

E.M. GOPALAKRISHNA KONE YADAVA WOMEN'S COLLEGE

**An Autonomous Institution -Affiliated to Madurai Kamaraj University
Re-accredited (3rd Cycle) with Grade A⁺ & CGPA 3.51 by NAAC**



**LESSON PLAN
2023-2024**

DEPARTMENT OF ZOOLOGY

(UG – Odd & Even Semester)



E.M.GOPALAKRISHNAKONEYADAVAWOMEN'SCOLLEGE
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LESSON PLAN
2023-2024

Class : I B.Sc Zoology

Sem : I

Sub. Code : 23OUZO11

Title of the Paper: Invertebrata

Total Hours : 75

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
July	I	<p>Taxonomy: Units of Classification, Criteria of classification - Principles of Classification - types of Coelom, types of Symmetry, Binomial nomenclature. Classification up to class level with example (Flow Chart only) - General characters of the phyla with examples: i) Protozoa ii) Porifera iii) Coelenterata iv) Platyhelminthes v) Nematoda vi) Annelida, vii) Arthropoda viii) Mollusca, ix) Echinodermata .</p> <p>Phylum: Protozoa - Type study - Paramecium- General organization, cyclosis, contractile vacuole and conjugation only. Structure, Life history, pathology, prevention and control measures of i) <i>Plasmodium vivax</i> and ii) <i>Entamoeba histolytica</i>.</p>	I B.Sc Zoology	20	Chalk and Talk, PPT, quiz, on the spot test	R.S. Rajal
Aug	II	<p>Phylum: Porifera: Type study- <i>Leucosolenia</i> - general organization, histology, Spicules, reproduction and development only. Canal system in Sponges.</p> <p>Phylum: Coelenterata: Type study- Obelia; structure of obelia colony, Medusa, Nematocyst, reproduction and development (metagenesis) - Polymorphism in Coelenterata. Types of Corals- Ecological and Economic importance.</p>	I B.Sc Zoology	20	Chalk and Talk, OHP quiz, on the spot test	R.S. Rajal

Sep	III	<p>Helminthes: Type study- <i>Fasciola hepatica</i> - external characters, digestive system, excretion, reproduction and development (life cycle). Structure, pathology and control measures of <i>Ascaris</i> and <i>Wuchereria</i></p> <p>Phylum: Annelida: Type study- Earth worm, External morphology, setae, nephridia, nerves system and reproductive system - Metamerism in Annelids.</p>	I B.Sc Zoology	15	Chalk and Talk, PPT, group discussion, OHP and You tube Links	R.S. Racia S. S. S.
Oct	IV	<p>Phylum: Arthropoda: Type study- <i>Penaeus indicus</i>- Marine Prawn - external morphology, appendages, digestive and excretory systems, reproductive system and development-Affinities of Peripatus.</p> <p>Phylum: Mollusca: Type study - <i>Pila globosa</i>- external morphology, digestive system, respiratory system, osphridium only. - Cephalopods as an advanced Mollusca.</p> <p>Phylum: Echinodermata; Type study Star fish (<i>Asterias</i>), external morphology, pedicellaria, -Water vascular system - Larval forms of Echinodermata</p>	I B.Sc Zoology	20	Chalk and Talk, OHP, PPT presentations, quiz,	R.S. Racia S. S. S.

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LESSON PLAN

2023-2024

Class : I B.Sc Zoology

Sem : I

Sub. Code : 23OUZOSECN1

Title of the Paper: Ornamental Fish Farming And Management

Total Hours : 30

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
July	I	Unit I - Introduction - ornamental fish keeping as hobby and cottage industry. Scope and self-employment of ornamental fish culture. Domestic and global scenario of ornamental fish trade and export potential.	I B.Sc Zoology	6	Chalk and Talk, PPT, quiz, on the spot test	
Aug	II	Unit II - Identification of popular Ornamental fishes: Siamese fighting fish, Gold fish, Rosy barb, Black molly, Guppy, Koi carp, Arowana and Angel fish.	I B.Sc Zoology	6	Chalk and Talk, PPT, group discussion, OHP and You tube Links	
Sep	III	Unit III - Construction of fish tank: Size and shape of fish tank, bottom settings, stocking of fish, planting with aquarium plants, Accessories of fish Tank - aerators, types of filters, nets, lights and hood.	I B.Sc Zoology	8	Chalk and Talk, OHP, PPT presentations, quiz,	
Oct	IV	Unit IV - Transport of fishes: Oxygen packing, Food and feeding: Culture of live food organisms- Micro worms, vinegar eel, tubifex. Artificial feed - Pellet feed formulation. Unit V - Breeding, hatchery and nursery management of Butterfly fish, Sword tails, Blue morph and Anemone fish- Common diseases and treatment of ornamental fishes : Nutritional diseases, White spot diseases, fungal diseases, Bacterial diseases, Dropsy diseases and ectoparasites.	I B.Sc Zoology	10	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, open book test	

