Academic Calendar

Department of Zoology, HMMCW

**July, 2023- December, 2023**

1. WBSU- NEP Syllabus
2. WBSU-CBCS Syllabus

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| **Semester/ Year** | **A. WBSU- NEP SYLLABUS** | **No. of Lecture** | **Teacher Name** | **Distribution Tentative** |
| **SEM-I HONOURS** | **DS-I: Non-Chordates I** | **45** |  |  |
|  | **Unit 1: General introduction to Protista and Metazoa** | **15** |  |  |
|  | General characteristics and Classification of Protozoa up to phylum (Levine, 1980) General characteristics Amoeba, Paramoecium and Euglena Life cycle and pathogenicity of Entamoeba histolytica, Plasmodium vivax, Giardia intestinalis and Leishmania donovani Locomotion and Reproduction in Protista (Amoeba, Paramoecium and Euglena) Evolution of symmetry and segmentation of Metazoa |  | Dr. Indrajit  Biswas | **July’23- October’23** |
|  |  |  |  |  |
|  | **Unit 2: Porifera**  General characteristics and Classification up to classes Canal system and spicules in sponges | **6** | Santanu Das | **July’23- Sepember’23** |
|  | **Unit 3: Cnidaria** | **5** |  | **July’23- October’23** |
|  | General organization and Classification up to classes Metagenesis in Obelia Polymorphism in Cnidaria Corals and coral reefs: types, formation, distribution, conservation significance |  | Rituparna Maity |  |
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|  | **Unit 4: Ctenophora**  General characteristics and evolutionary significance | **3** | Santanu Das | **August’23-October’23** |
|  | **Unit 5: Platyhelminthes**  General characteristics and Classification up to classes, Life cycle and pathogenicity of *Fasciola hepatica* and *Taenia solium* | **6** | Dr. S.  Rehan  Ahmad | **July’23- September’23** |
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|  | **Unit 6: Nemathelminthes**  General characteristics and Classification up to classes, Life  cycle, and pathogenicity of *Ascaris lumbricoides,and Wuchereria bancrofti* Parasitic | **10** | Dr. Anindya Sundar  Bhunia | **June’23-October’23** |
|  | adaptations in helminths  Origin and evolution of parasitic helminths |  |  | **June’23-July’23** |
|  | **DS-I: Non-Chordates I** | **30** | Dr. Indrajit Biswas  Rituparna Maity | **Acc. To Revised Syllabus 90% completed by end**  **of November** |
|  | Study of whole mount of *Amoeba, Paramoecium* and *Euglena* , Binary fission and Conjugation in *Paramoecium* | **NA** |  |  |
|  | Examination of pond water collected from different places for protistan diversity. | **NA** |  |  |
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|  | Study of Sycon (T.S. and L.S.), Hyalonema, Euplectella, Spongilla | **NA** |  |  |
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|  | Sudy of Obelia, Physalia, Millepora, Aurelia, Tubipora, Corallium, Alcyonium, Gorgonia, Metridium, Pennatula, Fungia, Meandrina, Madrepora | **NA** |  |  |
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|  | One specimen/slide of any Ctenophore | **NA** |  |  |
|  | Study of adult Fasciola hepatica, Taenia solium | **NA** |  |  |
|  | Study of adult male and female Ascaris lumbricoides | **NA** |  |  |
| **SEM-I GENERAL** | **ANIMAL DIVERSITY** |  |  |  |
|  | **Unit-1 Kingdom Protista**  General characters and classification of Subkingdom Protozoa up to Phylum (Levine et al., 1980) |  | Dr. Indrajit Biswas | **July’23** |
|  | **Unit-2 Phylum Porifera**  General character and classification up to classes; Canal System in Sycon |  | Dr. Indrajit Biswas | **August’23** |
