WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION

SYLLABUS FOR CLASSES XI AND XII

SUBJECT : PHYSICS (PHYS)

Preamble:

This Higher Secondary level Physics syllabus has been framed in such a way that it can serve as a bridge between the general physical science course taught at the secondary level and the discipline based curriculum followed at higher education. Effort has been given to make this crucial transition as smooth as possible.

The syllabus is divided into **Units** spread over two year's duration. The Units are logically so arranged that the students can gradually learn the different topics of Physics with higher degree of difficulty. Conventional topics as well as modern concepts have been included in the syllabus so that the students can cope up with the present day needs of the society committed to the use of Physics and technology. Both breadth and depth wise the syllabus is comparable with the national as well as international standards. At the same time emphasis has been given to reduce the syllabus load by eliminating overlapping contents within the subject or with other subjects.

Hope the students will enjoy learning Physics at this stage and will develop passion for the subject.

Outcome:

- The students will learn the basic physics laws and will develop conceptual understanding of the physical processes.
- Students will be able to understand and analysis the real-life events from physics point of view.
- Develop problem solving ability, experimental ability and analytical skills.
- Sufficient conceptual background of physics will be created to make the students competent to meet the requirements of academic and professional courses after the higher secondary stage.
- Interest will be developed for pursuing career in Physics.
- Inculcate scientific aptitude in the learners.

Course Structure :

Class	Semester	Contact Hours				Marks		Credit	
		Theory	Remedial Tutorial	Practical	Total	Theory	Practical	Theory	Practical
11	I	70	10	30 + (50) 20	110	35	30		
	II	60	10		90	35			
12	III	70	10	30 + (50) 20	110	35	30		
	IV	60	10		90	35			

CLASS - XI

SEMESTER – I

SUBJECT: PHYSICS (PHYS)

FULL MARKS: 35 **CONTACT HOURS: 70 Hours**

COURSE CODE : THEORY

UNIT No.	TOPICS	CONTACT HOURS	MARKS
1	**PHYSICAL WORLD AND MEASUREMENT** Physics - scope and excitement, nature of physical Law, physics technology and society. Need for measurement, units of measurement, length, mass and time measurement, accuracy and precision of measuring instruments, error in measurement, rounding off and order of magnitude, significant figures. Dimensions of physical quantities, dimensional analysis and its applications.	6	3
2	**KINEMATICS** **SUB TOPIC : MOTION IN A ONE DIMENSION AND TWO DIMENSION** Frame of reference (inertial and non-inertial frames).Motion in a straight line, position - time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion. Uniformly accelerated motion. Graphical analysis: position - time and velocity - time graph and calculation of relevant quantities Relations for uniformly accelerated motion (using graphical and calculus method). **SUB TOPIC : MOTION IN A PLANE** Scalar and vector quantities, position and displacement vectors, general vectors and their notations, equality of vectors, multiplication of vectors by a real number, addition and subtraction of vectors. Relative velocity. Unit vector, resolution of a vector in a plane - rectangular and non - rectangular components. Scalar and vector product. Motion in a plane. Cases of uniform velocity and uniform acceleration - projectile motion.	24	12
3	**LAWS OF MOTION** Intuitive concept of force. Inertia, Newton's first law of motion. Momentum and Newton's second law of motion, impulse and concept of impulsive force, Newton’s third law of motion and its examples.	16	8

UNIT No.	TOPICS	CONTACT HOURS	MARKS
	Law of Conservation of Linear Momentum and its application, concept of free body diagram and its application (simple cases). Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, ideas of coefficient of friction, angle of friction and angle of repose. Rolling friction. Dynamics of uniform circular motion, centripetal force, and example of circular motion (motion of a cyclist, vehicle on level circular road, vehicle on bank road). Concept of centrifugal force.		
4	**WORK ,ENERGY AND POWER** Work done by a constant force and variable force, kinetic energy. Work - energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces, conservation of mechanical energy (kinetic and potential energies). Non-conservative forces. Motion in a vertical circle. Elastic and inelastic collisions in one and two dimensions.	**10**	**5**
5	**MOTION OF SYSTEM OF PARTICLES AND RIGID BODY** Centre of mass of a two - particle system. Momentum conservation and motion of centre of mass. Centre of mass of a rigid body (examples of simple geometrical bodies). Moment of a force, torque, angular momentum, conservation of angular momentum with examples. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motion, moment of inertia, radius of gyration. Values of moment of inertia for simple geometrical objects (no derivation). Statement of parallel and perpendicular axis theorem and their applications.	**14**	**7**

FOR SEMESTER I

- **CONTACT HOURS FOR THEORY PART – 70 HOURS**
- **CONTACT HOURS FOR PRACTICAL PART – 30 HOURS**
- **CONTACT HOURS FOR REMEDIAL CLASSES AND TUTORIAL – 10 HOURS**

SO TOTAL CONTACT HOURS FOR 1st SEMESTER IS 110 HOURS.