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LESSON PLAN 2023-2024

Class : I B.Sc Zoology

Sem : I

Sub. Code : 3301201P

Title of the Paper: Lab in Invertebrata

Total Hours : 48

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
July	I	Earthworm: Nervous System Cockroach: Digestive System, Nervous System Cockroach: Nervous System Pila: Digestive system Earthworm: Body setae	I B.Sc Zoology	10	Dissection Charts Mounting	R.S.N
Aug	II	Cockroach: Trachea Honey bee: Mouth Parts Pila: Radula	I B.Sc Zoology	13	Mounting (Virtual lab) Mounting Mounting (Virtual lab)	R.S.N
Sep	III	Liver fluke: Miracidium, Redia and Cercaria Prawn: Nauplius, Zoea and Mysis Any Two Echinoderm Larvae. Protozoa: Paramecium-conjugation, Entamoeba	I B.Sc Zoology	10	Live specimen identification Observation of slides	R.S.N
Oct	IV	Porifera: Sponge-Gemmule and Spicules. Coelenterata: Obelia medusa, Sea anemone. Helminthes: Liver fluke, Ascaris (Male and Female) Annelida: Neris, Chaetopterus, Arthropoda: Prawn, Peripatus, Mollusca: Chiton, Sepia, Echinodermata: Starfish, Sea-urchin	I B.Sc Zoology	12	Observation of slides/images/spotters	R.S.N

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LESSON PLAN

2023-2024

Class : I B.Sc Zoology

Sub. Code : 23OUZOF01

Title of the Paper: Foundation Course in Zoology

Total Hours : 30

Sem : I

Month	Unit	Description of the Syllabus	Class	Hours Allotted	Teaching Mode & Methods	Course Teacher Signature
July	I	Unit I - Introduction to Zoology- Father of Zoology - Scope of zoology - Explain in brief account on Structural Zoology (Morphology, Anatomy, Histology, Cytology) - Developmental Zoology- Functional Zoology(Animal Physiology, Ethology)- Systemic Zoology (Protozoology, Entomology, Conchology, Malacology, Ichthyology, Herpetology, Ornithology, Mammalogy, Helminthology, Apiculture, Anthropology, Carcinology)- Distributional Zoology- Historical Zoology(Palaeontology, Phylogeny, Evolution) Medical Zoology, Economic Zoology. Molecular Biology and Genomics.	I B.Sc Zoology	4	Chalk and Talk, PPT, quiz, on the spot test	R.S.D.
Aug	II	Unit II - Laboratory and Safety Rules - Animal Care in lab, safety protocols for Microbes study in the laboratory - safety preparations for Field Activities - safety precautions for demonstration of animal dissections	I B.Sc Zoology	6	Chalk and Talk, PPT, group discussion, OHP and You tube Links	R.S.D.



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LESSON PLAN 2023-2024

Class : II B.Sc Zoology

Sem : III

Sub. Code : 22OUZ031

Title of the Paper: Cell & Molecular Biology

Total Hours : 60 hrs

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
July	I	Introductory Cytology: Cell theory - Prokaryotic and Eukaryotic cells. Cytological techniques: Fixation-Sectioning & Staining. Principle, Resolving power & uses of compound microscope, confocal microscope and electron microscope. Cell Junctions - Ultrastructure and functions of plasma membrane.	II B.Sc Zoology	9	Chalk and Talk, PPT, quiz, on the spot test	G. JB
Aug	II	Cell Organelles-Ultrastructure and functions of Endoplasmic reticulum , Golgi body, Nucleus & Nucleolus. DNA structure and function - DNA Replication - Chromatin - Nucleosome. Chromosomes: - Structure, types, Giant chromosomes. Regulation of gene expression.	II B.Sc Zoology	12	Chalk and Talk, OHP quiz, on the spot test	M. J.
Sep	III	Ultrastructure and functions of Lysosomes, centrosomes, Mitochondria - Krebs cycle. Cell cycle - Mitosis & Meiosis .Biology of cancer - Biology of aging - Apoptosis- definition, mechanism and significance.	II B.Sc Zoology	9	Chalk and Talk, PPT, group discussion , OHP and YouTube Links	G. JB

Oct	IV	Control of gene expression- Lac operon(Operon hypothesis: regulator gene, promoter gene, operator gene, structural gene, repressor gene, corepressor gene and inducer gene)Stem cells-Embryonic and adult stem cells	II B Sc Zoology	15	Chalk and Talk, OHP, PPT presentations, quiz,	G. J.
Nov	V	Types (mRNA , rRNA and tRNA)and role of RNAs - structure of tRNA only- Ultra structure, function and types of ribosome. Genetic code - Protein synthesis -Post translational modifications.	II B Sc Zoology	15	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, open book test	ML ✓