|  | **Unit-3 Phylum Cnidaria**  General characters and classification up to classes |  | Dr. Indrajit Biswas | **September’23** |
|  | **Unit-4 Phylum Platyhelminthes**  General characters and classification up to classes; Life  history of Taenia solium |  | Dr. Anindya Sundar Bhunia | **July’23** |
|  | **Unit-5 Phylum Nematoda**  General characters and classification up to classes; Life history of Ascaris lumbricoides |  | Dr. Anindya Sundar Bhunia | **August’23** |
|  | **Unit-6 Phylum Annelida**  General characters and classification up to classes |  | Dr. Anindya Sundar Bhunia | **Spetember’23** |
|  | **Unit 7 Phylum Arthropoda**  General characters and classification up to classes  Metamorphosis in Insects |  | Santanu Das | **July-August’23** |
|  | **Unit-8 Phylum Mollusca**  General characters and classification up to classes;  Respiration in Pila |  | Santanu Das | **September-October’23** |
|  | **Unit-9 Phylum Echinodermata**  General characters and classification up to classes; Water-vascular system in Asterias |  | Rituparna Maity | **July-August’23** |
|  | **Unit-10 Protochordates**  General features |  | Rituparna Maity | **September’23** |
|  | **Unit-11 Agnatha**  General features and classification up to classes (Young,1981) |  | Rituparna Maity | **September-October’23** |
|  | **Unit-12 Pisces**  General features and Classification up to Subclasses  (Romer, 1959); Osmoregulation in Fishes |  | Dr. Rehan Ahmad | **July’23** |
|  | **Unit-13 Amphibia**  General features and Classification up to living orders (Duellman & Trueb, 1986); Metamorphosis in Toad |  | Dr. Rehan Ahmad | **August’23** |
|  | **Unit-14 Reptiles**  General features and Classification up to living Subclass (Young, 1981); Poisonous and non- poisonous snakes |  | Dr. Rehan Ahmad | **September’23** |
|  | **Unit-15 Aves**  General features and Classification up to orders (Young, 1981); Flight adaptations in birds |  | Dr. Rehan Ahmad | **October’23** |
|  | **Unit-16 Mammals**  Classification up to Subclasses (Young, 1981) |  | Dr. Rehan Ahmad | **November’23** |
|  | **ANIMAL DIVERSITY LAB.** |  | Dr. Anindya Sundar Bhunia  Santanu Das | **90% will be completed on December’23** |
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| **SEM-III HONOURS** | 1. **WBSU-CBCS Syllabus**   **CHORDATES**  **PAPER CODE: ZOOACOR05T** | **60** |  |  |
| **Unit 1: Introduction to Chordates**  General characteristics and outline classification of Phylum Chordata | **4** | Santanu 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** | Santanu Das | **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** | Dr. Indrajit Biswas | **October”23- October”23** |
| **Unit 4: Agnatha**  General characteristics and classification of cyclostomes up to order | **2** | Dr. Indrajit Biswas | **November”23** |
| **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** | Rituparna Maity | **November”23- October’23** |
| **Unit 6: Amphibia**  General characteristics and classification up to living Orders Metamorphosis with parental care | **5** | Rituparna Maity | **September”23- September”23** |
| **Unit 7: Reptilia**  General characteristics and classification up to living Orders Poison apparatus and Biting mechanism in Snake | **7** | Dr.  Anindya Sundar Bhunia | **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** | Dr.  Anindya Sundar Bhunia | **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 Microchiropteransand Cetaceans | **10** | Dr. S  Rehan Ahmad | **September”23- November”23-** |

