

HKE Society's
A.V.Patil Degree college of Arts, Science & Commerce, Aland.

Department of Zoology

LESSON PLAN 2021-22

Semester : IstSem (NEP)

Course Zoology: Cell Biology & Cytogenetics

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
November	Chapter 1. Structure and Function of Cell Organelles I in Animal cell	2	Lect. method
November	Chapter 2 Plasma membrane: chemical structure-lipids and proteins	2	Group discussion
November	Chapter 3 Endomembrane system: protein targeting and sorting, transport, endocytosis and exocytosis	3	seminar
November	Chapter 2. Structure and Function of Cell Organelles II in Animal Cell	2	Practical method
November	Cytoskeleton: microtubules, microfilaments, intermediate filaments	2	Practical method
November	Mitochondria: Structure, oxidative phosphorylation; electron transport system	2	Practical method
November	Peroxisome and Ribosome: structure and function	2	Group discussion
November	Unit II Chapter 3. Nucleus and Chromatin Structure Structure and function of nucleus in eukaryotes	2	seminar
December	Chemical structure and base composition of DNA and RNA	1	ICT
December	DNA supercoiling, chromatin organization, structure of chromosomes	2	Group discussion
December	Types of DNA and RNA	3	ICT
December	Chapter 4. Cell cycle, Cell Division and Cell Signaling Cell division: mitosis and meiosis	3	ICT
December	Introduction to Cell cycle and its regulation, apoptosis	2	Lect. method
December	Signal transduction: intracellular 11 signaling and cell surface receptors, via G-protein linked receptors	2	
December	Cell-cell interaction: cell adhesion molecules, cellular junctions	3	Group discussion
January	Unit III Chapter 5. Mendelism and Sex Determination Basic principles of heredity: Mendel's laws- monohybrid cross	2	Practical method
January	hybrid cross Complete and Incomplete Dominance Penetrance and expressivity	2	Practical method
January	Genetic Sex-Determining Systems, Environmental Sex Determination,	2	Lect. method
January	Sex Determination and mechanism in <i>Drosophilamelanogaster</i> .	2	Lect. method
January	Sex-linked characteristics in humans and dosage compensation	2	Lect. method

February	Unit IV Chapter 6. Extensions of Mendelism, Genes and Environment Extensions of Mendelism: Multiple Alleles, Gene Interaction	2	Lect. method
February	The Interaction Between Sex and Heredity: Sex-Influenced and Sex-Limited Characteristics	1	Lect. method
February	Cytoplasmic Inheritance, Genetic Maternal Effects.	1	Lect. method
February	Interaction between Genes and Environment: Environmental Effects on Gene Expression, Inheritance of Continuous Characteristics.	2	Lect. method
February	Chapter 8. Infectious Diseases Introduction to pathogenic organisms: viruses, bacteria, fungi, protozoa and worms	2	Lect. method
February	Structure, life cycle, pathogenicity, including diseases, causes, symptoms and control of common parasites	3	Lect. method
February	<i>Trypanosoma, Giardia and Wuchereria.</i>	2	Lect. method

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Department of Zoology
LESSON PLAN 2021-22

Semester : IIIrd Sem(NONCBCS)

Course: **PHYSIOLOGY AND BIOCHEMISTRY**


<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
June	Unit 1: Nerve and muscle Structure of a neuron, Resting membrane potential, Graded potential,	2	Lect. method
June	Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres,	2	Group discussion
June	Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	3	seminar
July	Unit 2: Digestion Physiology of digestion in the alimentary canal;	2	Practical method
July	Absorption of carbohydrates, proteins, lipids	2	Practical method
July	Unit 3: Respiration Pulmonary ventilation, Respiratory volumes and capacities	2	Practical method
July	Transport of Oxygen and carbon dioxide in blood	2	Group discussion
August	Unit 4: Excretion Structure of Nephron, Mechanism of Urine formation	2	seminar
August	Counter-current Mechanism	1	ICT
August	Unit 5: Cardiovascular system Composition of blood, Hemostasis,	2	Group discussion
August	Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	3	ICT
September	Unit 6: Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis	3	ICT
September	Physiology of female reproduction:	2	Lect. method
September	Hormonal control of menstrual cycle	2	Lect. method
September	Structure and function of Pituitary, Thyroid, Parathyroid, Pancreas and Adrenal	3	Group discussion
September	Unit 7: Carbohydrate Metabolism Glycolysis, Krebs Cycle	2	Practical method
October	Pentose phosphate pathway, Gluconeogenesis,	2	Practical method
October	Glycogen metabolism, Review of electron transport chain	2	Lect. method