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LESSON PLAN 2023-2024

Class : II B.Sc Zoology


Sem :III (30 Hrs)

Sub. Code : 22OUZO4P


Title of the Paper: Lab in Cell &Molecular Biology and Developmental Biology

Total Hours : 60 Hrs

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Microscopy-Cell Observation methods and uses of microscope Observation of different stages of Mitosis in Onion Root tip.	II B.Sc Zoology	8	Mounting for Microscopic observation	
July	II	Total count of RBC and WBC-Human Differential count- Erythrocytes & Leucocytes	II B.Sc Zoology	8	Demo only Demo only	
Aug	III	Mounting of bar bodies - buccal cavity	II B.Sc Zoology	6	Mounting for Microscopic observation	
Sep	IV	Isolation of genomic DNA from bacteria/liver tissue(Goat or Chick)	II B.Sc Zoology	6	Virtual lab & Demo	

Oct	v	DNA and RNA	II B.Sc Zoology	2	Observation of slides	
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LESSON PLAN

2023-2024

Class : III B.Sc Zoology

Sem : V

Sub. Code : 21Z51

Title :Genetics

Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Introduction to Genetics: History of Genetics, Principles of Mendelian concept -Monohybrid and Dihybrid, Test cross & Back cross, Geneic interaction- Incomplete dominance & Co- dominance. Multiple Alleles – ABO Blood Group.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentation s, quiz, on the spot test	G. LB
July	II	Linkage and Crossing over : Drosophila-organ's experiments Complete and Incomplete linkage, Linkage groups, Crossing over types, Mechanisms - Cytological evidence for Crossing over, Chromosomal maps & its construction.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentation s, quiz, on the spot test	G. LB
Aug	III	Sex Determination and Sex Linked Inheritance: Sex Determination in Man, Sex influenced and	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP	G. LB

		Sex limited genes - Non Disjunction and Gynandromorphs - Cytoplasmic inheritance - Maternal effect on <i>Limnaea</i> (Shell Coiling), Kappa Particles in <i>Paramecium</i> .			presentation s, quiz, on the spot test	G. JB
Sep	IV	Molecular Basis of Mutation, Types of Mutation, Chromosomal aberrations: Autopolyploidy, neuploidy and Euploidy, Inborn errors of metabolism -Phenylketonuria, Parkinson's disease, Eugenics and Euthenics.	III B Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentation s, quiz, on the spot test	G. JB
Oct	V	Recombination in bacteria: Transformation- Griffith experiment, Conjugation- F factor, H Factor, Sexduction, Transduction- Hershey and Chase experiment. Regulation of gene expression in prokaryotes.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentation s, quiz, on the spot test	G. JB

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LESSON PLAN

2023-2024

Class : III B.Sc Zoology

Sem : V

Sub. Code : 21ZE5A

Title : Ecology & Evolution

Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
July	I	Introduction to Ecology: Subdivisions of ecology – Autecology and Synecology, Ecosystem : - structure and types, Dynamics of Ecosystem – Food chain, Food web and Ecological pyramids , Concepts of Ecosystem -Limiting factors – Concepts of limiting factors-Light as a limiting factor – Pigmentation, Reproduction, Colour changes, Vision, Locomotion and Lunar Rhythm. Temperature as a limiting factor- Eurythermal and Stenothermal, Metabolism and reaction rate, Reproduction and Morphology.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Aug	II	Habitat Ecology: Terrestrial habitat- Grass land ecosystem, Aquatic Habitat – Ecosystems (Lotic and lentic), Marine habitat : Characteristics, stratification, deep sea adaptations.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Sep	III	Community Ecology: Characteristics of Community Ecology- structure, stratification, Ecotone and edge effect, Ecological niche, concepts of community and ecological succession-process of	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	

		succession, climax, types, patterns and significance of succession.				
Oct	IV	Evidences of Evolution : Origin of life - Abiogenesis, Biogenesis, Cosmic theory, Biochemical origin of life - Urey -Miller experiment. Morphological and comparative anatomy- Homology & Analogy (example-forelimbs), Vestigial organs- (Vermiform appendix, Plica semilunaris), Embryological evidences - developmental stages, Theories of evolution- Lamarckism, Neo-Darwinism - Mimicry - Batesian and Mullerian Mimicry.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	R.S.D
Nov	V	Hardy Weinberg - Gene pool, gene frequency and genetic drift, Factors affecting gene equilibrium- Natural selection - Isolating mechanisms- Speciation - Allopatric & Sympatric speciation - Human evolution - Cultural Evolution.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	R.S.D

