Bhartiya Vidya Mandir Senior Secondary School,Sec-39 ,Chandigarh Road, Ludhiana

Syllabus of Class XI

Book: NCERT **SUBJECT- BIOLOGY** **SESSION 2024-2025**

MONTH	UNIT/CHAPTER/TOPIC	Learning Objectives	Resources/Art-Integrated Pedagogy Tools Used/E-Resources		Learning Outcomes/Skills Learnt by students
APRIL	**Theme-Diversity in the Living World** **Sub themes- Living World**	To make students understand and differentiate between Living and Non living organisms To classify different Living organism on the basis of hierarchy	1.Group discussion on how these aids are helpful for biology students. 2.Classifying organisms on the basis of hierarchy 3 Questioning	https://youtu.be/G7wez-jaKJM?si=frfObsWZWIaJ_xOf	Creating interest about wild life, providing education , furnishing recreation and conservation of endangered species Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Biological Classification	Understand and describe about two, three, four,five kingdom classification. Understand and explain systematics under four heads- identification, classification Nomenclature, Taxonomy Explain and comprehend the characteristic features of different kingdom (monera, protista, fungi) with examples, their physiology and their connectivity to different kingdom	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab activity 1.To study different parts of microscope and its working 2.To observe different slides of the kingdom monera and protista and comment on it 3.To observe different specimens and slides of kingdom Fungi and comment on it 4 Spotting- To identify the given organism, classify, draw and write its significant characteristics	https://youtu.be/S99qMwfjuLk?si=tfFA-S-B3KiZnljl	The learner have learnt and understood about the structure, habitat, physiology , life cycle and economic importsnce of different organisms of Kingdom- Monera, Protista, Fungi, Plant kingdom Learners have comprehended that basis of diversity is the adaptation evolved by organisms to survive in diverse environment in the face of competition for limited resources. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

MAY	**Chapter-3: Plant Kingdom** Classification of plants into major groups; Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae	Classify and describe plant kingdom under different divisions thalophyta, brophyta, pteridophyta, gymnosperm and angiosperm.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 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.	https://youtu.be/-qEqCEDGJ2Q?si=z5Hr0T9WwBUqEJS9 https://youtu.be/l-AHhAD8JFo?si=01sDhHWHiVqG6JPC	Blue green algae (ancient phosynthetic prokaryotes)added oxygen to the atmosphere which helped the evolution of aerobic eukaryotes. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-4: Animal Kingdom Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level	Students will be able to learn, understand the concept and classify Animal kingdom under different phylum porifera, cnidaria, ctenophore, platyhelminthes, aschelminthes, annelid, mollusca, arthropoda, echinodermata, chordata.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1.To observe the different specimens of animal kingdom and comment on it 2.Spotting- To identify the given organism, classify, draw and write its significant characteristics	https://youtu.be/a7A6PgGQ-B4?si=vxHzScxGz1BIhgXr	Blue green algae (ancient phosynthetic prokaryotes)added oxygen to the atmosphere which helped the evolution of aerobic eukaryotesSkills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
JUNE	**SUMMER VACATIONS**				
	Morphology of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed. Description of family Solanaceae	Students will learn to identify these structures, understand their functions, and describe morphological characteristics and modifications. They will practice observing plant structures, drawing diagrams, writing floral formulas, and conducting dissections.	**Tools** * Questioning * Contextual teaching and learning * Brainstorming * Discussion		Explain morphological structures of plants. defines "plant morphology". expresses working area of plant morphology. explain external morphological structure and functions of root and stem Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

