

K.T. S. P. Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Teaching Plan

A.Y.-2022-2023 (Semester II)

F.Y. B. Sc. Zoology

Course Title: Animal Diversity –I:- Course Code: ZO – 111

Sr. No	Month	Topics	Teacher
1	July & Aug	Principles of Classification: Taxonomy & Systematics 1.1 Taxonomy: Basic terminology and Introduction •Alpha, Beta and Gamma levels of taxonomy, Micro-taxonomy •Macrotaxonomy: Phenetics (numerical taxonomy, Cladistics (Phylogenetic systematics), Evolutionary taxonomy (evolutionary systematics) •Classical taxonomy and experimental or neo taxonomy (biochemical taxonomy and Cytotaxonomy) •Significance of Taxonomy 1.2 Systematics: definition introduction 1.3 Linnaean system of classification (Six level classification: Phylum, class, order, family, genus, species) 1.4 Concept of Species: Biological & Evolutionary 1.5 Introduction to Binomial Nomenclature. 1.6 Introduction to Five kingdom system	DNB
2	Aug	General Features of kingdom Animalia : 2.1 General characters of Kingdom Animalia, Grades of organization 2.2 Symmetry.	DNB
3	Aug & Sept	Kingdom Protista (Phylum: Protozoa) 3.1 Introduction to Phylum Protozoa 3.2 Salient features of Phylum Protozoa 3.3 Classification of Phylum Protozoa up to classes with two examples of each class (names only). Class Rhizopoda (e.g: Entamoeba histolytica, Arcella), Class Mastigophora (e.g: Euglenaviridis, Trypanosoma gambiense), Class Ciliata (e.g Paramoecium caudatum, Opalinaranarum), Class Sporozoa (e.g Plasmodium vivax, Toxoplasma gondii) 3.4 Locomotion in Protozoa: Amoeboid, Ciliary and Flagellar with suitable examples 3.5 Type Study: Paramecium caudatum: Classification, Habit and Habitat, External morphology, Feeding and digestion, Excretion, Reproduction (binary fission and Conjugation) 3.6. Economic importance of Protozoa (three harmful and one useful protozoan) 3.6.1- Harmful Protozoa: Plasmodium vivax (malaria parasite), Entamoeba histolytica (Amoebic dysentery), Trypanosoma gambiense (Gambians sleeping sickness). 3.6.2- Useful Protozoa: Trichonympha	DNB

4	Sept	Origin of Metazoa: 4.1 Introduction Origin and importance of Metazoa	DNB
5	Oct	Phylum: Porifera 5.1. Introduction to Phylum Porifera 5.2 Classification of Phylum Porifera up to classes with two examples of each class (names only, no description of specimens). Class Calcarea (e.g.: Leucosolenia, Sycon (Scypha) Class Hexactinellida (e.g.: Euplectella (venus flower basket), Hyalonema (glass sponge)) Class Demospongiae (e.g.: Chalina (Mermaid's gloves, Spongilla (fresh water sponge)) 5.3 Canal system in sponges: Ascon, Leucon and Rhagon type. 5.4 Skeleton in sponges: Spicules, its types: Microscleres & Megascleres, Monoaxon monactinal, diactinal, Amphidiscs, Triaxon, Polyaxon, Spongin fibres. 5.5 Regeneration in sponges. 5.6 Economic importance of Phylum Porifera.	DNB
6	Oct	Phylum: Cnidaria 6.1 Introduction to Phylum Cnidaria 6.2 Salient features of Phylum Cnidaria 6.3 Classification of Phylum Cnidaria up to class level with given examples each class (names of examples only) Class Hydrozoae.g.: Hydra, Physalia (Portuguese man of war) Class Scyphozoe.g.: Aurelia (Jellyfish), Leucernaria (trumpet shaped Jelly fish) Class Anthozoa: e.g.; Metridium (Common sea anemone) 6.4 Polymorphism in Hydrozoa: Polyps & Medusa (polytypes: gastrozooids, dactylozooids, gonozooids) and functions 6.5 Economic importance of Cnidarians with reference to Corals and Coral reefs.	DNB
7	Nov	Phylum: Platyhelminthes 7.1 Introduction to Phylum Platyhelminthes 7.2 Salient features of Phylum Platyhelminthes 7.3 Classification of Phylum Platyhelminthes up to classes with two examples each class (names of examples only). Class: Turbellaria (e.g.: Dugesia, Bipallium) Class: Trematoda (e.g.: Fasciola hepatica, schistosoma haematobium) Class Cestoda: (Taeniasolium (pork tapeworm), Echinococcus granulosus (dog tapeworm)) 7.4 Parasitic adaptations in Platyhelminthes: structural and physiological. 7.5 Economic importance of Platyhelminthes	DNB

