

**K. T. S. P. Mandal's**  
**Hutatma Rajguru Mahavidyalaya, Rajgurunagar.**

**Department of Zoology**  
**Teaching Plan (A.Y.2023–2024)**

**F.Y. B. Sc. Zoology**

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

Sr. No	Month	Topics	Teacher
1	July & Aug	<p><b>Principles of Classification:</b> Taxonomy &amp; Systematics</p> <p>1.1 <b>Taxonomy:</b> Basic terminology and Introduction</p> <ul style="list-style-type: none"> <li>•Alpha, Beta and Gamma levels of taxonomy, Micro-taxonomy</li> <li>•Macrotaxonomy: Phenetics (numerical taxonomy, Cladistics (Phylogenetic systematics), Evolutionary taxonomy (evolutionary systematics)</li> <li>•Classical taxonomy and experimental or neo taxonomy (biochemical taxonomy and Cytotaxonomy)</li> <li>•Significance of Taxonomy</li> </ul> <p>1.2 Systematics: definition introduction</p> <p>1.3 Linnaean system of classification (Six level classification: Phylum, class, order, family, genus, species)</p> <p>1.4 Concept of Species: Biological &amp; Evolutionary</p> <p>1.5 Introduction to Binomial Nomenclature.</p> <p>1.6 Introduction to Five kingdom system</p>	DNB
2	Aug	<p><b>General Features of kingdom Animalia :</b></p> <p>2.1 General characters of Kingdom Animalia, Grades of organization</p> <p>2.2 Symmetry.</p>	DNB
3	Aug & Sep	<p><b>Kingdom Protista (Phylum: Protozoa)</b></p> <p>3.1 Introduction to Phylum Protozoa</p> <p>3.2 Salient features of Phylum Protozoa</p> <p>3.3 Classification of Phylum Protozoa upto classes with two examples of each class (names only).</p> <p>Class Rhizopoda (e.g: Entamoeba histolytica, Arcella), Class Mastigophora (e.g: Euglenaviridis, Trypanosoma gambiense), Class Ciliata (e.g: Paramecium caudatum, Opalinaranarum), Class Sporozoa (e.g: Plasmodium vivax, Toxoplasma gondii)</p> <p>3.4 Locomotion in Protozoa: Amoeboid, Ciliary and Flagellar with suitable examples</p> <p>3.5 Type Study: Paramecium caudatum: Classification, Habit and Habitat, External morphology, Feeding and digestion, Excretion, Reproduction (binary fission and Conjugation)</p> <p>3.6. Economic importance of Protozoa (three harmful and one useful protozoan)</p> <p>3.6.1- Harmful Protozoa: Plasmodium vivax (malaria parasite), Entamoeba histolytica (Amoebic dysentery), Trypanosoma gambiense (Gambian sleeping sickness).</p> <p>3.6.2- Useful Protozoa: Trichonympha</p>	DNB
4	Sept	<p><b>Origin of Metazoa:</b></p> <p>4.1 Introduction Origin and importance of Metazoa</p>	DNB

5	Oct	<p><b>Phylum: Porifera</b></p> <p>5.1. Introduction to Phylum Porifera</p> <p>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))</p> <p>5.3 Canal system in sponges: Ascon, Leucon and Rhagon type.</p> <p>5.4 Skeleton in sponges: Spicules, its types: Microscleres &amp; Megascleres, Monoaxon monactinal, diactinal, Amphidiscs, Triaxon, Polyaxon, Spongin fibres.</p> <p>5.5 Regeneration in sponges.</p> <p>5.6 Economic importance of Phylum Porifera.</p>	DNB
6	Oct	<p><b>Phylum: Cnidaria</b></p> <p>6.1 Introduction to Phylum Cnidaria</p> <p>6.2 Salient features of Phylum Cnidaria</p> <p>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 Jellyfish)  Class Anthozoa: e.g.; Metridium (Common sea anemone)</p> <p>6.4 Polymorphism in Hydrozoa: Polyps &amp; Medusa (polytypes: gastrozooids, dactylozooids, gonozooids) and functions</p> <p>6.5 Economic importance of Cnidarians with reference to Corals and Coral reefs.</p>	DNB
7	Nov	<p><b>Phylum: Platyhelminthes</b></p> <p>7.1 Introduction to Phylum Platyhelminthes</p> <p>7.2 Salient features of Phylum Platyhelminthes</p> <p>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: (Taenia solium (pork tapeworm), Echinococcus granulosus (dog tapeworm))</p> <p>7.4 Parasitic adaptations in Platyhelminthes: structural and physiological.</p> <p>7.5 Economic importance of Platyhelminthes</p>	DNB