October	Unit 8: Lipid Metabolism Biosynthesis and B- oxidation of palmitic acid	2	Lect. method
October	Unit 9: Protein metabolism Transamination, Deamination and Urea Cycle	2	Lect. method
October	Unit 10: Enzymes Introduction, Mechanism of action,	2	Lect. method
October	Enzyme Kinetics	1	Lect. method
October	Inhibition and Regulation	1	Lect. method


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Department of Zoology
LESSON PLAN 2021-22

Semester : Vth Sem

Course: **CELL AND MOLECULAR BIOLOGY**

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
June	UNIT-I Cell theory; Differences of Prokaryotic and Eukaryotic cells	2	Lect. method
June	Ultrastructure of animal cell; Structure and functions of plasma membrane proteins.	2	Group discussion
June	Structure and functions of cell organelles - Endoplasmic reticulum, Golgi body, Ribosomes, Lysosomes	2	seminar
June	centrosomes, Mitochondria and Nucleus		Practical method
July	Chromosomes - Structure, types, giant chromosomes	2	Practical method
July	Cell Division - Mitosis, Meiosis; Cell cycle and its regulation.	3	Practical method
July	UNIT - II DNA (Deoxyribo Nucleic Acid) - Structure; DNA Replication.	2	Group discussion
August	RNA (Ribo Nucleic Acid) - Structure, types		seminar
August	Protein Synthesis - Transcription and Translation.		ICT
August	Gene Expression - Genetic Code; Operon concept	2	Group discussion
September	Molecular Biology Techniques - Polymerase Chain Reaction, Electrophoresis	2	ICT
September	UNIT-III Mendel's laws of Inheritance and Non-Medelian Inheritance; Linkage and Crossing over	3	ICT
September	Sex determination and sex-linked inheritance	2	Lect. method
October	Chromosomal Mutations- Deletion, Duplication, Inversion, Translocation, Aneuploidy and Polyploidy.	2	Lect. method
October	Inborn errors of metabolism; One gene one enzyme, one gene one polypeptide theory	2	Group discussion
October	Gene mutations- Induced versus Spontaneous mutations	2	Practical method

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Department of Botany
LESSON PLAN 2021-22

Semester : Vth Sem


Course: SEC: IMMUNOLOGY

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
September	Unit 1: Overview of the Immune System Introduction to basic concepts in immunology, components of immune system,	2	Lect. method
September	principles of innate and adaptive immune system	2	Group discussion
September	Unit 2: Cells and Organs of the Immune System Haematopoiesis	2	seminar
September	Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	2	Practical method
September	Unit 3: Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	2	Practical method
September	Unit 4: Antibodies Structure, classes and function of antibodies, monoclonal antibodies,	3	Practical method
October	antigen antibody interactions as tools for research and diagnosis.	2	Group discussion
October	Unit 5: Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing	3	seminar
October	Basic properties and functions of cytokines, Complement system: Components and pathways.	2	ICT
October	Unit 6: Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities	2	Group discussion
October	Introduction to concepts of autoimmunity and immunodeficiency	2	ICT
October	Unit 7: Vaccines General introduction to vaccines, Various types of vaccines	2	ICT


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LESSON PLAN 2021-22

Semester : IInd Sem (NEP)

Course: Biochemistry and Physiology

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
March	Unit I Biochemistry and Physiology Structure and Biological importance of carbohydrates (Monosaccharides	2	Lect. method
March	Disaccharides, Polysaccharides and Glycoconjugates).	2	Group discussion
March	Lipids (saturated and unsaturated Fatty acids, Tri-acylglycerols, Phospho lipids, Glycolipids and Steroids)	3	seminar
March	Structure, Classification and General Properties of α -amino acids; Essential and non-essential amino acids,	2	Practical method
March	Levels of organization in proteins; Simple and conjugate proteins.	2	Practical method
March	Chapter 2. Enzyme Action and Regulation Nomenclature and classification of enzymes; Cofactors; Specificity of enzyme action.	2	Practical method
March	Isozymes; Mechanism of enzyme action	2	Group discussion
March	Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions	2	seminar
	Equation of Michaela's -Mendon, Concept of K_m and V_{max} , Enzyme inhibition	1	ICT
April	Allosteric enzymes and their kinetics; Regulation of enzyme action	2	Group discussion
April	Unit 2 Chapter 3. Metabolism of Carbohydrates and Lipids Metabolism of Carbohydrates: glycolysis, citricacid cycle, gluconeogenesis	3	ICT
April	phosphate pentose pathway Glycogenolysis and Glycogenesis Lipids- Biosynthesis of palmiticacid; Ketogenesis,	3	ICT
April	B-oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbonatoms	2	Lect. method
April	Chapter 4. Metabolism of Proteins and Nucleotides Catabolism of amino acids: Transamination, Deamination, Ureacycle	2	Lect. method
April	Nucleotides and vitamins Peptide linkages	3	Group discussion
April	Unit 3 Chapter 5. Digestion and Respiration in humans Structural organization and functions of gastrointestinal tract and associated glands.	2	Practical method