Prof. D. N. Birhade

F. Y. B. Sc.

Course Code: ZO-121:

Animal Diversity II

Month	Title	Teacher Name
March	Phylum Aschelminthes 1.1 Introduction to phylum Aschelminthes 1.2 Salient features of Phylum Aschelminthes 1.3 Classification of Phylum Aschelminthes (Class Nematoda only with two examples – <i>Ascaris lumbricoides</i> (common round worm), <i>Wuchereria bancrofti</i> (Elephantiasis)). 1.4 Economic importance of class Nematoda.	DNB
March & April	Phylum Annelida 2.1 Introduction to Phylum Annelida 2.2 Salient features of Phylum Annelida. 2.3 Classification of Phylum Annelida up to classes with examples of following classes (names of examples only). Class Polychaeta (e.g: <i>Nereis pelagica</i> (<i>neries</i> / sand worm, <i>Aphrodita aculeata</i> (=Aphrodite/ seamouse) Class Oligochaeta (e.g.: <i>Pheritima posthuma</i> (earthworm), Class Hirudinea (e.g: <i>Hirudinaria granulosa</i> common cattle leech) 2.4 Economic importance of Annelida with reference to earthworms as friends of farmers and in their role in vermicomposting.	DNB
April	Phylum Arthropoda 3.1 Introduction to Phylum Arthropoda 3.2 Salient features of Phylum Arthropoda 3.3 Classification of Phylum Arthropoda with specific classes and mentioned examples (names only) Class:Crustacea: <i>Palaemon palaemon</i> (Prawn) <i>Brachyura</i> spp. crabs) Class: Chilopoda: <i>Scolopendra</i> sp. (centipede) Class: Diplopoda: <i>Julus</i> sp. (millipede) Class Insecta: <i>Periplaneta americana</i> (American Cockroach), <i>Anopheles stephensii</i> (mosquito). Class: Arachnida- Spiders, <i>Buthus sp</i> (scorpion) 3.4 mouth parts in insects: Mandibulate (cockroach), Piercing and sucking (female <i>Anopheles</i> mosquito), chewing and lapping type (honey bee) 3.5 Economic importance of Arthropoda Useful Insects: Honey bee, Lac insect, Silkworm. Harmful insects: Female <i>Anopheles</i> mosquito, Red cotton bug, Rice weevil	DNB
April & May	Phylum Mollusca 4.1 Introduction to Phylum Mollusca 4.2 Salient features of Phylum Mollusca	DNB

	<p>4.3 Classification of Phylum Mollusca with specific classes and mentioned examples (names only)</p> <p>Class Gastropoda e.g <i>Pila globosa</i> (apple snail)</p> <p>Class Pelecypoda e.g <i>Lamellidens marginalis</i>(Bivalve)</p> <p>Class Polyplacophora e.g <i>Chiton</i></p> <p>Class: Cephalopoda.e.g: <i>Octopus vulgaris</i> (common octopus), <i>Sepia officinalis</i> (common Cuttle fish)</p> <p>4.4 Economic importance of Mollusca.</p>	
May	<p>Study of Phylum Echinodermata</p> <p>5.1 Introduction to Phylum Echinodermata</p> <p>5.2 Salient features of Phylum Echinodermata.</p> <p>5.3 Classification of Phylum Echinodermata with specific classes and mentioned examples (names only)</p> <ul style="list-style-type: none"> •□ Class Asterozoa (<i>Asterias rubens</i> sea stars or starfish) •□ Class: Holothurozoa. <i>Holothuria sp.</i> sea cucumbers) •□ Class: Echinozoa (<i>Echinus esculentis</i> common sea urchins) •□ Class: Crinozoa (sea lilies or feather stars) <p>5.4 Type study: <i>Asterias rubens</i> (Sea Star): Classification, Habit Habitat, External Morphology, Digestive system, Water vascular System and autotomy and regeneration</p> <p>5.5 Pedicellaria in Echinodermata: straight, crossed, valvate, tridactylous, globigerous.</p> <p>5.6 Economic importance of Echinidermata.</p>	DNB

