গড়গাঁও মহাবিদ্যালয়

GARGAON COLLEGE

TEACHING PLAN

DEPARTMENT OF ZOOLOGY

JULY 2023 - JUNE 2024

GARGAON COLLEGE
TEACHING PLAN
Course: B. Sc.
Subject: ZOOLOGY

SESSION: ODD SEMESTER 2023

Name of the Teacher: Dr. Pimily Langthasa
Methods to be applied: Lecture and presentation method along with interaction and discussion.
Teaching Materials: Green & White Board, Chalk Pencil, Marker, Duster, Books, Journal, Laptop, Projector.

PAPER TITLE (CODE): ANIMAL DIVERSITY I (ZOOC1)	
Allotted Unit No	**2**
Unit Name	**Unit 2:Porifera, Cnideria and Ctenophora**
No. of Class required	9
Detail of the topics to be taught (Classes required)	General characteristics (1), Classification up to classes (1) Canal system (1)and spicules in sponges (1) General characteristics (1), Classification up to classes (1), Metagenesis in *Obelia (1)*, Polymorphism in Cnidaria (1) Corals and coral reefs (1) General characteristics and Evolutionary significance (1)
No. of Tutorials	2
PAPER TITLE (CODE): ANIMAL PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEM (CORE COURSE VI)	
Allotted Unit No	**1**
Unit Name	**Unit 1: Tissues**
No. of lass required	6
Detail of the topics to be taught (Classes required)	Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue
No. of Tutorials	2
Allotted Unit No	**2**
Unit Name	**Unit 2: Bone and Cartilage**
No. of lass required	6
Detail of the topics to be taught (Classes required)	Structure and types of bones and cartilages (3) Ossification (2), bone growth and resorption (1)
No. of Tutorials	2
Allotted Unit No	**3**
Unit Name	**Unit 3: Nervous System**
No. of Class required	**13**
Detail of the topics to be taught (Classes required)	Structure of neuron (1), resting membrane potential, Origin of action potential (1) and its propagation across the myelinated and unmyelinated nerve fibers (2); Types of synapse (1), Synaptic transmission (1) and, Neuromuscular junction (2); Reflex action and its types - reflex arc (1); Physiology of hearing (2) and vision (2).
No. of Tutorials	4
Allotted Unit No.	**4**
Unit Name	**Unit 4: Muscle**
No. of Class required	12

Detail of the topics to be taught (Classes required)	Histology of different types of muscle (2); Ultra structure of skeletal muscle (2); Molecular and chemical basis of muscle contraction (4); Characteristics of muscle twitch (1); Motor unit (1), summation and tetanus (2)
No. of Tutorials	3
Allotted Unit No.	**5**
Unit Name	**Unit 5: Reproductive System**
No. of Class required	11
Detail of the topics to be taught (Classes required)	Histology of testis (1) and ovary (2) ; Physiology of male and female reproduction (3); Puberty (1), Methods of contraception in male (2) and female (2)
No. of Tutorials	5
PAPER TITLE (CODE): FUNDAMENTALS OF BIOCHEMISTRY (CCVII)	
Allotted Unit No.	**3**
Unit Name	**Unit 3: Proteins**
No. of Class required	15
Detail of the topics to be taught (Classes required)	**Amino acids:** Structure, Classification and General properties of α-amino acids (3); Physiological importance of essential and non-essential α-amino acids (2) **Proteins:** Bonds stabilizing protein structure (2); Levels of organization in proteins ; Denaturation (3); Introduction to simple and conjugate proteins (2) **Immunoglobulins:** Basic Structure (1), Classes and Function (1), Antigenic Determinants (1)
No. of tutorials	6
Allotted Unit No.	**4**
Unit Name	**Unit 4: Nucleic Acids**
No. of Class required	12
Detail of the topics to be taught (Classes required)	Structure: Purines and pyrimidines (2), Nucleosides, Nucleotides, Nucleic acids (2) Cot Curves: Base pairing, Denaturation and Renaturation of DNA (3), Types of DNA and RNA (2), Complementarity of DNA (1), Hpyo-Hyperchromaticity of DNA (2)
No. of tutorials	**4**
PAPER TITLE (CODE): MOLECULAR BIOLOGY (XI)	
Allotted Unit No.	**1**
Unit Name	**Unit 1: Nucleic Acids**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Salient features of DNA and RNA (2), Watson and Crick model of DNA (2)
No. of Tutorials	3
Allotted Unit No.	**2**
Unit Name	**Unit 2: DNA Replication**
No. of Class required	12
Detail of the topics to be taught (Classes required)	DNA Replication in prokaryotes and eukaryotes (4), mechanism of DNA replication (3), Semi-conservative, bidirectional and semi-discontinuous replication (3), RNA priming (1), Replication of circular and linear ds-DNA(1)

No. of Tutorials	3
Allotted Unit No.	**3**
Unit Name	**Unit 3: Transcription**
No. of Class required	10
Detail of the topics to be taught (Classes required)	RNA polymerase and transcription Unit (2), mechanism of transcription in prokaryotes and eukaryotes (5), synthesis of rRNA and mRNA (2), transcription factors (1)
No. of Tutorials	2
Allotted Unit No.	**4**
Unit Name	**Unit 4: Translation**
No. of Class required	13
Detail of the topics to be taught (Classes required)	Genetic code, Degeneracy of the genetic code and Wobble Hypothesis (3); Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA (6); Proteins involved in initiation, elongation and termination of polypeptide chain (2); Inhibitors of protein synthesis (1); Difference between prokaryotic and eukaryotic translation (1)
No. of Tutorials	4
Allotted Unit No.	**5**
Unit Name	**Unit 5: Post Transcriptional Modifications and Processing of Eukaryotic RNA**
No. of Class required	8
Detail of the topics to be taught (Classes required)	Structure of globin mRNA (1); Split genes: concept of introns and exons, splicing mechanism, alternative splicing (4), exon shuffling (1), and RNA editing (1), Processing of tRNA (2)
No. of Tutorials	3
Allotted Unit No.	**6**
Unit Name	**Unit 6: Gene Regulation**
No. of Class required	10
Detail of the topics to be taught (Classes required)	Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon (4) and trp operon (2); Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, Genetic imprinting (4)
No. of Tutorials	4
Allotted Unit No.	**7**
Unit Name	**Unit 7: DNA Repair Mechanisms**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Pyrimidine dimerization and mismatch repair (3)
No. of Tutorials	Nil
Allotted Unit No.	**8**
Unit Name	**Unit 8: Regulatory RNAs**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Concept of Ribo-switches, RNA interference, miRNA, siRNA (3)
No. of Tutorials	1
PAPER TITLE (CODE): PRINCIPLE OF GENETICS (XII)	
Allotted Unit No.	**3**

