

## Curriculum Subject: Biology (044)

Class: XI Session: 2024-25

	Theory	
Units	Title	Marks
1	Diversity of Living Organisms	15
II	Structural Organization in Plants and Animals	10
III	Cell: Structure and Function	15
IV	Plant Physiology	12
٧	Human Physiology	18
	70	

Unit/ Month	Name of the Chapter	Practical and Competency Skill Based Activities/ Experiential Learning	Skills	Assessments
Unit I: (April- May)	The Living World Biodiversity Learning Outcome: Students will be able to: Understand the Need for classification; three domains of life; taxonomy and systematics; explain the concept of species and taxonomical hierarchy; binomial nomenclature  Biological Classification Students will be able to explain Five kingdom classification; Illustrate Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids  Plant Kingdom Students will be able to Classify plants into major groups; give Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae (Topics excluded – Angiosperms, Plant Life Cycle and Alternation of Generations  Animal Kingdom Students will be able to discuss Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and at a few examples of each category). (No live animals or specimen should be displayed.)	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.  Virtual specimens/slides/models and identifying features of - Amoeba, Hydra, Liverfluke, Ascaris, Leech, Earthworm, Prawn, Silkworm, Honey bee, Snail, Starfish, Shark, Rohu, Frog, Lizard, Pigeon and Rabbit  Field trip to Great Himalayan National Park Banjar	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity
Unit II (June- July)	Morphology of Flowering Plants Students will be able to explain Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed, describe family Solanaceae  Anatomy of Flowering Plants Students will be able to understand Anatomy and functions of tissue systems in dicots and monocots  Structural Organisation in Animals Students will be able to discuss Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.	-Study and describe locally available common flowering plants, from family Solanaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams), type of root (tap and adventitious); type of stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound).  Different types of inflorescence (cymose and racemose  Preparation and study of T.S. of dicot and monocot roots and stems (primary)  Field trip to Agriculture Institute, Bajaura	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lab activity

Unit III	Cell: Structure and Function		Knowledge,	Oral Test/
Aug- Sep)	Cell-The Unit of Life Students will be able to understand 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; Draw and explain basic cell organelle's structure and function; endomembrane system, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus.	Parts of a compound microscope	Understanding, Application, Analysis and Evaluation	Class test/ Quizzes / Lab activity
	Biomolecules Students will be able to discuss Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Describe Enzyme - types, properties, enzyme action. (Topics excluded: Nature of Bond Linking Monomers in a Polymer, Dynamic State of Body Constituents – Concept of	Mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.		
	Metabolism, Metabolic Basis of Living, The Living State)	Study of osmosis by potato osmometer		
	Cell Cycle and Cell Division Students will be able to explain the process of Cell cycle, mitosis, meiosis and their significance Photosynthesis in Higher Plants Students will be able to explain Photosynthesis as a means of autotrophic nutrition; site of photosynthesis,	Study of plasmolysis in epidermal peels (e.g. Rhoeo/Lily leaves or Fleshy scale leaves of onion bulb).		
Jnit IV Oct)	discuss pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; analyze factors affecting photosynthesis.	Study of distribution of stomata on the upper and lower surfaces of leaves.  Comparative study of the rates of transpiration in the upper and lower surfaces of leaves	Knowledge, Understanding,	Oral Test/ Class test/
	Respiration in Plants Students will be able to understand Exchange of gases in plants; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; discuss respiratory quotient	Separation of plant pigments through paper chromatography  Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials.	Application, Analysis and Evaluation	Quizzes / Lab activity
	Plant - Growth and Development Students will be able to explain Seed germination; phases of plant growth and plant growth rate; conditions of growth; define the terms differentiation, dedifferentiation and redifferentiation; discuss the sequence of developmental processes in a plant cell; give brief description about growth regulators - Auxin, Gibberellin, Cytokinin, Ethylene,	Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.		

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Unit V (Nov- Dec)	Breathing and Exchange of Gases Students will be able to understand the concept of Respiratory organs in animals (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; Discuss disorders related to respiration - asthma, emphysema, occupational respiratory disorders.		Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes
	Body Fluids and Circulation Students will be able to explain 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; Enlist disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.	Visit to a Physician		
	Excretory Products and their Elimination Modes of Excretion — Students will be able to define the terms ammonotelism, ureotelism, uricotelism; explain human excretory system — structure and function; urine formation, osmoregulation; regulation of kidney function - renin - 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, kidney transplant Locomotion and Movement Students will be able to understand different types of movement - ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; explain skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.	<ul> <li>Test for presence of urea in urine.</li> <li>Test for presence of sugar in urine.</li> <li>Test for presence of albumin in urine.</li> <li>Test for presence of bile salts in urine.</li> </ul>	Knowledge, Understanding, Application, Analysis and Evaluation	Oral Test/ Class test/ Quizzes / Lat activity
	Neural Control and Coordination Students will be able to understand Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; Analyze generation and conduction of nerve impulse:	<ul> <li>Human skeleton and different types of joints with the help of virtual images/ models only.</li> </ul>		
	Chemical Coordination and Integration Endocrine Glands and Hormones Students will be able to discuss human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary idea); explain the role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goitre, diabetes, Addison's disease. Note: Diseases related to all the human physiological systems to be taught in brief.			

## PRACTICAL

Sr. No.	Evaluation Scheme		Marks
1	One Major Experiment		5
2	One Minor Experiment		4
3	Slide Preparation		5
4	Spotting		7
5	Practical Record + Viva Voce	(Credit to the students' work over the academic session may be	4
6	Investigatory Project and its Project Record + Viva Voce	- given)	5
	Total	J	30

Sr. No.	Book	Publisher
1	Text Book of Biology	NCERT
2	Lab Manual	Evergreen