BIOLOGY

REVISED SYLLABUS FOR HIGHER SECONDARY FIRST YEAR COURSE

The present syllabus reinforces the ideas introduced in the lower classes while the students learn new concepts besides getting an exposure to contemporary areas of the subject. The syllabus also aims at emphasizing on the underlying principles which are common to both animals and plants as well as highlighting the relationship of biology with other areas of knowledge. The format of the syllabus allows a simple, clear, consequential flow of concepts without any jarring jumps. The syllabus also stresses on the connection of the study of Biology to real life problems, use of biological discoveries/innovations in everyday life- in environment, industry, health and agriculture. The updated syllabus also focuses on reducing the curriculum load while ensuring that ample opportunities and scope for learning and appreciating basic concepts of the subject continue to be available within its framework.

The prescribed syllabus is expected to

- ❖ Promote understanding of basic principles of biology
- ❖ Encourage learning of emerging knowledge and its relevance to individual and society
- ❖ Promote rational/specific attitude to issues related to population, environment and development
- ❖ Enhance awareness about environmental issues and problems and the appropriate solutions
- ❖ Create awareness amongst the learners about variations amongst the living, and developing respect for the diversities and to appreciate that the most complex biological phenomena are also built on essentially simple processes.

It is expected that the students would get an exposure to various branches of Biology in the syllabus in a more contextual and friendly manner as they study its various units.

SYLLABUS FOR HIGHER SECONDARY FIRST YEAR COURSE
COURSE STRUCTURE

One Paper (Theory) **Time : Three hours** **Marks : 70**

Unitwise Distribution of Marks & Periods :

Unit No.	Title	Marks	Periods
GROUP-A	**BOTANY**		
Unit-I	Diversity in the living world (Chapters 1,2&3)	06	10
Unit-II	Structural organization in plants (Chapter 5&6)	07	15
Unit-III	Cell : Structure and function (Chapter 8,9&10)	12	45
Unit-IV	Plant Physiology (Chapter 11,12 &13)	10	20
		35	
GROUP-B	**ZOOLOGY**		
Unit-I	Diversity in the living world (Chapter 4)	10	20
Unit-II	Structural organisation in animals.(Chapter7)	05	10
Unit-V	Human Physiology(Chapters 14,15,16,17,18&19)	20	60
		35	
	Total	**70**	**180**

Unitwise Distribution of Course contents :

Unit: I DIVERSITY IN THE LIVING WORLD

Chapter-1 The Living World

Biodiversity: Classification of living organisms, Taxonomy and Systemtics, Taxonomic Categories (From species to kingdom) Biological classification, Binomial nomenclature (Brief idea)

Chapter-2: Biological Classification

Five Kingdom classification, Salient features and classification of Monera, Protista, Fungi into major groups; lichens, viruses, viroid and prions.

Chapter-3: Plant Kingdom

Classification of plants into major groups, salient and distinguishing features and a few examples of Algae, Bryophytes, Pteridophytes, Gymnosperms and preliminary idea of Angiosperms.

Chapter-4: Animal Kingdom

Basis of classification. Salient features and classification of animals, Non-chordates upto phyla level and chordates upto class level (salient features and a few examples of each category) (No live animals or specimens should be displayed)

Unit-II : STRUCTURAL ORGANISATION IN PLANTS AND ANIMALS

Chapter-5 Morphology of flowering Plants

Morphology of different parts of flowering plants- root, stem, leaf, inflorescence, flower, fruit and seed. Description of family solanaceae

Chapter-6 Anatomy of Flowering Plants

Types of tissues; Tissue Systems in dicots and monocots, Anatomy of Dicotyledonous and Monocotyledonous plants.

Chapter-7 Structural Organisation in Animals

Morphology, Anatomy and functions of different systems (Digestive, Circulatory, Respiratory, Nervous and Reproductive) of frog.

Unit-III: CELL: STRUCTURE AND FUNCTION

Chapter-8 Cell: The Unit of Life

Cell theory and cell as the basic unit of life, structure of Prokaryotic and Eukaryotic cells: Plant cell and animal cell: Cell envelope; cell membrane, cell wall. Structure and function of endomembrane system, endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies, cytoskeleton, cilia, flagella, centrosome and centrioles (ultra structure and function): nucleus and its ultrastractures.

Chapter-9 Biomolecules

Chemical constituents of living cells: bionolecules ,structure and functions of Proteins, Carbohydrates and Nucleic Acids. Enzymes-Types,Properties, enzyme action, classification and nomenclature of enzymes.

Chapter-10 : Cell Cycle and Cell Division

Cell Cycle. Mitosis and Meiosis – their phases and their significance.