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LESSON PLAN
2023-2024

Class : III B.Sc Zoology



Sem : V

Sub. Code : 21ZE5B

Title : Biochemistry

Total Hours : 60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Carbohydrates: classification and biological importance - carbohydrate metabolism - Glycogenesis, Glycolysis, Citric acid cycle and Hexose Monophosphate Shunt.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	
July	II	Amino acid structure and classification, Protein - Structure, classification, Configuration of protein - Primary, Secondary, Tertiary and Quaternary, and biological importance - Transamination, Decarboxylation, Transdeamination, Transmethylation, Urea cycle. Ramachandran Plot.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	
Aug	III	Lipids: Classification and structure of cholesterol- β -oxidation of fatty acids - Biological importance of	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations	

		lipids-biosynthesis of fattyacids.			, quiz, on the spot test	
Sep	IV	Enzymes: classification, physico-chemical nature and mechanism of enzyme action, factors affecting enzyme activity - Applications of enzymes and coenzymes	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Oct	V	Bio-chemical techniques, Principle and biological application of Paper chromatography and Poly Acrylamide Gel Electrophoresis, pH meter, Spectrophotometry	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	

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LESSON PLAN

2023-2024

Class : III B.Sc Zoology


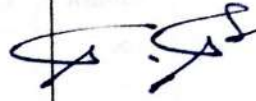
Sem : V

Sub. Code : 21SEZ51

Title : Biostatistics

Total Hours :30

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Basic concepts in Biostatistics - Collection of Data-Primary and Secondary Data. Analysis and interpretations of data collection – sampling.	III B.Sc Zoology	6	Chalk & Talk Method	
July	II	Classification and Tabulation of data. - Diagrammatic presentation of data - Graphic presentation of data – Histogram and Polygon.	III B.Sc Zoology	6	Chalk & Talk Method	
Aug	III	Measures of Central tendency – Mean, Median, and Mode (Individual series , Discrete series and continuous series)	III B.Sc Zoology	6	Chalk & Talk Method	

Sep	IV	Measures of Dispersion – Range, Standard Deviation, Variance, Standard Error	III B.Sc Zoology	6	Chalk & Talk Method	
Oct	V	Correlation & Regression, Basic concepts of probability – Measures and Theorems. Theoretical distributions – Binomial distribution.	III B.Sc Zoology	6	Chalk & Talk Method	

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LESSON PLAN
2023-2024

Class : III B.Sc Zoology

Sem : V

Sub. Code : 21Z61P

Title : Lab in Genetics, Ecology & Evolution and Biochemistry

Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
June	I	Genetics 1. Observation of simple Mendelian Traits in Man. 2. Study of probability with two coins using tossing experiments. 3. Multiple Allelic Inheritance- Rh factor 4. Observation on the study of Polygenetic inheritance of quantitative traits to be interpreted (Neem leaf serration).	III B.Sc Zoology	12	Demo and Hands on practice	G. RB
July	II	Ecology 1. Detection of Transparency of water by Secchi disc. 2. Analysis of dissolved oxygen in water sample.	III B.Sc Zoology	12	Demo and Hands on practice	G. RB
Aug	III	3. Observation of Animal association, symbiosis parasitism, predation and commensalism. 4. To study the distribution of road side species and investigate the changes in species richness.	III B.Sc Zoology	12	Demo and Hands on practice	G. RB

		5. Field report: Visit to a forest/ river/ wetland ecosystem				
Sep	IV	<p>Evolution:</p> <p>1. Variations – finger prints.</p> <p>2. Homologous & Analogous organs.</p> <p>3. Vestigial organs</p> <p>4. Connecting link- Archaeopteryx</p> <p>5. Examples of evolutionary importances - Peripatus, Limulus & Archaeopteryx.</p>	III B.Sc Zoology	12	Demo and Hands on practice	G. 2B
Oct	V	<p>Bio Chemistry:</p> <p>1. Principle and pH Measurements of various samples using pH meter.</p> <p>2. Principle and Amino acids separations using Paper Chromatography- demonstration.</p> <p>3. Qualitative tests for protein, carbohydrates & fats.</p> <p>4. Principle and Electrophoresis- demonstration (PAGE).</p>	III B.Sc Zoology	12	Demo and Hands on practice	G. 2B

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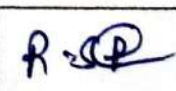
Class : I B.Sc Zoology

