

Academic Calendar

Department of Zoology, RBCCW

July, 2019 - June, 2020

- A. WBSU-CBCS Syllabus for both Odd and Even Semesters
 B. WBSU BSc. 3-Year Syllabus Under (1+1+1) System- Part-III

Semester/ Year	WBSU-CBCS Syllabus for Odd Semesters Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-I HONOURS	Non-Chordates I Paper Code: ZOOACOR01T	30		
	Unit 1: Protista, Parazoa and Metazoa General characteristics and Classification up to classes, Study of <i>Paramoecium</i> Life cycle and pathogenicity of <i>Entamoeba histolytica</i> and <i>Plasmodium vivax</i>	6	Nirmal Das	June'20-July'20 July'20-July'20
	Unit 2: Porifera General characteristics and Classification up to classes Canal system and spicules in sponges	5	Nirmal Das	August'20
	Unit 3: Cnidaria General characteristics and Classification up to classes Polymorphism in Cnidaria Corals and coral reefs: types, formation, distribution, conservation significance	6	Nirmal Das	August'20- October'20
	Unit 4: Ctenophora General characteristics	2	Nirmal Das	July'20-August'20
	Unit 5: Platyhelminthes General characteristics and Classification up to classes, Life cycle and pathogenicity of <i>Fasciola hepatica</i> and <i>Taenia solium</i>	6	Lipan Paul	August'20- September'20-
	Unit 6: Nematelminthes General characteristics and Classification up to classes, Life cycle, and pathogenicity of <i>Ascaris lumbricoides</i> , Parasitic adaptations in helminths	5	Lipan Paul	June'20-June'20 June'20-July'20
	Non-Chordates I Lab Paper Code: ZOOACOR01P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of November
	ECOLOGY PAPER CODE: ZOOACOR02T	30		August'20
	Unit 1: Introduction to Ecology History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.	6	Nandini Pal	August'20- October'20
	Unit 2: Population life tables, survivorship curves, exponential and logistic growth, r and K strategies Population regulation - density-dependent and independent factors	10	Lipan Paul	July'20-August'20 September'20-
	Unit 3: Community Community characteristics: species diversity, abundance, dominance, richness, Ecotone, Ecological succession and example of it.	5	Lipan Paul	September'20
	Unit 4: Ecosystem Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies	6	Nandini Pal	June'20- June'20

	Unit 5: Applied Ecology Wildlife Conservation (in-situ and ex-situ conservation). Wild life protection act (1972)	3	Nandini Pal	August'20
	ECOLOGY LAB PAPER CODE: ZOOACOR02P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
SEM-I GENERAL	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01T	30		
	Unit-1 Kingdom Protista General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980)	2	Lipan Paul	June'20
	Unit-2 Phylum Porifera General character and classification up to classes; Canal System in Sycon	2	Lipan Paul	June'20-July'20
	Unit-3 Phylum Cnidaria General characters and classification up to classes	1	Lipan Paul	July'20-July'20
	Unit-4 Phylum Platyhelminthes General characters and classification up to classes; Life history of Taenia solium	3	Lipan Paul	August'20
	Unit-5 Phylum Nematoda General characters and classification up to classes; Life history of Ascaris lumbricoides	3	Nandini Pal	June'20-July'20
	Unit-6 Phylum Annelida General characters and classification up to classes	1	Nandini Pal	August'20-
	Unit-6 Phylum Annelida General characters and classification up to classes;	1	Nandini Pal	September'20
	Unit 7 Phylum Arthropoda General characters and classification up to classes Metamorphosis in Insects	2	Nandini Pal	October'20
	Unit-8 Phylum Mollusca General characters and classification up to classes; Respiration in Pila	2	Dr. Paromita Bhattacharjee	November'20
	Unit-9 Phylum Echinodermata General characters and classification up to classes; Water-vascular system in Asterias	2	Dr. Paromita Bhattacharjee	June'20-July'20
	Unit-10 Protochordates General features	1	Lipan Paul	July'20-July'20
	Unit-11 Agnatha General features and classification up to classes (Young, 1981)	1	Nandini Pal	August'20
	Unit-12 Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	2	Lipan Paul	August'20-
	Unit-13 Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	2	Dr. Paromita Bhattacharjee	September'20
	Unit-14 Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non- poisonous snakes	2	Dr. Paromita Bhattacharjee	November'20
	Unit-15 Aves General features and Classification up to orders (Young, 1981); Flight adaptations in birds	2	Nandini Pal	June'20-July'20
	Unit-16 Mammals Classification up to Subclasses (Young, 1981)	1	Dr. Paromita Bhattacharjee	July'20-July'20

	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01P	30	Dr. Paromita Bhattacharjee Nandini Pal	Acc. To Revised Syllabus 90% completed by end of November
SEM-III HONOURS	CHORDATES PAPER CODE: ZOOACOR05T	60		
	Unit 1: Introduction to Chordates General characteristics and outline classification of Phylum Chordata	4	Nirmal Das	June'20-July'20
	Unit 2: Protochordata General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia Chordate Features and Feeding in Branchiostoma	8	Nandini Pal	July'20-July'20
	Unit 3: Origin of Chordata Dipleurula concept and the Echinoderm theory of origin of chordates Advanced features of vertebrates over Protochordata	5	Nandini Pal	August'20
	Unit 4: Agnatha General characteristics and classification of cyclostomes up to order	2	Nandini Pal	August'20-
	Unit 5: Pisces General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses Accessory respiratory organ, Advanced features of vertebrates over Protochordata, migration and parental care in fishes Swim bladder in fishes. Classification up to Sub- Classes	10	Nandini Pal	September November
	Unit 6: Amphibia General characteristics and classification up to living Orders Metamorphosis with parental care	5	Nirmal Das	June'20-July'20
	Unit 7: Reptilia General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	7	Nirmal Das	July'20-July'20
	Unit 8: Aves General characteristics and classification up to Sub-Classes, Exoskeleton and migration in Birds, Principles and aerodynamics of flight	7	Nirmal Das	August'20
	Unit 9: Mammals General characters and classification up to living orders, Phylogenetic significance of Prototheria Exoskeleton derivatives of mammals Adaptive radiation in mammals with reference to locomotory appendages Echolocation in Microchiropteransand Cetaceans	10	Nirmal Das	September'20 November'20
	Unit 10: Zoogeography Zoogeographical realms,-Plate tectonic and Continental drift theory, Distribution of birds and mammals in different realms	2	Nirmal Das	November'20
	CHORDATES LAB PAPER CODE: ZOOACOR05P	60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
PHYSIOLOGY PAPER CODE: ZOOACOR06T	60			

Unit 1: Tissues Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues	10	Nandini Pal	June'20-July'20
Unit 2: Bone and Cartilage Structure and types of bones and cartilages, Ossification	5	Nandini Pal	July'20-July'20
Unit 3: Nervous System Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and Neuromuscular junction, Reflex action and its types	15	Nirmal Das	September'20 November'20
Unit 4: Muscular system Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction, Characteristics of muscle fiber	10	Nirmal Das	June'20-July'20
Unit 5: Reproductive System Histology of testis and ovary; Physiology of Reproduction	5	Nirmal Das	August'20
Unit 6: Endocrine System Histology and function of pituitary, thyroid, Pancreas, and adrenal. Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non-steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system; Placental hormones	15	Nirmal Das	June'20-July'20
PHYSIOLOGY LAB PAPER CODE: ZOOACOR06P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of November
BIOCHEMISTRY PAPER CODE: ZOOACOR07T	60		
Unit 1: Fundamentals of biochemical reactions and metabolism Ionization of water, weak acids and bases, buffering and pH changes in living systems, Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways Shuttle systems and membrane transporters, ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms	10	Dr. Manika Biswas	September'20 November'20
Unit 2: Carbohydrates Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosaccharides, Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis	10	Dr. Manika Biswas	August'20
Unit 3: Lipids Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpenoids. Lipid metabolism: β -oxidation of fatty acids; Fatty acid biosynthesis	4	Dr. Manika Biswas	August'20 September'20

	Unit 4: Proteins Amino acids Structure, Classification, General and Electro chemical properties of α -amino acids; Physiological importance of essential and non-essential amino acids Proteins Bonds stabilizing protein structure; Levels of organization, Protein metabolism: Transamination, Deamination, Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids	14	Dr. Manika Biswas	June'20- July'20
	Unit 5: Nucleic Acids Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Types of DNA and RNA, Complementarity of DNA, Hypo- Hyperchromaticity of DNA Outlines of nucleotide metabolism	4	Dr. Manika Biswas	September'20 November'20
	Unit 6: Enzymes Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes, Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver- Burk plot; Factors affecting rate of enzyme-catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their kinetics; Strategy of enzyme action- Catalytic and Regulatory (Basic concept with one example each)	12	Dr. Manika Biswas	August'20 September'20
	Unit 7: Oxidative Phosphorylation Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System	6	Dr. Manika Biswas	September'20 November'20
	BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of November
SEM-III GENERAL	INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T	60		
	Unit-1 Introduction to Insects General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit	4	Nandini Pal	June'20-July'20
	Unit-2 Concept of Vectors Brief introduction to Vectors (mechanical and biological), Reservoirs, Host-vector relationship, Adaptations as vectors, Host specificity	6	Nandini Pal	June'20-July'20
	Unit-3 Insects as Vectors Detailed features of insect orders as vectors – Diptera, Siphonoptera, Siphunculata, Hemiptera	6	Nandini Pal	June'20-July'20
	Unit-4 Dipteran as Disease Vector Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies vectors Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis Control of mosquitoes	16	Dr. Paromita Bhattacharjee	June'20-July'20
	Unit-5 Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas	10	Dr. Paromita Bhattacharjee	August'20 November'20
	Unit-6 Siphunculata as Disease Vectors Human louse (Head, Body and Pubic louse) as important insect vectors; Control of human louse	8	Dr. Paromita Bhattacharjee	June'20- July'20

	Unit-7 Hemiptera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures	10	Dr. Paromita Bhattacharjee	September'20- November'20
	INSECT VECTORE AND DISEASES PAPER CODE: ZOOGCOR03P	60	Dr. Paromita Bhattacharjee Nandini Pal	Acc. To Revised Syllabus 90% completed by end of November

Semester/ Year	WBSU-CBCS Syllabus for Even Semesters Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-II HONOURS	Non-Chordates II Paper Code: ZOOACOR03T	30		
	Unit 1: Introduction to Coelomates Evolution of coelom and metamerism	3	Dr. Manika Biswas	1st week February
	Unit 2: Annelida General characteristics and Classification up to classes Excretion in Annelida	4	Dr. Manika Biswas	2 nd week March
	Unit 3: Arthropoda General characteristics and Classification up to classes, Metamorphosis in Insects Social life in bees and termites	8	Dr. Manika Biswas	3rd Week of April
	Unit 4: Onychophora General characteristics	2	Dr. Manika Biswas	1 st week of June
	Unit 5: Mollusca General characteristics and Classification up to classes Respiration in Mollusca Torsion and detorsion in Gastropoda	6	Dr. Manika Biswas	1 st week of May- 3rd week of May
	Unit 6: Echinodermata General characteristics and Classification up to classes Water-vascular system in Asteroidea Larval forms in Echinodermata	4	Dr. Manika Biswas	4 th week of May – 1 st week of June
	Unit 7: Hemichordata General characteristics of phylum Hemichordata. Phylogenetic relationship with non-chordates and chordates (only recent concept)	3	Dr. Manika Biswas	1 st week of May- 4 th week of May
	Non-Chordates II Lab Paper Code: ZOOACOR03P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of July
	CELL BIOLOGY PAPER CODE: ZOOACOR04T	30		Acc. To Revised Syllabus 90% completed by end of November
	Unit 1: Overview of Cells Prokaryotic and Eukaryotic cells, Virus, Viroids	2	Nirmal Das	1 st week of March
	Unit 2: Plasma Membrane Various models of plasma membrane structure Transport across membranes: Active and Passive transport, facilitated transport, Cell junctions: Tight junctions, Desmosomes, Gap junctions	5	Nirmal Das	2 nd week of May- 1 st week of June
	Unit 3: Endomembrane System Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes	4	Nirmal Das	end of April

	Unit 4: Mitochondria and Peroxisomes Mitochondria: Structure, Semi-autonomous nature, Mitochondrial Respiratory Chain, Peroxisomes	4	Nirmal Das	2 nd week of APRIL-3 rd week of June
	Unit 5: Cytoskeleton Structure and Functions: Microtubules, Microfilaments and Intermediate filaments	2	Nirmal Das	1 st week of April
	Unit 6: Nucleus Structure of Nucleus: Nuclear envelope, Nucleolus Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome)	4	Nirmal Das	1 st week of February
	Unit 7: Cell Division Mitosis and Meiosis Cell cycle and its regulation Mechanisms of cell death: brief overview	5	Nirmal Das	1 st week of March- End of April
	Unit 8: Cell Signaling Cell signalling transduction pathways; Types of signaling molecules and receptors GPCR and Role of second messenger (cAMP)	4	Nirmal Das	1 st week of June
	CELL BIOLOGY LAB PAPER CODE: ZOOACOR04P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of June
SEM-II GENERAL	PHYSIOLOGY AND BIOCHEMISTRY PAPER CODE: ZOOGCOR02T	30		
	Unit-1 Nerve and muscle 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	4	Lipan Paul	1 st week of May- End of March
	Unit-2 Digestion Absorption of carbohydrates, proteins, lipids	2	Dr. Paromita Bhattacharjee	1 st week of June
	Unit-3 Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	3	Lipan Paul	1 st week of May- End of May
	Unit-4 Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	3	Lipan Paul	1 st week of July- End of July
	Unit-5 Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	3	Dr. Paromita Bhattacharjee	1 st week of May- End of April
	Unit-6 Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of thyroid, pancreas	4	Lipan Paul	1 st week of June- 1 st week of July
	Unit 7 Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Electron transport chain	4	Dr.Paromita Bhattacharjee	1 st week of May- End of May
	Unit-8 Lipid: Structure and Metabolism Introduction to Lipids: Definitions; classes of lipids; β oxidation of palmitic acid	2	Dr. Paromita Bhattacharjee	1 st week of July
	Unit-9 Protein: Structure and metabolism Proteins and their biological functions, functions of amino acids; primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination.	2	Dr. Paromita Bhattacharjee	1 st week of May

	Unit-10 Enzymes 4 Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	2	Dr. Paromita Bhattacharjee	3 rd week of May
	PHYSIOLOGY AND BIOCHEMISTRY LAB PAPER CODE: ZOOGCOR02P	30	Lipan Paul Dr. Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by end of July
SEM-IV HONOURS	COMPARATIVE ANATOMY PAPER CODE: ZOOACOR08T	30		
	Unit 1: Integumentary System- Structure, function and derivatives of integument in mammals May	5	Lipan Paul	1st week of May- End of
	Unit 2: Skeletal System, Jaw Suspension	2	Nirmal Das	1st week of June
	Unit 3: Digestive System- Comparative anatomy of stomach; dentition in mammals	4	Nirmal Das	1st week of May- 3rd week of May
	Unit 4: Respiratory System- Respiratory organs in birds	4	Nirmal Das	4th week of May- 2nd week of June
	Unit 5: Circulatory System- Comparative account of heart and aortic arches	4	Nirmal Das	1st week of May- 3rd week of May
	Unit 6: Urinogenital System- Succession of kidney	3	Lipan Paul	3rd week of May- 1st week of June
	Unit 7: Nervous System Comparative account of brain, Cranial nerves in mammals	4	Lipan Paul	1st week of May- End of May
	Unit 8: Sense Organs Classification of receptors	4	Lipan Paul	1st week of June- 2nd week of June
	COMPARATIVE ANATOMY LAB	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM PAPER CODE: ZOOACOR09T	30		
	Unit 1: Physiology of Digestion-Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins, Digestive enzyme	4	Dr. Paromita Bhattacharjee	2 nd week of June- 3 rd week of June
	Unit 2: Physiology of Respiration- Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it,	6	Dr. Manika Biswas	3 rd week of June- 1 st week of July
	Unit 3: Physiology of Circulation- Components of Blood and their functions; Structure and functions of haemoglobin; Blood clotting system, Blood groups; ABO and Rh factor	4	Dr. Manika Biswas	1 st week of May- 3 rd week of May
	Unit 4: Physiology of Heart- Structure of mammalian heart, Origin and conduction of cardiac impulses; Cardiac Cycle and cardiac output; Blood pressure and its regulation	6	Dr. Paromita Bhattacharjee	4 th week of May- 2 nd week of June
	Unit 5: Thermoregulation & Osmoregulation Physiological classification based on thermal biology. Thermal biology of endotherms; Osmoregulation in aquatic vertebrates;	4	Dr. Manika Biswas	3 rd week of June- 1 st week of July
	Unit 6: Renal Physiology Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance	6	Dr. Paromita Bhattacharjee	1 st week of July- 4 th week of July

	PHYSIOLOGY: LIFE SUSTAINING SYSTEM LAB PAPER CODE: ZOOACOR09T	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of July
	IMMUNOLOGY PAPER CODE: ZOOACOR10T	30		
	Unit 1: Overview of Immune System-Organs (Primary & Secondary lymphoid organs and its importance) and Cells of the Immune system	1	Nirmal Das	3 rd week of June
	Unit 2: Innate and Adaptive Immunity Principle of Innate and Adaptive Immunity. Components of innate immunity – Epithelial barriers (skin and mucosal membranes [concept]) – Cellular mechanisms (phagocytes, NK cells, mast cells, eosinophils, inflammation [concept]) – Humoral mechanisms (complement, cytokines, chemokines etc. [concept]) Components of adaptive immunity – Cellular mechanisms (Cell-Mediated Immune System (CMIS) or T-Cell Immunity [concept]) – Humoral mechanisms (Formation of Plasma B cells and Memory B cells [concept])	5	Nirmal Das	3 rd week of June- 2 nd week of July
	Unit 3: Antigen, Antigen presentation & MHC Concept of Antigen, Immunogen, Allergen & Pathogen. Adjuvants and haptens, Factors influencing immunogenicity, Epitope. Types of Antigen Presenting Cells (APC), Co-stimulatory molecules on APC.	4	Nirmal Das	3 rd week of June- End of June
	Unit 4: T Cell development Structure of T cell receptors, Co-stimulatory molecules on T cells, Central differentiation of T cells; T cell selection in thymus Peripheral differentiation of T cells; Th1 & Th2	4	Nirmal Das	1 st week of July- 3 rd week of July
	Unit 5: Immunoglobulins Structure and functions of different classes of immunoglobulins, Antigen- antibody interactions, Immunoassays (ELISA and RIA), Hybridoma technology, Monoclonal antibody production	4	Nirmal Das	2 nd week of June-4 th week of June
	Unit 6: Cytokines & Chemokines Brief concept on types of Cytokines & Chemokines Cytokines (source & function of IL-1, IL-2, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12, Interferons, Tumor Necrosis Factors, Tumor Growth Factors, GM-CSF, M-CSF).	4	Lipan Paul	End of June-2 nd week of July
	Unit 7: Complement System Components and pathways of complement activation.	2	Lipan Paul	End of July
	Unit 8: Hypersensitivity Gell and Coombs' classification and brief description of various types of hypersensitivities.	2	Lipan Paul	End of July
	Unit 9: Immunology of diseases Malaria, Visceral Leishmaniasis, Filariasis, Dengue and Tuberculosis.	2	Lipan Paul	End of July
	Unit 10: Vaccines Various types of vaccines. Active & passive immunization (Artificial and natural).	2	Lipan Paul	2 nd week of July

	IMMUNOLOGY LAB PAPER CODE: ZOOACOR10T	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
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SEM-IV GENERAL	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04T	30		
	Unit 1: Introduction Sources of Environmental hazards, Hazard identification and accounting, Fate of toxic and persistent substances in the environment, Dose response evaluation, Exposure assessment	8	Lipan Paul	1 st week of May- End of July
	Unit 2: Climate Change Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health	6	Lipan Paul	1 st week May-end of June
	Unit 3: Pollution Air, water pollution: sources and effects, Pollution control	8	Nandini Pal	1 st week of May- End of July
	Unit 4: Waste Management Technologies Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal.	4	Lipan Paul	1 st week of May- End of June
	Unit 5: Diseases Causes, symptoms and control of tuberculosis, Asthma, Cholera.	2	Lipan Paul	1 st week of May- 4 th week of May
	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04P	30	Lipan Paul Dr. Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by end of July