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|  | **Unit 10: Zoogeography** Zoogeographical realms, Plate tectonic and Continental drift theory, Distribution of birds and mammals in diﬀerent realms | **2** | Dr. S  Rehan Ahmad | **January’22 (1st week)** |
| **CHORDATES LAB PAPER CODE: ZOOACOR05P** | **60** | Santanu 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** | Dr. Indrajit Biswas | **September”23- July20** |
| **Unit 2: Bone and Cartilage** Structure and types of bones and cartilages, Ossification | **5** | Dr. Indrajit Biswas | **October”23- November”23** |
| **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** | Dr. Indrajit Biswas | **November”23- November’23** |
| **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** | Santanu Das | **September”23- October”23** |
|  | **Unit 5: Reproductive System**  Histology of testis and ovary; Physiology of Reproduction | **5** | Dr. Rehan Ahmad | **November”23- september’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** | Dr. Anindya Sundar Bhunia | **September’23- December’23(1st Week)** |

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|  | **PHYSIOLOGY LAB PAPER CODE: ZOOACOR06T** | **60** | Rituparna Maity | **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. Anindya Sundar Bhunia | **September”23- October”23** |

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|  | **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. Indrajit Biswas | **October”23- September’23** |

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|  | **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** | Rituparna Maity | **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.  Anindya Sundar Bhunia | **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. Rehan Ahmad | **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 each) | **12** | Santanu Das | **September’23- October’23** |
| **Unit 7: Oxidative Phosphorylation**  Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers  of Electron Transport System | **6** | Dr. Rehan Ahmad | **November’23- December’23(1st week)** |

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|  | **BIOCHEMISTRY LAB PAPER CODE: ZOOACOR07T** | **60** | Dr. Anindya Sundar Bhunia | **Acc. To Revised Syllabus 90% completed by end of December** |

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|  | **SEC: SERICULTURE** | **15** | Dr. Indrajit Biswas | **4 weeks in December’23** |
| **SEC LAB: SERICULTURE** | **15** | Dr. Indrajit Biswas |
| **SEM-III GENERAL** | **INSECT VECTOR AND DISEASES PAPER CODE: ZOOGCOR03T** | **60** |  |  |
| **Unit-1 Introduction to Insect**s General Features of Insects, Morphological features, Head – Eyes, Types of antennae Mouth parts with respect to feeding habit | **4** | Santanu Das | **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** | Dr.  Anindya Sundar Bhunia | **September’23- October”23** |
| **Unit-3 Insects as Vectors**  Detailed features of insect orders as vectors  – Diptera, Siphonoptera, Siphunculata, Hemiptera | **6** | Dr. Indrajit Biswas | **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** | Dr. Indrajit Biswas | **Sepetember’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** | Dr. Rehan Ahmad | **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** | Dr. Rehan Ahmad | **September”23- November”23** |
| **Unit-7 Hempitera as Disease Vectors** Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures | **10** | Rituparna Maity | **September’23- November’23** |
| **INSECT VECTORE AND DISEASES PAPER CODE: ZOOGCOR03P** | **60** | Dr. Indrajit Biswas  Santanu Das | **Acc. To Revised Syllabus 90% completed by end of December** |
| **SEM-V HONOURS** | **MOLECULAR BIOLOGY PAPER CODE: ZOOACOR11T** | **60** |  |  |

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|  | **Unit 1: Nucleic Acids**  Salient features of DNA and RNA Watson and Crick Model of DNA | **2** | Dr. Anindya Sundar Bhunia | **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. Anindya Sundar Bhunia | **September”23- October”23** |
| **Unit 3: Transcription**  Mechanism of Transcription in prokaryotes and eukaryotes, Transcription factors, Diﬀerence between prokaryotic and eukaryotic transcription. | **8** | Dr. Indrajit Biswas | **September”23- November”23** |

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|  | **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. Indrajit Biswas | **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. Rehan Ahmad | **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. Rehan Ahmad | **Septembar’23- Octobar’23** |
| **Unit 7: DNA Repair Mechanisms**  Types of DNA repair mechanisms, RecBCD model in prokaryotes, nucleotide and base excision repair, SOS repair | **9** | Rituparna Maity | **September”23- November”23** |
| **Unit 8: Molecular Lab Techniques**  PCR, Western and Southern blot, Northern Blot,Sanger DNA sequencing, cDNA technology | **5** | Santanu Das | **September’23- November”23** |