JULY	**Chapter-6: Anatomy of Flowering Plants** Anatomy and functions of tissue systems in dicots and monocots.	The study of plant anatomy helps us to understand the structural adaptations of plants with respect to diverse environmental conditions. It also helps us to distinguish between monocots, dicots, and gymnosperms	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 Preparation and study of T.S. of dicot and monocot roots and stems (primary). 2 Study of plasmolysis in epidermal peels (e.g. Rhoeo/lily leaves or flashy scale leaves of onion bulb). 3 Study of distribution of stomata on the upper and lower surfaces of leaves 4 Comparative study of the rates of transpiration in the upper and lower surfaces of leaves.	https://youtu.be/5nHUN7_r-sM?si=NGwXs4xEd_IvV-yB	Knowledge regarding anatomy equipped the students to identify different types of tissues and make them able to correlate their physiology in a better away. This will also help them to understand how different plant tissue evolve and modify their structure and functions with respect to their environment Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-7: Structural Organisation in Animals Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog.	students will knows about that Frog has different types of sense organs, namely organs of touch (sensory papillae), taste (taste buds), smell (nasal epithelium), vision (eyes) and hearing (tympanum with internal ears). Out of these, eyes and internal ears are well-organised structures and the rest are cellular aggregations around nerve endings	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://youtu.be/hElRGAqMf80?si=mn6g2fI-M0T65tf3	Students understand about digestive, circulatory excretory and reproductive system of frog students understand about the importance of frog to farmers Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

AUGUST	**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; cell organelles	To make them comprehend and to connect with the earlier understanding s about the cell and its organelle To make them understand about the Cell theory and its different Discoveries and inventions of Cell To make them differentiate between prokaryotic and eukaryotic; unicellular and multicellular	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 Study of osmosis by potato osmometer.	https://youtu.be/g0z3MliHuA8?si=OPPg0fP0_qO4dSzn	understanding cell structure and function learning outcomes a student is able to: – Identify the cellular components of an animal cell –Identify the cellular components of a plant cell –State the functions of the cellular components in an animal cell –State the functions of the cellular components in a plant cell – Compare and contrast an animal cell and a plant cell –Relate the density of certain organelles with the functions of specific cells. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-9: Biomolecules Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, and nucleic acids; Enzyme - types, properties, enzyme action.	**Understand about the role of amino acids, proteins and amino acids**	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://www.youtube.com/live/6F8eA0EvUjY?si=22re2lFq-JDz23Lh	Students analysed that heat destroys the activity of enzymes and not the catalyst. Students knows that change of pH inhibits the enzyme activity. Be able to describe the basic properties of enzymes . Be able to describe the components of a metabolic pathway. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

	Chapter-10: Cell Cycle and Cell Division Cell cycle, mitosis, meiosis and their significance	To make them understand about the various stages of Mitosis in cell and relate with various examples of cell division Differentiate between amitosis and mitosis To make them understand the various phases of meiotic cell division of Meiosis I & II and relate it with the gamete formation in gonads. To evaluate and analyse the importance of meiosis in maintaining the DNA consistency of cell	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 Mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.	https://youtu.be/t7OGWflYFSc?si=QROFBqB-iEntZFbF	Students will be able to identify that cuts and wound heals due to the process of cell division They will be sensitized and will be able to apply their knowledge that genetic disorder cannot be cured. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
SEPTEMBER	**TERM -1 EXAMINATION**				
	Chapter-13: Photosynthesis in Higher Plants photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.	**(1) engage in experiments that enable students to gather evidence of inputs and outputs of photosynthesis,.** **(2) understand the relationship between light and photosynthesis, and.** **(3) understand the relationship between carbon dioxide and photosynthesis.**	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials. 2 Separation of plant pigments through paper chromatography.	https://youtu.be/3_JQ2xlYS74?si=OIpeTQTBl_XtSXtI https://youtu.be/mZ0sMZBzxZs?si=rm5DAE4HkhTLu3JQ	The learners learnt about the mechanism of light and dark reaction in the process of photosynthesis They were able to synthesized the importance of light, water and CO2 for the light and dark reaction of photosynthesis along with the role of stomata The learners understood and analyzed the C3 -C4 cycles Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

OCTOBER	**Chapter-14: 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; amphibolic pathways; respiratory quotient**.**	To make the student understand the mechanism of Glycolysis and relate it with other physiological process. To make them differentiate between Fermentation/Anaerobic and Aerobic respiration	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1 Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.	https://youtu.be/aQ8yTBMXxkg?si=uLQ9BOrjxfuxfdZc	Be able to identify key intermediates and the location of the key processes in cellular respiration. 3. Be able to explain the chemiosmotic mechanism of ATP synthesis. 4. Explain how glucose, fats, and proteins enter pathways for energy release. 5. Be able to describe and identify the structures of the mitochondrion. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-15: Plant - Growth and Development 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; plant growth regulators	To make them comprehend the above concept and relate it with Differentiation, Dedifferentiation and Re-differentiation To make them analzse growth and development with different growth regulators and its importance in day to day life.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://youtu.be/VBU_O4JEjnU?si=ZYt1i4JQWZqSR7D0	Recognize the developmental steps of a eudicot embryo and compare the function of its cotyledons to that of a cotyledon in monocots. Identify different types of fruits. Label seed structure and describe germination and dispersal.Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