BSC. /YEAR PART/MODULE	WBSU BSc. 3-Year Syllabus Under (1+1+1) System- Part-III SYLLABUS - PAPER	NO OF LECTURES	NAME OF TEACHER	TENTATIVE SCHEDULE
BSc. (Hons') PART-III	Paper VII: Theory			
Module 701: Animal Physiology	1. Transport across cell surface membrane, Donnan membrane equilibrium;2. Functions of mammalian blood: Oxygen transport and CO ₂ transport;3. Neurophysiology: Generation of action potential and propagation of nerve impulse in myelinated and non-myelinated nerve fibers. Synaptic and neuro-muscular junctions: structure and functions ;4. Respiration: gill respirations in fishes, respiration in air-breathing fishes, respiration in avian lungs;5. General architecture of skeletal (striated) muscle and smooth muscle; Ultrastructure of skeletal muscle sarcomere, molecular structure of actin and myosin, Muscle contraction: sliding filament theory ;6. Swim bladder and its functions in teleost fishes;7. Water and osmotic regulations: problems in marine cyclostomes, elasmobranchs and teleosts, freshwater teleosts, in hot desert environments(camel) and examples of significant adaptations solving it by different animal groups;8. Urine formation in human kidney;9. Bioluminescence: occurrence, mechanism of production		Dr. Manika Biswas	
Module 702: Endocrinology and Reproductive biology	1. Classification of vertebrate hormones based on chemical nature and mechanism of action (names and examples only).;2. Hormone delivery systems: Endocrine, neuroendocrine, paracrine, neurocrine, autocrine (Definitions and examples only); 3. Feedback control of hormone secretion: negative and positive. 4. Hormone biosynthesis (including sites of synthesis, outlines only): Thyroid hormones (T3, T4), testosterone, estrogen, progesterone, adreno-cortical hormones, Insulin, Adrenal catecholamines. 5. Physiologic functions of hormones: Insulin, glucagon. T3 and T4.;6. Hormonal control of spermatogenesis;7. Hormonal control of mammalian ovarian cycle, differences between estrous and menstrual cycle. 8. Mechanism of hormone actions (outlines only): cytoplasmic receptor, nuclear receptor, membrane Receptor, HRE, HSP, CAMP, cGMP, IP3-DAG, tyrosine kinase, calcium-calmodulin 9. Endocrine disorders (symptoms and causes		Dr. Manika Biswas	

	only): Diabetes insipidus; IDDM & NIDDM. Hypothyroidism and hyperthyroidism, Conn's and Cushing's syndrome.			
Module 703: Histology	1.Basic tissue types: epithelial, connective, cardiac and nervous tissue(typical structure of neuron and types of neuron, glial cells etc);2.Membrane specializations of epithelia. (Intercellular surface [cell junctions], luminal surfaces and Basal surfaces.); 3.Exocrine glands: Types and discharge of secretory products (merocrine, apocrine, holocrine).;4.Principles of tissue fixation, staining;;5.Histology of: stomach, pancreas, testis, ovary, thyroid, lymph node. (Outline of structures). 6. Histological structure of mammalian nephron and functions of each regions.		Dr. Manika Biswas	
	Paper VIII: Theory			
Module 801: Developmental Biology	1.Outlines of historical concepts and experiments in the emergence of developmental biology- Induction,Fate map, Spemann and Mangold's organizer transplant experiments, von Baer's laws.; 2. Germ layers and its contributions to the development of different tissues in vertebrates;. 3.Origin of germ cells, Structural features of sperms and eggs in sea urchins and in mammals,Gametogenesis in mammals;; 4. Fertilization: external fertilization in sea urchins, internal fertilization in mammals (in depth molecular Details not required); 5.Cleavage Types of cleavage found in animals and animal groups that exhibit a type, outlines of cleavage process in C. elegans, Zebrafish and Xenopus and chick; 6.Gastrulation: generalized patterns, brief outlines of the process in C. elegans, Zebra fish, Xenopus and chick; 7.Organogenesis: development of brain in chicken; 8. Conceptual outlines (very brief) of – Cell potency and Stem Cells, Sex determination in Drosophila and Man, Environmental sex determination in reptiles. HOX genes in development		Nirmal Das	
Module 802: Environmental Pollutions and Toxicology	1. Environmental pollutions (nature and sources of pollutants. Impacts on ecosystems and humans, remedies): water, soil, air and sound pollutions;2.Environmental laws: major ones applicable in West Bengal;3.Toxicology: including its significance as a branch of Science;4.Dose-response relationships;5.In vivo and In vitro toxicity test;6.Introduction to the concepts of detoxication mechanisms		Lipan Paul Aniket Chakraborty	

Module 805: Medical Zoology	1. Mosquito-borne diseases: Malaria and Filaria- causative agents, their life cycle, modes of infections in man, major modes of treatments, major vector species in India, their ecology and life cycles, control measures; 2. Mosquito-borne diseases: Dengue and DHF, Chikungunya- causative virus, symptoms and treatments;3. Visceral Leishmaniasis (Kala-azar)- causative species and vectors in West Bengal; 4. Common ticks and mites in human surroundings and diseases caused by them		Aniket Chakraborty Nandini Pal	
Module 806: Economic Zoology	1. Fishes and fishery: diversity of indigenous freshwater, estuarine, marine fishes and shell fishes in West Bengal. Invasive and exotic species of fishes in West Bengal. Techniques of modern pisciculture and prawn culture. Problems related to wild prawn seed collections in Sunderbans, fish productivities in India and West Bengal, ecology and degradation of freshwater fish habitats and decrease in wild fish stocks (very brief idea); 2. Sericulture: silks and silk worms, sericulture practices- methods, scopes and problems; 3. Apiculture: Honey bees and their behaviours in relation to bee-keeping, popular methods of bee keeping, scopes and problems; 4. Lac culture: Lac and lac insects, host plants and lac cultivation, scopes and problems; 5. Poultry birds: different breeds, their advantages and disadvantages, importance of indigenous breeds 6. Cattle, goats and lambs: different breeds, their advantages and disadvantages, importance of Indigenous breeds		Lipan Paul	
	Paper IX: Practical Group A Group B		Lipan Paul Aniket Chakraborty	
BSc. General Part-III	Paper-IV A			
	Aquaculture Principles, definition and scope. Fisheries resources of India (inland and off-shore). Exotic fishes their merits and demerits. Induced breeding and its importance. Basic principles of different aquaculture system (Polyculture and Integrated farming). Marine pearl culture, culture of prawn and shrimps; Sericulture Characteristics of sericulture industry and its scope; kinds of silk worm, host plants. Life history and rearing of Bombyx mori,		Lipan Paul	

	<p>harvesting and processing of cocoon, reeling and extraction of silk, pest on mulberry plants and diseases of Bombyx mori and control measures. Problems and prospects.; Apiculture Types of honey bees, modern methods of apiary management, products and its uses Pest and Pest Management – Pest – definition, types, life history and control i) Scirpophaga, ii) Sitophilus and iii) Bandicoota, Concept on IPM.; Poultry and Poultry Management – Duck and fowl – Types of breeds, rearing and disease management. Wild life and Biodiversity- 1. Conservation of Wild life- Importance and strategies, Concept of Biosphere Reserve, National Park and Wild life Sanctuary. 2. Basic concept of Biodiversity, Biodiversity hotspot.3. Endangered Indian mammals, Animal Cruelty Prevention Act. Biotechnology and Immunology –1. Basic concept of genetic engineering and cloning; 2. Concept of immunity; 3. Outline structure and classification of immunoglobulin; antigen-antibody reaction; 4. Basic principle of vaccination.</p>			
	<p>Paper-IV B- Practical</p>		Lipan Paul	

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

June2020/ July 2020 - December/ January 2021

1st, 3rd and 5th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-I HONOURS	Non-Chordates I Paper Code: ZOOACOR01T	30		
	Unit 1: Protista, Parazoa and Metazoa General characteristics and Classification up to classes, Study of <i>Paramecium</i> Life cycle and pathogenicity of <i>Entamoeba histolytica</i> and <i>Plasmodium vivax</i>	6	Dr. Manika Biswas	January'21- February'21
	Unit 2: Porifera General characteristics and Classification up to classes Canal system and spicules in sponges	5	Dr. Manika Biswas	February'- March'(1 st Week)
	Unit 3: Cnidaria General characteristics and Classification up to classes Polymorphism in CnidariaCorals and coral reefs: types, formation, distribution, conservation significance	6	Dr. Manika Biswas	January- February'
	Unit 4: Ctenophora General characteristics	2	Dr. Manika Biswas	February
	Unit 5: Platyhelminthes General characteristics and Classification up to classes, Life cycle and pathogenicity of <i>Fasciola hepatica</i> and <i>Taenia solium</i>	6	Dr. Manika Biswas	January- February'21
	Unit 6: Nematelminthes General characteristics and Classification up to classes, Life cycle, and pathogenicity of <i>Ascaris lumbricoides</i> , Parasitic adaptations in helminths	5	Dr. Manika Biswas	- March'21(1 st Week)
	Non-Chordates I Lab Paper Code: ZOOACOR01P	30	Dr. Manika Biswas	January'21- March'21(1 st Week)
	ECOLOGY PAPER CODE: ZOOACOR02T	30		
	Unit 1: Introduction to Ecology History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.	6	Nandini Pal	January'21- February'21

	Unit 2: Population life tables, survivorship curves, exponential and logistic growth, r and K strategies Population regulation - density dependent and independent factors	10	Lipan Paul	February'- March'(1 st Week)
	Unit 3: Community Community characteristics: species diversity, abundance, dominance, richness, Ecotone, Ecological succession and example of it.	5	Lipan Paul	January'- February ,
	Unit 4: Ecosystem Food chain: Detritus and grazing food chains ,Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies	6	Nandini Pal	February'- March'(1 st Week)

	Unit 5: Applied Ecology Wildlife Conservation (in-situ and ex-situ conservation). Wild life protection act (1972)	3	Nandini Pal	February'- March'1 st Week)
	ECOLOGY LAB PAPER CODE: ZOOACOR02P	30	Nirmal Das	January'21- March'21(1 st Week)
SEM-I GENERAL	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01T	30		
	Unit-1 Kingdom Protista General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980)	2	Dr. Paromita Bhattacharjee	January'21-
	Unit-2 Phylum Porifera General character and classification up to classes; Canal System in Sycon	2	Dr. Paromita Bhattacharjee	January- February'
	Unit-3 Phylum Cnidaria General characters and classification up to classes	1	Dr. Paromita Bhattacharjee	WITHIN Febraary'21
	Unit-4 Phylum Platyhelminthes General characters and classification up to classes; Life history of Taenia solium	3	Dr. Paromita Bhattacharjee	- March(1 st Week)
	Unit-5 Phylum Nematoda General characters and classification up to classes; Life history of Ascaris lumbricoides	3	Nandini Pal	WITHIN January'21
	Unit-6 Phylum Annelida General characters and classification up to classes	1	Nandini Pal	WITHIN January'
	Unit-6 Phylum Annelida General characters and classification up to classes;	1	Nandini Pal	- WITHIN Febraary'21

	Unit 7 Phylum Arthropoda General characters and classification up to classes Metamorphosis in Insects	2	Nandini Pal	February'21- Febraary'21
	Unit-8 Phylum Mollusca General characters and classification up to classes; Respiration in Pila	2	Dr. Paromita Bhattacharjee	February'21- March'21(1st Week
	Unit-9 Phylum Echinodermata General characters and classification up to classes; Water vascular system in Asterias	2	Dr. Paromita Bhattacharjee	February'21- March'21(1st Week)
	Unit-10 Protochordates General features	1	Lipan Paul	January'21- January'21
	Unit-11 Agnatha General features and classification up to classes (Young, 1981)	1	Nandini Pal	January'21- February'21
	Unit-12 Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	2	Lipan Paul	February'21- Febraary'21
	Unit-13 Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	2	Lipan Paul	January'21- February'21
	Unit-14 Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non- poisonous snakes	2	Lipan Paul	February'21- Febraary'21
	Unit-15 Aves General features and Classification up to orders (Young, 1981); Flight adaptations in birds	2	Lipan Paul	January'21- February'21
	Unit-16 Mammals Classification up to Subclasses (Young, 1981)	1	Lipan Paul	February'21- Febraary'21

	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01P	30	Dr. Paromita Bhattacharjee Nandini Pal	January'21- March'21(1st Week)
SEM-III	CHORDATES	60		

HONOURS	PAPER CODE: ZOOACOR05T			
	Unit 1: Introduction to Chordates General characteristics and outline classification of Phylum Chordata	4	Nirmal Das	June'20-June'20
	Unit 2: Protochordata General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia Chordate Features and Feeding in Branchiostoma	8	Nandini Pal	June'20-July'20
	Unit 3: Origin of Chordata Dipleurula concept and the Echinoderm theory of origin of chordates Advanced features of vertebrates over Protochordata	5	Nandini Pal	July'20-July'20
	Unit 4: Agnatha General characteristics and classification of cyclostomes up to order	2	Nandini Pal	August'20
	Unit 5: Pisces General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses Accessory respiratory organ, Advanced features of vertebrates over Protochordata, migration and parental care in fishes Swim bladder in fishes. Classification up to Sub-Classes	10	Nandini Pal	August'20-October'21
	Unit 6: Amphibia General characteristics and classification up to living Orders Metamorphosis with parental care	5	Nirmal Das	June'20-June'20
	Unit 7: Reptilia General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	7	Nirmal Das	June'20-July'20
	Unit 8: Aves General characteristics and classification up to Sub-Classes, Exoskeleton and migration in Birds, Principles and aerodynamics of flight	7	Nirmal Das	July'20-August'20
	Unit 9: Mammals General characters and classification up to living orders, Phylogenetic significance of Prototheria Exoskeleton derivatives of mammals Adaptive radiation in mammals with reference to locomotory appendages Echolocation in Microchiropteransand Cetaceans	10	Nirmal Das	August'20-September'20-
	Unit 10: Zoogeography Zoogeographical realms, Plate tectonic and Continental drift theory, Distribution of birds and mammals in different realms	2	Nirmal Das	September'20

	CHORDATES LAB PAPER CODE: ZOOACOR05P	60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
	PHYSIOLOGY PAPER CODE: ZOOACOR06T	60		

	Unit 1: Tissues Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues	10	Nandini Pal	June'20-July'20
	Unit 2: Bone and Cartilage Structure and types of bones and cartilages, Ossification	5	Nandini Pal	July'20-August'20
	Unit 3: Nervous System Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and Neuromuscular junction, Reflex action and its types	15	Lipan Paul	August'20-November'20
	Unit 4: Muscular system Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction, Characteristics of muscle fiber	10	Lipan Paul	June'20-July'20
	Unit 5: Reproductive System Histology of testis and ovary; Physiology of Reproduction	5	Lipan Paul	August'20-september'20

	<p>Unit 6: Endocrine System Histology and function of pituitary, thyroid, Pancreas, and adrenal. Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non-steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system; Placental hormones</p>	15	Lipan Paul	September'20- December'20(1 st Week)
	<p>PHYSIOLOGY LAB PAPER CODE: ZOOACOR06T</p>	60	Lipan Paul	<p>Acc. To Revised Syllabus 90% completed by end of November</p>
	<p>BIOCHEMISTRY PAPER CODE: ZOOACOR07T</p>	60		

	<p>Unit 1: Fundamentals of biochemical reactions and metabolism Ionization of water, weak acids and bases, buffering and pH changes in living systems, Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways Shuttle systems and membrane transporters; ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms</p>	10	Dr. Manika Biswas	June'20-July'20
	<p>Unit 2: Carbohydrates Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosachharides, Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis</p>	10	Dr. Manika Biswas	July'20-September'20
	<p>Unit 3: Lipids Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. Lipid metabolism: β-oxidation of fatty acids; Fatty acid biosynthesis</p>	4	Dr. Manika Biswas	October'20-November'20

	<p>Unit 4: Proteins Amino acids Structure, Classification, General and Electro chemical properties of α-amino acids; Physiological importance of essential and non-essential amino acids Proteins Bonds stabilizing protein structure; Levels of organization, Protein metabolism: Transamination, Deamination, Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids</p>	14	Dr. Manika Biswas	June'20-August'20
	<p>Unit 5: Nucleic Acids Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Types of DNA and RNA, Complementarity of DNA, Hypo- Hyper chromaticity ofDNA Outlines of nucleotide metabolism</p>	4	Dr. Paromita Bhattacharjee	June'20-July'20
	<p>Unit 6: Enzymes Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes, Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver- Burk plot; Factors affecting rate of enzyme catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their kinetics; Strategy of enzyme action- Catalytic and Regulatory (Basic concept with one example each)</p>	12	Dr. Manika Biswas	September'20-October'20

	Unit 7: Oxidative Phosphorylation Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System	6	Dr. Paromita Bhattacharjee	November'20-December'20(1 st week)
	BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07T	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of November
SEM-III GENERAL	INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T	60		
	Unit-1 Introduction to Insects General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit	4	Nandini Pal	June'20-July20
	Unit-2 Concept of Vectors Brief introduction to Vectors (mechanical and biological), Reservoirs, Host-vector relationship, Adaptations as vectors, Host specificity	6	Nandini Pal	June-July'20
	Unit-3 Insects as Vectors Detailed features of insect orders as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera	6	Nandini Pal	June'20-July'20
	Unit-4 Dipteran as Disease Vector Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies vectors Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis Control of mosquitoes	16	Nandini Pal	September'20-December'20(1 st Week)
	Unit-5 Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas	10	Nandini Pal	June'20-August'20
	Unit-6 Siphunculata as Disease Vectors Human louse (Head, Body and Pubic louse) as important insect vectors; Control of human louse	8	Nandini Pal	June'20-August'20

	Unit-7 Hemiptera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures	10	Nandini Pal	September'20-November'20
	INSECT VECTORE AND DISEASES PAPER CODE: ZOOGCOR03P	60	Nandini Pal	Acc. To Revised Syllabus 90% completed by end of

				November
SEM-V HONOURS	MOLECULAR BIOLOGY PAPER CODE: ZOOACOR11T	60		
	Unit 1: Nucleic Acids Salient features of DNA and RNA Watson and Crick Model of DNA	2	Dr. Paromita Bhattacharjee	June'20-June'20
	Unit 2: DNA Replication Mechanism of DNA Replication in Prokaryotes, Semi conservative, bidirectional and discontinuous Replication, RNA priming, Replication of telomeres	6	Dr. Paromita Bhattacharjee	June'20-July'20
	Unit 3: Transcription Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.	8	Dr. Paromita Bhattacharjee	August'20-September'20
	Unit 4: Translation Mechanism of protein synthesis in prokaryotes, Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation	14	Dr. Paromita Bhattacharjee	June'20-August'20
	Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, Processing of tRNA	10	Dr. Paromita Bhattacharjee	August'20-September'20
	Unit 6: Gene Regulation Regulation of Transcription in prokaryotes: lac operon and trp operon; Regulation of Transcription in eukaryotes	5	Dr. Paromita Bhattacharjee	September'20-October'20
	Unit 7: DNA Repair Mechanisms Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair	9	Dr. Paromita Bhattacharjee	June'20-August'20
	Unit 8: Molecular Lab Techniques PCR, Western and Southern blot, Northern Blot, Sanger DNA sequencing, cDNA technology	5	Dr. Paromita Bhattacharjee	August'20-September'20
MOLECULAR BIOLOGY LAB PAPER CODE: ZOOACOR11P	60	Dr. Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by	

				end of November
	GENETICS PAPER CODE: ZOOACOR12T	60		
	Unit 1: Mendelian Genetics and its Extension Background of Mendel's experiments Principles of Mendelian inheritance,	12	Nirmal Das	June'20-July'20

	Incomplete dominance and co-dominance, Epistasis, Multiple alleles, Lethal alleles, Pleiotropy, Sex-linked, sex influenced and sex-limited inheritance, Polygenic Inheritance			
	Unit 3: Mutations 1.Types of gene mutations (Classification), Types of chromosomal aberrations (Classification with one suitable example of each), Chromosomal aberrations, gene mutations and human diseases (Down's, Klienfelter's, Turner's, Cri du Chat, Sickle cell, Haemophilia, Thalassemia, Albinism only genetical aspects here, details of physiological consequences not required), Sex chromosomes and sex-linked inheritance Non-disjunction and variation in chromosome number; Molecular basis of mutations in relation to UV light and chemical mutagen	12	Nirmal Das	August'20-September'20
	Unit 4: Sex Determination Mechanisms of sex determination in Drosophila with reference to alternative splicing Sex determination in mammals, Dosage compensation in Drosophila & Human	12	Nirmal Das	October'20
	Unit 5: Extra-chromosomal Inheritance Criteria for extra chromosomal inheritance, Antibiotic resistance in Chlamydomonas, Kappa particle in Paramecium Shell spiralling in snail	8	Nirmal Das	June'20-July'20
	Unit 6: Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction, Complementation test in Bacteriophage	8	Nirmal Das	July'20-August'20
	Unit 7: Transposable Genetic Elements Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila, LINE, SINE, Alu elements in humans	8	Nirmal Das	August'20-September'20
	GENETICS LAB PAPER CODE: ZOOACOR12P	60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of