Unit Name	**Unit 3: Mutations**
No. of Class required	**10**
Detail of the topics to be taught (Classes required)	Types of gene mutations (Classification) (2), Types of chromosomal aberrations (Classification, figures and with one suitable example of each) (3), Molecular basis of mutations in relation to UV light and chemical mutagens(3); Detection of mutations: CLB method, attached X method.(2)
No. of Tutorials	3
Allotted Unit No.	**4**
Unit Name	**Unit 4: Sex Determination**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	Chromosomal mechanisms of sex determination in Drosophila (2) and Man (2)
No. of Tutorials	1

SESSION: EVEN SEMESTER 2024

PAPER TITLE (CODE): ANIMAL DIVERSITY II (ZOOC2)	
Allotted Unit No	**1**
Unit Name	**Unit 1: Overview of Cells**
No. of lass required	4
Detail of the topics to be taught (Classes required)	Prokaryotic and Eukaryotic cells (3) Virus, Viroids, Mycoplasma, Prions (1)
No. of Tutorials	1
PAPER TITLE (CODE): ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS (CORE COURSE IX)	
Allotted Unit No	**2**
Unit Name	**Unit 2: Physiology of Respiration**
No. of Class required	**15**
Detail of the topics to be taught (Classes required)	Histology of trachea and lung (3); Mechanism of respiration (2), pulmonary ventilation; Respiratory volumes and capacities (2); Respiratory pigments(1), Transport of oxygen and carbon dioxide in blood(3); Dissociation curves and the factors influencing it (2); Carbon monoxide poisoning (1); Control of respiration (1)
No. of tutorials	**5**
Allotted Unit No	**3**
Unit Name	**Unit 3: Renal Physiology**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Structure of kidney (1) and its functional unit (2); Mechanism of urine formation (3); Regulation of water balance (1); Regulation of acid-base balance (1)
No. of tutorials	3
PAPER TITLE (CODE): BIOCHEMISTRY OF METABOLIC PROCESSES (CORE COURSE X)	
Allotted Unit No	**4**
Unit Name	**Unit 4: Protein Metabolism**

No. of Class required	**10**
Detail of the topics to be taught (Classes required)	Catabolism of amino acids (2): Transamination, Deamination, Urea cycle (4); Fate of C-skeleton of Glucogenic and Ketogenic amino acids (4)
No. of tutorials	**2**
Allotted Unit No	**5**
Unit Name	**Unit 5: Oxidative Phosphorylation**
No. of Class required	**10**
Detail of the topics to be taught (Classes required)	Redox systems (2); Review of mitochondrial respiratory chain (3), Inhibitors and un-couplers of Electron Transport System (3)
No. of tutorials	**2**
PAPER TITLE (CODE): DEVELOPMENTAL BIOLOGY (CORE COURSE XIII)	
Allotted Unit No	**1**
Unit Name	**Introduction**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	Historical perspective and basic concepts: Phases of development, Cell-Cell interaction, Pattern formation, Differentiation and growth, Differential gene expression, Cytoplasmic determinants and asymmetric cell division
No. of tutorials	**1**
Allotted Unit No	**2**
Unit Name	**Unit 2: Early Embryonic Development**
No. of Class required	**28**
Detail of the topics to be taught (Classes required)	Gametogenesis (1), Spermatogenesis (2), Oogenesis (2); Types of eggs (2), Egg membranes (1); Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy (6); Planes and patterns of cleavage (2); Types of Blastula (2); Fate maps (including Techniques) (2); Early development of frog and chick up to gastrulation (6); Embryonic induction and organizers (2)
No. of tutorials	**6**
Allotted Unit No	**3**
Unit Name	**Late Embryonic Development**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Fate of Germ Layers; Extra-embryonic membranes in birds; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta)
No. of tutorials	**4**
Allotted Unit No	4
Unit Name	**Post Embryonic Development**
No. of Class required	**12**
Detail of the topics to be taught (Classes required)	Metamorphosis: Changes in amphibians and insects; Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatory regeneration (with one example each); Ageing: Concepts and Theories
No. of tutorials	**2**
Allotted Unit No	**5**
Unit Name	**Implications of Developmental Biology**
No. of Class required	**8**

Detail of the topics to be taught (Classes required)	Teratogenesis: Teratogenic agents and their effects on embryonic development; *In vitro* fertilization, Stem cell (ESC), Amniocentesis
No. of tutorials	1
PAPER TITLE (CODE): EVOLUTIONARY BIOLOGY (CORE COURSE XIV)	
Allotted Unit No	**7**
Unit Name	**Unit 7: Extinctions**
No. of Class required	5
Detail of the topics to be taught (Classes required)	Back ground of Extinctions and mass extinctions (causes and effects), (4) detailed example of K-T extinction (1)
No. of tutorials	2
Allotted Unit No	**8**
Unit Name	**Unit 9: Phylogenetic trees**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Phylogenetic trees, Multiple sequence alignment, construction of phylogenetic tress, interpretation of trees (4)
No. of tutorials	2