	Mechanical and chemical digestion of food; Absorptions of carbohydrates,		
May	lipids, proteins, water, minerals and vitamins; Physiology of trachea and Lung.	2	Practical method
May	Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities;	2	Lect. method
May	Transport of oxygen and carbon dioxide in blood, Respiratory pigments,	2	Lect. method
May	Dissociation curves and the factors influencing it; Control of respiration.	2	Lect. method
June	Chapter 6. Circulation and Excretion in humans Components of blood and their functions; hemopoiesis	2	Lect. method
June	Blood clotting: Blood clotting system, Blood groups: Rh-factor, ABO & MN Structure of mammalian heart	1	Lect. method
June	Cardiac cycle; Cardiac output and its regulation, Electrocardiogram, Blood pressure and its regulation	1	Lect. method
June	Structure of kidney and its functional unit; Mechanism of urine formation	2	Lect. method
June	Unit IV Chapter 7. Nervous System and Endocrinology in humans Structure of neuron, resting membrane potential (RMP)	2	Lect. method
June	Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers.	3	Lect. method
July	Types of synapse Endocrine glands - pineal, pituitary, thyroid, parathyroid, pancreas and adrenal; hormones secreted by them.	2	Lect. method
July	Classification of hormones; Mechanism of Hormone action.	2	Lect. method
July	Chapter 8. Muscular System in humans Histology of different types of muscle; Ultra structure of skeletal muscle;	2	Lect. method
July	Molecular and chemical basis of muscle contraction;	2	Lect. method
July	Characteristics of muscle twitch; Motor unit, summation and tetanus	2	Lect. method


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Department of Zoology

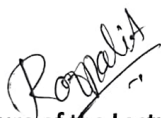
LESSON PLAN 2021-22

Semester : IV Sem (CBCS)

Course: GENETICS AND EVOLUTION:

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
December	Unit 1: Introduction to Genetics Mendel's work on transmission of traits, Genetic Variation	2	Lect. method
December	Molecular basis of Genetic Information		Group discussion
December	Unit 2: Mendelian Genetics and its Extension Principles of Inheritance, Chromosome theory of inheritance,	3	seminar
January	Incomplete dominance and codominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy,	2	Practical method
January	Sex linked inheritance, Extra-chromosomal inheritance.	2	Practical method
January	Unit 3: Linkage, Crossing Over and Chromosomal Mapping Linkage and crossing over,	2	Practical method
February	Recombination frequency as a measure of linkage intensity, two factor and three factor crosses,	3	Group discussion
February	Interference and coincidence, Somatic cell genetics. an alternative approach to gene mapping	2	seminar
February	Unit 4: Mutations Chromosomal Mutations: Deletion, Duplication, Inversion, Translocation	2	ICT
February	Aneuploidy and Polyploidy; Gene mutations:	1	Group discussion
February	Induced versus Spontaneous mutations, Back versus Suppressor mutations		ICT
February	Unit 5: Sex Determination Chromosomal mechanisms, dosage compensation	3	ICT
March	Unit 6: History of Life 2 Major Events in History of Life	1	Lect. method
March	Unit 7: Introduction to Evolutionary Theories Lamarckism, Darwinism, Neo-Darwinism	2	Lect. method
March	Unit 8: Direct Evidences of Evolution Types of fossils, Incompleteness of fossil record,	3	Group discussion
March	Dating of fossils. Phylogeny of Horse	1	Practical method
April	Unit 9: Processes of Evolutionary Change Organic variations; Isolating Mechanisms;	3	Practical method
April	Natural selection (Example: Industrial melanism		Lect. method
April	Types of natural selection (Directional, Stabilizing, Disruptive), Artificial selection	2	Lect. method

