



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, Cnidaria 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 <i>Obelia</i> (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; <i>In vitro</i> 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 trees, interpretation of trees (4)
No. of tutorials	2

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Name of the Teacher: Dr. Rashmi Dutta

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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 <i>Tetrapoda</i> (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 <i>Sphenodon</i> (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); <i>Archaeopteryx</i> —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 (<i>in brief</i>)
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 <i>Drosophila</i> 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 <i>Chlamydomonas</i> , (1); Mitochondrial mutations in <i>Saccharomyces</i> , (1); Infective heredity in <i>Paramecium</i> 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 <i>Drosophila</i> ; 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



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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-Kininogen 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 & Nematelminthes
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 <i>Fasciola hepatica</i> (3), Life cycle and pathogenicity of <i>Taenia solium</i> (3)
No. of Tutorials	1
Allotted 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
<p style="text-align: center;">Course Code: ZD504T DSE Course IV: BIOLOGY OF INSECTA</p>	
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 perturbation. 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; Bioluminescence; 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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