(Dr. Rina Handique)
HoD
Department of Zoology

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Paper Title (Code): ANIMAL DIVERSITY I (ZOOC1)	
Allotted Unit No	4
Unit Name	**Unit 4: Section B: Chordates I**
No. of Class required	**12**
Detail of the topics to be taught (Classes required)	Introduction to Chordates and Protochordata; General Characteristics and outline classification; General Characteristics of Hemichordata, Urochordata and Cephalochordata; Study of Larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Origin of Chordata and Agnatha; Dipleurula concept and the Echinoderm theory of origin of chordates; Advanced features of vertebrates over protochordates; General Characteristics and classification of Cyclostomes up to classes
No. of Tutorials	2
Allotted Unit No	5
Unit Name	**Unit 5: Zoogeography**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Zoogeographical realms; Theories pertaining to distribution of animals; Plate tectonic and Continental drift theory; Distribution of vertebrates in different realms.
No. of Tutorials	1
Paper Title (Code): ANIMAL DIVERSITY I (MINZOO1)	
Allotted Unit No	4
Unit Name	**Unit 4: Section B: Chordates I**
No. of Class required	**12**
Detail of the topics to be taught (Classes required)	Introduction to Chordates and Protochordata; General Characteristics and outline classification; General Characteristics of Hemichordata, Urochordata and Cephalochordata; Study of Larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Origin of Chordata and Agnatha; Dipleurula concept and the Echinoderm theory of origin of chordates; Advanced features of vertebrates over protochordates; General Characteristics and classification of Cyclostomes up to classes
No. of Tutorials	2
Allotted Unit No	5
Unit Name	**Unit 5: Zoogeography**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Zoogeographical realms; Theories pertaining to distribution of animals; Plate tectonic and Continental drift theory; Distribution of vertebrates in different realms.
No. of Tutorials	1
Paper Title (Code): Freshwater Aquaculture (SEC111)	
Allotted Unit No	3
Unit Name	**Unit 3: Induced Breeding and Ornamental Fishes**
No. of Class required	
Detail of the topics to be taught (Classes required)	Concept of induced breeding, ornamental fish, Captive breeding of carp, catfishes, Diagnostic characters of brood fishes and ornamental fishes, Breeding of carps and catfishes in simulated environments, Standardisation of hormonal doses.
No. of Tutorials	1
Paper Title (Code): DIVERSITY OF CHORDATA (CCV)	

Allotted Unit No	**1**
Unit Name	**Unit 1: Introduction to Chordates**
No. of lass required	2
Detail of the topics to be taught (Classes required)	General characteristics and outline classification of Chordates (2)
No. of Tutorials	Nil
Allotted Unit No	**2**
Unit Name	**Unit 2: Protochordata**
No. of lass required	
Detail of the topics to be taught (Classes required)	General characteristics of Hemichordata (1); Urochordata and Cephalochordata (2); Study of larval forms in protochordates*;* (2); Retrogressive metamorphosis in Urochordata (1)
No. of Tutorials	2
Allotted Unit No	3
Unit Name	**Unit 3: Origin of Chordata**
Detail of the topics to be taught (Classes required)	Dipleurula concept and the Echinoderm theory of origin of chordates (1); Advanced features of vertebrates over Protochordata (1)
No. of Tutorials	2
Allotted Unit No.	**4**
Unit Name	**Unit 4: Agnatha**
No. of Class required	**2**
Detail of the topics to be taught (Classes required)	General characteristics and classification of cyclostomes up to class (2)
No. of Tutorials	Nil
Allotted Unit No.	**5**
Unit Name	**Unit 5: Pisces**
No. of Class required	7
Detail of the topics to be taught (Classes required)	General characteristics of Chondrichthyes and Osteichthyes (2); Classification up to order (2); Migration, Osmoregulation and (1); Parental care in fishes (2)
No. of Tutorials	1
Allotted Unit No.	**6**
Unit Name	**Unit 6: Amphibia**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	Origin of *Tetrapoda* (Evolution of terrestrial ectotherms) (1); General characteristics and classification up to order (1); Parental care in Amphibians (2)
No. of Tutorials	2
Allotted Unit No.	**7**
Unit Name	**Unit 7: Reptilia**
No. of Class required	**6**
Detail of the topics to be taught (Classes required)	General characteristics and classification up to order (3); Affinities of *Sphenodon* (1); Poison apparatus and (1); Biting mechanism in snakes (1)
No. of Tutorials	**2**
Allotted Unit No.	**8**
Unit Name	**Unit 8: Aves**
No. of class required	**10**
Detail of the topics to be taught (Classes required)	General characteristics and classification up to order (3); *Archaeopteryx*—a connecting link (1); Principles and aerodynamics of flight, (2); Flight adaptations (2); and Migration in birds (2)
No. of Tutorials	**2**
Allotted Unit No.	**9**
Unit Name	**Unit 9: Mammals**
No. of Class required	**6**
Detail of the topics to be taught (Classes required)	General characters and classification up to order; (2); Affinities of Prototheria (1) Adaptive radiation with reference to locomotory appendages (3)
No. of Tutorials	**3**
Allotted Unit No.	**10**
Unit Name	**Unit 10: Zoogeography**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Zoogeographical realms (2); Theories pertaining to distribution of animals (2); Plate tectonic and Continental drift theory (1); Distribution of vertebrates in different realms (2)
No. of Tutorials	**2**
Paper Title (Code): FUNDAMENTALS OF BIOCHEMISTRY (CCVII)	
Allotted Unit No.	**1**