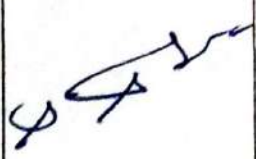




Sem : II

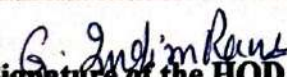
Sub. Code : 23OUZO21


Title of the Paper: Chordata

Total Hours : 75

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Taxonomy And Phylum Chordata - Chordates characteristics, Outline classification up to class level with examples. Cephalochordate - Amphioxus: External morphology, Digestive System and Excretory System only. Uro-chordata - Tadpole larva and Retrogressive metamorphosis in Ascidian, Hemichordate - Balanoglossus external morphology and Affinities of Hemichordate. Unit 2 : Pisces And Amphibians - General Characters and Classification of Fishes and Amphibians up to order level with examples -Pisces -Shark: External Morphology and Digestive System only, Migration of Fishes-	I B.Sc Zoology	19	Chalk and Talk, PPT, quiz, on the spot test	 
Jan	II	Agnatha- Petromyzon -External morphology, Amphibia: General characters and classification - Rana hexadactyla -	I B.Sc Zoology	18	Chalk and Talk, PPT, quiz, on the spot	

		External Morphology and Respiratory system only, Parental Care in Amphibians. Unit 3 : Reptiles - General Characters and Classification of Reptiles up to orders with examples. Calotes: External Morphology, Heart, Arterial and Venous system only.			test	
Feb	III	Snakes of India - Poisonous and non-poisonous snakes - Identification and biting mechanism. Origin, Dominance and Decline of Mesozoic reptiles. Unit 4 : Aves - General Characters and Classification of Aves up to orders with examples. Columba livia -Pigeon: External Morphology, Respiratory System, Synsacrum, Pectoral and Pelvic girdles only-Flightless Birds.	I B.Sc Zoology	19	Chalk and Talk, PPT, quiz, on the spot test	 
Mar	IV	Unit 5 : Mammals - General Characters and Classification of Mammals up to orders with examples- General Characters of Prototherians, Metatherians and Eutherians with examples. Rabbit: External Morphology, Excretory system and Reproductive System only - Dentition in mammals - Adaptation of aquatic mammals.	I B.Sc Zoology	19	Chalk and Talk, PPT, quiz, on the spot test	 


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LESSON PLAN
2023-2024

Class : I B.Sc Zoology
Sem : II
Sub. Code : 23OUZO2P
Title of the Paper: Lab in Chordata
Total Hours : 45

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Calotes: Arterial System and Venous System Shark: Placoid Scales Calotes: Arterial System and Venous System	I B.Sc Zoology	10	Charts Mounting Charts	RSP
Jan	II	Frog: Brain Shark: Cranial nerves Frog: Tadpole Salamander: Axolotyl	I B.Sc Zoology	10	Mounting (Virtual lab) Charts Live specimen identification	RSP
Feb	III	Prochordata: Amphioxus, Amphioxus - T.S.through pharynx, Balanoglossus, Ascidian. Agnatha: Petromyzon Pisces: Narcine, Echeneis, Hippocampus, Eel, Catla, Tilapia.	I B.Sc Zoology	9	Observation of slides/images/spotters	RSP
Mar	IV & V	Reptilia: Poisonous Snakes: Cobra, Krait, and Viper. Non-Poisonous Snakes: Dryophis and Ptyas. Lizards - Chaemeleon and Draco. Aves: Pectoral and Pelvic girdle of Pigeon,	I B.Sc Zoology	16	Observation of slides/images/spotters	RSP

		Archaeopteryx					(RSP)
		Mammals: Bat, Loris.					
		Field trip compulsory					

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LESSON PLAN
2023-2024

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LESSON PLAN 2023-2024

Class : I B.Sc Zoology


Sem : II

Sub. Code : 23OUZOSECN2

Title of the Paper: Basic Course in Ornithology

Total Hours : 30 hrs

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Introduction to Ornithology; Birds and Humans; Classification of Birds, Bird Endemism, Books written by Salim Ali. Acts related to Bird conservation, -Bird Sanctuaries.	I B.Sc Zoology	5	Chalk and Talk, PPT, quiz, on the spot test	M.H.K
Jan	II	External Morphology of the Bird; Bird Lore; Structure of bird feather, Internal Structure of the Bird - Beaks and feet in Birds.	I B.Sc Zoology	6	Chalk and Talk, PPT, quiz, on the spot test	M.H.K
Feb	III	Bird Behaviour: Foraging, Roosting, Vocalization, Imprinting, Feather care, Bird Intelligence, Social Behaviour, Mixed Species Flocks, Migration of Birds.	I B.Sc Zoology	6	Chalk and Talk, PPT, quiz, on the spot test	M.H.K
Mar	IV & V	Breeding Biology: Differential investment of sexes; territoriality, courtship and display behaviour, nesting, eggs, incubation and care of	I B.Sc Zoology	13	Chalk and Talk, PPT,	M.H.K

	young. Identification of Birds by Calls and songs. Bird Watching: - Equipment for Bird Watching. Studying bird populations and communities, sampling methods, Macro ecology; Threats faced by birds; Bird Conservation with case studies.			quiz, on the spot test	
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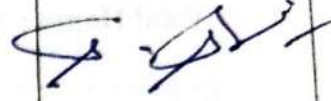