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|  | **MOLECULAR BIOLOGY LAB PAPER CODE: ZOOACOR11P** | **60** | Dr. Anindya Sundar Bhunia | **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** | Santanu Das | **September”23- October”23** |
| **Unit 2: Linkage, Crossing Over and Chromosomal Mapping**  Linkage and Crossing Over, molecular basis of crossing over, Measuring Recombination frequency and linkage intensity using three factor crosses, Interference and coincidence |  | Santanu Das | **October”23- November’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** | Dr. Indrajit Biswas | **November”23- Sepetember’23** |

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|  | **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** | Rituparna Maity | **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** | Rituparna Maity | **September”23- October”23** |
| **Unit 6: Recombination in Bacteria and Viruses** Conjugation, Transformation, Transduction, Complementation test in Bacteriophage | **8** | Rituparna Maity | **October”23- November”23** |
| **Unit 7: Transposable Genetic Elements**  Transposons in bacteria,  Ac-Ds elements in maize and P elements in | **8** | Dr Anindya Sundar Bhunia | **September”23- November”23** |

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|  | Drosophila, LINE, SINE, Alu elements in humans |  |  |  |
| **GENETICS LAB PAPER CODE: ZOOACOR12P** | **60** | Dr. S  Rehan Ahmad | **Acc. To Revised Syllabus 90% completed by end of December** |
| **ENTOMOLOGY PAPER CODE: ZOOADSEO2T** | **60** |  |  |
| **Unit 1: Introduction**  General Features of Insects Distribution and Success of Insects on the Earth | **2** | Dr. Indrajit Biswas | **September”23** |
| **Unit 2: Insect Diversity and Classiﬁcations** Classifications of Arthropods with special reference to Insects (Insects are to be classified up to order) with estimated species richness of the orders globally, in India and in West Bengal.  Conspicuous/important families/Genera/species of each order have to be noted with their peculiar habits and habitats) | **4** | Dr. Indrajit Biswas | **September”23- October”23** |
| **Unit 3: General Morphology of Insects (brief outlines)** External Features; Head – Eyes, Types of antennae, Mouth parts w.r.t. feeding habits Thorax: Wings and wing types, Types of Legs adapted to diverse habitats, Peculiar Abdominal appendages and genitalia- only brief introduction. | **12** | Dr. Indrajit Biswas | **October”23- November”23** |
| **Unit 4: Physiology of Insects**  Structure and physiology of Insect body systems  - Integumentary, digestive, excretory, circulatory, respiratory, endocrine, reproductive, and nervous system (brief outlines only) Photoreceptors: Types, Structure and Function (brief introductions) Metamorphosis: Types and Neuroendocrine control of metamorphosis (introductory) | **16** | Santanu Das | **September’23- October’23** |
| **Unit 5: Insect Society**  Social insects: diﬀerent types of social insects with brief outlines of their social systems Trophallaxis in social insects such as ants, termites and bees | **8** | Rituparna Maity | **October’23- November’23** |
| **Unit 6: Insect Plant Interaction**  Outline of the concept of co-evolution, role of allo chemicals in host plant mediation,  Host-plant selection by phytophagous insects; Major insect pests in paddy (brief introductions) | **14** | Dr. Rehan Ahmad | **November’23** |