Unit Name	Unit 1: Carbohydrates
No. of Class required	5
Detail of the topics to be taught (Classes required)	Structure and Biological importance of carbohydrates (1); Monosaccharides (1); Disaccharides (1); Polysaccharides and Glycoconjugates (2)
No. of Tutorials	2
Allotted Unit No.	**2**
Unit Name	**Unit 2: Lipids**
No. of Class required	6
Detail of the topics to be taught (Classes required)	Structure and Significance of Lipids (3); Physiologically important saturated and unsaturated fatty acids (1); Tri-acylglycerols, Phospholipids, Glycolipids, Steroids (2)
No. of Tutorials	2
Allotted Unit No.	**5**
Unit Name	**Unit 5: Enzymes**
No. of Class required	15
Detail of the topics to be taught (Classes required)	Nomenclature and classification of Enzyme (1); Cofactors; Specificity of enzyme action (2); Isozymes (1); Mechanism of enzyme action; Enzyme kinetics (3); Factors affecting rate of enzyme-catalyzed reactions (1) Derivation of Michaelis Menten equation (1); Concept of Km and Vmax (1); Lineweaver-Burk plot (1); multi-substrate reactions (1); Enzyme inhibition (1); Allosteric enzymes and their kinetics (1); Regulation of enzyme action (1)
No. of tutorials	**5**
Paper Title (Code): **HUMAN PHYSIOLOGY(GE3)**	
Allotted Unit No.	**1**
Unit Name	**Unit 1: Digestion and Absorption of Food**
No. of Class required	5
Detail of the topics to be taught (Classes required)	Structure and function of digestive glands; Digestion and absorption of carbohydrates, fats and proteins; Nervous and hormonal control of digestion (*in brief*)
No. of Tutorials	1
Allotted Unit No.	**5**
Unit Name	**Unit 5: Cardiovascular Physiology**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Structure of heart, Coordination of heartbeat, Cardiac cycle, ECG
No. of Tutorials	1
Paper Title (Code): Principle of Genetics (XII)	
Allotted Unit No.	1
Unit Name	Unit 1: Mendelian Genetics and its Extension
No. of Class required	10
Detail of the topics to be taught (Classes required)	Principles of inheritance, (3); Incomplete dominance and co-dominance (1); Multiple alleles, Lethal alleles, Epistasis, Pleiotropy (4); Sex-linked, sex- influenced and sex-limited characters inheritance (2)
No. of Tutorials	3
Allotted Unit No.	2
Unit Name	Unit 2: Linkage, Crossing Over and Chromosomal Mapping
No. of Class required	11
Detail of the topics to be taught (Classes required)	Linkage and crossing over, (1); Cytological basis of crossing over, (2); Molecular mechanisms of crossing over including models of recombination, (3); Recombination frequency as a measure of linkage intensity, (1); Two factor and three factor crosses, (2); Interference and coincidence (1); Somatic cell hybridization (1)
No. of Tutorials	3
Allotted Unit No.	3
Unit Name	**Unit 3: Mutations**
No. of Class required	8
Detail of the topics to be taught (Classes required)	Types of gene mutations (Classification), (2); Types of chromosomal aberrations (2) (Classification, figures and with one suitable example of each); Molecular basis of mutations in relation to UV light and chemical mutagens (2); Detection of mutations: CLB method, attached *X* method (2)
No. of Tutorials	2

Allotted Unit No.	4
Unit Name	**Unit 4: Sex Determination**
No. of Class required	2
Detail of the topics to be taught (Classes required)	Chromosomal mechanisms of sex determination in Drosophila and Man (2)
No. of Tutorials	Nil
Allotted Unit No.	**5**
Unit Name	**Unit 5: Extra-chromosomal Inheritance**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Criteria for extra-chromosomal inheritance, (1); Antibiotic resistance in Chlamydomonas, (1); Mitochondrial mutations in *Saccharomyces*, (1); Infective heredity in *Paramecium* and Maternal effects (1)
No. of Tutorials	2
Allotted Unit No.	**6**
Unit Name	**Unit 6: Polygenic Inheritance**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Polygenic inheritance with suitable examples; (1); simple numericals based on it (2)
No. of Tutorials	Nil
Allotted Unit No.	**7**
Unit Name	**Unit 7: Recombination in Bacteria and Viruses**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Conjugation, Transformation, Transduction, (2); Complementation test in Bacteriophage (1)
No. of Tutorials	1
Allotted Unit No.	8
Unit Name	Unit 8: Transposable Genetic Elements
No. of Class required	4
Detail of the topics to be taught (Classes required)	Transposons in bacteria (1); Ac-Ds elements in maize and P elements in Drosophila*;* Transposons in humans (3)
No. of Tutorials	1
Paper Title (Code): **BIOLOGY OF INSECTA (DSEII)**	
Allotted Unit No.	**1**
Unit Name	**Unit I: Introduction of Insects**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	General Features of Insects (1); Distribution and Success of Insects on the Earth (3)
No. of Tutorials	1
Allotted Unit No.	**2**
Unit Name	**Unit II: Insect Taxonomy**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	Basis of insect classification; (1); Classification of insects up to orders (3)
No. of Tutorials	1
Allotted Unit No.	**3**
Unit Name	**Unit III: General Morphology of Insects**
No. of Class required	**9**
Detail of the topics to be taught (Classes required)	External Features; Head – Eyes, Types of antennae, (2); Mouth parts w.r.t. feeding habits (1); Thorax: Wings and wing articulation, (2); Types of Legs adapted to diverse habitat (2); Abdominal appendages and genitalia (2)
No. of Tutorials	2
Allotted Unit No.	**4**
Unit Name	**Unit IV: Physiology of Insects**
No. of Class required	**13**
Detail of the topics to be taught (Classes required)	Structure and physiology of Insect body systems – Integumentary System, (2); Digestive system, (1); Excretory system, (1); Circulatory

	system, (1); Respiratory system, (3); Endocrine system and (1); Reproductive system. (1); Sensory receptors and nervous system (2); Growth and metamorphosis (1)
No. of Tutorials	4
Allotted Unit No.	**5**
Unit Name	**Unit V: Insect Society**
No. of Class required	**5**
Detail of the topics to be taught (Classes required)	Group of social insects and their social life (2); Social organization and social behaviour (w.r.t. any one example) (3)
No. of Tutorials	1

(Dr. Rina Hnadique)