				November
	PAPER CODE: ANIMAL BEHAVIOUR and CHRONOBIOLOGY ZOOADSEO1T	60		
	Unit 1: Introduction to animal behavior	12	Lipan Paul	June'20
	Unit 2: Behaviors of individuals	4	Lipan Paul	June'20-July'20
	Unit 3: Social and Sexual Behavior	12	Lipan Paul	July'20-August'20
	Unit 4: Introduction to Chronobiology	16	Lipan Paul	September'20- October'20

	Unit 5: Biological Rhythm	16	Lipan Paul	October'20- November'20

	ANIMAL BEHAVIOUR and CHRONOBIOLOGY ZOOADSE01P	60	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of November
	ENDOCRINOLOGY PAPER CODE: ZOOADSE03T	60		
	Unit 1: Introduction to Endocrinology General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones Neurosecretions and Neurohormones	12	Dr. Manika Biswas	September'20-november'20
	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction; Structure and functions of hypothalamus and Hypothalamic nuclei, Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland, Hormones and their functions, Hypothalamo-hypophysial portal system, Disorders of pituitary gland.	18	Dr. Manika Biswas	September'20-November'20
	Unit 3: Peripheral Endocrine Glands Structure, Hormones, Functions and Regulation of Thyroid gland, , Parathyroid, Adrenal, Pancreas, Ovary and Testis; Hormones in homeostasis, Disorders of endocrine glands	16	Dr. Manika Biswas	September'20-1stWeek of december'20
	Unit 4: Regulation of Hormone Action Mechanism of action of steroidal, non-steroidal hormones with receptors Bioassays of hormones using ELISA and RIA; Estrous cycle in rat and menstrual cycle in human Multifaceted role of Vasopressin & Oxytocin; Hormonal regulation of parturition	14	Dr. Manika Biswas	September'20-1stWeek of december'20
	ENDOCRINOLOGY LAB PAPER CODE: ZOOADSE03P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of November
SEM-V GENERAL	APPLIED ZOOLOGY PAPER CODE: ZOOGDSE01T	60		
	Unit-1 Introduction to Host-parasite Relationship Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	2	Nandini Pal	June'20-June'20

	Unit-2 Epidemiology of Diseases Transmission, Prevention and control of	4	Nandini Pal	June'20-july'20
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	diseases: Tuberculosis, Typhoid			
	Unit-3 Rickettsia and Spirochetes Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum	6	Nandini Pal	June'20-July'20
	Unit-4 Parasitic Protozoa Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense	8	Nandini Pal	June'20-August'20
	Unit-5 Parasitic Helminthes Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti	4	Nandini Pal	September'20-October'20
	Unit-6 Insects of Economic Importance Biology, Control and damage caused by Helicoverpa armigera, Pyrrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum	12	Nandini Pal	August'20-November'20
	Unit-7 Insects of Medical Importance Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis	8	Nandini Pal	August'20-October'20
	Unit-8 Animal Husbandry Preservation of semen and artificial insemination in cattle	6	Dr. Paromita Bhattacharjee	June'20-July'20
	Unit-9 Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs Unit	6	Dr. Paromita Bhattacharjee	August'20-September'20
	Unit-10 Fish Technology Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	4	Dr. Paromita Bhattacharjee	October'20-November'20
	APPLIED ZOOLOGY LAB PAPER CODE: ZOOGDSE01P	60	Dr. Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by end of November

ACADEMIC CALENDAR
DEPARTMENT OF ZOOLOGY
January/ February 2021 - June/July 2021

2nd, 4th and 6th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-II HONOURS	Non-Chordates II Paper Code: ZOOACOR03T	30		
	Unit 1: Introduction to Coelomates Evolution of coelom and metamerism	3	Dr. Manika Biswas	1st week May
	Unit 2: Annelida General characteristics and Classification up to classes Excretion in Annelida	4	Dr. Manika Biswas	2 nd week May
	Unit 3: Arthropoda General characteristics and Classification up to classes, Metamorphosis in Insects Social life in bees and termites	8	Dr. Manika Biswas	3rd Week of May 3 rd week of June
	Unit 4: Onychophora General characteristics	2	Dr. Manika Biswas	
	Unit 5: Mollusca General characteristics and Classification up to classes Respiration in Mollusca Torsion and detorsion in Gastropoda	6	Dr. Manika Biswas	1 st week of May 3rd week of May
	Unit 6: Echinodermata General characteristics and Classification up to classes Water-vascular system in Asterozoa Larval forms in Echinodermata	4	Dr. Manika Biswas	4 th week of May – 1 st week of June
	Unit 7: Hemichordata General characteristics of phylum Hemichordata. Phylogenetic relationship with non-chordates and chordates (only recent concept)	3	Dr. Manika Biswas	1 st week of May 4 th week of May
	Non-Chordates II Lab Paper Code: ZOOACOR03P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of July
	CELL BIOLOGY PAPER CODE: ZOOACOR04T	30		
	Unit 1: Overview of Cells Prokaryotic and Eukaryotic cells, Virus, Viroids	2	Nirmal Das	1 st week of May

	Unit 2: Plasma Membrane Various models of plasma membrane structure Transport across membranes: Active and Passive transport, facilitated transport, Cell junctions: Tight junctions, Desmosomes, Gap junctions	5	Nirmal Das	2 nd week of May 1 st week of June
	Unit 3: Endomembrane System Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes	4	Nirmal Das	2 nd week June-end of June
	Unit 4: Mitochondria and Peroxisomes Mitochondria: Structure, Semi-autonomous nature, Mitochondrial Respiratory Chain, Peroxisomes	4	Nirmal Das	2 nd week of June 3 rd week of June

	Unit 5: Cytoskeleton Structure and Functions: Microtubules, Microfilaments and Intermediate filaments	2	Nirmal Das	1 st week of July
	Unit 6: Nucleus Structure of Nucleus: Nuclear envelope, Nucleolus Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome)	4	Nirmal Das	1 st week of May - end of may
	Unit 7: Cell Division Mitosis and Meiosis Cell cycle and its regulation Mechanisms of cell death: brief overview	5	Nirmal Das	1 st week of June End of June
	Unit 8: Cell Signaling Cell signalling transduction pathways; Types of signaling molecules and receptors GPCR and Role of second messenger (cAMP)	4	Nirmal Das	1 st week of July End of July
	CELL BIOLOGY LAB PAPER CODE: ZOOACOR04P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
SEM-II GENERAL	PHYSIOLOGY AND BIOCHEMISTRY PAPER CODE: ZOOGCOR02T	30		
	Unit-1 Nerve and muscle 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	4	Lipan Paul	1 st week of May End of May

Unit-2 Digestion Absorption of carbohydrates, proteins, lipids	2	Dr. Paromita Bhattacharjee	1st week of July
Unit-3 Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	3	Lipan Paul	1st week of May End of May
Unit-4 Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	3	Lipan Paul	1st week of July End of July
Unit-5 Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	3	Dr. Paromita Bhattacharjee	1st week of May End of May
Unit-6 Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of thyroid, pancreas	4	Lipan Paul	1st week of June 1st week of July
Unit 7 Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Electron transport chain	4	Dr. Paromita Bhattacharjee	1st week of May End of May
Unit-8 Lipid: Structure and Metabolism Introduction to Lipids: Definitions; classes of lipids; β oxidation of palmitic acid	2	Dr. Paromita Bhattacharjee	1st week of July
Unit-9 Protein: Structure and metabolism	2	Dr. Paromita Bhattacharjee	1st week of May

Proteins and their biological functions, functions of amino acids; primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination.			
Unit-10 Enzymes 4 Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	2	Dr. Paromita Bhattacharjee	3rd week of May
PHYSIOLOGY AND BIOCHEMISTRY LAB PAPER CODE: ZOOGCOR02P	30	Lipan Paul Dr. Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by end of July

SEM-IV HONOURS	COMPARATIVE ANATOMY PAPER CODE: ZOOACOR08T	30		
	Unit 1: Integumentary System- Structure, function and derivatives of integument in mammals	5	Lipan Paul	1 st week of May End of May
	Unit 2: Skeletal System, Jaw Suspension	2	Nirmal Das	1 st week of June
	Unit 3: Digestive System- Comparative anatomy of stomach; dentition in mammals	4	Nirmal Das	1st week of May 3rd week of May
	Unit 4: Respiratory System- Respiratory organs in birds	4	Nirmal Das	4th week of May 2nd week of June
	Unit 5: Circulatory System- Comparative account of heart and aortic arches	4	Nirmal Das	1st week of May 3rd week of May
	Unit 6: Urinogenital System- Succession of kidney	3	Lipan Paul	3rd week of May 1st week of June
	Unit 7: Nervous System Comparative account of brain, Cranial nerves in mammals	4	Lipan Paul	1st week of May End of May
	Unit 8: Sense Organs Classification of receptors	4	Lipan Paul	1st week of June 2nd week of June
	COMPARATIVE ANATOMY LAB PAPER CODE: ZOOACOR08P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM PAPER CODE: ZOOACOR09T	30		
	Unit 1: Physiology of Digestion-Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins, Digestive enzyme	4	Dr. Paromita Bhattacharjee	2nd week of June 3rd week of June
	Unit 2: Physiology of Respiration- Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it,	6	Dr. Manika Biswas	3rd week of June 1st week of July

	Unit 3: Physiology of Circulation- Components of Blood and their functions; Structure and functions of haemoglobin; Blood clotting system, Blood groups; ABO and Rh factor	4	Dr. Manika Biswas	1st week of May 3rd week of May
	Unit 4: Physiology of Heart- Structure of mammalian heart, Origin and conduction of cardiac impulses; Cardiac Cycle and cardiac output; Blood pressure and its regulation	6	Dr. Paromita Bhattacharjee	4th week of May 2nd week of June

	Unit 5: Thermoregulation & Osmoregulation Physiological classification based on thermal biology. Thermal biology of endotherms; Osmoregulation in aquatic vertebrates;	4	Dr. Manika Biswas	3rd week of June 1st week of July
	Unit 6: Renal Physiology Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance	6	Dr. Paromita Bhattacharjee	1st week of July 4th week of July
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM LAB PAPER CODE: ZOOACOR09T	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of July
	IMMUNOLOGY PAPER CODE: ZOOACOR10T	30		
	Unit 1: Overview of Immune System-Organs (Primary & Secondary lymphoid organs and its importance) and Cells of the Immune system	1	Nirmal Das	3rd week of June
	Unit 2: Innate and Adaptive Immunity Principle of Innate and Adaptive Immunity. • Components of innate immunity– Cellular mechanisms (phagocytes, NK cells, mast cells, eosinophils, inflammation [concept]) – Humoral mechanisms (complement, cytokines, chemokines etc. [concept]) • Components of adaptive immunity – Cellular mechanisms (Cell-Mediated Immune System (CMIS) or T- Cell Immunity [concept]) – Humoral mechanisms (Formation of Plasma B	5	Nirmal Das	3rd week of June 2nd week of July

	cells and Memory B cells [concept]			
	Unit 3: Antigen, Antigen presentation & MHC Concept of Antigen, Immunogen, Allergen & Pathogen. Adjuvants and haptens, Factors influencing immunogenicity, Epitope. Types of Antigen Presenting Cells (APC), Co-stimulatory molecules on APC.	4	Nirmal Das	3 rd week of June End of June
	Unit 4: T Cell development Structure of T cell receptors, Co-stimulatory molecules on T cells, Central differentiation of T cells; T cell selection in thymus Peripheral differentiation of T cells; Th1 & Th2	4	Nirmal Das	1 st week of July 3 rd week of July
	Unit 5: Immunoglobulins Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA and RIA), Hybridoma technology, Monoclonal antibody production	4	Nirmal Das	2 nd week of June 4 th week of June

	Unit 6: Cytokines & Chemokines Brief concept on types of Cytokines & Chemokines Cytokines (source & function of IL-1, IL-2, IL-4, IL-5, IL-6, IL 8, IL-10, IL-12, Interferons, Tumor Necrosis Factors, Tumor Growth Factors, GM-CSF, M-CSF).	4	Lipan Paul	End of June-2 nd week of July
	Unit 7: Complement System Components and pathways of complement activation	2	Lipan Paul	End of July
	Unit 8: Hypersensitivity Gell and Coombs' classification and brief description of various types of hypersensitivities.	2	Lipan Paul	End of July
	Unit 9: Immunology of diseases Malaria, Dengue	2	Lipan Paul	2 nd week of July
	Unit 10: Vaccines Various types of vaccines. Active & passive immunization (Artificial and natural).	2	Lipan Paul	End of July

	IMMUNOLOGY LAB PAPER CODE: ZOOACOR10T	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
SEM-IV GENERAL	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04T	30		
	Unit 1: Introduction Sources of Environmental hazards, Hazard identification and accounting, Fate of toxic and persistent substances in the environment, Dose response evaluation, Exposure assessment	8	Nandini Pal	1st week of May End of July
	Unit 2: Climate Change Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health	6	Nandini Pal	1st week May-end of June
	Unit 3: Pollution Air, water pollution: sources and effects, Pollution control	8	Nandini Pal	1st week of May End of July
	Unit 4: Waste Management Technologies Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal.	4	Dr. Paromita Bhattacharjee	1st week of May End of June
	Unit 5: Diseases Causes, symptoms and control of tuberculosis, Asthma, Cholera.	2	Dr. Paromita Bhattacharjee	1st week of May 4th week of May
	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04P	30	Nandini Pal	Acc. To Revised Syllabus 90% completed by end of July
SEM-VI HONOURS	DEVELOPMENTAL BIOLOGY PAPER CODE: ZOOACOR13T	30		
	Unit 1: Introduction Basic concepts: Phases of Development, Cell-cell interaction, Differentiation and growth	4	Lipan Paul	1st week of May 3rd week of May

Unit 2: Early Embryonic Development Gametogenesis, Spermatogenesis, Oogenesis; Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy; Planes and patterns of cleavage; Types of Blastula; Fate maps (including Techniques); Early development of chick up to gastrulation; Embryonic induction and organizers	8	Nirmal Das	1st week of May End of May
Unit 3: Late Embryonic Development Fate of Germ Layers; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)	6	Nirmal Das	1st week of May 4th week of May
Unit 4: Post Embryonic Development Development of brain and Eye in Vertebrate	6	Lipan Paul	4th week of May 2nd week of June
Unit 5: Implications of Developmental Biology Teratogenesis: Teratogenic agents and their effects on embryonic development; In vitro fertilization, Stem cell (ESC), Amniocentesis	6	Lipan Paul	4th week of May 1st week of June
DEVELOPMENTAL BIOLOGY LAB PAPER CODE: ZOOACOR13P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of July
EVOLUTIONARY BIOLOGY PAPER CODE: ZOOACOR14T	30		
Unit 1: Origin of earliest life- Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes, three domains of life	2	Dr. Paromita Bhattacharjee	1st week of May
Unit 2: Historical review of evolutionary concept-Pre Darwinian Concepts and theories including Lamarckism, Darwinian Theory Neo-Darwinian Synthesis	4	Dr. Paromita Bhattacharjee	2nd week of May End of May
Unit 3: Evidences in favour of Evolution-Fossil records: types of fossils, geological time scale, transitional forms:	4	Dr. Paromita Bhattacharjee	3rd week of June
Unit 4: Sources of variations Heritable variations present in nature populations (classical study of Lewontin and Hubby , 1996 in Drosophila , as example)	3	Dr. Paromita Bhattacharjee	

	<p>Unit 5: Population genetics- Concept of Populations and calculation of allele frequencies in a population Hardy-Weinberg Law and equilibrium (derivations, applications of law to find gene and genotype frequencies in human Populations) Evolutionary forces disrupting H-W equilibrium Natural selection: Definition as the non-differential rate of reproductions and survivals of competing alleles, concept of fitness, selection coefficient, Types of natural selection with examples- Disrupting, Stabilizing, Directional. Genetic Drift- outline of its mechanism, basic concepts and examples of founder's effect, bottleneck phenomenon;</p>	8	Nirmal Das	1st week of June End of June
	<p>Unit 6: Products of evolution Inter-population variations: clines, races, Species concepts and modes of speciation (just outlines of Allopatric, Sympatric isolating mechanisms Adaptive radiations)</p>	5	Nandini Pal	2nd week June-4th week Of June

	<p>Unit 8: Origin and evolution of man-Unique hominin characteristics contrasted with primate characteristics (including social and cultural ones), Molecular evidences of human origin and migrations (brief outline)</p>	6	Nandini Pal	1st week of May 4th week of May
	<p>Unit 9: Molecular Phylogeny-Neutral theory of molecular evolution, molecular clock (brief introductions) Example of evolution in vertebrate globin genes</p>	4	Nandini Pal	End of May-1st week of June
	<p>EVOLUTIONARY BIOLOGY LAB PAPER CODE: ZOOACOR14P</p>	30	Nirmal Das	
	<p>FISH AND FISHERY PAPER CODE: ZOOADSEO4T</p>	30		
	<p>Unit 1: Introduction and Classification-Feeding habit, habitat and manner of reproduction Classification of fish (up to Subclasses) with important examples</p>	2	Lipan Paul	1st week of July
	<p>Unit 2: Morphology and Physiology Types of fins, Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in</p>	8	Lipan Paul	4th week of June 2nd week of July

	Respiration, buoyancy, Bioluminescence			
	Unit 3: Fisheries Inland Fisheries; Marine Fisheries; Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal; Fishing crafts and Gears; Depletion of fishery resources; Application of remote sensing and GIS in fisheries;	8	Lipan Paul	1 st week of July 3 rd week of July
	Unit 4: Aquaculture Sustainable Aquaculture; Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish, Fish diseases	10	Lipan Paul	End of June-3 rd week of July
	Unit 5: Fish in research Transgenic fish	2	Lipan Paul	2 nd week of June
	FISH AND FISHERYLAB PAPER CODE: ZOADSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of July
	Wild life and Conservation PAPER CODE: ZOADSE06T	60		
	Unit 1: Introduction to wild life Unit 2: Evaluation and management of wild life	5 12	Dr. Manika Biswas	4 th week of July
	Unit 3: Management of habitats Unit 4: Population estimation	8 10	Dr. Manika Biswas	2 nd week of July End of July

	Unit 5: Wild life conservation practice in India Unit 6: Management planning of wild life in protected areas	5 5	Dr. Manika Biswas	3 rd week of July end of July
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	Unit 7: Man and wild life Unit 8: Protected areas	5 10	Dr. Manika Biswas	3rd week of June end of July
	Wild life and Conservation Lab PAPER CODE: ZOADSE06P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of July
SEM-VI GENERAL	IMMUNOLOGY PAPER CODE: ZOOGDSE04T	30		
	Unit-1 Overview of the Immune System Introduction to basic concepts in immunology, components of immune system, principles of innate and adaptive immune system	4	Lipin Paul	1st week of May End of May
	Unit-2 Cells and Organs of the Immune System Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	4	Lipin Paul	1st week of May End of May
	Unit-3 Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	6	Lipin Paul	End of May-end of June
	Unit-4 Antibodies Structure, classes and function of antibodies, antigen antibody interactions as tools for research and diagnosis	4	Lipin Paul	1st week of May End of May
	Unit-5 Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing, Basic properties and functions of cytokines,	4	Nandini Pal	1st week of May End of May
	Unit-6 Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities, Introduction to concepts of autoimmunity and immunodeficiency	6	Nandini Pal	1st week of May 2nd week of June
	Unit-7 Vaccines General introduction to vaccines, Types of vaccines	2	Nandini Pal	3rd week of June
	IMMUNOLOGY LAB PAPER CODE: ZOOGDSE04P	30	Lipin Paul	Acc. To Revised Syllabus 90% completed by end of July

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

July'21/Sepetember'21- December'21/January'22

1st, 3rd and 5th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-I HONOURS	Non-Chordates I Paper Code: ZOOACOR01T	30		
	Unit 1: Protista, Parazoa and Metazoa General characteristics and Classification up to classes, Study of <i>Paramecium</i> Life cycle and pathogenicity of <i>Entamoeba histolytica</i> and <i>Plasmodium vivax</i>	6	Dr. Manika Biswas	Sepetember'21- November'21
	Unit 2: Porifera General characteristics and Classification up to classes Canal system and spicules in sponges	5	Dr. Manika Biswas	November'21-1st week of January'22
	Unit 3: Cnidaria General characteristics and Classification up to classes Polymorphism in Cnidaria Corals and coral reefs: types, formation, distribution, conservation significance	6	Dr. Manika Biswas	September'21- November'21
	Unit 4: Ctenophora General characteristics	2	Dr. Manika Biswas	November'21- November'21
	Unit 5: Platyhelminthes General characteristics and Classification up to classes, Life cycle and pathogenicity of <i>Fasciola hepatica</i> and <i>Taenia solium</i>	6	Dr. Manika Biswas	September'21- November'21
	Unit 6: Nematelminthes General characteristics and Classification up to classes, Life cycle, and pathogenicity of <i>Ascaris lumbricoides</i> , Parasitic adaptations in helminths	5	Dr. Manika Biswas	November'21-1st week of January'22
	Non-Chordates I Lab Paper Code: ZOOACOR01P	30	Dr. Manika Biswas	September'21- 1st week of January'22
	ECOLOGY PAPER CODE: ZOOACOR02T	30		