Unit-IV: PANT PHYSIOLOGY

Chapter -11: Photosynthesis in Higher Plants

Early experiments relating to photosynthesis. Photosynthesis as a means of autotrophic nutrition: Site of photosynthesis ,Pigments involved in photosynthesis(elementary idea) ,Photochemical and biosynthetic phases of photosynthesis, cyclic and non-cyclic photophosphorylation, chemiosmotic hypothesis; photorespiration; C_3 and C_4 pathways, factors affecting photosynthesis.

Chapter -12 Respiration in Plants

Exchange of gases ; Cellular respiration: Glycolysis ,Fermentation ,(anaerobic) ,TCA Cycle and Electron transport system (aerobic) ,Energy relations – Number of ATP molecules generated ,anphibolic pathway ,respiratory quotient .

Chapter -13 Plant Growth and Development

Phases of Plant Growth and Plant Growth rate ,conditions required for growth ,differentiation, dedifferentiation and redifferentiation. Sequence of developmental process in a plants cell Plant, Growth regulators-Auxin, Gibberelins, Cytokinins. Eltylene , ABA.

Unit-V: HUMAN PHYSIOLOGY

Chapter-14 Breathing and Exchange of Gases

Respiratory organs in animal (recall only); Respiratory system in humans; mechanism of breathing and its regulation in humans-exchange of gases, transport of gases and regulation of respiration, respiratory volume, disorders related to respiration- Asthma, Emphysema, Occupational respiratory disorders.

Chapter-15: Body Fluids and Circulation

Composition of blood; blood groups; coagulation of blood; composition of lymph and its function; human circulatory system- structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system-hypertension, coronary artery disease, angina pectoris, heart failure.

Chapter-16: Excretory Products and their elimination

Modes of Excretion- ammonotelism, ureotelism, uricotelism; human excretory system-structure and function-urine formation, osmoregulation, regulation of kidney function-renin angiotensin, mechanism, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion: excretory disorder-uremia, renal failure, renal calculi, nephritis, dialysis and artificial kidney, kidney transplant.

Chapter-17: Locomotion and Movement

Types of movement-ciliary, flagellar, muscular, skeletal muscle, contractile proteins and mechanism of muscle contraction; skeletal system and its functions; joints, disorders of muscular and skeletal systems- myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

Chapter-18: Neural Control and Coordination

Neuron and Nerves; Nervous system in human-Central nervous system; Peripheral nervous system and Visceral nervous system; generation and conduction of nerve inpulse.

Chapter-19: Chemical Coordination and Integration

Endocrine glands and hormones; human endocrine system- Hypothalamus, Pituitary, Pincal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads. Mechanism of hormone action (elementary idea), role of hormonesas messengers and regulators, hypo and hyperactivity and related disorders, dwarfism, acromegaly, cretinism, goiter, exophthalanic goiter, diabetes, Addison's disease

Note: (Diseases related to all the human physiological systems to be taught in brief)

SYLLABUS FOR BOTANY PRACTICAL

Marks - 15

1. Study parts of compound microscope.
2. Study of the specimens and identification with reasons- Bacteria, Oscillatoria, Spirogyra, Rhizopus, Mushroom, Yeast, Liverwort, Moss, Fern, Pinus; one monocotyledon, one dicotyledon and one lichen.
3. Study of tissues and diversity in shapes and sizes of plant cells (e.g. palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem) through temporary/permanent slides.
4. Study of mitosis in onion root tip cells (permanent slides).
5. Study of different modifications in root, stem and leaves.
6. Study and identify different types of inflorescences.(Racemose and Cymose)
7. Study and describe three common flowering plants (Solanaceae, Fabaceae and Liliaceae).
8. Preparation and study of L.S.of dicot and monocot roots and stems (normal).
9. Study of osmosis by potato osmometer.
10. Study of imbibition in seeds/raisins
11. Study of distribution of stomata in the upper and lower surface of leaves.
12. Observation and comments on the experimental set up on :
    (a) Moll's half leaf experiment
    (b) Suction due to transpiration

SYLLABUS FOR ZOOLOGY PRACTICAL

Marks - 15

1. Study of specimens and identification with reasons with the help of preserved samples/virtual samples/slides/models- Amoeba, Hydra, Liverfluke, Ascaris, Leech, Earthworm, Prawn, Silk worm, Honeybee, Snail, Starfish, Shark, Rohu, Frog, House Lizard, Pigeon and Rabbit.
2. Study of tissues and diversity in shapes and sizes of animal cells (e.g. squamous epithlium, muscle fibres and mammalian blood cells from blood smear) through temporary/permanent slides.
3. Study of external morphology of earthworm, cockroach and frog through models/Virtual Specimens.
4. Test for the presence of sugar and starch, proteins in suitable biological materials.
5. Study effect of different temperature upon salivary gland amylase on starch.
6. To test the presence of urea in urine.
7. To detect the presence of sugar in urine / blood sample.
8. To detect the presence of albumin in urine.
9. To study human skeleton and different types of joints with the help of virtual images/ models only.