Head
Department of Zoology
Gargaon College, Simaluguri
Sivasagar, Assam

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Paper Title (Code): Animal Diversity II (ZOOC2)	
Allotted Unit No	1
Unit Name	**Unit 1: Introduction to Coelomates**
No. of Class required	5
Detail of the topics to be taught (Classes required)	Evolution of coelom and metamerism (3); Theory of Metamerism (1); Theory of Coelom (1)
No. of tutorials	2
Allotted Unit No	2
Unit Name	**Unit 2: Annelida**
No. of Class required	5
Detail of the topics to be taught (Classes required)	General characteristics and Classification up to classes (3); Excretion in Annelida (2)
No. of tutorials	1
Allotted Unit No	4
Unit Name	**Unit 4: Onychophora**
No. of Class required	3
Detail of the topics to be taught (Classes required)	General characteristics and (1) Evolutionary significance (2)
No. of tutorials	Nil
Allotted Unit No	6
Unit Name	**Unit 6: Echinodermata**
No. of Class required	
Detail of the topics to be taught (Classes required)	General characteristics and (1); Classification up to classes (1); Water-vascular system in Asteroidea (1); Larval forms in Echinodermata (2); Affinities with Chordates (1)
No. of tutorials	2
Allotted Unit No	4
Unit Name	**Unit 4: Reptiles**
No. of Class required	
Detail of the topics to be taught (Classes required)	General characteristics and (1); Classification up to order (1); Affinities of Sphenodon; Poison apparatus and Biting mechanism in snakes
No. of tutorials	1
Allotted Unit No	5
Unit Name	**Unit 5: Mammals**
No. of Class required	4
Detail of the topics to be taught (Classes required)	General characteristics and (1); Classification up to order (1); Affinities of Prototheria; Adaptive radiations with reference to locomotary appendages
No. of tutorials	2
Paper Title (Code): COMPARATIVE ANATOMY OF VERTEBRATES (CORE COURSE VIII)	
Allotted Unit No	1
Unit Name	**Unit 1: Integumentary System**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Structure of Integument in Vertebrates, (3); functions of Integuments in Vertebrates and (2); Derivatives of integument (2)
No. of tutorials	2
Allotted Unit No	2
Unit Name	**Unit 2: Skeletal System**
No. of Class required	9
Detail of the topics to be taught (Classes required)	Overview of axial and appendicular skeleton of different Vertebrates (4); Jaw suspensorium in Vertebrates, (3); Visceral arches in Different Vertebrates (2)
No. of tutorials	3
Allotted Unit No	4

Unit Name	**Unit 4: Respiratory System**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Skin of Vertebrates (2); Gills of Vertebrates (1); Lungs of Vertebrates (1); and air sacs of Vertebrates (1); Accessory respiratory organs of Vertebrates (2)
No. of tutorials	2
Allotted Unit No	5
Unit Name	**Unit 5: Circulatory System**
No. of Class required	5
Detail of the topics to be taught (Classes required)	General plan of circulation of Vertebrates (3); evolution of heart and aortic arches of Vertebrates (2)
No. of tutorials	1
Allotted Unit No	6
Unit Name	**Unit 6: Urinogenital System**
No. of Class required	6
Detail of the topics to be taught (Classes required)	Succession of kidney of Vertebrates (2); Evolution of urinogenital ducts of Vertebrates (3); Types of mammalian uteri (1)
No. of tutorials	2
Allotted Unit No	7
Unit Name	**Unit 7: Nervous System**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Comparative account of brain of Vertebrates (2); Autonomic nervous system of Vertebrates (2); Spinal cord of Vertebrates (2); Cranial nerves in mammals (1)
No. of tutorials	2
Allotted Unit No	8
Unit Name	**Unit 8: Sense Organs**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Classification of receptors (2); Brief account of visual and (1); Auditory receptors in man (1)
No. of tutorials	1
Paper Title (Code): ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS (CORE COURSE IX)	
Allotted Unit No	1
Unit Name	**Unit 1: Physiology of Digestion**
No. of Class required	12
Detail of the topics to be taught (Classes required)	Structural organization and (1); Functions of gastrointestinal tract and associated glands (2); Mechanical and chemical digestion of food (2); Absorptions of carbohydrates (1); Absorption of lipids, (1); Absorption of proteins, (1); Absorption of water, (1); Absorption of minerals and vitamins (1); Hormonal control of secretion of enzymes in Gastrointestinal tract (2)
No. of tutorials	5
Allotted Unit No	4
Unit Name	**Unit 4: Blood**
No. of Class required	14
Detail of the topics to be taught (Classes required)	Components of blood and their functions (2); Structure and functions of haemoglobin (1); Haemostasis: Blood clotting system, (3); Kallikrein-Kinninogen system, (2); Complement system & Fibrinolytic system, (3); Haemopoiesis (1); Blood groups: Rh factor, (1); ABO and MN blood group (1)
No. of tutorials	3
Allotted Unit No	5
Unit Name	**Unit 5: Physiology of Heart**
No. of Class required	14
Detail of the topics to be taught (Classes required)	Structure of mammalian heart (2); Coronary circulation (2); Structure and working of conducting myocardial fibers (2) Origin and conduction of cardiac impulses (1); Cardiac cycle; (2); Cardiac output and its regulation, (1); Frank-Starling Law of the heart, (1); Nervous and chemical regulation of heart rate (1) Electrocardiogram (1); Blood pressure and its regulation (1)
No. of tutorials	5
Paper Title (Code): BIOCHEMISTRY OF METABOLIC PROCESSES (Core Course X)	
Allotted Unit No	1
Unit Name	**Unit 1: Overview of Metabolism**
No. of Class required	10
Detail of the topics to be taught (Classes required)	Catabolism *vs* Anabolism, (1); Compartmentalization of metabolic pathways, (1) Shuttle systems and membrane transporters; (2); ATP as "Energy Currency of cell" (1); Coupled reactions; (1); Use of reducing equivalents and cofactors;(2)