	<p>Unit 1: Introduction to Ecology History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.</p>	6	Nandini Pal	September'21- November'21
	<p>Unit 2: Population life tables, survivorship curves, exponential and logistic growth, r and K strategies Population regulation - density- dependent and independent factors</p>	10	Lipan Paul	November'21-1st week of January'22
	<p>Unit 3: Community Community characteristics: species diversity, abundance, dominance, richness, Ecotone, Ecological succession and example of it.</p>	5	Lipan Paul	September'21- 1st week of January'22

	<p>Unit 4: Ecosystem Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies</p>	6	Nandini Pal	November'21-1st week of January'22
	<p>Unit 5: Applied Ecology Wildlife Conservation (in-situ and ex-situ conservation). Wild life protection act (1972)</p>	3	Nandini Pal	November'21-1st week of January'22
	<p>ECOLOGY LAB PAPER CODE: ZOOACOR02P</p>	30	Nirmal Das	September'21- 1st week of January'22
SEM-I GENERAL	<p>ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01T</p>	30		
	<p>Unit-1 Kingdom Protista General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980)</p>	2	Lipan Paul	September'21- September'21
	<p>Unit-2 Phylum Porifera General character and classification up to classes; Canal System in Sycon</p>	2	Lipan Paul	September'21- November'21
	<p>Unit-3 Phylum Cnidaria General characters and classification up to classes</p>	1	Lipan Paul	November'21 1st week of January'22
	<p>Unit-4 Phylum Platyhelminthes General characters and classification up to classes; Life history of Taenia solium</p>	3	Lipan Paul	November'21-1st week of January'22

	Unit-5 Phylum Nematoda General characters and classification up to classes; Life history of <i>Ascaris lumbricoides</i>	3	Nandini Pal	September'21- September'21
	Unit-6 Phylum Annelida General characters and classification up to classes	1	Nandini Pal	September'21- September'21
	Unit-6 Phylum Annelida General characters and classification up to classes;	1	Nandini Pal	November'21- 1st week of January'22
	Unit 7 Phylum Arthropoda General characters and classification up to classes Metamorphosis in Insects	2	Nandini Pal	November'21- 1st week of January'22
	Unit-8 Phylum Mollusca General characters and classification up to classes; Respiration in Pila	2	Nandini Pal	November'21-1st week of January'22
	Unit-9 Phylum Echinodermata General characters and classification up to classes; Water-vascular system in Asterias	2	Dr. Paromita Bhattacharjee	November'21-1st week of January'21(1st Week)
	Unit-10 Protochordates General features	1	Lipan Paul	September'21- September'21
	Unit-11 Agnatha General features and classification up to classes (Young, 1981)	1	Nandini Pal	September'21- November'21
	Unit-12 Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	2	Dr. Paromita Bhattacharjee	November'21- Febraary'21
	Unit-13 Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	2	Dr. Paromita Bhattacharjee	September'21- November'21

	Unit-14 Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non poisonous snakes	2	Dr. Paromita Bhattacharjee	November'21- 1st week of January'22
	Unit-15 Aves General features and Classification up to orders (Young, 1981); Flight adaptations in	2	Dr. Paromita Bhattacharjee	September'21- November'21

	birds			
	Unit-16 Mammals Classification up to Subclasses (Young, 1981)	1	Lipan Paul	November'21-
	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01P	30	Dr.Paromita Bhattacharjee Nandini Pal	September'21- 1st week of January'22
SEM-III HONOURS	CHORDATES PAPER CODE: ZOOACOR05T	60		
	Unit 1: Introduction to Chordates General characteristics and outline classification of Phylum Chordata	4	Nirmal Das	September'21- September'21
	Unit 2: Protochordata General characteristics and classification of sub phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia Chordate Features and Feeding in Branchiostoma	8	Nandini Pal	September'21- October'21
	Unit 3: Origin of Chordata Dipleurula concept and the Echinoderm theory of origin of chordates Advanced features of vertebrates over Protochordata	5	Nandini Pal	October'21- October'21
	Unit 4: Agnatha General characteristics and classification of cyclostomes up to order	2	Nandini Pal	November'21
	Unit 5: Pisces General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses Accessory respiratory organ, Advanced features of vertebrates over Protochordata,migration and parental care in fishes Swim bladder in fishes. Classification up to Sub- Classes	10	Nandini Pal	November'21- October'21
	Unit 6: Amphibia General characteristics and classification up to living Orders Metamorphosis with parental care	5	Nirmal Das	September'21- September'21
	Unit 7: Reptilia General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	7	Nirmal Das	September'21- October'21

	<p align="center">Unit 8: Aves</p> <p>General characteristics and classification up to Sub Classes, Exoskeleton and migration in Birds, Principles and aerodynamics of flight</p>	7	Nirmal Das	October'21- November'21
	<p align="center">Unit 9: Mammals</p> <p>General characters and classification up to living orders, Phylogenetic significance of Prototheria Exoskeleton derivatives of mammals</p>	10	Nirmal Das	September'21- November'21-

	Adaptive radiation in mammals with reference to locomotory appendages Echolocation in Microchiropteransand Cetaceans			
	<p align="center">Unit 10: Zoogeography</p> <p>Zoogeographical realms, Plate tectonic and Continental drift theory, Distribution of birds and mammals in different realms</p>	2	Nirmal Das	January'22 (1st week)
	<p>CHORDATES LAB</p> <p>PAPER CODE: ZOOACOR05P</p>	60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
	<p>PHYSIOLOGY</p> <p>PAPER CODE: ZOOACOR06T</p>	60		
	<p align="center">Unit 1: Tissues</p> <p>Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues</p>	10	Nandini Pal	September'21- July20
	<p align="center">Unit 2: Bone and Cartilage</p> <p>Structure and types of bones and cartilages, Ossification</p>	5	Nandini Pal	October'21- November'21
	<p align="center">Unit 3: Nervous System</p> <p>Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and Neuromuscular junction, Reflex action and its types</p>	15	Lipan Paul	November'21- November'21
	<p align="center">Unit 4: Muscular system</p> <p>Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction, Characteristics of muscle fiber</p>	10	Lipan Paul	September'21- October'21

	<p align="center">Unit 5: Reproductive System Histology of testis and ovary; Physiology of Reproduction</p>	5	Lipan Paul	November'21- september'21
	<p align="center">Unit 6: Endocrine System Histology and function of pituitary,thyroid,Pancreas, and adrenal. Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non-steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system; Placental hormones</p>	15	Lipan Paul	September'21- December'21(1 st Week)
	<p>PHYSIOLOGY LAB PAPER CODE: ZOOACOR06T</p>	60	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of December
	<p>BIOCHEMISTRY PAPER CODE: ZOOACOR07T</p>	60		
	<p>Unit 1: Fundamentals of biochemical reactions and metabolism Ionization of water, weak acids and bases, buffering and pH changes in living systems,</p>	10	Dr. Manika Biswas	September'21- October'21

	<p>Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways Shuttle systems and membrane transporters;-ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms</p>		Dr. Manika Biswas	
	<p align="center">Unit 2: Carbohydrates Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosaccharides, Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis</p>	10	Dr. Manika Biswas	October'21- September'21

	<p align="center">Unit 3: Lipids</p> <p>Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpenoids. Lipid metabolism: β-oxidation of fatty acids; Fatty acid biosynthesis</p>	4	Dr. Manika Biswas	October'21- November'21
	<p align="center">Unit 4: Proteins</p> <p>Amino acids Structure, Classification, General and Electro chemical properties of α-amino acids; Physiological importance of essential and non essential amino acids Proteins Bonds stabilizing protein structure; Levels of organization, Protein metabolism: Transamination, Deamination, Urea cycle, Fate of C-skeleton of Glucogenic and Ketogenic amino acids</p>	1 4	Dr. Manika Biswas	September'21- November'21
	<p align="center">Unit 5: Nucleic Acids</p> <p>Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Types of DNA and RNA, Complementarity of DNA, Hypo-Hyperchromaticity of DNA Outlines of nucleotide metabolism</p>	4	Dr. Paromita Bhattacharjee	September'21- October'21
	<p align="center">Unit 6: Enzymes</p> <p>Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes, Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver- Burk plot; Factors affecting rate of enzyme-catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their kinetics; Strategy of enzyme action Catalytic and Regulatory (Basic concept with one example each)</p>	1 2	Dr. Manika Biswas	September'21- October'21
	<p align="center">Unit 7: Oxidative Phosphorylation</p> <p>Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System</p>	6	Dr. Paromita Bhattacharjee	November'21- December'21(1st week)

	<p>BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07T</p>	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of December
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	SEC: SERICULTURE	15	Nandini Pal	4 weeks in December'21
	SEC LAB: SERICULTURE	15	Nandini Pal	
SEM-III GENERAL	INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T	60		
	Unit-1 Introduction to Insects General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit	4	Nandini Pal	September'21-October'21
	Unit-2 Concept of Vectors Brief introduction to Vectors (mechanical and biological), Reservoirs, Host-vector relationship, Adaptations as vectors, Host specificity	6	Nandini Pal	September'21-October'21
	Unit-3 Insects as Vectors Detailed features of insect orders as vectors – Diptera, Siphonoptera, Siphunculata, Hemiptera	6	Nandini Pal	September'21-October'21
	Unit-4 Dipteran as Disease Vector Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies vectors Study of mosquito borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis Control of mosquitoes	16	Nandini Pal	September'21-December'21(1st Week)
	Unit-5 Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas	10	Nandini Pal	September'21-November'21
	Unit-6 Siphunculata as Disease Vectors Human louse (Head, Body and Pubic louse) as important insect vectors; Control of human louse	8	Nandini Pal	September'21-November'21
	Unit-7 Hemiptera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures	10	Nandini Pal	September'21-November'21
	INSECT VECTORE AND DISEASES PAPER CODE: ZOOGCOR03P	60	Nandini Pal	Acc. To Revised Syllabus 90% completed by end of December
SEM-V HONOURS	MOLECULAR BIOLOGY PAPER CODE: ZOOACOR11T	60		

	<p align="center">Unit 1: Nucleic Acids</p> <p align="center">Salient features of DNA and RNA Watson and Crick Model of DNA</p>	2	Dr.Paromita Bhattacharjee	September"21- September"21
	<p align="center">Unit 2: DNA Replication</p> <p align="center">Mechanism of DNA Replication in Prokaryotes, Semi-conservative, bidirectional and discontinuous Replication, RNA priming, Replication of telomeres</p>	6	Dr.Paromita Bhattacharjee	September"21- October"21
	<p align="center">Unit 3: Transcription</p> <p align="center">Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.</p>	8	Dr.Paromita Bhattacharjee	September"21- November"21

	<p align="center">Unit 4: Translation</p> <p align="center">Mechanism of protein synthesis in prokaryotes, Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation</p>	14	Dr.Paromita Bhattacharjee	September "21- November "21
	<p align="center">Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA</p> <p align="center">Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, Processing of tRNA</p>	10	Dr.Paromita Bhattacharjee	September "21- November "21
	<p align="center">Unit 6: Gene Regulation</p> <p align="center">Regulation of Transcription in prokaryotes: lac operon and trp operon; Regulation of Transcription in eukaryotes</p>	5	Dr.Paromita Bhattacharjee	September '21- October' 21
	<p align="center">Unit 7: DNA Repair Mechanisms</p> <p align="center">Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair</p>	9	Dr.Paromita Bhattacharjee	September "21- November "21
	<p align="center">Unit 8: Molecular Lab Techniques</p> <p align="center">PCR, Western and Southern blot, Northern Blot, Sanger DNA sequencing, cDNA technology</p>	5	Dr.Paromita Bhattacharjee	November "21- September '21

	MOLECULAR BIOLOGY LAB PAPER CODE: ZOOACOR11P	60	Dr.Paromita Bhattacharjee	Acc. To Revised Syllabus 90% completed by end of December
	GENETICS PAPER CODE: ZOOACOR12T	60		
	Unit 1: Mendelian Genetics and its Extension Background of Mendel's experiments Principles of Mendelian inheritance, Incomplete dominance and co-dominance, Epistasis, Multiple alleles, Lethal alleles, Pleiotropy, Sex-linked, sex- influenced and sex-limited inheritance, Polygenic Inheritance	12	Nirmal Das	September "21- October" 21
	Unit 3: Mutations 1.Types of gene mutations (Classification), Types of chromosomal aberrations (Classification with one suitable example of each), Chromosomal aberrations, gene mutations and human diseases (Down's, Klienfelter's, Turner's, Cri du Chat, Sickle cell, Haemophilia, Thallassimia, Albinism only genetical aspects here, details of physiological consequences not required), Sex chromosomes and sex-linked inheritance Non-disjunction and variation in chromosome number; Molecular basis of mutations in relation to UV light and chemical mutagen	12	Nirmal Das	November" 21- Sepetembe r'21

	Unit 4: Sex Determination Mechanisms of sex determination in Drosophila with reference to alternative splicing Sex determination in mammals, Dosage compensation in Drosophila & Human	12	Nirmal Das	October"20
	Unit 5: Extra-chromosomal Inheritance Criteria for extra chromosomal inheritance, Antibiotic resistance in Chlamyadomonas, Kappa particle in Paramoecium Shell spiralling in snail	8	Nirmal Das	September"21- October"21
	Unit 6: Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction, Complementation test in Bacteriophage	8	Nirmal Das	October"21- November"21
	Unit 7: Transposable Genetic Elements Transposons in bacteria, Ac-Ds elements in maize and P elements in	8	Nirmal Das	September"21- November"21

	Drosophila, LINE, SINE, Alu elements in humans			
	GENETICS LAB PAPER CODE: ZOOACOR12P	60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of December
	Animal behavior and Chronobiology PAPER CODE: ZOOADSEO1T	60		
	Unit 1: Introduction to animal behaviour	10	Lipan Paul	September'21
	Unit 2: Behaviours of Individuals	12	Lipan Paul	September'21-October'21
	Unit 3: Social and Sexual Behaviour	12	Lipan Paul	October'21-November'21
	Unit 4: Introduction to Chronology	16	Lipan Paul	September'21-October'21
	Unit 5: Biological Rhythm	10	Lipan Paul	October'21-November'21

concept of co-evolution, role of allochemicals in host plant mediation, Host-plant selection by phytophagous insects; Major insect pests in paddy (brief

	Animal behavior and Chronobiology LAB PAPER CODE: ZOADSE01P	60	Lipan Paul	Acc. To Revised Syllabus 90% completed by 1 st Week of January'22
	ENDOCRINOLOGY PAPER CODE: ZOADSE03T	60		
	Unit 1: Introduction to Endocrinology General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones Neurosecretions and Neurohormones	12	Dr. Manika Biswas	September'21- november'21
	Unit 2: Epiphysis, Hypothalamo-hypophysial Axis Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction; Structure and functions of hypothalamus and Hypothalamic nuclei, Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland, Hormones and their functions, Hypothalamo-hypophysial portal system, Disorders of pituitary gland.	18	Dr. Manika Biswas	September'21- November'21
	Unit 3: Peripheral Endocrine Glands Structure, Hormones, Functions and Regulation of Thyroid gland, Parathyroid, Adrenal, Pancreas, Ovary and Testis; Hormones in homeostasis, Disorders of endocrine glands	16	Dr. Manika Biswas	September'21- 1stWeek of december'21
	Unit 4: Regulation of Hormone Action Mechanism of action of steroidal, non-steroidal hormones with receptors Bioassays of hormones using ELISA and RIA; Estrous cycle in rat and menstrual cycle in human Multifaceted role of Vasopressin & Oxytocin; Hormonal regulation of parturition	14	Dr. Manika Biswas	September'21- 1stWeek of December'21
	ENDOCRINOLOGY LAB PAPER CODE: ZOADSE03P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by 1st week of January '22
SEM-V GENERAL	APPLIED ZOOLOGY PAPER CODE: ZOOGDSE01T	60		

	Unit-1 Introduction to Host-parasite Relationship Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	2	Nandini Pal	September'21- September'21
	Unit-2 Epidemiology of Diseases Transmission, Prevention and control of diseases: Tuberculosis, Typhoid	4	Nandini Pal	September'21- October'21
	Unit-3 Rickettsia and Spirochetes Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum	6	Nandini Pal	September'21- October'21
	Unit-4 Parasitic Protozoa Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense	8	Nandini Pal	September'21- November'21

	Unit-5 Parasitic Helminthes Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti	4	Nandini Pal	September'21- October'21
	Unit-6 Insects of Economic Importance Biology, Control and damage caused by Helicoverpa armigera, Pyrrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum	1 2	Nandini Pal	November'21- November'21
	Unit-7 Insects of Medical Importance Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis	8	Dr. Paromita Bhattacharjee	October'21- November'21
	Unit-8 Animal Husbandry Preservation of semen and artificial insemination in cattle	6	Dr. Paromita Bhattacharjee	September'21- October'21
	Unit-9 Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs Unit	6	Dr. Paromita Bhattacharjee	September November'21-
	Unit-10 Fish Technology Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	4	Dr. Paromita Bhattacharjee	October'21- November'21
	APPLIED ZOOLOGY LAB PAPER CODE: ZOOGDSE01P	6 0	Dr. Paromita Bhattacharjee Nandini Pal	Acc. To Revised Syllabus 90% completed by end of December

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

January/February 2022 - May/June 2022

2nd, 4th and 6th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-II HONOURS	Non-Chordates II Paper Code: ZOOACOR03T	30		
	Unit 1: Introduction to Coelomates Evolution of coelom and metamerism	3	Dr. Manika Biswas	2nd week February, 22
	Unit 2: Annelida General characteristics and Classification up to classes Excretion in Annelida	4	Dr. Manika Biswas	3 rd week February, 22
	Unit 3: Arthropoda General characteristics and Classification up to classes, Metamorphosis in Insects Social life in bees and termites	8	Dr. Manika Biswas	3 rd Week of February-3 rd week of May, 22
	Unit 4: Onychophora General characteristics	2	Dr. Manika Biswas	3 rd Week of February-3 rd week of May, 22
	Unit 5: Mollusca General characteristics and Classification up to classes Respiration in Mollusca Torsion and detorsion in Gastropoda	6	Dr. Manika Biswas	1 st week of February-3 rd week of February, 22
	Unit 6: Echinodermata General characteristics and Classification up to classes Water-vascular system in Asterozoa Larval forms in Echinodermata	4	Dr. Manika Biswas	4 th week of February – 1 st week of May, 22
	Unit 7: Hemichordata General characteristics of phylum Hemichordata. Phylogenetic relationship with non-chordates and chordates (only recent concept)	3	Dr. Manika Biswas	2 nd week of February- 4 th week of February, 22
	Non-Chordates II Lab Paper Code: ZOOACOR03P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 22
	CELL BIOLOGY PAPER CODE: ZOOACOR04T	30		
Unit 1: Overview of Cells Prokaryotic and Eukaryotic cells, Virus, Viroids	2	Nirmal Das	2nd week of February, 22	

	Unit 2: Plasma Membrane Various models of plasma membrane structure Transport across membranes: Active and Passive transport, facilitated transport, Cell junctions: Tight junctions, Desmosomes, Gap junctions	5	Nirmal Das	2 nd week of February-1 st week of May, 22
	Unit 3: Endomembrane System Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes	4	Nirmal Das	2 nd week May-end of May, 22
	Unit 4: Mitochondria and Peroxisomes Mitochondria: Structure, Semi-autonomous nature, Mitochondrial Respiratory Chain, Peroxisomes	4	Nirmal Das	2 nd week of May 3 rd week of May, 22

	Unit 5: Cytoskeleton Structure and Functions: Microtubules, Microfilaments and Intermediate filaments	2	Nirmal Das	1 st week of May, 22
	Unit 6: Nucleus Structure of Nucleus: Nuclear envelope, Nucleolus Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome)	4	Nirmal Das	2 nd week of February -end of February, 22
	Unit 7: Cell Division Mitosis and Meiosis Cell cycle and its regulation Mechanisms of cell death: brief overview	5	Nirmal Das	1 st week of May End of May, 22
	Unit 8: Cell Signaling Cell signalling transduction pathways; Types of signaling molecules and receptors GPCR and Role of second messenger (cAMP)	4	Nirmal Das	1 st week of May End of May, 22
	CELL BIOLOGY LAB PAPER CODE: ZOOACOR04P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 22
SEM-II GENERAL	PHYSIOLOGY AND BIOCHEMISTRY PAPER CODE: ZOOGCOR02T	30		
	Unit-1 Nerve and muscle 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	4	Lipan Paul	2 nd week of February-End of February, 22

