration, values of moment of inertia for simple geometrical object (No derivation) Statement of Parallel and perpendicular axes theorems and their application.
	19-24	6	Unit-VI : Gravitation Keplers laws of planetary motion, The universal law of gravitation. Acceleration due to gravity & its variation with altitude and depth Gravitational potential energy, gravitational potential.
	26-31	5	Escape Velocity, Osbital Velocity of satellite, Geo - stationary satellites Unit VII Properties of bulk matter, Elastic behaviour stress strain relationship Hooke's Law Yong modulus, bulk modulus, snear modulus of rigidity.
Nov	2-7	5	Pressured due to a fluid Column, Pascal's law & its applications (hydraulic lift and hydraulic brakes ) effect of gravity on fluid pressure.
	9-14	5	Viscosity, stokes law, terminal velocity, Reynold's number, stream line and turbulent flow, Bernoullis theorem and its applications surface energy, surface tension, angle of contact.

	16-21	6	Application of Surface Tension ideas of drop, bubbles and capillary rise. Unit-VIII Heat and Temperature, thermal expansion, specific heat, calorimeter, change of state CCEP – 2 : 11-12-2009
	23-30	6	Latent Heat, transfer of heat – conduction, convection, radiation, thermal conductivity, Newtons law of cooling.
Dec	1-5	5	Unit VIII : Thermodynamics : Thermal equilibrium and definition of temperature (Zeroth law of thermodynamics) Heat work and internal energy, First law of thermodynamics.
Dec	7-12	6	Second laws of thermodynamics, reversible and irreversible processes, heat engines and refrigerator.
Dec	15-22		Ind Terminal Examination
Dec	23-24	1	Discussion of question paper
Dec	25-31		Winter Break
Jan	1-2	2	Unit IX : Behaviour of perfect gas and kinetic theory, equation state of perfect gas work done on compressing a gas.
Jan	4-9	5	Kinetic theory of gases-assumptions, concept of pressure kinetic energy and temp mean square speed of gas molecules, degrees of freedom, law of equipartition of energy (statement only) Application to specific heats of gases.

Jan	11-16	6	Concept of mean free path, Avogadro's number Unit X : Oscillations and waves, Periodic motion period, frequency displacement as a function of time, periodic function simple harmonic motion (SHM ) and its equation, Phase, Oscillations of a spring, Restoring Force and force constant.
Jan	18-23	6	Energy in SHM Kinetic and potential energy, simple pendulum, derivation of expression for its time period, free forced and damped oscillations (qualitative ideas only) resonance. Wave motion longitudinal and transverse waves speed of wave motions.
Jan	25-30	4	Displacement relation for a progressive wave, principles of superposition of waves, Reflection of Waves standing waves in strings and organ pipes fundamental mode and harmonics,
Feb	1—6	6	Beats, Doppler effect
Feb	8-13	6	Revision
Feb	15-20	6	Revision
Feb	22-27	5	Revision

List of experiments and activities same as in last year syllabus.

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