	Intermediary metabolism and regulatory mechanisms (2)
No. of tutorials	3
Allotted Unit No	2
Unit Name	**Unit 2: Carbohydrate Metabolism**
No. of Class required	10
Detail of the topics to be taught (Classes required)	Sequence of reactions and regulation of glycolysis, (4); Citric acid cycle, (2) Phosphate pentose pathway (1); Gluconeogenesis (1); Glycogenolysis and (1) Glycogenesis (1)
No. of tutorials	5
Allotted Unit No	3
Unit Name	**Unit 3: Lipid Metabolism**
No. of Class required	10
Detail of the topics to be taught (Classes required)	β-oxidation and (2); omega -oxidation of saturated fatty acids with even and odd number of carbon atoms; (4); Biosynthesis of palmitic acid; (3); Ketogenesis (1)
No. of tutorials	4
Paper Title (Code): ENVIRONMENT AND PUBLIC HEALTH (GE 4)	
Allotted Unit No	1
Unit Name	**Unit 1: Introduction:** Environmental hazards
No. of Class required	6
Detail of the topics to be taught (Classes required)	Sources of Environmental hazards, hazard identification and accounting, fate of toxic and persistent substances in the environment, dose Response Evaluation, exposure Assessment.
No. of tutorials	1
Paper Title (Code): EVOLUTIONARY BIOLOGY (CORE COURSE XIV)	
Allotted Unit No	**5**
Unit Name	**Unit 5: Basic concept of Population genetics:**
No. of Class required	**20**
Detail of the topics to be taught (Classes required)	Hardy-Weinberg Law (statement and derivation of equation, application of law to human Population); Evolutionary forces upsetting H-W equilibrium; (5) Natural selection (concept of fitness, mechanism of working, types of selection, (3); Density dependent selection (1); Heterozygous superiority (1); Kin selection (2); Adaptive resemblances, (1); Sexual selection. (1); Genetic Drift (mechanism, founder's effect, bottleneck phenomenon) (3); Role of Migration and (1); Mutation in changing allele frequencies (2)
No. of tutorials	5
Allotted Unit No	**6**
Unit Name	**Unit 6: Product of evolution:**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Micro evolutionary changes (inter-population variations, clines, races (2); Species concept, (1); Isolating mechanisms, (1); Modes of speciation— allopatric, sympatric, Adaptive radiation (2) Macroevolution (exemplified by Galapagos finches) (1)
No. of tutorials	2
Paper Title (Code): IMMUNOLOGY (DSE 3)	
Allotted Unit No	**1**
Unit Name	**Unit 1: Overview of Immune System**
No. of Class required	6
Detail of the topics to be taught (Classes required)	Historical perspective of Immunology, (1); Early theories of Immunology (2); Cells and organs of the Immune system (3)
No. of tutorials	2
Allotted Unit No	2
Unit Name	**Unit 2: Innate and Adaptive Immunity**
No. of Class required	17
Detail of the topics to be taught (Classes required)	Anatomical barriers, (1); Inflammation, (1); Cell and molecules involved in innate immunity, (2); Adaptive immunity (Cell mediated and humoral) (3); Passive: Artificial and natural Immunity (2); Active: Artificial and natural Immunity (2); Immune dysfunctions (1); Brief account of autoimmunity with reference to Rheumatoid Arthritis and tolerance (2); AIDS (2)
No. of tutorials	4
Allotted Unit No	**3**
Unit Name	**Unit 3: Antigens**
No. of Class required	8
Detail of the topics to be taught (Classes required)	Antigenicity and immunogenicity (2); Immunogens, Adjuvants and haptens, (2)

	Factors influencing immunogenicity (2); B and T-Cell epitopes (2)
No. of tutorials	3
Allotted Unit No	4
Unit Name	**Unit 4: Immunoglobulins**
No. of Class required	13
Detail of the topics to be taught (Classes required)	Structure and functions of different classes of immunoglobulins (2); Antigen-antibody interactions (3); Immunoassays (ELISA and RIA) (3); Polyclonal sera (2); Hybridoma technology (1);Monoclonal antibodies in therapeutics and diagnosis (2)
No. of tutorials	3
Allotted Unit No	**5**
Unit Name	**Unit 5: Major Histocompatibility Complex**
No. of Class required	5
Detail of the topics to be taught (Classes required)	Structure and functions of MHC molecules (2); Endogenous and exogenous pathways of antigen processing and presentation (3)
No. of tutorials	1
Allotted Unit No	**6**
Unit Name	**Unit 6: Cytokines**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Properties and functions of cytokines (2); Therapeutics Cytokines (2)
No. of tutorials	1
Allotted Unit No	**7**
Unit Name	**Unit 7: Complement System**
No. of Class required	5
Detail of the topics to be taught (Classes required)	Complement System (2); Components and pathways of complement activation (3)
No. of tutorials	1
Allotted Unit No	**8**
Unit Name	**Unit 8: Vaccines**
No. of Class required	3
Detail of the topics to be taught (Classes required)	Vaccines (1) Various types of vaccines (2).
No. of tutorials	1

(Dr.Rina Handique)

Head

Department of Zoology
Gargaon College, Simaluguri

GARGAON COLLEGE
TEACHING PLAN
Course: B. Sc.
Session: Odd semester 2023

Subject: ZOOLOGY
Name of the Teacher: DR. ANURAG PROTIM DAS
Methods to be applied: Lecture and presentation method along with interaction and discussion.
Teaching Materials: Green & White Board, Chalk Pencil, Marker, Duster, Books, Journal, Newspaper, Magazine, Periodicals, Laptop, Projector.

PAPER TITLE (CODE): ANIMAL DIVERSITY I (COURSE CODE : ZOOC1) NATURE OF THE COURSE : CORE	
Allotted Unit No	**1**
Unit Name	**Section A: Non-Chordates –I Protista, Parazoa and Metazoa**
No. of Class required	6
Detail of the topics to be taught (Classes required)	General characteristics and Classification up to Classes, Structural organization & nutrition of Euglena, Amoeba and Paramecium. Locomotion and Reproduction in Animal protista (Protozoa)
No. of Tutorials	1
Allotted Unit No	**2**
Unit Name	**Unit 2: Porifera, Cnidaria & Ctenophora**
No. of class required	2
Detail of the topics to be taught (Classes required)	Corals and coral reefs. General characteristics and Evolutionary significance
No. of Tutorials	1
Allotted Unit No	**3**
Unit Name	**Unit 3: Platyhelminthes & Nemathelminthes**
No. of Class required	6
Detail of the topics to be taught (Classes required)	General characteristics (1), Classification up to classes (2) Life cycle and pathogenicity of *Fasciola hepatica* (3), Life cycle and pathogenicity of *Taenia solium* (3)
No. of Tutorials	1
Alloted Unit No	**5**
Unit Name	**Unit 5: Zoogeographical realms**
No. of class required	7
Detail of the topics to be taught (Classes required)	Zoogeographical realms, Theories pertaining to distribution of animals, Plate tectonic and Continental drift theory, distribution of vertebrates in different realms
No. of tutorials	1
TITLE OF THE COURSE : FRESHWATER AQUACULTURE COURSE CODE : SEC111 NATURE OF THE COURSE : SEC	
Allotted Unit No	**1**
Unit Name	**Unit 1**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Introduction to Aquaculture, Basic concept of extensive, intensive and superintensive aquaculture, monoculture, polyculture and integrated farming.
No. of Tutorials	
Allotted Unit No.	**2**
Unit Name	**Unit 2**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Rearing of Larval and brood fishes, Traditional and Chinese hatcheries, feed preparation for carps and catfishes, Live food culture, Transportation of fish seeds and brooders.