Unit-2 Digestion Absorption of carbohydrates, proteins, lipids	2	Dr. Paromita Bhattacharjee	1st week of May, 22
Unit-3 Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	3	Lipan Paul	1 st week of February- End of February, 22
Unit-4 Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	3	Lipan Paul	1 st week of May End of May, 22
Unit-5 Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	3	Dr. Paromita Bhattacharjee	1 st week of February- End of February, 22
Unit-6 Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of thyroid, pancreas	4	Lipan Paul	1 st week of May 1 st week of May, 22
Unit 7 Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Electron transport chain	4	Dr. Paromita Bhattacharjee	1 st week of February- End of February, 22
Unit-8 Lipid: Structure and Metabolism Introduction to Lipids: Definitions; classes of lipids; β oxidation of palmitic acid	2	Dr. Paromita Bhattacharjee	1 st week of May, 22
Unit-9 Protein: Structure and metabolism	2	Dr. Paromita Bhattacharjee	1 st week of February, 22

Proteins and their biological functions, functions of amino acids; primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination.			
Unit-10 Enzymes 4 Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	2	Dr. Paromita Bhattacharjee	3 rd week of February, 22
PHYSIOLOGY AND BIOCHEMISTRY LAB PAPER CODE: ZOOGCOR02P	30	Dr. Paromita Bhattacharjee Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May, 22

SEM-IV HONOURS	COMPARATIVE ANATOMY PAPER CODE: ZOOACOR08T	30		
	Unit 1: Integumentary System- Structure, function and derivatives of integument in mammals	5	Lipan Paul	2nd week of February-End of February, 22
	Unit 2: Skeletal System, Jaw Suspension	2	Nirmal Das	1 st week of May, 22
	Unit 3: Digestive System- Comparative anatomy of stomach; dentition in mammals	4	Nirmal Das	2 nd week of February-3 rd week of February, 22
	Unit 4: Respiratory System- Respiratory organs in birds	4	Nirmal Das	4 th week of February- 2 nd week of May, 22
	Unit 5: Circulatory System- Comparative account of heart and aortic arches	4	Nirmal Das	2 nd week of February-3 rd week of February, 22
	Unit 6: Urinogenital System- Succession of kidney	3	Lipan Paul	3 rd week of February-1 st week of May, 22,
	Unit 7: Nervous System Comparative account of brain, Cranial nerves in mammals	4	Lipan Paul	2 nd week of February-End of February, 22
	Unit 8: Sense Organs Classification of receptors	4	Lipan Paul	1 st week of May 2 nd week of May, 22,
	COMPARATIVE ANATOMY LAB PAPER CODE: ZOOACOR08P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 22
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM PAPER CODE: ZOOACOR09T	30		
	Unit 1: Physiology of Digestion-Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins, Digestive enzyme	4	Dr. Paromita Bhattacharjee	2 nd week of May 3 rd week of May, 22
	Unit 2: Physiology of Respiration- Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it,	6	Dr. Manika Biswas	3 rd week of May, 22

	Unit 3: Physiology of Circulation- Components of Blood and their functions; Structure and functions of haemoglobin; Blood clotting system, Blood groups; ABO and Rh factor	4	Dr. Manika Biswas	2 nd week of February-3 rd week of February, 22
	Unit 4: Physiology of Heart- Structure of mammalian heart, Origin and conduction of cardiac impulses;	6	Dr. Paromita Bhattacharjee	4 th week of February-2 nd week of May, 22

	Cardiac Cycle and cardiac output; Blood pressure and its regulation			
	Unit 5: Thermoregulation & Osmoregulation Physiological classification based on thermal biology. Thermal biology of endotherms; Osmoregulation in aquatic vertebrates;	4	Dr. Manika Biswas	3 rd week of May, 22,
	Unit 6: Renal Physiology Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance	6	Dr. Paromita Bhattacharjee	1 st week of May 4 th week of May, 22
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM LAB PAPER CODE: ZOOACOR09T	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 22
	IMMUNOLOGY PAPER CODE: ZOOACOR10T	30		
	Unit 1: Overview of Immune System-Organs (Primary & Secondary lymphoid organs and its importance) and Cells of the Immune system	1	Nirmal Das	3 rd week of May, 22
	Unit 2: Innate and Adaptive Immunity Principle of Innate and Adaptive Immunity. • Components of innate immunity– Cellular mechanisms (phagocytes, NK cells, mast cells, eosinophils, inflammation [concept]) – Humoral mechanisms (complement, cytokines, chemokines etc. [concept]) • Components of adaptive immunity – Cellular mechanisms (Cell-Mediated Immune System (CMIS) or T- Cell Immunity [concept]) – Humoral	5	Nirmal Das	3 rd week of May 2 nd week of May, 22

	mechanisms (Formation of Plasma B cells and Memory B cells [concept])			
	Unit 3: Antigen, Antigen presentation & MHC Concept of Antigen, Immunogen, Allergen & Pathogen. Adjuvants and haptens, Factors influencing immunogenicity, Epitope. Types of Antigen Presenting Cells (APC), Co-stimulatory molecules on APC.	4	Nirmal Das	3 rd week of May End of May, 22,
	Unit 3: T Cell development Structure of T cell receptors, Co-stimulatory molecules on T cells, Central differentiation of T cells; T cell selection in thymus Peripheral differentiation of T cells; Th1 & Th2	4	Nirmal Das	1 st week of May 3 rd week of May, 22
	Unit 4: Immunoglobulins Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA and	4	Nirmal Das	2 nd week of May 4 th week of May, 22

	RIA), Hybridoma technology, Monoclonal antibody production			
	Unit 6: Cytokines & Chemokines Brief concept on types of Cytokines & Chemokines Cytokines (source & function of IL-1, IL-2, IL-4, IL-5, IL-6, IL 8, IL-10, IL-12, Interferons, Tumor Necrosis Factors, Tumor Growth Factors, GM-CSF, M-CSF).	4	Lipan Paul	End of May-2 nd week of May, 22
	Unit 7: Complement System Components and pathways of complement activation	2	Lipan Paul	End of May, 22
	Unit 8: Hypersensitivity Gell and Coombs' classification and brief description of various types of hypersensitivities.	2	Lipan Paul	End of May, 22
	Unit 9: Immunology of diseases Malaria, Dengue	2	Lipan Paul	2 nd week of May, 22,
	Unit 10: Vaccines Various types of vaccines. Active & passive immunization (Artificial and natural).	2	Lipan Paul	End of May, 22

	IMMUNOLOGY LAB PAPER CODE: ZOOACOR10T	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 22
SEM-IV GENERAL	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04T	30		
	Unit 1: Introduction Sources of Environmental hazards, Hazard identification and accounting, Fate of toxic and persistent substances in the environment, Dose response evaluation, Exposure assessment	8	Nandini Pal	2 nd week of February-End of May, 22
	Unit 2: Climate Change Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health	6	Nandini Pal	2 nd week February-end of May, 22
	Unit 3: Pollution Air, water pollution: sources and effects, Pollution control	8	Nandini Pal	2 nd week of February-End of May, 22
	Unit 4: Waste Management Technologies Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal.	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of May, 22
	Unit 5: Diseases Causes, symptoms and control of tuberculosis, Asthma, Cholera.	2	Dr. Paromita Bhattacharjee	2 nd week of February-4 th week of February, 22
	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04P	30	Nandini Pal	Acc. To Revised Syllabus 90% completed by end of May, 22
SEM-VI HONOURS	DEVELOPMENTAL BIOLOGY PAPER CODE: ZOOACOR13T	30		
	Unit 1: Introduction Basic concepts: Phases of Development, Cell-cell interaction, Differentiation and growth	4	Nirmal Das	2 nd week of February-3 rd week of February, 22

Unit 2: Early Embryonic Development Gametogenesis, Spermatogenesis, Oogenesis; Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy; Planes and patterns of cleavage; Types of Blastula; Fate maps (including Techniques); Early development of chick up to gastrulation; Embryonic induction and organizers	8	Nirmal Das	2 nd week of February-End of February, 22
Unit 3: Late Embryonic Development Fate of Germ Layers; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)	6	Nirmal Das	2 nd week of February-4 th week of February, 22
Unit 4: Post Embryonic Development Development of brain and Eye in Vertebrate	6	Lipan Paul	4 th week of February-2 nd week of May, 22
Unit 5: Implications of Developmental Biology Teratogenesis: Teratogenic agents and their effects on embryonic development; In vitro fertilization, Stem cell (ESC), Amniocentesis	6	Lipan Paul	4 th week of February-1 st week of May, 22
DEVELOPMENTAL BIOLOGY LAB PAPER CODE: ZOOACOR13P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 22
EVOLUTIONARY BIOLOGY PAPER CODE: ZOOACOR14T	30		
Unit 1: Origin of earliest life- Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes, three domains of life	2	Dr. Paromita Bhattacharjee	2 nd week of February, 22
Unit 2: Historical review of evolutionary concept-Pre Darwinian Concepts and theories including Lamarckism, Darwinian Theory Neo-Darwinian Synthesis	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of February, 22
Unit 3: Evidences in favour of Evolution-Fossil records: types of fossils, geological time scale, transitional forms:	2	Dr. Paromita Bhattacharjee	3 rd week of May, 22

	<p>Unit 5: Population genetics- Concept of Populations and calculation of allele frequencies in a population Hardy-Weinberg Law and equilibrium (derivations, applications of law to find gene and genotype frequencies in human Populations) Evolutionary forces disrupting H-W equilibrium Natural selection: Definition as the non-differential rate of reproductions and survivals of competing alleles, concept of fitness, selection coefficient, Types of natural selection with examples- Disrupting, Stabilizing, Directional. Genetic Drift- outline of its mechanism, basic concepts and examples of founder's effect, bottleneck phenomenon;</p>	8	Nirmal Das	1 st week of May End of May, 22
	<p>Unit 6: Products of evolution Inter-population variations: clines, races, Species concepts and modes of speciation (just outlines of Allopatric, Sympatric isolating mechanisms Adaptive radiations)</p>	5	Nandini Pal	2 nd week May-4 th week of May, 22

	<p>Unit 8: Origin and evolution of man-Unique hominin characteristics contrasted with primate characteristics (including social and cultural ones), Molecular evidences of human origin and migrations (brief outline)</p>	6	Nandini Pal	2 nd week of February-4 th week of February, 22
	<p>Unit 9: Molecular Phylogeny-Neutral theory of molecular evolution, molecular clock (brief introductions) Example of evolution in vertebrate globin genes</p>	4	Nandini Pal	End of February 1 st week of May, 22
	<p>EVOLUTIONARY BIOLOGY LAB PAPER CODE: ZOOACOR14P</p>	30	Nirmal Das	
	<p>FISH AND FISHERY PAPER CODE: ZOOADSEO4T</p>	30		
	<p>Unit 1: Introduction and Classification-Feeding habit, habitat and manner of reproduction Classification of fish (up to Subclasses) with important examples</p>	2	Lipan Paul	1 st week of May, 22
	<p>Unit 2: Morphology and Physiology Types of fins, Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in</p>	8	Lipan Paul	4 th week of May 2 nd week of May, 22

	Respiration, buoyancy, Bioluminescence			
	Unit 3: Fisheries Inland Fisheries; Marine Fisheries; Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal; Fishing crafts and Gears; Depletion of fishery resources; Application of remote sensing and GIS in fisheries;	8	Lipan Paul	1 st week of May 3 rd week of May, 22
	Unit 4: Aquaculture Sustainable Aquaculture; Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish, Fish diseases	10	Lipan Paul	End of May-3 rd week of May, 22
	Unit 5: Fish in research Transgenic fish	2	Lipan Paul	2 nd week of May, 22
	FISH AND FISHERYLAB PAPER CODE: ZOADSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May, 22
	Wild life and Conservation PAPER CODE: ZOADSE06T	30		
	Unit 1: Introduction to wild life Unit 2: Evaluation and management of wild life	5 12	Dr. Manika Biswas	4 th week of May, 22
	Unit 3: Management of habitats Unit 4: Population estimation	8 10	Dr. Manika Biswas	2 nd week of May End of May, 22

	Unit 5: Wild life conservation practice in India Unit 6: Management planning of wild life in protected areas	5 5	Dr. Manika Biswas	3 rd week of May End of May, 22
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	Unit 7: Man and wild life Unit 8: Protected areas	5 10	Dr. Manika Biswas	3 rd week of May end of May, 22
	Wild life and Conservation LAB PAPER CODE: ZOOADSE06P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 22
SEM-VI GENERAL	IMMUNOLOGY PAPER CODE: ZOOGDSE04T	30		
	Unit-1 Overview of the Immune System Introduction to basic concepts in immunology, components of immune system, principles of innate and adaptive immune system	4	Lipan Paul	2 nd week of February-End of February, 22
	Unit-2 Cells and Organs of the Immune System Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	4	Lipan Paul	2 nd week of February-End of February, 22
	Unit-3 Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	6	Lipan Paul	End of February end of May, 22
	Unit-4 Antibodies Structure, classes and function of antibodies, antigen antibody interactions as tools for research and diagnosis	4	Lipan Paul	2 nd week of February-End of February, 22
	Unit-5 Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing, Basic properties and functions of cytokines,	4	Nandini Pal	2 nd week of February-End of February, 22
	Unit-6 Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities, Introduction to concepts of autoimmunity and immunodeficiency	6	Nandini Pal Rupa Mukherjee	2 nd week of February-2 nd week of May, 22,
	Unit-7 Vaccines General introduction to vaccines, Types of vaccines	2	Nandini Pal	3 rd week of May 22,
	IMMUNOLOGY LAB PAPER CODE: ZOOGDSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May 22

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

July 2022- January 2023

1st, 3rd and 5th Semester

Semester	(Hons/General)	Syllabus		No. of Lecture (Hours)	Teacher Name	Distribution
		Module/ Unit	Topic			
SEM-I	HONOURS	Non-Chordates I Paper Code: ZOOACOR01T		30		
		Unit 1	Protista, Parazoa and Metazoa General characteristics and Classification up to classes, Study of <i>Paramoecium</i> Life cycle and pathogenicity of <i>Entamoeba histolytica</i> and <i>Plasmodium vivax</i>	6	Dr. Manika Biswas	September'22-November'22
		Unit 2	Porifera General characteristics and Classification up to classes Canal system and spicules in sponges	5	Dr. Manika Biswas	November'22-1st week of January'23
		Unit 3	Cnidaria General characteristics and Classification up to classes Polymorphism in Cnidaria Corals and coral reefs: types, formation, distribution, conservation significance	6	Dr. Manika Biswas	September'22-November'22
		Unit 4	Ctenophora General characteristics	2	Dr. Manika Biswas	November'22-November'22
		Unit 5	Platyhelminthes General characteristics and Classification up to classes, Life cycle and pathogenicity of <i>Fasciola hepatica</i> and <i>Taenia solium</i>	6	Dr. Manika Biswas	September'22-November'22
		Unit 6	Nemathelminthes General characteristics and Classification up to classes, Life cycle, and pathogenicity of <i>Ascaris lumbricoides</i> , Parasitic adaptations in helminths	5	Dr. Manika Biswas	November'22-1st week of January'23
		Non-Chordates I Lab Paper Code: ZOOACOR01P		30	Dr. Manika Biswas Rupa Mukherjee	September'22-1st week of January'23
		ECOLOGY PAPER CODE: ZOOACOR02T		30		
			Unit 1: Introduction to Ecology History of ecology, Autecology and synecology, Levels of organization, Laws of limiting factors, Study of Physical factors, The Biosphere.	6	Nandini Pal	September'22-November'22

			Unit 2: Population life tables, survivorship curves, exponential and logistic growth, r and K strategies Population regulation - density- dependent and independent factors	10	Lipan Paul	November'22-1st week of January'23
			Unit 3: Community Community characteristics: species diversity, abundance, dominance, richness, Ecotone, Ecological succession and example of it.	5	Lipan Paul	September'22-1st week of January'23
			Unit 4: Ecosystem Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Ecological pyramids and Ecological efficiencies	6	Nandini Pal	November'22-1st week of January'23
			Unit 5: Applied Ecology Wildlife Conservation (in-situ and ex-situ conservation). Wild life protection act (1972)	3	Nandini Pal	November'22-1st week of January'23
		ECOLOGY LAB PAPER CODE: ZOOACOR02P		30	Nirmal Das	September'22-1st week of January'23
	GENERAL	ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01T		30		
SEM-I		Unit-1	Kingdom Protista General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980)	2	Lipan Paul	September'22-September'22
		Unit-2	Phylum Porifera General character and classification up to classes; Canal System in Sycon	2	Lipan Paul	September'22-November'22
		Unit-3	Phylum Cnidaria General characters and classification up to classes	1	Lipan Paul	November'22 1st week of January'23
		Unit-4	Phylum Platyhelminthes General characters and classification up to classes; Life history of Taenia solium	3	Lipan Paul	November'22-1st week of January'23
		Unit-5	Phylum Nematoda General characters and classification up to classes; Life history of Ascaris lumbricoides	3	Lipan Paul	September'22-September'22
		Unit-6	Phylum Annelida General characters and classification up to classes	1	Nandini Pal	September'22-September'22
			Phylum Annelida General characters and classification up to classes;	1	Nandini Pal	November'22-1st week of January'23
		Unit 7	Phylum Arthropoda General characters and classification up to classes Metamorphosis in Insects	2	Nandini Pal	November'22-1st week of January'23

		Unit-8	Phylum Mollusca General characters and classification up to classes; Respiration in Pila	2	Rupa Mukherjee	November'22-1st week of January'23
		Unit-9	Phylum Echinodermata General characters and classification up to classes; Water-vascular system in Asterias	2	Rupa Mukherjee	November'22-1st week of January'22(1st Week)
		Unit-10	Protochordates General features	1	Rupa Mukherjee	September'22-September'22
		Unit-11	Agnatha General features and classification up to classes (Young, 1981)	1	Rupa Mukherjee	September'22-November'22
		Unit-12	Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	2	Rupa Mukherjee	November'22-February'22
		Unit-13	Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	2	Rupa Mukherjee	September'22-November'22
		Unit-14	Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non- poisonous snakes	2	Rupa Mukherjee	November'22-1st week of January'23
		Unit-15	Aves General features and Classification up to orders (Young, 1981); Flight adaptations in birds	2	Nandini Pal	September'22-November'22
		Unit-16	Mammals Classification up to Subclasses (Young, 1981)	1	Nandini Pal	November'22-
		ANIMAL DIVERSITY PAPER CODE: ZOOGCOR01P		30	Nandini Pal Rupa Mukherjee	September'22-1st week of January'23
SEM-III	HONOURS	CHORDATES PAPER CODE: ZOOACOR05T		60		
		Unit 1	Introduction to Chordates General characteristics and outline classification of Phylum Chordata	4	Nirmal Das	September'22-September'22
		Unit 2	Protochordata General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia Chordate Features and Feeding in Branchiostoma	8	Nandini Pal	September'22-October'22
		Unit 3	Origin of Chordata Dipleurula concept and the Echinoderm theory of origin of chordates Advanced features of vertebrates over Protochordata	5	Nandini Pal	October'22-October'22
		Unit 4	Agnatha General characteristics and	2	Nandini Pal	November'22

			classification of cyclostomes up to order			
		Unit 5	Pisces General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses Accessory respiratory organ, Advanced features of vertebrates over Protochordata, migration and parental care in fishes Swim bladder in fishes. Classification up to Sub-Classes	10	Nandini Pal	November"22-October"22
		Unit 6	Amphibia General characteristics and classification up to living Orders Metamorphosis with parental care	5	Nirmal Das	September"22-September"22
		Unit 7	Reptilia General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	7	Nirmal Das	September"22-October"22
		Unit 8	Aves General characteristics and classification up to Sub-Classes, Exoskeleton and migration in Birds, Principles and aerodynamics of flight	7	Nirmal Das	October"22-November"22
		Unit 9	Mammals General characters and classification up to living orders, Phylogenetic significance of Prototheria Exoskeleton derivatives of mammals Adaptive radiation in mammals with reference to locomotory appendages Echolocation in Microchiropterans and Cetaceans	10	Nirmal Das	September"22-November"22-
		Unit 10	Zoogeography Zoogeographical realms, Plate tectonic and Continental drift theory, Distribution of birds and mammals in different realms	2	Nirmal Das	January'23 (1st week)
		CHORDATES LAB PAPER CODE: ZOOACOR05P		60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
		PHYSIOLOGY PAPER CODE: ZOOACOR06T		60		
		Unit 1	Tissues Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues	10	Lipan Paul	September"22-July20
		Unit 2	Bone and Cartilage Structure and types of bones and cartilages, Ossification	5	Lipan Paul	October"22-November"22
		Unit 3	Nervous System	15	Lipan Paul	November"22-November"22

			Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and Neuromuscular junction, Reflex action and its types			
		Unit 4	Muscular system Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction, Characteristics of muscle fiber	10	Lipan Paul	September'22-October'22
		Unit 5	Reproductive System Histology of testis and ovary; Physiology of Reproduction	5	Lipan Paul	November'22-september'22
		Unit 6	Endocrine System Histology and function of pituitary, thyroid, Pancreas, and adrenal. Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non-steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system; Placental hormones	15	Lipan Paul	September'22-December'22(1st Week)
		PHYSIOLOGY LAB PAPER CODE: ZOOACOR06T		60	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of December
		BIOCHEMISTRY PAPER CODE: ZOOACOR07T		60		
		Unit 1	Fundamentals of biochemical reactions and metabolism Ionization of water, weak acids and bases, buffering and pH changes in living systems, Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways Shuttle systems and membrane transporters; ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms	10	Dr. Manika Biswas	September'22-October'22

		Unit 2	Carbohydrates Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosachharides, Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis	10	Dr. Manika Biswas	October'22-Sept ember'22
		Unit 3	Lipids Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. Lipid metabolism: β -oxidation of fatty acids; Fatty acid biosynthesis	4	Dr. Manika Biswas	October'22- November'22
		Unit 4	Proteins Amino acids Structure, Classification, General and Electro chemical properties of α -amino acids; Physiological importance of essential and non-essential amino acids Proteins Bonds stabilizing protein structure; Levels of organization, Protein metabolism: Transamination, Deamination, Urea cycle,-Fate of C-skeleton of Glucogenic and Ketogenic amino acids	14	Dr. Manika Biswas	September'22- N ovember'22
		Unit 5	Nucleic Acids Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Types of DNA and RNA, Complementarity of DNA,-Hypo-Hyperchromaticity of DNA Outlines of nucleotide metabolism	4	Dr. Manika Biswas	September'22- October'22
		Unit 6	Enzymes Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes, Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver- Burk plot; Factors affecting rate of enzyme-catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their kinetics;-Strategy of enzyme action- Catalytic and Regulatory (Basic concept with one example	12	Dr.Paromita Bhattacharjee	September'22- October'22

			each)			
		Unit 7	Oxidative Phosphorylation Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System	6	Dr.Paromita Bhattacharjee	November'22-December'22(1st week)
		BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07T		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of December
		SEC: SERICULTURE		15	Nandini Pal	4 weeks in December' 22
		SEC LAB: SERICULTURE		15	Nandini Pal	
SEM-III	GENERAL	INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T		60		
		Unit-1	Introduction to Insects General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit	4	Lipan Paul	September'22-October'22
		Unit-2	Concept of Vectors Brief introduction to Vectors (mechanical and biological), Reservoirs, Host-vector relationship, Adaptations as vectors, Host specificity	6	Rupa Mukherjee	September'22-October'22
		Unit-3	Insects as Vectors Detailed features of insect orders as vectors – Diptera, Siphonoptera, Siphunculata, Hemiptera	6	Rupa Mukherjee	September'22-October'22
		Unit-4	Dipteran as Disease Vector Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies vectors Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis Control of mosquitoes	16	Nandini Pal	September'22-December'22(1st Week)
		Unit-5	Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas	10	Nandini Pal	September'22- November'22
		Unit-6	Siphunculata as Disease Vectors Human louse (Head, Body and Pubic louse) as important insect vectors; Control of human louse	8	Nandini Pal	September'22- November'22
		Unit-7	Hemiptera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures	10	Nandini Pal	September'22- November'22
		INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03P		60	Nandini Pal Rupa Mukherjee	Acc. To Revised Syllabus 90% completed by end of December

SEM-V	HONOURS	MOLECULAR BIOLOGY PAPER CODE: ZOOACOR11T		60		
		Unit 1	Nucleic Acids Salient features of DNA and RNA Watson and Crick Model of DNA	2	Dr. Paromita Bhattacharjee	September'22- September'22
		Unit 2	DNA Replication Mechanism of DNA Replication in Prokaryotes, Semi-conservative, bidirectional and discontinuous Replication, RNA priming, Replication of telomeres	6	Dr. Paromita Bhattacharjee	September'22- October'22
		Unit 3	Transcription Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.	8	Dr. Paromita Bhattacharjee	September'22- November'22
		Unit 4	Translation Mechanism of protein synthesis in prokaryotes, Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation	14	Dr. Paromita Bhattacharjee	September'22- November'22
		Unit 5	Post Transcriptional Modifications and Processing of Eukaryotic RNA Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, Processing of tRNA	10	Dr. Paromita Bhattacharjee	September'22- November'22
		Unit 6	Gene Regulation Regulation of Transcription in prokaryotes: lac operon and trp operon; Regulation of Transcription in eukaryotes	5	Dr. Paromita Bhattacharjee	September'22- October'22
		Unit 7	DNA Repair Mechanisms Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair	9	Dr. Paromita Bhattacharjee	September'22- November'22
		Unit 8	Molecular Lab Techniques PCR, Western and Southern blot, Northern Blot, Sanger DNA sequencing, cDNA technology	5	Dr. Paromita Bhattacharjee	November'22- September'22
			MOLECULAR BIOLOGY LAB PAPER CODE: ZOOACOR11P		60	Dr. Paromita Bhattacharjee

		GENETICS PAPER CODE: ZOOACOR12T		60	
		Unit 1	Mendelian Genetics and its Extension Background of Mendel's experiments Principles of Mendelian inheritance, Incomplete dominance and co-dominance, Epistasis, Multiple alleles, Lethal alleles, Pleiotropy, Sex-linked, sex- influenced and sex-limited inheritance, Polygenic Inheritance	12	Nirmal Das September"22-O ctober"22
		Unit 3	Mutations 1.Types of gene mutations (Classification), Types of chromosomal aberrations (Classification with one suitable example of each), Chromosomal aberrations, gene mutations and human diseases (Down's, Klienfelter's, Turner's, Cri du Chat, Sickle cell, Haemophilia, Thallassimia, Albinism only genetical aspects here, details of physiological consequences not required), Sex chromosomes and sex-linked inheritance Non-disjunction and variation in chromosome number; Molecular basis of mutations in relation to UV light and chemical mutagen	12	Nirmal Das November"22-Se petember"22
		Unit 4	Sex Determination Mechanisms of sex determination in Drosophila with reference to alternative splicing Sex determination in mammals,- Dosage compensation in Drosophila & Human	12	Nirmal Das October"20
		Unit 5	Extra-chromosomal Inheritance Criteria for extra chromosomal inheritance, Antibiotic resistance in Chlamyadomonas, Kappa particle in Paramoecium Shell spiralling in snail	8	Nirmal Das September"22-O ctober"22
		Unit 6	Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction, Complementation test in Bacteriophage	8	Nirmal Das October"22-Nove mber"22
		Unit 7	Transposable Genetic Elements Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila, LINE, SINE, Alu elements in humans	8	Nirmal Das September"22-N ovember"22
		GENETICS LAB PAPER CODE: ZOOACOR12P		60	Nirmal Das Acc. To Revised Syllabus 90% completed by end of December

		Animal Behaviour and Chronobiology PAPER CODE: ZOOADSE01T		60		
		Unit 1	Introduction to animal behavior	12	Dr. Manika Biswas	September'22
		Unit 2	Behaviours of Individuals	4	Dr. Manika Biswas	September'22-October'22
		Unit 3	Social and Sexual Behaviour	12	Dr. Manika Biswas	October'22-November'22
		Unit 4	Introduction to Chronobiology	16	Dr. Manika Biswas	September'22-October'22
		Unit 5	Biological Rhythm	16	Dr. Manika Biswas	October'22-November'22

		Animal Behaviour and Chronobiology LAB PAPER CODE: ZOOADSE01P		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by 1 st Week of January'23
		ENDOCRINOLOGY PAPER CODE: ZOOADSE03T		60		
		Unit 1	Introduction to Endocrinology General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones Neurosecretions and Neurohormones	12	Dr. Manika Biswas	September'22-no vember'22
		Unit 2	Epiphysis, Hypothalamo-hypophysial Axis Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction; Structure and functions of hypothalamus and Hypothalamic nuclei, Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland, Hormones and their functions, Hypothalamo-hypophysial portal system, Disorders of pituitary gland.	18	Dr. Manika Biswas	September'22-No vember'22
		Unit 3	Peripheral Endocrine Glands Structure, Hormones, Functions and Regulation of Thyroid gland, Parathyroid, Adrenal, Pancreas, Ovary and Testis; Hormones in homeostasis, Disorders of endocrine glands	16	Nirmal Das	September'22-1s tWeek of december'22
		Unit 4	Regulation of Hormone Action Mechanism of action of steroidal, non-steroidal hormones with receptors Bioassays of hormones using ELISA and RIA; Estrous cycle in rat and menstrual cycle in human Multifaceted role of Vasopressin & Oxytocin; Hormonal regulation of parturition	14	Nirmal Das	September'22-1s tWeek of December'22
		ENDOCRINOLOGY LAB PAPER CODE: ZOOADSE03P		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by 1st week of January '23
SEM-V	GENERAL	APPLIED ZOOLOGY PAPER CODE: ZOOGDSE01T		60		
		Unit-1	Introduction to Host-parasite Relationship Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	2	Nandini Pal	September'22-September'22
		Unit-2	Epidemiology of Diseases Transmission, Prevention and control of diseases: Tuberculosis, Typhoid	4	Nandini Pal	September'22-October'22

		Unit-3	Rickettsia and Spirochetes Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum	6	Nandini Pal	September'22- October'22
		Unit-4	Parasitic Protozoa Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense	8	Rupa Mukherjee	September'22- November'22
		Unit-5	Parasitic Helminthes Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti	4	Rupa Mukherjee	September'22- October'22
		Unit-6	Insects of Economic Importance Biology, Control and damage caused by Helicoverpa armigera, Pyrrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum	12	Rupa Mukherjee	November'22- November'22
		Unit-7	Insects of Medical Importance Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis	8	Nandini Pal	October'22- November'22
		Unit-8	Animal Husbandry Preservation of semen and artificial insemination in cattle	6	Dr. Paromita Bhattacharjee	September'22- October'22
		Unit-9	Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs Unit	6	Dr. Paromita Bhattacharjee	September- November'22-
		Unit-10	Fish Technology Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	4	Dr. Paromita Bhattacharjee	October'22- November'22
		APPLIED ZOOLOGY LAB PAPER CODE: ZOOGDSE01P		60	Nandini Pal Rupa Mukherjee	Acc. To Revised Syllabus 90% completed by end of December

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

January/February 2023 - May/June 2023

2nd, 4th and 6th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-II HONOURS	Non-Chordates II Paper Code: ZOOACOR03T	30		
	Unit 1: Introduction to Coelomates Evolution of coelom and metamerism	3	Dr. Manika Biswas	2nd week February, 23
	Unit 2: Annelida General characteristics and Classification up to classes Excretion in Annelida	4	Dr. Manika Biswas	3 rd week February, 23
	Unit 3: Arthropoda General characteristics and Classification up to classes, Metamorphosis in Insects Social life in bees and termites	8	Dr. Manika Biswas	3 rd Week of February-3 rd week of May, 23
	Unit 4: Onychophora General characteristics	2	Dr. Manika Biswas	3 rd Week of February-3 rd week of May, 23
	Unit 5: Mollusca General characteristics and Classification up to classes Respiration in Mollusca Torsion and detorsion in Gastropoda	6	Dr. Manika Biswas	1 st week of February-3 rd week of February, 23
	Unit 6: Echinodermata General characteristics and Classification up to classes Water-vascular system in Asteroidea Larval forms in Echinodermata	4	Dr. Manika Biswas	4 th week of February – 1 st week of May, 23
	Unit 7: Hemichordata General characteristics of phylum Hemichordata. Phylogenetic relationship with non-chordates and chordates (only recent concept)	3	Dr. Manika Biswas	2 nd week of February- 4 th week of February, 23
	Non-Chordates II Lab Paper Code: ZOOACOR03P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 23
	CELL BIOLOGY PAPER CODE: ZOOACOR04T	30		
Unit 1: Overview of Cells Prokaryotic and Eukaryotic cells, Virus, Viroids	2	Nirmal Das	2nd week of February, 23	

	Unit 2: Plasma Membrane Various models of plasma membrane structure Transport across membranes: Active and Passive transport, facilitated transport, Cell junctions: Tight junctions, Desmosomes, Gap junctions	5	Nirmal Das	2 nd week of February-1 st week of May, 23
	Unit 3: Endomembrane System Structure and Functions: Endoplasmic Reticulum, Golgi Apparatus, Lysosomes	4	Nirmal Das	2 nd week May-end of May, 23
	Unit 4: Mitochondria and Peroxisomes Mitochondria: Structure, Semi-autonomous nature, Mitochondrial Respiratory Chain, Peroxisomes	4	Nirmal Das	2 nd week of May 3 rd week of May, 23

	Unit 5: Cytoskeleton Structure and Functions: Microtubules, Microfilaments and Intermediate filaments	2	Nirmal Das	1 st week of May, 23
	Unit 6: Nucleus Structure of Nucleus: Nuclear envelope, Nucleolus Chromatin: Euchromatin and Heterochromatin and packaging (nucleosome)	4	Nirmal Das	2 nd week of February -end of February, 23
	Unit 7: Cell Division Mitosis and Meiosis Cell cycle and its regulation Mechanisms of cell death: brief overview	5	Nirmal Das	1 st week of May End of May, 23
	Unit 8: Cell Signaling Cell signalling transduction pathways; Types of signaling molecules and receptors GPCR and Role of second messenger (cAMP)	4	Nirmal Das	1 st week of May End of May, 23
	CELL BIOLOGY LAB PAPER CODE: ZOOACOR04P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 23
SEM-II GENERAL	PHYSIOLOGY AND BIOCHEMISTRY PAPER CODE: ZOOGCOR02T	30		
	Unit-1 Nerve and muscle 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated and non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	4	Lipan Paul	2 nd week of February-End of February, 23

Unit-2 Digestion Absorption of carbohydrates, proteins, lipids	2	Dr. Paromita Bhattacharjee	1st week of May, 23
Unit-3 Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	3	Lipan Paul	1 st week of February- End of February, 23
Unit-4 Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	3	Lipan Paul	1 st week of May End of May, 23
Unit-5 Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	3	Dr. Paromita Bhattacharjee	1 st week of February- End of February, 23
Unit-6 Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of thyroid, pancreas	4	Lipan Paul	1 st week of May 1 st week of May, 23
Unit 7 Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Electron transport chain	4	Dr. Paromita Bhattacharjee	1 st week of February- End of February, 23
Unit-8 Lipid: Structure and Metabolism Introduction to Lipids: Definitions; classes of lipids; β oxidation of palmitic acid	2	Dr. Paromita Bhattacharjee	1 st week of May, 23
Unit-9 Protein: Structure and metabolism	2	Dr. Paromita Bhattacharjee	1 st week of February, 23

Proteins and their biological functions, functions of amino acids; primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination.			
Unit-10 Enzymes 4 Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	2	Dr. Paromita Bhattacharjee	3 rd week of February, 23
PHYSIOLOGY AND BIOCHEMISTRY LAB PAPER CODE: ZOOGCOR02P	30	Dr. Paromita Bhattacharjee Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May, 23

SEM-IV HONOURS	COMPARATIVE ANATOMY PAPER CODE: ZOOACOR08T	30		
	Unit 1: Integumentary System- Structure, function and derivatives of integument in mammals	5	Lipan Paul	2nd week of February-End of February, 23
	Unit 2: Skeletal System, Jaw Suspension	2	Nirmal Das	1 st week of May, 23
	Unit 3: Digestive System- Comparative anatomy of stomach; dentition in mammals	4	Nirmal Das	2 nd week of February-3 rd week of February, 23
	Unit 4: Respiratory System- Respiratory organs in birds	4	Nirmal Das	4 th week of February- 2 nd week of May, 23
	Unit 5: Circulatory System- Comparative account of heart and aortic arches	4	Nirmal Das	2 nd week of February-3 rd week of February, 23
	Unit 6: Urinogenital System- Succession of kidney	3	Lipan Paul	3 rd week of February-1 st week of May, 23
	Unit 7: Nervous System Comparative account of brain, Cranial nerves in mammals	4	Lipan Paul	2 nd week of February-End of February, 23
	Unit 8: Sense Organs Classification of receptors	4	Lipan Paul	1 st week of May 2 nd week of May, 23,
	COMPARATIVE ANATOMY LAB PAPER CODE: ZOOACOR08P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 23
	PHYSIOLOGY: LIFE SUSTANING SYSTEM PAPER CODE: ZOOACOR09T	30		
	Unit 1: Physiology of Digestion-Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins, Digestive enzyme	4	Dr. Paromita Bhattacharjee	2 nd week of May 3 rd week of May, 23
Unit 2: Physiology of Respiration- Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it,	6	Dr. Manika Biswas	3 rd week of May, 23	

	Unit 3: Physiology of Circulation- Components of Blood and their functions; Structure and functions of haemoglobin; Blood clotting system, Blood groups; ABO and Rh factor	4	Dr. Manika Biswas	2 nd week of February-3 rd week of February, 23
	Unit 4: Physiology of Heart- Structure of mammalian heart, Origin and conduction of cardiac impulses;	6	Dr. Paromita Bhattacharjee	4 th week of February-2 nd week of May, 23

	Cardiac Cycle and cardiac output; Blood pressure and its regulation			
	Unit 5: Thermoregulation & Osmoregulation Physiological classification based on thermal biology. Thermal biology of endotherms; Osmoregulation in aquatic vertebrates;	4	Dr. Manika Biswas	3 rd week of May, 23
	Unit 6: Renal Physiology Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance	6	Dr. Paromita Bhattacharjee	1 st week of May 4 th week of May, 23
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM LAB PAPER CODE: ZOOACOR09T	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 23
	IMMUNOLOGY PAPER CODE: ZOOACOR10T	30		
	Unit 1: Overview of Immune System-Organs (Primary & Secondary lymphoid organs and its importance) and Cells of the Immune system	1	Nirmal Das	3 rd week of May, 23
	Unit 2: Innate and Adaptive Immunity Principle of Innate and Adaptive Immunity. • Components of innate immunity– Cellular mechanisms (phagocytes, NK cells, mast cells, eosinophils, inflammation [concept]) – Humoral mechanisms (complement, cytokines, chemokines etc. [concept]) • Components of adaptive immunity – Cellular mechanisms (Cell-Mediated Immune System (CMIS) or T- Cell Immunity [concept]) – Humoral	5	Nirmal Das	3 rd week of May 2 nd week of May, 23

	mechanisms (Formation of Plasma B cells and Memory B cells [concept])			
	Unit 3: Antigen, Antigen presentation & MHC Concept of Antigen, Immunogen, Allergen & Pathogen. Adjuvants and haptens, Factors influencing immunogenicity, Epitope. Types of Antigen Presenting Cells (APC), Co-stimulatory molecules on APC.	4	Nirmal Das	3 rd week of May End of May, 23
	Unit 3: T Cell development Structure of T cell receptors, Co-stimulatory molecules on T cells, Central differentiation of T cells; T cell selection in thymus Peripheral differentiation of T cells; Th1 & Th2	4	Nirmal Das	1 st week of May 3 rd week of May, 23
	Unit 4: Immunoglobulins Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA and	4	Nirmal Das	2 nd week of May 4 th week of May, 23

	RIA), Hybridoma technology, Monoclonal antibody production			
	Unit 6: Cytokines & Chemokines Brief concept on types of Cytokines & Chemokines Cytokines (source & function of IL-1, IL-2, IL-4, IL-5, IL-6, IL 8, IL-10, IL-12, Interferons, Tumor Necrosis Factors, Tumor Growth Factors, GM-CSF, M-CSF).	4	Lipan Paul	End of May-2 nd week of May, 23
	Unit 7: Complement System Components and pathways of complement activation	2	Lipan Paul	End of May, 23
	Unit 8: Hypersensitivity Gell and Coombs' classification and brief description of various types of hypersensitivities.	2	Lipan Paul	End of May, 23
	Unit 9: Immunology of diseases Malaria, Dengue	2	Nandini Pal	2 nd week of May, 23
	Unit 10: Vaccines Various types of vaccines. Active & passive immunization (Artificial and natural).	2	Nandini Pal	End of May, 23

