

DAV PUBLIC SCHOOL UPPAL'S SOUTHEND SECTOR 49, GURGAON
ACADEMIC PLAN
CLASS XI BIOLOGY (THEORY)

Time: 3 Hours

M.M. 70

	Title	No. of Periods	Marks
I	Diversity of Living Organisms	23	07
II	Structural Organization in Plants & Animals	22	11
III	Cell: Structure and Function	35	15
IV	Plant Physiology	40	17
V	Human Physiology	40	20
	Total	160	70

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/scientific attitude towards issues related to population, environment and development
- Enhance awareness about environmental issues, problems and their appropriate solutions
- Create awareness amongst the learners about diversity in the living organisms and developing respect for other living beings
- Appreciate that the most complex biological phenomena are built on essentially simple processes

APRIL

Unit-V Human Physiology

Chapter-16: Digestion and Absorption (6 periods)

Alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; calorific values of proteins, carbohydrates and fats, egestion, nutritional and digestive disorders - PEM, indigestion, constipation, vomiting, jaundice, diarrhea.

Chapter-17: Breathing and Exchange of Gases (6periods)

Respiratory organs in animals (Introduction), 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.

MAY

Chapter-18: Body Fluids and Circulation (8 periods)

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-19: Excretory Products and Their Elimination (8 periods)

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

Chapter-20: Locomotion and Movement**(6 periods)**

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

Chapter-21: Neural Control and Coordination**(8 periods)**

Neuron and nerves; Nervous system in humans central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse; reflex action; sensory perception; sense organs; elementary structure and functions of eye and ear.

JULY**Chapter-22: Chemical Coordination and Integration****(7 periods)**

Endocrine glands and hormones; human endocrine system hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Unit-I Diversity of Living Organisms**Chapter-1: The Living World****(4 periods)**

What is living? Biodiversity; Need for classification; three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature; tools for study of taxonomy museums, zoological parks, herbaria, botanical gardens.

Chapter-2: Biological Classification**(6 periods)**

Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups: Lichens, Viruses and Viroids.

Chapter-3: Plant Kingdom**(9 periods)**

Salient features and classification of plants into major groups Algae, Bryophyta, Pteridophyta, Gymnospermae and Angiospermae (three to five salient and distinguishing features and at least two examples of each category); Angiosperm classification upto class, characteristic features and examples.\

AUGUST**Unit-I Diversity of Living Organisms****Chapter-4: Animal Kingdom****(9 periods)**

Salient features and classification of animals non-chordates up to phyla level and chordates up to class level (three to five salient features and at least two examples of each category).

(No live animals or specimen should be displayed.)

Unit-II Structural Organization in Animals and Plants**Chapter-5: Morphology of Flowering Plants****(10 periods)**

Morphology and modifications: Tissues.

SEPTEMBER**REVISION AND FIRST TERM EXAMINATION****OCTOBER****Unit-II Structural Organization in Animals and Plants****Chapter-6: Anatomy of Flowering Plants****(9 periods)**

Anatomy and functions of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed (to be dealt along with the relevant experiment of the Practical Syllabus).

Chapter-7: Structural Organization in Animals**(8 periods)**

Animal tissues: Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (a brief account only)

NOVEMBER**Unit-III Cell: Structure and Function****Chapter-8: Cell-The Unit of Life****(9 periods)**

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; cell organelles - structure and function; endomembrane system, endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultra structure and function); nucleus, nuclear membrane, chromatin, nucleolus.

Chapter-9: Biomolecules**(6 periods)**

Chemical constituents of living cells: bio molecules, structure and function of proteins, carbohydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action.

Chapter-10: Cell Cycle and Cell Division**(5 periods)**

Cell cycle, mitosis, meiosis and their significance.

DECEMBER**Unit-IV Plant Physiology****Chapter-11: Transport in Plants****(6 periods)**

Movement of water, gases and nutrients; cell to cell transport, Diffusion, facilitated diffusion, active transport; plant-water relations, Imbibition, water potential, osmosis, plasmolysis; long distance transport of water - Absorption, apoplast, symplast, transpiration pull, root pressure and

guttation; transpiration, opening and closing of stomata; Uptake and translocation of mineral nutrients - Transport of food, phloem transport, massflow hypothesis; diffusion of gases.

Chapter-12: Mineral Nutrition

(5 periods)

Essential minerals, macro- and micronutrients and their role; deficiency symptoms; mineral toxicity; elementary idea of hydroponics as a method to study mineral nutrition; nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.

Chapter-13: Photosynthesis in Higher Plants

(7 periods)

Photosynthesis as a mean 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; C₃ and C₄ pathways; factors affecting photosynthesis.

JANUARY

Chapter-14: Respiration in Plants

(5 periods)

Exchange of gases; cellular respiration glycolysis, fermentation(anaerobic), TCA cycle and electron transport system(aerobic); energy relations number of ATP molecules generated; amphibolic pathways; respiratory quotient.

Chapter-15: Plant - Growth and Development

(7 periods)

Seed germination; phases of plant growth and plant growth rate; conditions of growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA; seed dormancy; vernalisation; photoperiodism.

FEBRUARY

REVISION OF COMPLETE SYLLABUS

PRACTICALS

Time Allowed: 3 hours

Max. Marks: 30

Evaluation Scheme

One Major Experiment	5 Marks
One Minor Experiment	4 Marks
Slide Preparation	5 Marks
Spotting	7 Marks
Practical Record + Viva Voce	4 Marks
Project Record + Viva Voce	5 Marks
Total	30 Marks

A. List of Experiments

1. Study and description of three locally available common flowering plants, one from each of the families Solanaceae, Fabaceae and Liliaceae including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams). Types of root (Tap and adventitious); stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound).
2. Preparation and study of T.S. of dicot and monocot roots and stems (primary).
3. Study of osmosis by potato osmometer.
4. Study of plasmolysis in epidermal peels (e.g. Rhoëo leaves).
5. Study of distribution of stomata in the upper and lower surface of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
7. Test for the presence of sugar, starch, proteins and fats. Detection in suitable plant and animal materials.
8. Separation of plant pigments through paper chromatography.
9. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
10. Test for presence of urea in urine.
11. Test for presence of sugar in urine.

12. Test for presence of albumin in urine.

13. Test for presence of bile salts in urine.

B. Study/observation of the following (spotting)

1. Study of the parts of a compound microscope.
2. Study of the specimens/slides/models and identification with reasons-Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.
3. Study of virtual specimens/slides/models and identification with reasons - Amoeba, Hydra, liverfluke, Ascaris, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.
4. Study of tissues and diversity in shapes and sizes of plant and animal cells (palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, squamous epithelium, muscle fibers and mammalian blood smear) through temporary/permanent slides.
5. Study of mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.
6. Study of different modifications in roots, stems and leaves.
7. Study and identification of different types of inflorescence (cymose and racemose).
8. Study of imbibition in seeds/raisins.
9. Observation and comments on the experimental set up for showing:
 - a) Anaerobic respiration
 - b) Phototropism
 - c) Effect of apical bud removal
 - d) Suction due to transpiration
10. Study of human skeleton and different types of joints with the help of virtual images/models only.
11. Study of external morphology of cockroach through virtual images/models.