No. of Tutorials	
Allotted Unit No.	**4**
Unit Name	**Unit 4**
No. of Class required	8
Detail of the topics to be taught (Classes required)	Maintenance of fish health and prophylactic measures, Diagnostic of common fungal, bacterial, protozoan and ectoparasites, Control measures for common fish diseases, Role of immunostimulants in aquaculture.
No. of Tutorials	
Course Code: ZC306T CORE COURSE VI: ANIMAL PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEMS	
Allotted Unit No	**1**
Unit Name	**Unit 3: Nervous System**
No. of Class required	**13**
Detail of the topics to be taught (Classes required)	Structure of neuron (1), resting membrane potential, Origin of action potential (1) and its propagation across the myelinated and unmyelinated nerve fibers (2); Types of synapse (1), Synaptic transmission (1) and, Neuromuscular junction (2); Reflex action and its types - reflex arc (1); Physiology of hearing (2) and vision (2).
No. of Tutorials	4
Allotted Unit No.	**4**
Unit Name	**Unit 4: Muscle**
No. of Class required	12
Detail of the topics to be taught (Classes required)	Histology of different types of muscle (2); Ultra structure of skeletal muscle (2); Molecular and chemical basis of muscle contraction (4); Characteristics of muscle twitch (1); Motor unit (1), summation and tetanus (2)
No. of Tutorials	3
Allotted Unit No.	**5**
Unit Name	**Unit 6: Endocrine System**
No. of Class required	18
Detail of the topics to be taught (Classes required)	Histology of endocrine glands - pineal, pituitary, thyroid, parathyroid, pancreas, adrenal; hormones secreted by them and their mechanism of action; Classification of hormones; Regulation of their secretion; Mode 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
No. of Tutorials	6
PAPER TITLE (CODE): ANIMAL BEHAVIOUR AND CHRONOBIOLOG (DSE I)	
Allotted Unit No.	**1**
Unit Name	**Unit 1.** Introduction to Animal Behavior
No. of Class required	7
Detail of the topics to be taught (Classes required)	Origin and history of Ethology; Brief profiles of Karl Von Frish, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen, Proximate and ultimate causes of behavior.
No. of Tutorials	Nil
Allotted Unit No.	**2**
Unit Name	**Unit 2: Patterns of Behaviour**
No. of Class required	**10**
Detail of the topics to be taught (Classes required)	Stereotyped Behaviours (Orientation, Reflexes); Individual Behavioural patterns; Instinct vs. Learnt Behaviour; Associative learning, classical and operant conditioning, Habituation, Imprinting.
No. of Tutorials	1
Allotted Unit No.	**3**
Unit Name	**Unit 3: Social and Sexual Behaviour**
No. of Class required	**14**

Detail of the topics to be taught (Classes required)	Social Behaviour: Concept of Society; Communication and the senses; Altruism; Insects' society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance. Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care.
No. of Tutorials	2
Allotted Unit No.	**4**
Unit Name	**Unit 4: Introduction to Chronobiology**
No. of Class required	**9**
Detail of the topics to be taught (Classes required)	Historical developments in chronobiology; Biological oscillation: the concept of Average, amplitude, phase and period. Adaptive significance of biological clocks
No. of Tutorials	1
Allotted Unit No.	**5**
Unit Name	**Unit 5: Biological Rhythm**
No. of Class required	**13**
Detail of the topics to be taught (Classes required)	Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates; Role of melatonin.
No. of Tutorials	**2**
Allotted Unit No.	**Unit 6**
Unit Name	**Unit 6: Biological Clocks**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Relevance of biological clocks; Chronopharmacology, Chronomedicine, Chronotherapy.
No. of Tutorials	Nil
Course Code: ZD504T **DSE Course IV: BIOLOGY OF INSECTA**	
Allotted Unit No.	**1**
Unit Name	**Unit V: Insect Plant Interaction**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Theory of co-evolution, role of allelochemicals in host plant mediation Host-plant selection by phytophagous insects, Insects as plant pests
No. of Tutorials	Nil
Allotted Unit No.	**2**
Unit Name	**Unit VI: Insects as Vectors**
No. of Class required	**6**
Detail of the topics to be taught (Classes required)	Insects as mechanical and Biological vectors, Brief discussion on houseflies and mosquitoes as important insect vectors

GARGAON COLLEGE

TEACHING PLAN
Course: B. Sc.
Session: Even semester 2024

Subject: ZOOLOGY
Name of the Teacher: Dr. Anurag Protim Das
Methods to be applied: Lecture and presentation method along with interaction and discussion.
Teaching Materials: Green & White Board, Chalk Pencil, Marker, Duster, Books, Journal, Newspaper, Magazine, Periodicals, Laptop, Projector.

TITLE OF THE COURSE : ANIMAL DIVERSITY II COURSE CODE : ZOOC2 NATURE OF THE COURSE : CORE	
Allotted Unit No	**2**
Unit Name	**Unit 2: Onychophora & Mollusca and Echinodermata**
No. of class required	6
Detail of the topics to be taught (Classes required)	General characteristics and Evolutionary significance, Classification up to classes, Torsion and detorsion in Gastropoda
No. of Tutorials	1
Allotted Unit No	**4**
Unit Name	**Unit 4: Chordates II**
No. of lass required	5
Detail of the topics to be taught (Classes required)	Pisces: General characteristics of Chondrichthyes and Osteichthyes, classification upto order Migration, Osmoregulation and Parental care in fishes
No. of Tutorials	1
Allotted Unit No	**5**
Unit Name	**Unit 5: Amphibia & Reptilia**
No. of Class required	**3**
Detail of the topics to be taught (Classes required)	General characteristics and classification up to order; Parental care in Amphibians
No. of Tutorials	
Allotted Unit No.	**6**
Unit Name	**Unit 6: Aves and Mammals:**
No. of Class required	7
Detail of the topics to be taught (Classes required)	General characteristics and classification up to order Archaeopteryx-- a connecting link; Principles and aerodynamics of flight, Flight adaptations and Migration in birds, General characters and classification up to order; Affinities of Prototheria; Adaptive radiation with reference to locomotory appendages
No. of Tutorials	1
TITLE OF THE COURSE: WILD LIFE CONSERVATION AND MANAGEMENT COURSE CODE: GECZOO2 NATURE OF THE COURSE: GE	
Allotted Unit No	**1**
Unit Name	**Unit 1: Introduction to Wildlife**
No. of Class required	**5**
Detail of the topics to be taught (Classes required)	Values of wild life - positive and negative; Conservation ethics; Importance of conservation; Causes of depletion; World conservation strategies.
No. of tutorials	**1**
Allotted Unit No	**2**
Unit Name	**Unit 2: Evaluation and management of wildlife**
No. of Class required	**9**