Prof. D. N. Bihade



S.Y.B. Sc. (Zoology)
Course Title: Animal Diversity – III Course Code: ZO – 231

Sr. No	Month	Topics	Teacher
1	Aug	1. Introduction to Phylum Chordata – 1.1 Origin & Ancestry of Chordates. 1.2 Comparative account of fundamental characters of Chordates with Non Chordates. 1.3 Salient features of Phylum Chordata. 1.4 Classification of Phylum Chordata upto classes – Pisces, Amphibia, Reptilia, Aves, Mammalia.	DNB
2	Sept	2. Introduction to Group – Protochordata. 2.1 Salient features of Protochordata. 2.2 Salient features of subphylums with two example each - Names only. Hemichordata – <i>Balanoglossus</i> and <i>Rhabdopleura</i> , Urochordata – <i>Herdmania</i> and <i>Salpa</i> , Cephalochordata – <i>Branchiostoma</i> (Amphioxus) and <i>Asymmetron</i> .	DNB
3	Sept	3. Introduction to subphylum – Vertebrata 3.1 Salient features of Vertebrata. 3.2 Introduction and General characters of sections with two examples - Names only. Agnatha– <i>Petromyzon</i> & <i>Myxine</i> & Gnathostomata–Frog & <i>Labeo</i>	DNB
4	Oct	4. Introduction to Class – Pisces 4.1 Salient features of Class – Pisces. 4.2 Introduction and Salient features of sections with two examples - Names only. Class – Chondrichthyes– <i>Scoliodon</i> and <i>Chimaera</i> & Osteichthyes – <i>Labeo</i> and <i>Catla</i> 4.3 Types of Scales in Fishes. 4.4 Types of Fins in Fishes.	DNB

5	Oct	<p>5. Introduction to Class – Amphibia</p> <p>5.1 Salient features of Class – Amphibia.</p> <p>5.2 Introduction to order – Apoda–<i>Ichthyophis</i>, Urodela–<i>Salamandra</i> (Salamander) & Anura - <i>Rana</i>.</p> <p>5.3 Parental care in Amphibia.</p>	DNB
6	Nov	<p>6. Study of <i>Scoliodon Scoliodon</i> – 6.1 - Systematic position, Geographical distribution, Habit, Habitat 6.2 - External characters</p> <p>6.3 - Digestive System, Food and feeding mechanism. 6.4 - Respiratory System – Structure of Holobranch only.</p> <p>6.5- External & Internal Structure of heart, Working of heart.</p> <p>6.6 - Nervous System – Brain only.</p> <p>6.7 - Male urinogenital system & Female reproductive System.</p> <p>6.8- Yolk sac placenta.</p>	DNB

Prof. D. N. Birkhade



S. Y. B. Sc.

Course Title: Animal Diversity - IV

Course Code: ZO – 241

Month	Title	Teacher Name
March	Introduction to class –Reptilia 1.1 Salient features of class Reptilia with one example (name only) – <i>Chelone, Calotes</i> . 1.2 Venomous and Non-venomous snakes – Cobra, Russell’s viper, Rat snake, Grass snake. 1.3 Snake venom, symptoms, effect and cure of snake bite, first aid treatment of snakebite. 1.4 Desert adaptations in reptiles in brief.	DNB
April	Introduction to class –Aves 2.1 Salient features of class Aves with two examples (names only) – Sparrow, Parrot. 2.2 Flight adaptations in birds. 2.3 Types of Beaks and feet in birds. 2.4 Migration in birds – Altitudinal, Latitudinal	DNB
April & May	3. Introduction to class - Mammalia. 3.1 Salient features of class Mammalia with two examples (names only) – Rat, Rabbit. 3.2 Egg laying mammals. 3.3 Aquatic adaptations in mammals. 3.4 Flying adaptations in mammals. 3.5 Cursorial and fossorial adaptation in mammals	DNB
May	4. Study of Rat 4.1 Systematic position, habit and habitat. 4.2 External characters. 4.3 Digestive system, food and feeding. 4.4 Respiratory system. 4.5 Blood vascular system – Structure of Heart. 4.6 Nervous system – Central Nervous system only. 4.7 Sense organs – Structure and functions of Eye & Ear. 4.8 Reproductive system	DNB