November	**Chapter-17: Breathing and Exchange of Gases** 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	Understand that The exchange of gases occurs in the alveoli of the lungs, where oxygen diffuses into the bloodstream while carbon dioxide passes from the bloodstream into the alveoli to be exhaled. This process ensures the supply of oxygen for cellular respiration and the removal of waste carbon dioxide from the body**.**	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://www.youtube.com/live/0xwh6ajPVL0?si=LLVvmE4Rf_RScBkH	The learners learnt about the mechanism of respiration and different parts responsible for the respiratory system Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter 18 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	Students will be able to trace the flow of blood throughout the body. Students will be able to identify where blood enters and leaves the heart and where it becomes oxygenated. Students will also be able to label the chambers of the heart and trace the flow of blood through it	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://youtu.be/gJtUCuPfwAQ?si=StXJ5Vk3avXIgETs	Students will be able to identify where blood enters and leaves the heart and where it becomes oxygenated. Students will also be able to label the chambers of the heart and trace the flow of blood through it. Students will understand the function of valves Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-19: 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, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion	• Students should be able to:. • Define excretion, distinguishing it from egestion during the lesson. •Identify the excretory products released through the skin and lungs. • Identify the main parts of the urinary system of humans.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1Test for presence of urea in urine. 2. Test for presence of sugar in urine. 3. Test for presence of albumin in urine. 4 Test for presence of bile salts in urine.	https://youtu.be/1hxk3At9v5I?si=ZRbEvxDBJkbhgYAH	Outline the structures and functions of the urinary system. Explain how the kidneys filter blood and produce urine. Describe how the kidneys help maintain homeostasis. Identify kidney diseases and how they are treated .Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

December	**Chapter-20: Locomotion and Movement** 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	To understand different types of bones associated with various movement To make them aware of the mechanism of muscle contraction Skeletal System To explore the working of various joints	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion Lab Activity 1Human skeleton and different types of joints with the help of virtual images/models only.	https://youtu.be/gxnrssv7TUM?si=_X8OfCjefy-gcnNV	Identify and describe the functions of the skeletal system. Distinguish between long bones, short bones, flat bones, and irregular bones and provide an example of each. Identify the parts of a typical long bone. . Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	Chapter-21: Neural Control and Coordination Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse	To familiarize with different parts of Neural System To study different parts of brain and their function. To explore about Reflex Action and Arc and analyze critically its involvement with day to day life. To illustrate conduction of nerve impulse with diagram.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://youtu.be/j_Ws30aGFTw?si=VSMaX-BP7BWswYHI	Describe the general structure of a neuron. Explain how differences in structure and function are used to classify neurons. Explain how information passes from one neuron to another. Explain how a membrane becomes polarized. Describe the events that lead to the generation of an action potential. Compare nerve impulse conduction in myelinated and unmyelinated neurons. Identify the changes in membrane potential associated with excitatory and inhibitory neurotransmitters. Describe the function of each part of a reflex arc, and name two reflex examples. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion

JANUARY	**Chapter-22: Chemical Coordination and Integration** 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 goitre, diabetes, Addison's disease.	Appreciate the importance of different Endocrine glands and the hormones they secrete. To apply the learning to determine the effect of hypo and hyper secretion of hormones from different glands.	Tools * Questioning * Contextual teaching and learning * Brainstorming * Discussion	https://youtu.be/8LcDxktJtNo?si=-hw7qyLaSFu0eLD6	Identify and describe the effects of the hormones that are released by the anterior pituitary gland. Know what stimulates their production and where they are produced. Understand how the regulation of GH, PRL, and MSH differs from that of TSH, ACTH, LH, and FSH. Skills: * Scientific attitude and temper *Observation * Experimentation * Analysis * Conclusion
	PRE ANNUAL EXAMINATION				
	ANNUAL EXAMINATION				