Detail of the topics to be taught (Classes required)	Evaluation and management of wildlife, Habitat analysis, Physical parameters: Topography, Geology, Soil and water; Biological Parameters: food, cover, forage, browse and cover estimation; Standard evaluation procedures: remote sensing and GIS.
No. of tutorials	**1**
Allotted Unit No	**3**
Unit Name	**Unit 3: Management of habitats**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Setting back succession; Grazing logging; Mechanical treatment; Advancing the successional process; Cover construction; Preservation of general genetic diversity; Restoration of degraded habitats
No. of tutorials	**1**
Allotted Unit No	**4**
Unit Name	**Unit 4: Population estimation**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	Population density, Natality, Birth rate, Mortality, fertility schedules and sex ratio computation; Faecal analysis of ungulates and carnivores: Faecal samples, slide preparation, Hair identification, Pug marks and census method.
No. of tutorials	**1**
Allotted Unit No	**5**
Unit Name	**Unit 5: Management planning of wild life in protected areas**
No. of Class required	**5**
Detail of the topics to be taught (Classes required)	Estimation of carrying capacity; Eco tourism / wild life tourism in forests; Ecology of perturbance. Care of injured and diseased animal; Quarantine
No. of tutorials	**1**
Allotted Unit No	**6**
Unit Name	**Unit 6: Protected areas**
No. of Class required	**7**
Detail of the topics to be taught (Classes required)	National parks & sanctuaries, Community reserve; Important features of protected areas in India with special reference to NE India.
No. of tutorials	**Nil**
Course Code: ZC408T **CORE COURSE VIII: COMPARATIVE ANATOMY OF VERTEBRATES**	
Allotted Unit No	**2**
Unit Name	**Unit 1: Integumentary System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Structure, functions and derivatives of integument
No. of tutorials	**2**
Allotted Unit No	**3**
Unit Name	**Unit 2: Skeletal System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Overview of axial and appendicular skeleton, Jaw suspensorium, Visceral arches
No. of tutorials	2
Allotted Unit No	**3**
Unit Name	**Unit 3: Digestive System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Alimentary canal and associated glands, dentition
No. of tutorials	2
Allotted Unit No	**4**
Unit Name	**Unit 4: Respiratory System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Skin, gills, lungs and air sacs; Accessory respiratory organs

No. of tutorials	2
Allotted Unit No	**5**
Unit Name	**Unit 5: Circulatory System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	General plan of circulation, evolution of heart and aortic arches
No. of tutorials	2
Allotted Unit No	**6**
Allotted Unit No	**6**
Unit Name	**Unit 7: Nervous System**
No. of Class required	**8**
Detail of the topics to be taught (Classes required)	Comparative account of brain, Autonomic nervous system, Spinal cord, Cranial nerves in mammals
No. of tutorials	3
Allotted Unit No	**8**
PAPER TITLE (CODE): ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS (CORE COURSE IX)	
Allotted Unit No	**1**
Unit Name	**Unit 1: Physiology of Digestion**
No. of Class required	**14**
Detail of the topics to be taught (Classes required)	Structural organization and functions of gastrointestinal tract and associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Hormonal control of secretion of enzymes in Gastrointestinal tract
No. of tutorials	**3**
PAPER TITLE (CODE): EVOLUTIONARY BIOLOGY (CORE COURSE XIV)	
Allotted Unit No	**1**
Unit Name	**Unit 1: Life's Beginnings:**
No. of Class required	7
Detail of the topics to be taught (Classes required)	Life's Beginnings: Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes
No. of tutorials	3
Allotted Unit No	**7**
Unit Name	**Unit 2: Historical review of evolutionary concept:**
No. of Class required	4
Detail of the topics to be taught (Classes required)	Historical review of evolutionary concept: Lamarckism, Darwinism, Neo-Darwinism
No. of tutorials	2
Allotted Unit No	**8**
Unit Name	**Unit 3: Evidences of Evolution:**
No. of Class required	10
Detail of the topics to be taught (Classes required)	Evidences of Evolution: Fossil record (types of fossils, transitional forms, geological time scale, evolution of horse, three domains of life, neutral theory of molecular evolution, molecular clock, example of globin gene family
No. of tutorials	2
Allotted Unit No	**8**
Course Code: ZD607T DSE Course - VII: FISH AND FISHERIES	
Allotted Unit No.	**1**
Unit Name	**Unit 1: Introduction and Classification:**
No. of Class required	6

Detail of the topics to be taught (Classes required)	General description of fish; Account of systematic classification of fishes (up to classes); Classification based on feeding habit, habitat and manner of reproduction.
No. of Tutorials	Nil
Allotted Unit No.	**2**
Unit Name	**Unit 2: Morphology and Physiology:**
No. of Class required	**18**
Detail of the topics to be taught (Classes required)	Types of fins and their modifications; Locomotion in fishes; Hydrodynamics; Types of Scales, Use of scales in Classification and determination of age of fish; Gills and gas exchange; Swim Bladder: Types and role in Respiration, buoyancy; Communication in teleosts; Reproductive strategies (special reference to Indian fishes); Electric organs; Bioluminiscience; Mechanoreceptors; Schooling; Parental care; Migration
No. of Tutorials	5
Allotted Unit No.	**3**
Unit Name	**UNIT 3: Fisheries**
No. of Class required	**12**
Detail of the topics to be taught (Classes required)	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 fisheries resources; Application of remote sensing and GIS in fisheries; Fisheries law and regulations
No. of Tutorials	3
Allotted Unit No.	**5**
Unit Name	**Unit 5. Fish in research**
No. of Class required	**4**
Detail of the topics to be taught (Classes required)	Transgenic fish, Zebrafish as a model organism in research
No. of Tutorials	Nil

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