

SCIENCE

Course Structure

I Term Units	Topics	Marks
I	Chemical Substances – Nature & Behaviour	33
II	World of Living	21
IV	Effects of Current	29
V	Natural Resources	7
Total		90
II Term Units	Topics	Marks
I	Chemical Substances – Nature & Behaviour	23
II	World of Living	30
III	Natural Phenomenon	29
V	Natural Resources	8
Total		90

First Term Course Syllabus

Unit I: Chemical Substances – Nature & Behaviour

Chapter 1: Chemical Reactions

- Chemical equation
- Balanced chemical equation
- Implications of a balanced chemical equation
- Types of chemical reactions
- Combination
- Decomposition
- Displacement
- Double Displacement
- Precipitation
- Neutralization
- Oxidation
- Reduction

Chapter 2: Acids, Bases and Salts

- Definitions in terms of furnishing of H^+ and OH^- ions
- General properties
- Examples and uses
- Concept of pH scale (Definition relating to logarithm not required)
- Importance of pH in everyday life
- Preparation and uses of sodium hydroxide
- Bleaching powder
- Baking soda
- Washing soda
- Plaster of Paris

Chapter 3: Metals and Non-metals

- Properties of metals and non-metals
- Reactivity series
- Formation and properties of ionic compounds
- Basic metallurgical processes
- Corrosion and its prevention

Unit II: World of Living

Chapter 1: Life processes

- Living Being
- Basic concept of nutrition
- Respiration
- Transport
- Excretion in plants and animals

Chapter 2: Control and co-ordination in animals and plants

- Tropic movements in plants
- Introduction to plant hormones
- Control and co-ordination in animals
- Nervous system
- Voluntary, involuntary and reflex action
- chemical co-ordination
- Animal hormones

Unit IV: Effects of Current

Chapter 1: Electric Current

- Potential difference and electric current
- Ohm's law
- Resistance, Resistivity, Factors on which the resistance of a conductor depends
- Series combination of resistors, parallel combination of resistors and its applications in daily life
- Heating effect of electric current and its applications in daily life
- Electric power
- Inter relation between P , V , I and R

Chapter 2: Magnetic Effects of Current

- Magnetic field
- Field lines
- Field due to a current carrying conductor
- Field due to current carrying coil or solenoid
- Force on current carrying conductor
- Fleming's left hand rule
- Electromagnetic induction
- Induced potential difference
- Induced current
- Fleming's Right Hand Rule
- Direct current
- Alternating current
- Frequency of AC
- Advantage of AC over DC
- Domestic electric circuits

Unit V: Natural Resources

Chapter 1: Sources of energy

- Different forms of energy
- Conventional and non-conventional sources of energy
 - Fossil fuels
 - Solar energy
 - Biogas
 - Wind

- Water and tidal energy
- Nuclear energy
- Renewable versus non-renewable sources

Second Term Course Syllabus

Unit I: Chemical Substances – Nature & Behaviour

Chapter 4: Carbon compounds

- Covalent bonding in carbon compounds
- Versatile nature of carbon
- Homologous series Nomenclature of carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes)
- Difference between saturated hydrocarbons and unsaturated hydrocarbons
- Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction)
- Ethanol and Ethanoic acid (only properties and uses), soaps and detergents

Chapter 5: Periodic classification of elements

- Need for classification
- Modern periodic table
- Gradation in properties
- Valency
- Atomic number
- Metallic and non-metallic properties

Unit II: World of Living

Chapter 3: Reproduction

- Reproduction in animal and plants (asexual and sexual)
- Reproductive health-need for and methods of family planning
- Safe sex vs HIV/AIDS
- Child bearing and women's health

Chapter 4: Heredity and Evolution

- Heredity
- Mendel's contribution - Laws for inheritance of traits
- Sex determination: brief introduction

- Basic concepts of evolution

Unit III: Natural Phenomenon

Chapter 1: Reflection

- Reflection of light at curved surfaces
- Images formed by spherical mirrors
- Centre of curvature
- Principal axis
- Principal focus
- Focal length
- Mirror formula (Derivation not required)
- Magnification

Chapter 2: Refraction

- Refraction
- Laws of refraction
- Refractive index
- Refraction of light by spherical lens
- Image formed by spherical lenses
- Lens formula (Derivation not required)
- Magnification
- Power of a lens
- Functioning of a lens in human eye
- Defects of vision and their corrections
- Applications of spherical mirrors and lenses
- Refraction of light through a prism
- Dispersion of light
- Scattering of light
- Applications in daily life

Unit V: Natural Resources

Chapter 2: Conservation of Natural Resources

- Management of natural resources
- Conservation and judicious use of natural resources
- Forest and wild life
- Coal and petroleum conservation
- Examples of People's participation for conservation of natural resources

Chapter 3: The Regional environment

- Big dams: advantages and limitations; alternatives if any
- Water harvesting
- Sustainability of natural resources

Chapter 4: Our environment

- Eco-system
- Environmental problems
- Ozone depletion
- Waste production and their solutions
- Biodegradable and non-biodegradable substances

First Term: Practical Syllabus

1. To find the pH of the following samples by using pH paper/universal indicator:

- Dilute Hydrochloric Acid
- Dilute NaOH solution
- Dilute Ethanoic Acid solution
- Lemon juice
- Water
- Dilute Sodium Bicarbonate solution

2. To study the properties of acids and bases (HCl & NaOH) by their reaction with:

- Litmus solution (Blue/Red)
- Zinc metal
- Solid sodium carbonate

3. To perform and observe the following reactions and classify them into:

- Combination reaction
- Decomposition reaction
- Displacement reaction
- Double displacement reaction
 - Action of water on quick lime
 - Action of heat on ferrous sulphate crystals

- Iron nails kept in copper sulphate solution
- Reaction between sodium sulphate and barium chloride solutions

4. i) To observe the action of Zn, Fe, Cu and Al metals on the following salt solutions:

- ZnSO_4 (aq)
- FeSO_4 (aq)
- CuSO_4 (aq)
- $\text{Al}_2(\text{SO}_4)_3$ (aq)

ii) Arrange Zn, Fe, Cu and Al (metals) in the decreasing order of reactivity based on the above result.

5. To study the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance. Also plot a graph between V and I.

6. To determine the equivalent resistance of two resistors when connected in series.

7. To determine the equivalent resistance of two resistors when connected in parallel.

8. To prepare a temporary mount of a leaf peel to show stomata.

9. To show experimentally that light is necessary for photosynthesis.

10. To show experimentally that carbon dioxide is given out during respiration.

Second Term: Practical Syllabus

1. To study the following properties of acetic acid (ethanoic acid):

- Odour
- Solubility in water
- Effect on litmus

- Reaction with sodium bicarbonate

2. To study saponification reaction for preparation of soap.
3. To study the comparative cleaning capacity of a sample of soap in soft and hard water.
4. To determine the focal length of:
 - Concave mirror
 - Convex lens

By obtaining the image of a distant object.

5. To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence and interpret the result.

6. To study:

- Binary fission in Amoeba
- Budding in yeast with the help of prepared slides

7. To trace the path of the rays of light through a glass prism.

8. To find the image distance for varying object distances in case of a convex lens and draw corresponding ray diagrams to show the nature of image formed.

9. To study homology and analogy with the help of models/charts of animals and models/ charts/ specimens of plants.

10. To identify the different parts of an embryo of a dicot seed (Pea, gram or red kidney bean).