SCIENCE

Course Structure

I Term Units	Topics	Marks
I	Matter - Its Nature & Behaviour	29
II	Organisation in the Living World	18
III	Motion, Force and Work	30
V	Food; Food Production	13
Total		**90**
II Term Units	**Topics**	**Marks**
I	Matter - Its Nature & Behaviour	18
II	Organisation in Living World	26
III	Motion, Force and Work	36
IV	Our Environment	10
Total		**90**

First Term Course Syllabus

Unit I: Matter - Its Nature & Behaviour

Chapter I: Definition of Matter

- Definition of matter
- Solid, liquid and gas
- Characteristics - shape, volume, density
- Change of state-melting (absorption of heat)
- Freezing
- Evaporation (cooling by evaporation)
- Condensation
- Sublimation

Chapter II: Nature of Matter

- Elements
- Compounds

- Mixtures
- Heterogenous and homogenous mixtures
- Colloids and suspensions

Unit II: Organisation in the Living World

Chapter I: Cell - Basic Unit of life

- Cell as a basic unit of life
- Prokaryotic and eukaryotic cells
- Multicellular organisms
- Cell membrane and cell wall
- Cell organelles; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus, nucleus
- Chromosomes - basic structure, number

Chapter II: Tissues, Organs, Organ System, Organism

- Structure and functions of animal and plant tissues
- Types of Tissue (four types in animals; meristematic and permanent tissues in plants).

Unit III: Motion, Force and Work

Chapter I: Motion

- Distance and displacement
- Velocity
- Uniform and non-uniform motion along a straight line
- Acceleration
- Distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion
- Equations of motion by graphical method
- Elementary idea of uniform circular motion.

Chapter II: Force and Newton's Laws

- Force and motion
- Newton's laws of motion
- Inertia of a body, inertia and mass, momentum, force and acceleration

- Elementary idea of conservation of momentum
- Action and reaction forces

Chapter III: Gravitation

- Gravitation
- Universal law of gravitation
- Force of gravitation of the earth (gravity)
- Acceleration due to gravity
- Mass and weight
- Free fall

Unit V: Food Production

Chapter I: Plant and Animal

- Plant and animal breeding and selection for quality improvement and management
- Use of fertilizers, manures
- Protection from pests and diseases
- Organic farming

Second Term Course Syllabus

Unit I: Matter - Its Nature & Behaviour

Chapter III: Particle nature, basic units

- Atoms and molecules
- Law of constant proportions
- Atomic and molecular masses

Chapter IV: Mole Concept

- Relationship of mole to mass of the particles and numbers
- Valency
- Chemical formula of common compounds

Chapter V: Structure of atom

- Electrons, protons and neutrons
- Isotopes
- Isobars

Unit II: Organisation in the Living World

Chapter III: Biological Diversity

- Diversity of plants and animals - basic issues in scientific naming, basis of classification
- Hierarchy of categories / groups, Major groups of plants (salient features) (Bacteria, Thalophyta, Bryo phyta, Pteridophyta, gymnosperms and Angiosperms)
- Major groups of animals (salient features) (Non-chordates up to phyla and chordates up to classes)

Chapter IV: Health and Diseases

- Health and its failure
- Infectious and Non-infectious diseases, their causes and manifestation
- Diseases caused by microbes (Virus, Bacteria and protozoans) and their prevention, Principles of treatment and prevention. Pulse Polio programmes.

Unit III: Motion, Force and Work

Chapter IV: Floatation

- Thrust and pressure
- Archimedes' principle
- Buoyancy
- elementary idea of relative density

Chapter V: Work, energy and power

- Work done by a force, energy, power
- Kinetic and potential energy
- Law of conservation of energy

Chapter VI: Sound

- Nature of sound and its propagation in various media, speed of sound, range of hearing in humans
- Ultrasound
- Reflection of sound; echo and SONAR
- Structure of the human ear (auditory aspect only).

Unit IV: Our Environment

Chapter I: Physical Resources

- Air, Water, Soil
- Air for respiration, for combustion, for moderating temperatures
- Movements of air and its role in bringing rains across India
- Air, water and soil pollution (brief introduction)
- Holes in ozone layer and the probable damages

Chapter II: Bio-geo chemical cycles in nature

- Water
- Oxygen
- Carbon
- Nitrogen

Practical Topics: First Term

Test

- The presence of starch in the given food sample
- The presence of the adulterant metanil yellow in dal.

Prepare

- A true solution of common salt, sugar and alum
- A suspension of soil, chalk powder and fine sand in water
- A colloidal solution of starch in water and egg albumin/milk in water and distinguish between these on the basis of:
  - Transparency
  - Filtration criterion
  - Stability

Prepare

- A mixture
- A compound

By using iron filings and sulphur powder, distinguish between these on the basis of:

- Appearance, i.e., homogeneity and heterogeneity

- Behaviour towards a magnet
- Behaviour towards carbon disulphide as a solvent
- Effect of heat

Carry out the following reactions and classify them as physical or chemical changes:

- Iron with copper sulphate solution in water
- Burning of magnesium in air
- Zinc with dilute sulphuric acid
- Heating of copper sulphate
- Sodium sulphate with barium chloride in the form of their solutions in water

Prepare stained temporary mounts of:

- Onion peel and
- Human cheek cells and to record observations and draw their labeled diagrams

Identify:

- Parenchyma and sclerenchyma tissues in plants
- Stripe muscle fibers and nerve cells in animals
- Prepare slides and to draw their labeled diagrams.

Separate

- Components of a mixture of sand
- Common salt and ammonium chloride (or camphor) by sublimation

Determine

- Melting point of ice
- Boiling point of water

Establish

- Relationship between weight of a rectangular wooden block lying on a horizontal table and the minimum force required to just move it using a spring balance

Determine

- Mass percentage of water imbibed by raisins

Practical Topics: Second Term

Verify

- Laws of reflection of sound

Determine

- Density of solid (denser than water) by using a spring balance and a measuring cylinder

Establish

- Relation between the loss in weight of a solid when fully immersed in
  - Tap water
  - Strongly salty water, with the weight of water displaced by it by taking at least two different solids

Observe and compare

- Pressure exerted by a solid iron cuboid on fine sand/ wheat flour while resting on its three different faces and to calculate the pressure exerted in the three different cases.

Determine

- Velocity of a pulse propagated through a stretched string/slinky.

Study

- Characteristic of Spirogyra/Agaricus, Moss/Fern, Pinus (either with male or female cone) and an Angiospermic plant
- Draw and give two identifying features of the groups they belong to

Observe

- Given pictures/charts/models of earthworm, cockroach, bony fish and bird. For each organism, draw their picture and record:
  - One specific feature of its phylum
  - One adaptive feature with reference to its habitat

Verify

- Law of conservation of mass in a chemical reaction

Study the external features of:

- Root
- Stem
- Leaf and
- Flower of monocot and dicot plants

Study

- Life cycle of mosquito