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LESSON PLAN 2023-2024

Class : I B.Sc Zoology
Sem : II
Sub. Code : 23OUZOSEC3
Title of the Paper: Basics of Marine Biology
Total Hours : 30 hrs

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Marine Ecology : Marine environment- ecological factors- light, temperature, salinity, pressure; Classification of marine environment; Pelagic environment – Planktonic and Nektonic adaptations; Benthic environment - intertidal, interstitial and deep sea adaptations; Distribution and ecological role of other coastal environments - estuaries, mangroves.	I B.Sc Zoology	5	Chalk and Talk, PPT, quiz, on the spot test	R.S.N
Jan	II	Physical Oceanography : Physical Properties of Seawater- density, viscosity, surface tension, conductivity and their relationship; temperature distribution in the sea - heat budget, UV radiation; El Nino/La Nina – global impact; Dynamics of the ocean-general surface circulation, Waves, Currents and Tides, Tsunami.	I B.Sc Zoology	6	Chalk and Talk, PPT, quiz, on the spot test	R.S.N
Feb	III	Chemical Oceanography : Chemical composition of seawater-major and minor elements, trace elements- their importance, distribution. Chemistry of seawater constituents- concept of chlorinity and salinity - methods of measurements, nutrients - biogeochemical cycles.	I B.Sc Zoology	6	Chalk and Talk, PPT, quiz, on the spot test	R.S.N

Mar	IV & V	<p>Biological Oceanography: Sea as a biological environment- Plankton-classification -Phytoplankton and Zooplankton - methods of collection, Oxidation as carbon (as organic matter). Primary productivity - estimation and factors affecting primary productivity.</p> <p>Marine Pollution and Ocean Management: Ocean pollution-kinds and quantities of pollutants, toxic effects and control measures - oil spills, plastics, nuclear waste disposal in marine environment, Eutrophication. Role of National and international agencies and organizations in ocean management-FAO, UNEP, DOD, WOCE, WHOI, IOI Malta, IMO INMARSAT- IUCN, SCAR, SCOR, Marpol, Traffic. Ocean policy (India) - research and management.</p>	III B.Sc Zoology	13	Chalk and Talk, PPT, quiz, on the spot test	<p>R.S.V.</p> 
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LESSON PLAN

2023-2024

Class : II B.Sc Zoology

Sem : IV

Sub. Code : 22OUZO41

Title of the Paper: Developmental Biology

Total Hours : 60 Hrs

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Gametes & Fertilization :Basic concepts of developmental biology. Structure & types of Spermatozoa, Mammalian egg - Egg membranes. Patterns of egg - Spermatogenesis - Oogenesis. Fertilization - mechanism, theories and significance - Parthenogenesis.	II B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test and Virtual Labs.	G. 2R
Jan	II	Blastulation & Gastrulation: Cleavage - Planes & Patterns, Factors controlling cleavage - Fate map & its construction. Blastulation - Morphogenetic movements - Gastrulation of frog & chick.	II B.Sc Zoology	10	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test and Virtual Labs.	MAL V
Feb	III	Organogenesis :Development of Brain, Eye and Heart in frog. Development of Nervous system in chick & Foetal membranes in chick. Placentation in mammals. Development of Pronephric, Mesonephric & Metanephric	II B.Sc Zoology	13	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot	G. 2R

	IV	kidneys Applied Embryology : Organizer concept - Structure - mechanism of induction and competence. Nuclear transplantation - teratogenesis		7	test and Virtual Labs	<i>MDL ✓</i>
Mar	IV	Regeneration: types - events and factors. Embryonic stem cells & significance. Methods to culture embryo.	II B Sc Zoology	6	Chalk and Talk, PPT, group discussion , OHP presentatio ns, quiz, on the spot test and Virtual Labs	<i>G. 2B</i>
	V	Embryological Techniques: Oestrous, Menstrual cycle and menopause - Pregnancy - trimesters - development. Erythroblastosis foetalis - Twins - types. Infertility - causes - Test tube baby and Assisted Reproductive Technology - Embryo transfer - Amniocentesis.		12		<i>MDL ✓</i>

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LESSON PLAN 2023-2024

Class : II B.Sc Zoology

Sem : IV (30 Hrs)

Sub. Code : 22OUZO4P

Title : Lab in Cell & Molecular Biology and Developmental Biology

Total Hours : 60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Microscopy-Cell Observation methods and uses of microscope Observation of different stages of Mitosis in Onion Root tip.	II B.Sc Zoology	9	Mounting for Microscopic observation	
Jan	II	Structure of Egg and Sperm Observation of 48hrs and 72hrs Chick Embryo	II B.Sc Zoology	9	Observation of Slides Demo only	
Feb	III	Mitochondria & Golgi complex Ribosomes, Lysosomes & Nucleus	II B.Sc Zoology	6	Observation of Slides, Specimen	
Mar	IV	Blastula and Gastrula of Frog Teratology-Abnormal embryos	II B.Sc Zoology	6	Observation of Slides, Specimen	