	IMMUNOLOGY LAB PAPER CODE: ZOOACOR10T	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 23
SEM-IV GENERAL	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04T	30		
	Unit 1: Introduction Sources of Environmental hazards, Hazard identification and accounting, Fate of toxic and persistent substances in the environment, Dose response evaluation, Exposure assessment	8	Nandini Pal	2 nd week of February-End of May, 23
	Unit 2: Climate Change Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health	6	Nandini Pal	2 nd week February-end of May, 23
	Unit 3: Pollution Air, water pollution: sources and effects, Pollution control	8	Nandini Pal	2 nd week of February-End of May, 23
	Unit 4: Waste Management Technologies Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal.	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of May, 23
	Unit 5: Diseases Causes, symptoms and control of tuberculosis, Asthma, Cholera.	2	Dr. Paromita Bhattacharjee	2 nd week of February-4 th week of February, 23
	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04P	30	Nandini Pal	Acc. To Revised Syllabus 90% completed by end of May, 23
SEM-VI HONOURS	DEVELOPMENTAL BIOLOGY PAPER CODE: ZOOACOR13T	30		
	Unit 1: Introduction Basic concepts: Phases of Development, Cell-cell interaction, Differentiation and growth	4	Nirmal Das	2 nd week of February-3 rd week of February, 23

Unit 2: Early Embryonic Development Gametogenesis, Spermatogenesis, Oogenesis; Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy; Planes and patterns of cleavage; Types of Blastula; Fate maps (including Techniques); Early development of chick up to gastrulation; Embryonic induction and organizers	8	Nirmal Das	2 nd week of February-End of February, 23
Unit 3: Late Embryonic Development Fate of Germ Layers; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)	6	Nirmal Das	2 nd week of February-4 th week of February, 23
Unit 4: Post Embryonic Development Development of brain and Eye in Vertebrate	6	Lipan Paul	4 th week of February-2 nd week of May, 23
Unit 5: Implications of Developmental Biology Teratogenesis: Teratogenic agents and their effects on embryonic development; In vitro fertilization, Stem cell (ESC), Amniocentesis	6	Lipan Paul	4 th week of February-1 st week of May, 23
DEVELOPMENTAL BIOLOGY LAB PAPER CODE: ZOOACOR13P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May, 23
EVOLUTIONARY BIOLOGY PAPER CODE: ZOOACOR14T	30		
Unit 1: Origin of earliest life- Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes, three domains of life	2	Dr. Paromita Bhattacharjee	2 nd week of February, 23
Unit 2: Historical review of evolutionary concept-Pre Darwinian Concepts and theories including Lamarckism, Darwinian Theory Neo-Darwinian Synthesis	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of February, 23
Unit 3: Evidences in favour of Evolution-Fossil records: types of fossils, geological time scale, transitional forms:	2	Dr. Paromita Bhattacharjee	3 rd week of May, 23

	<p>Unit 5: Population genetics- Concept of Populations and calculation of allele frequencies in a population Hardy-Weinberg Law and equilibrium (derivations, applications of law to find gene and genotype frequencies in human Populations) Evolutionary forces disrupting H-W equilibrium Natural selection: Definition as the non-differential rate of reproductions and survivals of competing alleles, concept of fitness, selection coefficient, Types of natural selection with examples- Disrupting, Stabilizing, Directional. Genetic Drift- outline of its mechanism, basic concepts and examples of founder's effect, bottleneck phenomenon;</p>	8	Nirmal Das	1 st week of May End of May, 23
	<p>Unit 6: Products of evolution Inter-population variations: clines, races, Species concepts and modes of speciation (just outlines of Allopatric, Sympatric isolating mechanisms Adaptive radiations)</p>	5	Nandini Pal	2 nd week May-4 th week of May, 23

	<p>Unit 8: Origin and evolution of man-Unique hominin characteristics contrasted with primate characteristics (including social and cultural ones), Molecular evidences of human origin and migrations (brief outline)</p>	6	Nandini Pal	2 nd week of February-4 th week of February, 23
	<p>Unit 9: Molecular Phylogeny-Neutral theory of molecular evolution, molecular clock (brief introductions) Example of evolution in vertebrate globin genes</p>	4	Nandini Pal	End of February 1 st week of May, 23
	<p>EVOLUTIONARY BIOLOGY LAB PAPER CODE: ZOOACOR14P</p>	30	Nirmal Das	
	<p>FISH AND FISHERY PAPER CODE: ZOOADSEO4T</p>	30		
	<p>Unit 1: Introduction and Classification-Feeding habit, habitat and manner of reproduction Classification of fish (up to Subclasses) with important examples</p>	2	Lipan Paul	1 st week of May, 23
	<p>Unit 2: Morphology and Physiology Types of fins, Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in</p>	8	Lipan Paul	4 th week of May 2 nd week of May, 23

	Respiration, buoyancy, Bioluminescence			
	Unit 3: Fisheries Inland Fisheries; Marine Fisheries; Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal; Fishing crafts and Gears; Depletion of fishery resources; Application of remote sensing and GIS in fisheries;	8	Lipan Paul	1 st week of May 3 rd week of May, 23
	Unit 4: Aquaculture Sustainable Aquaculture; Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish, Fish diseases	10	Lipan Paul	End of May-3 rd week of May, 23
	Unit 5: Fish in research Transgenic fish	2	Lipan Paul	2 nd week of May, 23
	FISH AND FISHERYLAB PAPER CODE: ZOADSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May, 23
	Wild life and Conservation PAPER CODE: ZOADSE06T	30		
	Unit 1: Introduction to wild life Unit 2: Evaluation and management of wild life	5 12	Dr. Manika Biswas	4 th week of May, 23
	Unit 3: Management of habitats Unit 4: Population estimation	8 10	Dr. Manika Biswas	2 nd week of May End of May, 23

	Unit 5: Wild life conservation practice in India Unit 6: Management planning of wild life in protected areas	5 5	Dr. Manika Biswas	3 rd week of May End of May, 23
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	Unit 7: Man and wild life Unit 8: Protected areas	5 10	Dr. Manika Biswas	3 rd week of May end of May, 23
	Wild life and Conservation LAB PAPER CODE: ZOOADSE06P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 23
SEM-VI GENERAL	IMMUNOLOGY PAPER CODE: ZOOGDSE04T	30		
	Unit-1 Overview of the Immune System Introduction to basic concepts in immunology, components of immune system, principles of innate and adaptive immune system	4	Lipan Paul	2 nd week of February-End of February, 23
	Unit-2 Cells and Organs of the Immune System Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	4	Lipan Paul	2 nd week of February-End of February, 23
	Unit-3 Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	6	Lipan Paul	End of February end of May, 23
	Unit-4 Antibodies Structure, classes and function of antibodies, antigen antibody interactions as tools for research and diagnosis	4	Lipan Paul	2 nd week of February-End of February, 23
	Unit-5 Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing, Basic properties and functions of cytokines,	4	Nandini Pal	2 nd week of February-End of February, 23
	Unit-6 Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities, Introduction to concepts of autoimmunity and immunodeficiency	6	Nandini Pal Rupa Mukherjee	2 nd week of February-2 nd week of May, 23
	Unit-7 Vaccines General introduction to vaccines, Types of vaccines	2	Nandini Pal	3 rd week of May 23
	IMMUNOLOGY LAB PAPER CODE: ZOOGDSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May 23

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

July 2023- January 2024

NEP + CBCS Syllabus
Distribution

1st, 3rd and 5th Semester

Semester	(Hons/General)	Syllabus		No. of Lecture (Hours)	Teacher Name	Distribution
		Module/ Unit	Topic			
SEM-I (NEP)	HONOURS	Non-Chordates I Paper Code: ZOODSC101T (DS-1)		45		
		Unit 1	General introduction to Protista and Metazoa	15	Dr. Manika Biswas	September'23- November'23
		Unit 2	Porifera	6	Dr. Manika Biswas	November'23-1st week of January'24
		Unit 3	Cnidaria	5	Dr. Manika Biswas	September'23- November'23
		Unit 4	Ctenophora	3	Nirmal Das	November'23- November'23
		Unit 5	Platyhelminthes	6	Nirmal Das	September'23- November'23
		Unit 6	Nemathelminthes	10	Nirmal Das	November'23-1st week of January'24
		Non-Chordates I Lab Paper Code: ZOODSC101P		30	Dr. Manika Biswas Nirmal Das	September'23-1st week of January'24
		SEC PAPER	FISHERY	30	Lipan Paul	September 23 to 1 st week of January 24

	GENERAL	ANIMAL DIVERSITY PAPER CODE: ZOOCOR101T/ ZOOMIN101T		45	
SEM-I (NEP)		Unit-1	Kingdom Protista General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980)	3	Lipan Paul September'23-September'23
		Unit-2	Phylum Porifera General character and classification up to classes; Canal System in Sycon	3	Lipan Paul September'23- November'23
		Unit-3	Phylum Cnidaria General characters and classification up to classes	3	Lipan Paul November'23 1st week of January'24
		Unit-4	Phylum Platyhelminthes General characters and classification up to classes; Life history of Taenia solium	3	Lipan Paul November'23-1st week of January'24
		Unit-5	Phylum Nematoda General characters and classification up to classes; Life history of Ascaris lumbricoides	3	Lipan Paul September'23-September'23
		Unit-6	Phylum Annelida General characters and classification up to classes	3	Nandini Pal September'23-September'23
		Unit 7	Phylum Arthropoda General characters and classification up to classes Metamorphosis in Insects	5	Nandini Pal November'23-1st week of January'24

		Unit-8	Phylum Mollusca General characters and classification up to classes; Respiration in Pila	3	Rupa Mukherjee	November'23-1st week of January'24
		Unit-9	Phylum Echinodermata General characters and classification up to classes; Water-vascular system in Asterias	4	Rupa Mukherjee	November'23-1st week of January'24(1st Week)
		Unit-10	Protochordates General features	2	Rupa Mukherjee	September'23-September'23
		Unit-11	Agnatha General features and classification up to classes (Young, 1981)	2	Rupa Mukherjee	September'23-November'23
		Unit-12	Pisces General features and Classification up to Subclasses (Romer, 1959); Osmoregulation in Fishes	3	Rupa Mukherjee	November'23
		Unit-13	Amphibia General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad	3	Rupa Mukherjee	September'23-November'23
		Unit-14	Reptiles General features and Classification up to living Subclass (Young, 1981); Poisonous and non- poisonous snakes	4	Rupa Mukherjee	November'23-1st week of January'24
		Unit-15	Aves General features and Classification up to orders (Young, 1981); Flight adaptations in birds	3	Nandini Pal	September'23-November'23
		Unit-16	Mammals Classification up to Subclasses (Young, 1981)	3	Nandini Pal	November'23
		ANIMAL DIVERSITY PAPER CODE: ZOOCOR101P /ZOOMIN101P		30	Nandini Pal Rupa Mukherjee Dr. Paromita Bhattacharjee	September'23-1st week of January'24
SEM-III (CBCS)	HONOURS	CHORDATES PAPER CODE: ZOOACOR05T		60		
		Unit 1	Introduction to Chordates General characteristics and outline classification of Phylum Chordata	4	Nirmal Das	September'23-September'23
		Unit 2	Protochordata General characteristics and classification of sub-phylum Urochordata and Cephalochordata up to Classes. Metamorphosis in Ascidia Chordate Features and Feeding in Branchiostoma	8	Nandini Pal	September'23-October'23
		Unit 3	Origin of Chordata Dipleurula concept and the Echinoderm theory of origin of chordates Advanced features of vertebrates over Protochordata	5	Nandini Pal	October'23-October'23
		Unit 4	Agnatha General characteristics and	2	Nandini Pal	November'23

			classification of cyclostomes up to order			
		Unit 5	Pisces General characteristics and classification of Chondrichthyes and Osteichthyes up to Subclasses Accessory respiratory organ, Advanced features of vertebrates over Protochordata, migration and parental care in fishes Swim bladder in fishes. Classification up to Sub-Classes	10	Nandini Pal	November"23-October"23
		Unit 6	Amphibia General characteristics and classification up to living Orders Metamorphosis with parental care	5	Nirmal Das	September"23-September"23
		Unit 7	Reptilia General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake	7	Nirmal Das	September"23-October"23
		Unit 8	Aves General characteristics and classification up to Sub-Classes, Exoskeleton and migration in Birds, Principles and aerodynamics of flight	7	Nirmal Das	October"23-November"23
		Unit 9	Mammals General characters and classification up to living orders, Phylogenetic significance of Prototheria Exoskeleton derivatives of mammals Adaptive radiation in mammals with reference to locomotory appendages Echolocation in Microchiropterans and Cetaceans	10	Nirmal Das	September"23-November"23-
		Unit 10	Zoogeography Zoogeographical realms, Plate tectonic and Continental drift theory, Distribution of birds and mammals in different realms	2	Nirmal Das	January'24 (1st week)
		CHORDATES LAB PAPER CODE: ZOOACOR05P		60	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of November
		PHYSIOLOGY PAPER CODE: ZOOACOR06T		60		
		Unit 1	Tissues Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues	10	Lipan Paul	September"23
		Unit 2	Bone and Cartilage Structure and types of bones and cartilages, Ossification	5	Lipan Paul	October"23 November"23
		Unit 3	Nervous System	15	Lipan Paul	November"23

			Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and Neuromuscular junction, Reflex action and its types			
		Unit 4	Muscular system Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction, Characteristics of muscle fiber	10	Lipan Paul	September'23-October'23
		Unit 5	Reproductive System Histology of testis and ovary; Physiology of Reproduction	5	Lipan Paul	November'23
		Unit 6	Endocrine System Histology and function of pituitary, thyroid, Pancreas, and adrenal. Classification of hormones; Mechanism of Hormone action; Signal transduction pathways for Steroidal and Non-steroidal hormones; Hypothalamus (neuroendocrine gland) - principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system; Placental hormones	15	Lipan Paul	September'23-December'23(1st Week)
		PHYSIOLOGY LAB PAPER CODE: ZOOACOR06T		60	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of December
		BIOCHEMISTRY PAPER CODE: ZOOACOR07T		60		
		Unit 1	Fundamentals of biochemical reactions and metabolism Ionization of water, weak acids and bases, buffering and pH changes in living systems, Metabolism: Catabolism and Anabolism, Compartmentalization of metabolic pathways Shuttle systems and membrane transporters; ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms	10	Dr. Manika Biswas	September'23-October'23

		Unit 2	Carbohydrates Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides; Derivatives of Monosachharides, Carbohydrate metabolism: Glycolysis, Citric acid cycle, Pentose phosphate pathway, Gluconeogenesis	10	Dr. Manika Biswas	October'23- September'23
		Unit 3	Lipids Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Sphingolipid, Glycolipids, Steroids, Eicosanoids and terpinoids. Lipid metabolism: β -oxidation of fatty acids; Fatty acid biosynthesis	4	Dr. Manika Biswas	October'23-November'23
		Unit 4	Proteins Amino acids Structure, Classification, General and Electro chemical properties of α -amino acids; Physiological importance of essential and non-essential amino acids Proteins Bonds stabilizing protein structure; Levels of organization, Protein metabolism: Transamination, Deamination, Urea cycle,-Fate of C-skeleton of Glucogenic and Ketogenic amino acids	14	Dr. Manika Biswas	September'23- November'23
		Unit 5	Nucleic Acids Structure: Purines and pyrimidines, Nucleosides, Nucleotides, Nucleic acids Types of DNA and RNA, Complementarity of DNA,-Hypo-Hyperchromaticity of DNA Outlines of nucleotide metabolism	4	Dr. Manika Biswas	September'23- October'23
		Unit 6	Enzymes Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes, Mechanism of enzyme action; Enzyme kinetics; Derivation of Michaelis-Menten equation, Lineweaver- Burk plot; Factors affecting rate of enzyme-catalyzed reactions; Enzyme inhibition; Allosteric enzymes and their kinetics;-Strategy of enzyme action- Catalytic and Regulatory (Basic concept with one example	12	Dr.Paromita Bhattacharjee	September'23 - October'23

			each)				
		Unit 7	Oxidative Phosphorylation Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System	6	Dr.Paromita Bhattacharjee	November'23-December'23(1st week)	
		BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07T		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of December	
		SEC: SERICULTURE		15	Nandini Pal	4 weeks in December' 23	
		SEC LAB: SERICULTURE		15	Nandini Pal		
SEM-III (CBCS)	GENERAL	INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T		60			
		Unit-1	Introduction to Insects General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit	4	Lipan Paul	September'23-October'23	
		Unit-2	Concept of Vectors Brief introduction to Vectors (mechanical and biological), Reservoirs, Host-vector relationship, Adaptations as vectors, Host specificity	6	Rupa Mukherjee	September'23-October'23	
		Unit-3	Insects as Vectors Detailed features of insect orders as vectors – Diptera, Siphonoptera, Siphunculata, Hemiptera	6	Rupa Mukherjee	September'23-October'23	
		Unit-4	Dipteran as Disease Vector Study of important Dipteran vectors – Mosquitoes, Sand fly, Houseflies vectors Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis Control of mosquitoes	16	Nandini Pal	September'23-December'23(1st Week)	
		Unit-5	Siphonaptera as Disease Vectors Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas	10	Nandini Pal	September'23-November'23	
		Unit-6	Siphunculata as Disease Vectors Human louse (Head, Body and Pubic louse) as important insect vectors; Control of human louse	8	Nandini Pal	September'23-November'23	
		Unit-7	Hemiptera as Disease Vectors Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures	10	Nandini Pal	September'23-November'23	
			INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03P		60	Nandini Pal Rupa Mukherjee	Acc. To Revised Syllabus 90% completed by end of December

SEM-V (CBCS)	HONOURS	MOLECULAR BIOLOGY PAPER CODE: ZOOACOR11T		60		
		Unit 1	Nucleic Acids Salient features of DNA and RNA Watson and Crick Model of DNA	2	Dr. Paromita Bhattacharjee	September'23- September'23
		Unit 2	DNA Replication Mechanism of DNA Replication in Prokaryotes, Semi-conservative, bidirectional and discontinuous Replication, RNA priming, Replication of telomeres	6	Dr. Paromita Bhattacharjee	September'23- October'23
		Unit 3	Transcription Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Difference between prokaryotic and eukaryotic transcription.	8	Dr. Paromita Bhattacharjee	September'23- November'23
		Unit 4	Translation Mechanism of protein synthesis in prokaryotes, Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation	14	Dr. Paromita Bhattacharjee	September'23- November'23
		Unit 5	Post Transcriptional Modifications and Processing of Eukaryotic RNA Capping and Poly A tail formation in mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, Processing of tRNA	10	Dr. Paromita Bhattacharjee	September'23- November'23
		Unit 6	Gene Regulation Regulation of Transcription in prokaryotes: lac operon and trp operon; Regulation of Transcription in eukaryotes	5	Dr. Paromita Bhattacharjee	September'23- October'23
		Unit 7	DNA Repair Mechanisms Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair	9	Dr. Paromita Bhattacharjee	September'23- November'23
		Unit 8	Molecular Lab Techniques PCR, Western and Southern blot, Northern Blot, Sanger DNA sequencing, cDNA technology	5	Dr. Paromita Bhattacharjee	November'23- September'23
			MOLECULAR BIOLOGY LAB PAPER CODE: ZOOACOR11P		60	Dr. Paromita Bhattacharjee

		GENETICS PAPER CODE: ZOOACOR12T		60	
		Unit 1	Mendelian Genetics and its Extension Background of Mendel's experiments Principles of Mendelian inheritance, Incomplete dominance and co-dominance, Epistasis, Multiple alleles, Lethal alleles, Pleiotropy, Sex-linked, sex- influenced and sex-limited inheritance, Polygenic Inheritance	12	Nirmal Das September"23-O ctober"23
		Unit 3	Mutations 1.Types of gene mutations (Classification), Types of chromosomal aberrations (Classification with one suitable example of each), Chromosomal aberrations, gene mutations and human diseases (Down's, Klienfelter's, Turner's, Cri du Chat, Sickle cell, Haemophilia, Thallassimia, Albinism only genetical aspects here, details of physiological consequences not required), Sex chromosomes and sex-linked inheritance Non-disjunction and variation in chromosome number; Molecular basis of mutations in relation to UV light and chemical mutagen	12	Nirmal Das November"23-Se petember"23
		Unit 4	Sex Determination Mechanisms of sex determination in Drosophila with reference to alternative splicing Sex determination in mammals,- Dosage compensation in Drosophila & Human	12	Nirmal Das October"23
		Unit 5	Extra-chromosomal Inheritance Criteria for extra chromosomal inheritance, Antibiotic resistance in Chlamyadomonas, Kappa particle in Paramoecium Shell spiralling in snail	8	Nirmal Das September"23- October"23
		Unit 6	Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction, Complementation test in Bacteriophage	8	Nirmal Das October"23-Nove mber"23
		Unit 7	Transposable Genetic Elements Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila, LINE, SINE, Alu elements in humans	8	Nirmal Das September"23- November"23
		GENETICS LAB PAPER CODE: ZOOACOR12P		60	Nirmal Das Acc. To Revised Syllabus 90% completed by end of December