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|  | **Unit 7: Insects as Vectors**  Insects as mechanical and biological vectors, Brief discussion on houseﬂies and mosquitoes as important vectors | **4** | Dr Anindya Sundar Bhunia | **End In 1st Week of January’22** |
| **BIOLOGY OF INSECTS LAB PAPER CODE: ZOOADSE02P** | **60** | Dr. Indrajit Biswas | **Acc. To Revised Syllabus 90% completed by 1st Week of January’22** |
| **ANIMAL BEHAVIOUR & CHRONOBIOLOGY**  **PAPER CODE: ZOOADSE01T** | **60** |  |  |
| **Unit 1: Introduction to Animal Behaviour**  1.A brief history of animal behaviour studies including the works of Fabre, Darwin, Von Frisch, Lorenz, Tinbergen, Jane Goodal, Biruté Galdikas, Dian Fossey, Salim Ali, Gopal Bhattacharyya, M. K. Chandrashekhar, Raghavendra Gadagkar. 2. The objectives of modern animal behaviour studies: Tinbergen’s four questions. 3. Methods of studying behaviours: Observation vs Watching, Ad libitum observations, Focal animal studies, Instantaneous scan, etc. 4. Branches of Animal Behaviour Studies | **12** | Rituparna Maity | **September’23- november’23** |
| **Unit 2: Behaviours of Individuals**  1. Reflexes and Orientations 2. Instinct 3. Learning: Imprinting and other Programmed Learning, Habituation, Innovations and Cultural Transmission / Social Learning | **18** | Rituparna Maity | **September’23- November’23** |
| **Unit 3: Social and Sexual Behaviour**  1. Social Behaviour: Concept of Sociality, Types of animal Society with examples, Altruism 2. Communications in animals- different types (e.g. pheromones, visuals, tactile, acoustics, etc) with common examples 3. Insects’ society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance. 4. Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care. | **16** | Dr. Indrajit Bisaws | **September’23- 1stWeek of december’23** |
| **Unit 4: Introduction to Chronobiology**  1. Historical developments in chronobiology; 2. Biological oscillation: the concept of Average, amplitude, phase and period 3. Adaptive significance of biological clocks | **14** | Santanu Das | **September’23- 1stWeek of December’23** |
| **Unit 5: Biological Rhythm**  1. Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; 2. Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; 3. Photoperiod and regulation of seasonal reproduction of vertebrates;Role of melatonin. |  | Dr.Rehan Ahmad |  |
| **ANIMAL BEHAVIOUR & CHRONOBIOLOGY** | **60** | Rituparna Maity | **Acc. To Revised Syllabus 90% completed by 1st week of January ‘22** |
| **SEM-V GENERAL** | **ANIMAL BEHAVIOUR & CHRONOBIOLOGY** | **60** |  |  |

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|  | **Unit-1 Introduction to Host-parasite Relationship** Host, Definitive host, Intermediate host, Parasitism, Symbiosis, Commensalism, Reservoir, Zoonosis | **2** | Santanu Das | **September”23- September”23** |
| **Unit-2 Epidemiology of Diseases** Transmission, Prevention and control of diseases: Tuberculosis, Typhoid | **4** | Santanu Das | **September”23- October”23** |
| **Unit-3 Rickettsia and Spirochetes** Brief account of Rickettsia prowazekii, Borrelia recurrentis and Treponema pallidum | **6** | Dr. Indrajit Biswas | **September”23- October”23** |
| **Unit-4 Parasitic Protozoa**  Life history and pathogenicity of Entamoeba histolytica, Plasmodium vivax and Trypanosoma gambiense | **8** | Dr. Indrajit Biswas | **September”23- November”23** |

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|  | **Unit-5 Parasitic Helminthes**  Life history and pathogenicity of Ancylostoma duodenale and Wuchereria bancrofti | **4** | Rituparna Maity | **September’23- October’23** |
| **Unit-6 Insects of Economic Importance** Biology, Control and damage caused by Helicoverpa armigera, Pyrilla perpusilla and Papilio demoleus, Callosobruchus chinensis, Sitophilus oryzae and Tribolium castaneum | **12** | Dr. Rehan Ahmad | **November”23- November’23** |
| **Unit-7 Insects of Medical Importance** Medical importance and control of Pediculus humanus corporis, Anopheles, Culex, Aedes, Xenopsylla cheopis | **8** | Dr. Rehan Ahmad | **October’23- November’23** |
| **Unit-8 Animal Husbandry**  Preservation of semen and artificial insemination in cattle | **6** | Dr. Rehan Ahmad | **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. Anindya Sundar Bhunia | **September November”23-** |
| **Unit-10 Fish Technology**  Genetic improvements in aquaculture industry; Induced breeding and transportation of fish seed | **4** | Dr. Anindya Sundar Bhunia | **October’23- November’23** |
| **APPLIED ZOOLOGY LAB PAPER CODE: ZOOGDSE01P** | **60** | Dr. Rehan Ahmad Santanu Das | **Acc. To Revised Syllabus 90% completed by end of December** |