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LESSON PLAN
2023-2024




Class : III B.Sc Zoology

Sem : VI

Sub. Code : 21Z62P

Title : Lab in Physiology, Microbiology & Immunology and Biotechnology

Total Hours : 60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Animal Physiology: 1. Effect of temperature on human salivary amylase activity. 2. Estimation of oxygen consumption by fish 3. Haemoglobinometer 4. Qualitative analysis of ammonia, urea and uric acid. 5. Demonstration of blood pressure using Sphygmomanometer.	III B.Sc Zoology	12	Demo and Hands on practice	
Jan	II	Microbiology: 1. Simple staining. 2. Gram staining. 3. Sterilization technique (Moist heat and Dry heat technique) 4. Media preparation - Agar plate method. 4. Structure of Bacteria, HIV, TMV and Algae (Nostoc).	III B.Sc Zoology	12	Demo and Hands on practice	
Feb	III	Immunology: 1. Structure - Bone marrow, Bursa fabricus, Spleen and Thymus	III B.Sc Zoology	12	Demo and Hands on practice	

		2. ABO blood groups & Rh factor 3. Immunoglobulin -IgG				(R.S.N)
Mar	IV	Biotechnology 1. Transgenic mice - Microinjection method 2. Super bug - Pseudomonas putida 3. pBR 322 4. Ti plasmid 5. Spectrophotometer 6. Genomic library - Chart	III B Sc Zoology	12	Demo and Hands on practice	(R.S.N)

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LESSON PLAN
2023-2024

Class : III B.Sc Zoology
Sem : VI
Sub. Code : 21Z61
Title : Physiology
Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I&II	Digestion in human - Physiology of digestion - digestive glands - role of enzymes in digestion - hormonal control of digestion. Respiration in human -Types and mechanism of respiration- respiratory pigments- Oxygen transport - CO2 transport - Respiratory Quotient (RQ). Circulation - Structure and function of human heart - coronary circulation-ischemic heart diseases- origin and conduction of heart beat - Electrocardiogram (ECG) Blood pressure (BP)- blood cholesterol.	II B.Sc Zoology	18	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Jan	III	Osmoregulation - Mechanisms of osmoregulation - Poikilosmotic and Homeoosmotic animals. Euryhaline, Stenohaline - Osmoconfirmers, Osmoregulators,	II B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP	

		Osmoregulations in crustaceans, fishes and birds. Excretion - Ultra structure and function of kidney and structure of nephron - mechanism of urine formation.			presentations, quiz, on the spot test	<u>R.S.N</u>
Feb	IV	Muscle system - Ultra structure of skeletal muscle - mechanism of muscle contraction. Sense organs: Physiology of vision. Chronobiology - Biological clock, Lunar Rhythm and Circadian Rhythm.	II B.Sc Zoology	6	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	<u>R.S.N</u>
Mar	V	Nervous system: Structure and types of neuron — conduction of nerve impulse Synapse and Neuromuscular junctions - Reflex arc. Endocrine system- Hormones of Pituitary, Thyroid, Parathyroid and Adrenal.	II B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	<u>R.S.N</u>

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LESSON PLAN
2023-2024

Class : III B.Sc Zoology





Sem : VI


Sub. Code: 21Z62

Title : Microbiology & Immunology

Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Introduction to Microbiology -The history and scope of Microbiology - Classification of Microorganisms : Classification based on Robert H. Whittaker (Five Kingdom system). Outline classification for bacteria as per the second edition of Bergey's Manual of Systematic Bacteriology and Classification of Fungi (Alexopoulos and Mims). Bacterial growth curves, Bacterial media-complex and selective media. Bacterial staining techniques- Control of microbes- Sterilization, disinfection, antiseptic, tyndallisation, pasteurization: Physical- dry heat, moist heat, UV light, ionizing radiation, filtration, HEPA filter, Chemical methods. Pure culture methods (streak plate, spread plate, Pour plate, stab culture, slant culture).	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	