		Animal Behaviour and Chronobiology PAPER CODE: ZOOADSE01T		60		
		Unit 1	Introduction to animal behavior	12	Dr. Manika Biswas	September'23
		Unit 2	Behaviours of Individuals	4	Dr. Manika Biswas	September'23-October'23
		Unit 3	Social and Sexual Behaviour	12	Dr. Manika Biswas	October'23-November'23
		Unit 4	Introduction to Chronobiology	16	Dr. Manika Biswas	September'23-October'23
		Unit 5	Biological Rhythm	16	Dr. Manika Biswas	October'23-November'23

		Animal Behaviour and Chronobiology LAB PAPER CODE: ZOOADSE01P		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by 1 st Week of January'24
		ENDOCRINOLOGY PAPER CODE: ZOOADSE03T		60		
		Unit 1	Introduction to Endocrinology General idea of Endocrine systems, Classification, Characteristic and Transport of Hormones Neurosecretions and Neurohormones	12	Dr. Manika Biswas	September'23- november'23
		Unit 2	Epiphysis, Hypothalamo-hypophysial Axis Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction; Structure and functions of hypothalamus and Hypothalamic nuclei, Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland, Hormones and their functions, Hypothalamo-hypophysial portal system, Disorders of pituitary gland.	18	Dr. Manika Biswas	September'23- November'23
		Unit 3	Peripheral Endocrine Glands Structure, Hormones, Functions and Regulation of Thyroid gland, Parathyroid, Adrenal, Pancreas, Ovary and Testis; Hormones in homeostasis, Disorders of endocrine glands	16	Nirmal Das	September'23- 1 st Week of december'23
		Unit 4	Regulation of Hormone Action Mechanism of action of steroidal, non-steroidal hormones with receptors Bioassays of hormones using ELISA and RIA; Estrous cycle in rat and menstrual cycle in human Multifaceted role of Vasopressin & Oxytocin; Hormonal regulation of parturition	14	Nirmal Das	September'23- 1 st Week of December'23
		ENDOCRINOLOGY LAB PAPER CODE: ZOOADSE03P		60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by 1 st week of January '24
SEM-V (CBCS)	GENERAL	APPLIED ZOOLOGY PAPER CODE: ZOOGDSE01T		60		
		Unit-1	Introduction to Host-parasite Relationship Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis	2	Nandini Pal	September 23
		Unit-2	Epidemiology of Diseases Transmission, Prevention and control of diseases: Tuberculosis, Typhoid	4	Nandini Pal	September'23- October'23

		Unit-3	Rickettsia and Spirochetes Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum	6	Nandini Pal	September'23- October'23
		Unit-4	Parasitic Protozoa Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense	8	Rupa Mukherjee	September'23- November'23
		Unit-5	Parasitic Helminthes Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti	4	Rupa Mukherjee	September'23- October'23
		Unit-6	Insects of Economic Importance Biology, Control and damage caused by Helicoverpa armigera, Pyrrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum	12	Rupa Mukherjee	November'23- November'23
		Unit-7	Insects of Medical Importance Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis	8	Nandini Pal	October'23- November'23
		Unit-8	Animal Husbandry Preservation of semen and artificial insemination in cattle	6	Dr. Paromita Bhattacharjee	September'23- October'23
		Unit-9	Poultry Farming Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs Unit	6	Dr. Paromita Bhattacharjee	September-23 November'23
		Unit-10	Fish Technology Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed	4	Dr. Paromita Bhattacharjee	October'23- November'23
		APPLIED ZOOLOGY LAB PAPER CODE: ZOOGDSE01P		60	Nandini Pal Rupa Mukherjee	Acc. To Revised Syllabus 90% completed by end of December

ACADEMIC CALENDAR

DEPARTMENT OF ZOOLOGY

NEP+CBCS Syllabus Distribution

January/February 2024 - May/June 2024

2nd, 4th and 6th Semester

Semester/ Year	Syllabus Module/ Unit	No. of Lecture	Teacher Name	Distribution Tentative
SEM-II HONOURS (NEP)	Non-Chordates II Paper Code: ZOODSC202T (DS-2)	45		
	Unit 1: Introduction to Coelomates	3	Dr. Manika Biswas	2nd week May, 2024
	Unit 2: Annelida	4	Ms. Nandini Pal	3 rd week May, 24
	Unit 3: Arthropoda	8	Dr. Manika Biswas	3 rd Week of March-3 rd week of May, 24
	Unit 4: Onychophora	2	Mr. Nirmal Das	3 rd Week of March, 24
	Unit 5: Mollusca	10	Mr. Nirmal Das	1 st week of May- 3 rd week of June, 24
	Unit 6: Echinodermata	8	Mr. Nirmal Das	4 th week of March – 1 st week of May, 24
	Unit 7: Hemichordata	8	Mr. Nirmal Das	2 nd week of April- 4 th week of May, 24
	Non-Chordates II Lab Paper Code: ZOODSC202P	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 24

SEM-II GENERAL (NEP)	PHYSIOLOGY AND BIOCHEMISTRY PAPER CODE: ZOOCOR202T/ZOOMIN202T	45		
	Unit-1 Nerve and muscle 1. Structure of a neuron, Resting membrane potential, Graded potential, Origin of Action potential and its propagation in myelinated non-myelinated nerve fibres. 2. Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.	8	Lipan Paul	End of June, 24
	Unit-2 Digestion Absorption of carbohydrates, proteins, lipids	5	Dr. Paromita Bhattacharjee	1st week of May, 24

Unit-3 Respiration Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood	5	Lipan Paul	1 st week of May- End of June, 24	
Unit-4 Excretion Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism	5	Lipan Paul	1 st week of May End of May, 24	
Unit-5 Cardiovascular system Composition of blood, Homeostasis, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle	6	Dr. Paromita Bhattacharjee	1 st week of June- End of June,24	
Unit-6 Reproduction and Endocrine Glands Physiology of male reproduction: hormonal control of spermatogenesis; Physiology of female reproduction: hormonal control of menstrual cycle. Structure and function of Pituitary, thyroid, pancreas and Adrenal	7	Lipan Paul	1 st week of May 1 st week of May, 24	
Unit 7 Carbohydrate: Structure and Metabolism Introduction to Carbohydrates, Structure & Types of Carbohydrates, Isomerism, Introduction to Intermediary metabolism: Glycolysis, Krebs cycle, Pentose Phosphate Pathway, Gluconeogenesis, Electron Transport Chain	8	Dr. Paromita Bhattacharjee	1 st week of May- End of May,24	
Unit-8 Lipid: Structure and Metabolism Introduction to Lipids: Definitions, Fat and Oils; classes of lipids; Lipoproteins, Biosynthesis and β oxidation of palmitic acid	5	Dr. Paromita Bhattacharjee	1 st week of June, 24	
Unit-9 Protein: Structure and metabolism	5	Dr. Paromita Bhattacharjee	Last week of May, 24	

Proteins and their biological functions, functions of amino acids; Physiochemical Properties of Amino Acid, Peptides – Structure and Properties, primary structure of protein, secondary, tertiary and quaternary structures. Transamination, Deamination and Urea Cycle			
Unit-10 Enzymes Introduction, Classification of Enzymes, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation	4	Dr. Paromita Bhattacharjee	3 rd week of June, 24
PHYSIOLOGY AND BIOCHEMISTRY LAB PAPER CODE: ZOOCOR202P/ZOOMIN202P	30	Dr. Paromita Bhattacharjee Lipan Paul	Acc. To Revised Syllabus 90% completed by end of June, 24

SEM-IV HONOURS (CBCS)	COMPARATIVE ANATOMY PAPER CODE: ZOOACOR08T	30		
	Unit 1: Integumentary System- Structure, function and derivatives of integument in mammals	5	Lipan Paul	2 nd week of February-End of February
	Unit 2: Skeletal System, Jaw Suspension	2	Nirmal Das	1 st week of May
	Unit 3: Digestive System- Comparative anatomy of stomach; dentition in mammals	4	Nirmal Das	2 nd week of February-3 rd week of February
	Unit 4: Respiratory System- Respiratory organs in birds	4	Nirmal Das	4 th week of February- 2 nd week of May
	Unit 5: Circulatory System- Comparative account of heart and aortic arches	4	Nirmal Das	2 nd week of February-3 rd week of February
	Unit 6: Urinogenital System- Succession of kidney	3	Lipan Paul	3 rd week of February-1 st week of May
	Unit 7: Nervous System Comparative account of brain, Cranial nerves in mammals	4	Lipan Paul	2 nd week of February-End of February
	Unit 8: Sense Organs Classification of receptors	4	Lipan Paul	1 st week of May 2 nd week of May
	COMPARATIVE ANATOMY LAB PAPER CODE: ZOOACOR08P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM PAPER CODE: ZOOACOR09T	30		
	Unit 1: Physiology of Digestion-Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins, Digestive enzyme	4	Nandini Pal	2 nd week of May 3 rd week of May, 24
Unit 2: Physiology of Respiration- Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociation curves and the factors influencing it,	6	Nandini Pal	3 rd week of May, 24	

	Unit 3: Physiology of Circulation- Components of Blood and their functions; Structure and functions of haemoglobin; Blood clotting system, Blood groups; ABO and Rh factor	4	Nandini Pal	2 nd week of February-3 rd week of February, 24
	Unit 4: Physiology of Heart- Structure of mammalian heart, Origin and conduction of cardiac impulses;	6	Dr. Paromita Bhattacharjee	4 th week of February-2 nd week of May, 24

	Cardiac Cycle and cardiac output; Blood pressure and its regulation			
	Unit 5: Thermoregulation & Osmoregulation Physiological classification based on thermal biology. Thermal biology of endotherms; Osmoregulation in aquatic vertebrates;	4	Nandini Pal	3 rd week of May 1 st week of May, 24
	Unit 6: Renal Physiology Structure of Kidney and its functional unit, Mechanism of urine formation, Regulation of acid-base balance	6	Dr. Paromita Bhattacharjee	1 st week of May 4 th week of May, 24
	PHYSIOLOGY: LIFE SUSTAINING SYSTEM LAB PAPER CODE: ZOOACOR09T	30	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May
	IMMUNOLOGY PAPER CODE: ZOOACOR10T	30		
	Unit 1: Overview of Immune System-Organs (Primary & Secondary lymphoid organs and its importance) and Cells of the Immune system	1	Lipan Paul	3 rd week of May, 24
	Unit 2: Innate and Adaptive Immunity Principle of Innate and Adaptive Immunity. • Components of innate immunity– Cellular mechanisms (phagocytes, NK cells, mast cells, eosinophils, inflammation [concept]) – Humoral mechanisms (complement, cytokines, chemokines etc. [concept]) • Components of adaptive immunity – Cellular mechanisms (Cell-Mediated Immune System (CMIS) or T- Cell Immunity [concept]) – Humoral	5	Lipan Paul	3 rd week of May 2 nd week of May, 24

	mechanisms (Formation of Plasma B cells and Memory B cells [concept])			
	Unit 3: Antigen, Antigen presentation & MHC Concept of Antigen, Immunogen, Allergen & Pathogen. Adjuvants and haptens, Factors influencing immunogenicity, Epitope. Types of Antigen Presenting Cells (APC), Co-stimulatory molecules on APC.	4	Nirmal Das	3 rd week of May End of May, 24
	Unit 3: T Cell development Structure of T cell receptors, Co-stimulatory molecules on T cells, Central differentiation of T cells; T cell selection in thymus Peripheral differentiation of T cells; Th1 & Th2	4	Nirmal Das	1 st week of May 3 rd week of May, 24
	Unit 4: Immunoglobulins Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA and	4	Nirmal Das	2 nd week of May 4 th week of May, 24

	RIA), Hybridoma technology, Monoclonal antibody production			
	Unit 6: Cytokines & Chemokines Brief concept on types of Cytokines & Chemokines Cytokines (source & function of IL-1, IL-2, IL-4, IL-5, IL-6, IL 8, IL-10, IL-12, Interferons, Tumor Necrosis Factors, Tumor Growth Factors, GM-CSF, M-CSF).	4	Lipan Paul	End of May, 24
	Unit 7: Complement System Components and pathways of complement activation	2	Lipan Paul	End of May, 24
	Unit 8: Hypersensitivity Gell and Coombs' classification and brief description of various types of hypersensitivities.	2	Lipan Paul	End of May, 24
	Unit 9: Immunology of diseases Malaria, Dengue	2	Nandini Pal	2 nd week of May, 24
	Unit 10: Vaccines Various types of vaccines. Active & passive immunization (Artificial and natural).	2	Nandini Pal	End of May, 24

	IMMUNOLOGY LAB PAPER CODE: ZOOACOR10T	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May, 24
SEM-IV GENERAL (CBCS)	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04T	30		
	Unit 1: Introduction Sources of Environmental hazards, Hazard identification and accounting, Fate of toxic and persistent substances in the environment, Dose response evaluation, Exposure assessment	8	Rupa Mukherjee	2 nd week of February-End of May, 24
	Unit 2: Climate Change Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health	6	Rupa Mukherjee	2 nd week February-end of May, 24
	Unit 3: Pollution Air, water pollution: sources and effects, Pollution control	8	Rupa Mukherjee	2 nd week of February-End of May, 24
	Unit 4: Waste Management Technologies Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, Biomedical waste handling and disposal.	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of May, 24
	Unit 5: Diseases Causes, symptoms and control of tuberculosis, Asthma, Cholera.	2	Dr. Paromita Bhattacharjee	2 nd week of February-4 th week of February, 24
	ENVIRONMENT AND PUBLIC HEALTH PAPER CODE: ZOOGCOR04P	30	Rupa Mukherjee	Acc. To Revised Syllabus 90% completed by end of May
SEM-VI HONOURS (CBCS)	DEVELOPMENTAL BIOLOGY PAPER CODE: ZOOACOR13T	30		
	Unit 1: Introduction Basic concepts: Phases of Development, Cell-cell interaction, Differentiation and growth	4	Nirmal Das	2 nd week of February-3 rd week of February, 24

Unit 2: Early Embryonic Development Gametogenesis, Spermatogenesis, Oogenesis; Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy; Planes and patterns of cleavage; Types of Blastula; Fate maps (including Techniques); Early development of chick up to gastrulation; Embryonic induction and organizers	8	Nirmal Das	2 nd week of February-End of February, 24
Unit 3: Late Embryonic Development Fate of Germ Layers; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)	6	Nirmal Das	2 nd week of February-4 th week of February, 24
Unit 4: Post Embryonic Development Development of brain and Eye in Vertebrate	6	Lipan Paul	4 th week of February-2 nd week of May, 24
Unit 5: Implications of Developmental Biology Teratogenesis: Teratogenic agents and their effects on embryonic development; In vitro fertilization, Stem cell (ESC), Amniocentesis	6	Lipan Paul	4 th week of February-1 st week of May, 24
DEVELOPMENTAL BIOLOGY LAB PAPER CODE: ZOOACOR13P	30	Nirmal Das	Acc. To Revised Syllabus 90% completed by end of May
EVOLUTIONARY BIOLOGY PAPER CODE: ZOOACOR14T	30		
Unit 1: Origin of earliest life- Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes, three domains of life	2	Dr. Paromita Bhattacharjee	2 nd week of February, 24
Unit 2: Historical review of evolutionary concept-Pre Darwinian Concepts and theories including Lamarckism, Darwinian Theory Neo-Darwinian Synthesis	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of February, 24
Unit 3: Evidences in favour of Evolution-Fossil records: types of fossils, geological time scale, transitional forms:	2	Dr. Paromita Bhattacharjee	3 rd week of May, 24

	<p>Unit 5: Population genetics- Concept of Populations and calculation of allele frequencies in a population Hardy-Weinberg Law and equilibrium (derivations, applications of law to find gene and genotype frequencies in human Populations) Evolutionary forces disrupting H-W equilibrium Natural selection: Definition as the non-differential rate of reproductions and survivals of competing alleles, concept of fitness, selection coefficient, Types of natural selection with examples- Disrupting, Stabilizing, Directional. Genetic Drift- outline of its mechanism, basic concepts and examples of founder's effect, bottleneck phenomenon;</p>	8	Nirmal Das	1 st week of May End of May, 24
	<p>Unit 6: Products of evolution Inter-population variations: clines, races, Species concepts and modes of speciation (just outlines of Allopatric, Sympatric isolating mechanisms Adaptive radiations)</p>	5	Nandini Pal	2 nd week May-4 th week of May, 24

	<p>Unit 8: Origin and evolution of man-Unique hominin characteristics contrasted with primate characteristics (including social and cultural ones), Molecular evidences of human origin and migrations (brief outline)</p>	6	Nandini Pal	2 nd week of February-4 th week of February, 24
	<p>Unit 9: Molecular Phylogeny-Neutral theory of molecular evolution, molecular clock (brief introductions) Example of evolution in vertebrate globin genes</p>	4	Nandini Pal	End of February 1 st week of May, 24
	<p>EVOLUTIONARY BIOLOGY LAB PAPER CODE: ZOOACOR14P</p>	30	Nirmal Das	
	<p>FISH AND FISHERY PAPER CODE: ZOOADSEO4T</p>	30		
	<p>Unit 1: Introduction and Classification-Feeding habit, habitat and manner of reproduction Classification of fish (up to Subclasses) with important examples</p>	2	Lipan Paul	1 st week of May, 24,
	<p>Unit 2: Morphology and Physiology Types of fins, Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in</p>	8	Lipan Paul	4 th week of May 2 nd week of May 24

	Respiration, buoyancy, Bioluminescence			
	Unit 3: Fisheries Inland Fisheries; Marine Fisheries; Environmental factors influencing the seasonal variations in fish catches in the Arabian Sea and the Bay of Bengal; Fishing crafts and Gears; Depletion of fishery resources; Application of remote sensing and GIS in fisheries;	8	Lipan Paul	1 st week of May 3 rd week of May, 24
	Unit 4: Aquaculture Sustainable Aquaculture; Extensive, semi-intensive and intensive culture of fish; Pen and cage culture; Polyculture; Composite fish culture; Brood stock management; Induced breeding of fish, Fish diseases	10	Lipan Paul	End of May-3 rd week of May, 24
	Unit 5: Fish in research Transgenic fish	2	Lipan Paul	2 nd week of May, 24,
	FISH AND FISHERYLAB PAPER CODE: ZOADSE04P	30	Lipan Paul	Acc. To Revised Syllabus 90% completed by end of May
	Wild life and Conservation PAPER CODE: ZOADSE06T	30		
	Unit 1: Introduction to wild life Unit 2: Evaluation and management of wild life	5 12	Dr. Manika Biswas	4 th week of May 24
	Unit 3: Management of habitats Unit 4: Population estimation	8 10	Dr. Manika Biswas	2 nd week of May End of May, 24

	Unit 5: Wild life conservation practice in India Unit 6: Management planning of wild life in protected areas	5 5	Dr. Manika Biswas	3 rd week of May end of May, 24
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	Unit 7: Man and wild life Unit 8: Protected areas	5 10	Dr. Manika Biswas	3 rd week of May end of May, 24
	Wild life and Conservation LAB PAPER CODE: ZOOADSE06P	60	Dr. Manika Biswas	Acc. To Revised Syllabus 90% completed by end of May, 24
SEM-VI GENERAL (CBCS)	IMMUNOLOGY PAPER CODE: ZOOGDSE04T	30		
	Unit-1 Overview of the Immune System Introduction to basic concepts in immunology, components of immune system, principles of innate and adaptive immune system	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of February, 24
	Unit-2 Cells and Organs of the Immune System Cells of immune system and organs (primary and secondary lymphoid organs) of the immune system	4	Dr. Paromita Bhattacharjee	2 nd week of February-End of February, 24
	Unit-3 Antigens Basic properties of antigens, B and T cell epitopes, haptens and adjuvants	6	Lipan Paul	End of February end of May, 24
	Unit-4 Antibodies Structure, classes and function of antibodies, antigen antibody interactions as tools for research and diagnosis	4	Lipan Paul	2 nd week of February-End of February, 24
	Unit-5 Working of the immune system Structure and functions of MHC, exogenous and endogenous pathways of antigen presentation and processing, Basic properties and functions of cytokines,	4	Nandini Pal	2 nd week of February-End of February, 24
	Unit-6 Immune system in health and disease Gell and Coombs' classification and brief description of various types of hypersensitivities, Introduction to concepts of autoimmunity and immunodeficiency	6	Nandini Pal	2 nd week of February-2 nd week of May, 24
	Unit-7 Vaccines General introduction to vaccines, Types of vaccines	2	Nandini Pal	3 rd week of May, 24
	IMMUNOLOGY LAB PAPER CODE: ZOOGDSE04P	30	Lipan Paul Nandini Pal	Acc. To Revised Syllabus 90% completed by end of May, 24