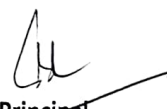
April	Unit 10: Species Concept Biological species concept (Advantages and Limitations);	2	Lect. method
April	Modes of speciation (Allopatric, Sympatric)	2	Lect. method
April	Unit 11: Macro-evolution Macro-evolutionary Principles (example: Darwin's Finches)	3	Lect. method
April	Unit 12: Extinction Mass extinction (Causes, Names of five major extinctions,	2	Lect. method
April	K-T extinction in detail), Role of extinction in evolution	2	Lect. method



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LESSON PLAN 2021-22

Semester : VIth Sem(NONCBCS)

Course: ECOLOGY, WILDLIFE BIOLOGY

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
December	Unit - I: Ecology Ecosystem structure and functions. Types of Ecosystems -Aquatic and Terrestrial	2	Lect. method
December	Biogeochemical cycles - Nitrogen, Carbon, Phosphorus and Water.	2	Group discussion
December	Energy flow in ecosystem; Food chain, food web and ecological pyramids.	2	seminar
December	Animal Associations - Mutualism, commensalism, parasitism, competition, predation	2	Practical method
January	Concept of Species, Population dynamics and Growth curves.	2	Practical method
January	Community Structure and dynamics; Ecological Succession. Ecological Adaptations.	3	Practical method
January	Environmental Pollution - Sources, Effect and Control measures of Air, Water, Soil and Noise pollution	2	Group discussion
January	Zoogeographical regions of the world, their Climatic and faunal peculiarities. Wallace line.	3	seminar
January	Continuous & Discontinuous distribution. Continental Drift.	2	ICT
February	Unit-II Wildlife Biology Distribution of Wildlife in India: the Himalayan ranges, The Peninsular Indian sub region,	2	Group discussion
February	Deccan Plateau, The Western Ghats, Eastern hill chain - Aravali ranges, The Indian desert	2	ICT
February	rain forests, wildlife in Andaman and Nicobar Islands.	3	ICT
February	Wildlife Problems: Hunting, over harvesting, habitat destruction due to overpopulation, degradation,	2	Lect. method
March	habitat shrinkage, and possibilities of climatic changes, transgenic changes.	2	Lect. method
March	Wildlife Conservation : Need for wildlife conservation -	2	Group discussion
March	Agencies engaged in wildlife conservation. Government organization and	2	Practical method
March	non-government organizations (NGOs). Wildlife (Protection) Act 1972.	2	Practical method
March	CITES (Convention on International Trade in endangered species of wildlife flora and fauna - endangered).	2	Lect. method
March	Fauna and flora of India. Red data book. Ramsar convention	2	Lect. method

April	CBD (Convention on Biological Diversity). Project Tiger	2	Lect. method
April	Unit-III Animal Behaviour Types of Behaviour- Innate (Inborn) and Acquired (learned) Innate: Taxes, Kineses,	2	Lect. method
April	Instinctive and Motivated behavior. Aquired: Habituation	3	Lect. method
April	Imprinting, trial and error & Conditioned reflexes	2	Lect. method
April	Social behavior, Communication, Pheromones	2	Lect. method
April	Breaf account on Courtship, Nesting, Migration and Parental care in Birds. Mimicry: Definition & types.	2	Lect. method
April	Chronobiology: Biological clock, Biological rhythms (Circadian & Cicannual rhythms	2	Lect. method

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Department of Zoology

LESSON PLAN 2021-22

Semester : VIth Sem (CBCS)

Course: SEC: SERICULTURE

<u>Month</u>	<u>Teaching learning plan</u>	<u>Lecture hour</u>	<u>Teaching method</u>
March	Unit 1: Introduction Sericulture: Definition, history and present status	2	Lect. method
March	Silk route. Types of silkworms	2	Group discussion
March	Unit 2: Biology of Silkworm Life cycle of Bombyx mori, Structure of silk gland and secretion of silk	3	seminar
March	Unit 3: Rearing of Silkworms Selection of mulberry variety and establishment of mulberry garden, Rearing house and rearing appliances,	2	Practical method
April	Disinfectants: Formalin, bleaching powder, RKO, Silkworm rearing technology	2	Practical method
April	Early age and Late age rearing, Types of moults, Spinning, harvesting and storage of cocoons	2	Practical method
April	Unit 4: Pests and Diseases Pests of silkworm: Uzi fly, dermestid beetles and vertebrates.	2	Group discussion
April	Pathogenesis of silkworm diseases: Protozoan, viral, fungal and bacterial. Control and prevention of pests and diseases	2	seminar
April	Unit 5: Entrepreneurship in Sericulture Prospectus of Sericulture in India: Sericulture industry in different states	2	ICT
April	employment potential in mulberry and non-mulberry sericulture. Visit to various sericulture unit.	3	Group discussion


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