Jan	II & III	<p>Food Microbiology- Types of food-Food spoilage, spoilage of Milk & Milk products. Spoilage of beer & wine, Spoilage of vegetables, fruits, meat & canned food. Physical preservation methods: Asepsis, filtration & centrifugation, high & low temperature & Pasteurization, desiccation, radiation, anaerobiosis, canning and controlled atmosphere. Chemical preservation methods: Salt, Sugar, organic acid (Benzoic acid, Sorbic acid, propionates, acetic acid & lactic acid), nitrates, nitrites, sulfur dioxide, ethylene dioxide, propylene oxide, wood smoke and antibiotics. Food poisoning: Aspergillus flavus & Clostridium botulinum. Probiotics and prebiotics - Benefits & applications.</p> <p>Role of microorganisms in Biogeochemical cycles- Nitrogen Cycle and Phosphorus Cycle - Role of microorganisms in soil fertility- Rhizobium, Blue Green Algae (BGA) Biofertilizer, Azotobacter.</p>	III B.Sc Zoology	18	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	  
Feb	IV	<p>History of Immunology: Contributions of Edward Jenner - Louis Pasteur - Elie Metchnikoff. Types of immunity: Innate-anatomic, physiologic, phagocytic, and inflammatory - Acquired or Adaptive - specificity - diversity - Immunologic memory - self/nonself recognition. Ontogeny of Lymphoid organs - Myeloid Lineage and Lymphoid Lineage. Primary and secondary Lymphoid organs - Thymus, Bone marrow, Spleen, lymph node - Specific and nonspecific immunity - B cells, T cells and sub cells - Immune response - humoral immune response & cell mediated immune response.</p>	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	

Mar	V	Structure and properties of antigen. Antigen - antibody reaction (precipitation & agglutination) Transplantation- MHC, HLA typing, Hypersensitivity reactions - Type I- anaphylactic reactions, Type II - cytotoxic reactions, Type III - immune complex reactions, Type IV - delayed type hypersensitivity reactions.	III B.Sc Zoolo gy	6	Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test	
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LESSON PLAN
2023-2024

Class : III B.Sc Zoology
Sem : VI
Sub. Code : 21ZE6A
Title : Biotechnology
Total Hours :60

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Introduction & Recombinant DNA Technology –History and Scope of biotechnology, Conventional vs Modern Biotechnology. Biotechnology tree-Tools of gene cloning: Restriction Endonucleases , Linkers & adapters – vectors (E.coli) Major steps in gene cloning- Cloning of human insulin gene.	III B.Sc Zoology	12	Chalk & Talk method	G. LB
Jan	II	IndustrialBiotechnology:Microbialproducts – Productionof Cyanocobalamine (Primary) and Penicillin (Secondary) - Bio Gas Production - stages of methanogenesis – uses. Industrial production and application of ethanol (green fuel)	III B.Sc Zoology	12	Chalk & Talk method	G. LB
Feb	III	Environmental Biotechnology - Biopesticides – biological control of crop pest (bacterial pesticides only) – plant extracts – bt toxin production. Bioremediation of Heavy metals (e.g super bug), Bioleaching and Xenobiotics.	III B.Sc Zoology	6	Chalk & Talk method	G. LB

Mar	IV & V	<p>Animal Biotechnology - Animal tissue culture - Basic requirements - Culture media and its composition - Transgenesis - Transgenic Fish and Cattle - Monoclonal Antibody (Mab) - production & its application.</p> <p>Applied Biotechnology : r-DNA Proteins and their uses - Interferon, Interleukin -2, Factor VII , Urokinase , TPA , FMD Vaccine in Cattle.</p>	III B.Sc Zoology	18	Chalk & Talk method	G. Jh
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LESSON PLAN
2023-2024

Class : III B.Sc Zoology
Sem : VI
Sub. Code : 21SEZ61
Title : Economic Zoology
Total Hours :30

Month	Unit	Description of the Syllabus	Class	Hours Allocated	Teaching Mode & Methods	Course Teacher Signature
Dec	I	Unit -I Sericulture - Introduction to Sericulture - Types of silk worms - culture of Mulberry Silkworms-Diseases and enemies of silkworms - uses of silk -central silk board. Apiculture - Introduction to Apiculture - Types of Honey Bee - Bee Keeping - Hives- Products of Bee keeping - Economic importance of honey - enemies and diseases of bees - Bee Keeping industry.	III B.Sc Zoology	18	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Jan	II	Aquaculture - Qualities of culturable fishes - Types of Fish farming. Fish culture - Breeding ponds - nursery ponds - rearing ponds - stocking ponds - Harvesting - Preservation of fishes-live fish feed culture - Dubifex, Chironomous larva.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	
Feb	III	Poultry -Commercial layers and broilers. Poultry housing- deep litter system, cage rearing, feeders & waterers. Summer management, winter management in brief.	III B.Sc Zoology	12	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	

		Debeaking, Poultry diseases- viral disease, bacterial disease, fungal disease and parasitic diseases (one each) Vaccination programme.				
Mar	IV	Dairy farming -Breeds of cattles, dairy products, Marketing, Management. Diseases affecting cattle's (Any four) and mode of prevention.	III B.Sc Zoology	6	Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test	


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