Prof. D. N. Birhade

T. Y. B. Sc. (Zoology)

Course Title: Genetics

Course code: ZO 354

Sr. No	Month	Topics	Teacher
1	Sept	1. Introduction to genetics: 1.1 Classical and Modern concept of Gene, Cistron, Muton, Recon. 1.2 Mendel's laws of Inheritance.	DNB
2	Sept	2 Exceptions to Mendelian Inheritance: 2.1 Incomplete dominance. 2.2 Co-dominance. 2.3 Multiple alleles: Concept, characteristics and importance of multiple alleles, ABO & Rh - blood group system and its medico legal importance. 2.4 Lethal alleles.	DNB
3	Sept & Oct	3. Gene Mutation: 3.1 Definition. 3.2 Types of mutations: spontaneous, induced, somatic, gametic, forward, reverse. Types of point mutation - deletion, insertion, substitution, transversion, transition. 3.3 Mutagenic agents a) UV radiation and ionising radiation. b) Base analogs, alkylating and intercalating agents.	DNB
4	Oct	4. Sex-determination: 4.1 Introduction. 4.2 Types of sex determination: -XX-XY, ZZ-ZW, XX-XO and Parthenogenesis, Hypodiploidy. 4.3 Gynandromorphism.	DNB

5	Oct	<p>5. Population Genetics:</p> <p>5.1 Basic Concepts in population genetics: Mendelian population, gene pool, gene / allele, Frequency, chance mating (Panmictic mating).</p> <p>5.2 Hardy Weinberg law and its equilibrium.</p>	DNB
6	Nov	<p>6.1 Karyotype.</p> <p>6.2 Genetic disorders, Structural & numerical alterations of chromosomes (chromosomal aneuploidy - Down, Patau, Edward, Turner and Klinefelter syndromes).</p>	DNB
7	Nov	<p>7. Sex linked inheritance in human:</p> <p>7.1 Colour – blindness.</p> <p>7.2 Haemophilia.</p> <p>7.3 Hypertrichosis.</p>	DNB
8	Nov	<p>8. Application of genetics:</p> <p>8.1 Genetic counselling.</p> <p>8.2 Diagnostics & breeding technology.</p>	DNB

Prof. D. N. Birhade



T.Y. B. Sc.

Course Title: Medical & Forensic Zoology

Course Code: ZO-361

Month	Title	Teacher Name
Feb	Introduction to medical zoology and its importance :	DNB
Feb & March	Medico-legal Autopsy: 2.1 Death and its Causes- External examination of deceased body – Internal Examination - Determination of time since death and cause of death. 2.2 Injuries – Classification - Medico-legal aspects of injuries. 2.3 Post-mortem changes - collection of post-mortem samples and Preservation.	DNB
March	Urine Analysis: 3.1 Physical characteristics, abnormal constituents, renal failure, renal calculi, dialysis.	DNB
April	Non infectious Diseases: 4.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Diabetes (Type I and II), Hypertension, Hypotension, Obesity, Atherosclerosis, Myocardial Infraction.	DNB
April	Infectious Diseases: 5.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Tuberculosis and Hepatitis.	DNB
April	Introduction to Forensic Zoology: 6.1 Definition, Scope and Application of Forensic Zoology. 6.2 Forensic Laboratories in India. 6.3 Basic Principles of Forensic Science with Examples.	DNB
May	Forensic Medicine: 7.1 Introduction to Forensic Medicine: Definitions of Forensic Medicine. 7.2 Medical Jurisprudence. 7.3 Medical evidence documentations.	DNB
May	Forensic Analysis: 8.1 Examination of Biological Materials: Examination of Hair, Fibres, Diatoms, plants materials, human tissues. 8.2 Examination of Body Fluid: Blood, Semen and Saliva.8.3 Forensic Importance of Insects: Insects of forensic importance -indicators of time of death stages of insect development &	DNB

<p>comparative decomposition of human body - colonization - Evidence collection of insects – Territorial & Aquatic Insects. 8.4 DNA Fingerprint Technique and Examination of Biological Traces: Liquid blood, blood stains, & swabs, semen, Seminal stains, tissues, Bones, Hairs, Teeth, Saliva, Skeletal remains.</p> <p>8.5 Toxicological Investigations: Poisons – Definition, Forms of Poison – Physical, Chemical & Mechanical state. Introduction with examples of – Neurotoxic Poisons – Cerebral & Spinal, Cardiovascular Poisons, Asphyxiants, Miscellaneous poisons – Pesticides, Pharmaceutical drugs, Petroleum poisons, Food poisons, Radioactive poisons.</p>	
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