LORD MAHAVIRA SCHOOL

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LESSON PLAN

Class- XI

SUBJECT-BIOLOGY (Code No. 044)

(BOOK- NCERT TEXTBOOK / EXEMPLAR / REFERENCE BOOK)

S.NO	MONTH	UNIT/ TITLE	CHAPTERS-TOPIC/SUB-TOPICS	ACTIVITY/ PROJECT/ EXPERIMENTS
	JULY	Unit-I of Diversity Living Organisms Unit-II Structural Organization in Plants and Animals	Chapter-1: The Living World Biodiversity; Need for classification; three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature Chapter-2: Biological Classification Five kingdom classification; Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and Viroids. Chapter-3: Plant Kingdom Classification of plants into major groups; Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnospermae (Topics excluded – Angiosperms, Plant Life Cycle and Alternation of Generations) Chapter-4: Animal Kingdom 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.) 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	EXPERIMENTS □ Parts of a compound microscope. EXPERIMENTS □ Preparation and study of T.S. of dicot and monocot roots and stems (primary) □ 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. EXPERIMENTS □ Virtual specimens/slides/models and identifying features of - Amoeba, Hydra, liver fluke, Ascaris, leech, earthworm, prawn, silkworm, honey bee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit. □ Different types of inflorescence (cymose and racemose).

6	AUGUST		Chapter-6: Anatomy of Flowering Plants Anatomy	EXPERIMENTS □ Study and describe locally available common
		Cell: and Unit-III Structure Function	and functions of tissue systems in dicots and monocots. Chapter-7: Structural Organisation in Animals Morphology, Anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of frog 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 - structure and function; endomembrane system, endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, micro bodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus. 3 Chapter-9: Biomolecules Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, and nucleic acids; Enzyme - types, properties, enzyme action. (Topics excluded: Nature of Bond Linking Monomers in a Polymer, Dynamic State of Body Constituents – Concept of Metabolism, Metabolic Basis of Living, The Living State) Chapter-10: Cell Cycle and Cell Division Cell cycle, mitosis, meiosis and their significance	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). EXPERIMENTS □ Study of distribution of stomata on the upper and lower surfaces of leaves. EXPERIMENTS □ Study of osmosis by potato osmometer □ Study of plasmolysis in epidermal peels (e.g. Rhoeo/lily leaves or flashy scale leaves of onion bulb).. EXPERIMENTS □ Mitosis in onion root tip cells and animals cells (grasshopper) from permanent slides.
7	SEPTEMBER		**REVISION AND TERM 1 EXAMS**	
8	OCTOBER	Unit-IV Plant Physiology	Chapter-13: Photosynthesis in Higher Plants Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and	EXPERIMENTS □ Comparative study of the rates of transpiration in the upper and lower surfaces of leaves. □ Separation of plant pigments through paper chromatography.

			non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis. 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. □ 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 - auxin, gibberellin, cytokinin, ethylene, ABA.	□ Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
9	NOVEMBER	Unit-V Human Physiology	□ 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, respiratory volume; disorders related to respiration - asthma, emphysema, occupational respiratory disorders. □ 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; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure.	EXPERIMENTS □ Test for the presence of sugar, starch, proteins and fats in suitable plant and animal materials

10	DECEMBER		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; disorders - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant. 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 systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout. 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	. Test for presence of urea in urine. 11. Test for presence of sugar in urine. Human skeleton and different types of joints with the help of virtual images/models only. . Test for presence of albumin in urine. Test for presence of bile salts in urine.
11	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 goiter, diabetes, Addison's disease. Note: Diseases related to all the human physiological systems to be taught in brief	
12	FEBRUARY		REVISION FOR EXAMS	
13	MARCH		**TERM 2 EXAM**	

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LESSON PLAN

Class- XII

SUBJECT-BIOLOGY (044)

(BOOK- NCERT TEXTBOOK / EXEMPLAR / REFERENCE BOOK)

S.NO	MONTH	UNIT/ TITLE	CHAPTERS-TOPIC/SUB-TOPICS	ACTIVITY/ PROJECT/ EXPERIMENTS
1	APRIL	Unit-VI Reproduction	Chapter-2: Sexual Reproduction in Flowering Plants Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; out breeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation. Chapter-3: Human Reproduction Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis spermatogenesis and oogenesis; menstrual cycle; fertilization, embryo development up to blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea). Chapter-4: Reproductive Health Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).	ACTIVITY-1 • Controlled pollination - emasculation, tagging and bagging. ACTIVITY-2 • Flowers adapted to pollination by different agencies (wind, insects, birds). ACTIVITY-3 • T.S. of blastula through permanent slides (Mammalian).

3	MAY	Unit-VIII Biology and Human Welfare	Chapter-8: Human Health and Diseases • Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; • Basic concepts of immunology - vaccines; cancer, HIV and AIDS; • Adolescence - drug and alcohol abuse. Chapter-10: Microbes in Human Welfare Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use	ACTIVITY-4 • Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images or specimens. Comment on symptoms of diseases that they cause. ACTIVITY-5 • Pollen germination on stigma through a permanent slide or scanning electron micrograph • Investigatory Project .
4	JUNE		SUMMER VACTION	
5	JULY	Unit-VII Genetics and Evolution	Chapter-5: Principles of Inheritance and Variation Heredity and variation: Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in humans, birds and honey bee; linkage and crossing over; sex linked inheritance - hemophilia, colour blindness; Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes. Chapter-6: Molecular Basis of Inheritance Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central Dogma; transcription, genetic code, translation; gene 8 expression and regulation - lac operon; Genome, Human and rice genome projects; DNA fingerprinting.	ACTIVITY-5 • Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness ACTIVITY-6 • Mendelian inheritance using seeds of different colour/sizes of any plant. ACTIVITY-7 • Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc
6	AUGUST		Chapter-7: Evolution Origin of life; • biological evolution and evidences for biological	ACTIVITY-8 • Meiosis in onion bud cell or grasshopper testis through permanent slides.

			evolution (paleontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution - variation (mutation and recombination) and natural selection with examples, types of natural selection; □ Gene flow and genetic drift; Hardy - Weinberg's principle; adaptive radiation; human evolution.	ACTIVITY-9 □ Prepare a temporary mount of onion root tip to study mitosis ACTIVITY-10 □ Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
7	SEPTEMBER		REVISION AND MIDTERM EXAMS	
8	OCTOBER	Unit-IX Biotechnology and its Applications	Chapter-11: Biotechnology - Principles and Processes □ Genetic Engineering (Recombinant DNA Technology). □ Chapter-12: Biotechnology and its Applications Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, □ gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, bio piracy and patents.	ACTIVITY-11 □ Pollen germination on stigma through a permanent slide or scanning electron micrograph.
9	NOVEMBER	Unit-X Ecology and Environment	Chapter-13: Organisms and Populations □ Population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution. (Topics excluded: Organism and its Environment, Major Aboitic Factors, Responses to Abioitic Factors, Adaptations) Chapter-14: Ecosystem Ecosystems: □ Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy (Topics excluded: Ecological Succession and Nutrient Cycles).	ACTIVITY-12 □ Study the plant population frequency by quadrat method ACTIVITY-13 □ Study the plant population density by quadrat method.

10	DECEMBER		Chapter-15: Biodiversity and its Conservation □ Biodiversity-Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramasar sites.	
11	JANUARY		PRE-BOARD EXAMS ,REVISION	
12	FEBRUARY		REVISION, PRACTICALS ETC.	