

## **Syllabus::**

### **1. Natural and Physical Sciences**

#### **MDC-1: Introduction to Natural and Physical Sciences**

**Unit 1:** Structure and Constituents of the Material World—atoms, molecules, and ions; Essential Elements; Structure and Bonding; Acids and Bases; Chemical Formula and Equations; Night Sky.

**Unit 2:** Laws of Nature— Gas laws; Kinds of Forces; Equilibrium, Kinetics, Osmosis; Heat and Thermodynamics; Electrical and Magnetic Behaviour of Nature, Friction, Waves & Oscillations.

**Unit 3:** Properties of Matter— States and Strength of Materials, Optical properties- Emissions and Absorptions, Interference, Diffraction, and Polarization; Nanomaterials; Smart Materials; Sounds and Musical Instruments.

#### **MDC-2: Natural and Physical Sciences in Everyday Life**

**Unit 1:** Carbohydrates, Proteins, and Amino Acids, Vitamins & Minerals, Foods and Beverages; Germicides, Pesticides; Human Health; Patterns and Variations in Nature.

**Unit 2:** Solutions and Colloids, Plastics, Cements, Glass, Soaps and Detergents; Pollutants and Contaminants; Heavy Metal Poisoning; Poisonous Gases; Green House Effect; Acid Rain, Corrosion.

**Unit 3:** Waste Water Treatment; Nuclear Energy; Conventional and Renewable Energy Sources; Battery Basics; Future Fuels.

#### **MDC-3: Applications and Prospects of Natural and Physical Sciences**

**Unit 1:** Solar Light and Radiations; Introduction to Microscopic and Spectroscopic Techniques; MRI and CT Scan; Fluorescence.

**Unit 2:** Sensors & Detectors; Telescopes; Images and Information; Communications; Space and Atmosphere.

**Unit 3:** Measurements and Errors; Observation, Representation, and Interpretation—Testing and Analysis; Evaluation and Conclusion.