**Prof. D. N. Birhade**

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

Sr. No	Month	Topics	Teacher
1	July	<p><b>1. Introduction to Phylum Chordata –</b></p> <p>1.1 Origin &amp; 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.</p>	DNB
2	Aug	<p><b>2. Introduction to Group – Protochordata.</b></p> <p>2.1 Salient features of Protochordata.            2.2 Salient features of subphylum 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>.</p>	DNB
3	Aug & Sept	<p><b>3. Introduction to subphylum – Vertebrata</b></p> <p>3.1 Salient features of Vertebrata.            3.2 Introduction and General characters of sections with two examples - Names only.            Agnatha – <i>Petromyzon</i> &amp; <i>Myxine</i> &amp; Gnathostomata – Frog &amp; <i>Labeo</i></p>	DNB
4	Sept	<p><b>4. Introduction to Class – Pisces</b></p> <p>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> &amp; Osteichthyes – <i>Labeo</i> and <i>Catla</i>            4.3 Types of Scales in Fishes.            4.4 Types of Fins in Fishes.</p>	DNB
5	Oct	<p><b>5. Introduction to Class – Amphibia</b></p> <p>5.1 Salient features of Class – Amphibia.            5.2 Introduction to order – Apoda – <i>Ichthyophis</i>, Urodela – <i>Salamandra</i> (Salamander) and &amp; Annura - <i>Rana</i>.            5.3 Parental care in Amphibia.</p>	DNB

6	Nov	<b>6. Study of <i>Scoliodon</i></b> <i>Scoliodon</i> – 6.1 - Systematic position, Geographical distribution, Habit, Habitat 6.2 - External characters 6.3 - Digestive System, Food and feeding mechanism. 6.4 - Respiratory System – Structure of Holobranch only. 6.5- External & Internal Structure of heart, Working of heart. 6.6 - Nervous System – Brain only. 03 6.7 - Male urinogenital system & Female reproductive System. 6.8- Yolk sac placenta.	DNB
---	-----	--	-----

**Prof. D. N. Birhade**



**F. Y. B. Sc.**  
**Course Code: ZO-121:**  
**Animal Diversity II**

Month	Title	Teacher Name
<b>Dec</b>	<b>Phylum Aschelminthes</b> 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.	<b>DNB</b>
<b>Dec &amp; Jan</b>	<b>Phylum Annelida</b> 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> (neries/ 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.	<b>DNB</b>
<b>Jan</b>	<b>Phylum Arthropoda</b> 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</i> sp (scorpion) 3.4 mouth parts in insects: Mandibulate (cockroach), Piercing and sucking (female Anopheles mosquito), chewing and lapping type (honey bee) 3.5 Economic importance of Arthropoda, Useful Insects: Honey bee, Lac insect, Silkworm. Harmful insects: Female Anopheles mosquito, Red cotton bug, Rice weevil	<b>DNB</b>
<b>Feb</b>	<b>Phylum Mollusca</b> 4.1 Introduction to Phylum Mollusca, 4.2 Salient features of Phylum Mollusca 4.3 Classification of Phylum Mollusca with specific classes and mentioned examples (names only) Class Gastropoda e.g <i>Pila globosa</i> (apple snail), Class Pelecypoda e.g <i>Lamellidens marginalis</i> (Bivalve), Class Polyplacophora e.g <i>Chiton</i> Class: Cephalopoda e.g: <i>Octopus vulgaris</i> (common octopus), <i>Sepia officinalis</i> (common Cuttle fish), 4.4 Economic importance of Mollusca.	<b>DNB</b>
<b>March</b>	<b>Study of Phylum Echinodermata</b> 5.1 Introduction to Phylum Echinodermata, 5.2 Salient features of Phylum Echinodermata. 5.3 Classification of Phylum Echinodermata with specific classes and mentioned examples Class Asteroidea ( <i>Asterias rubens</i> sea stars or starfish), Class: Holothuroidea.	<b>DNB</b>

<p><i>Holothuria sp.</i> sea cucumbers), Class: Echinoidea (<i>Echinus esculentis</i> common sea urchins), Class: Crinoidea (sea lilies or feather stars)</p> <p>5.4 <b>Type study: <i>Asterias rubens</i> (Sea Star):</b> 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 Echinodermata.</p>	
--	--



**Prof. D. N. Birhade**



**S. Y. B. Sc.**  
**Course Title: Animal Diversity - IV**  
**Course Code: ZO – 241**

Month	Title	Teacher Name
<b>Jan</b>	<b>Introduction to class –Reptilia</b> Salient features of class Reptilia with one example (name only) – <i>Chelone</i> , <i>Calotes</i> . Venomous and Non-venomous snakes – Cobra, Russell’s viper, Rat snake, Grass snake. Snake venom, symptoms, effect and cure of snake bite, first aid treatment of snakebite. Desert adaptations in reptiles in brief.	<b>DNB</b>
<b>Feb</b>	<b>Introduction to class –Aves</b> 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	<b>DNB</b>
<b>March</b>	<b>3. Introduction to class - Mammalia.</b> 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	<b>DNB</b>
<b>April</b>	<b>4. Study of Rat</b> 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	<b>DNB</b>

**Prof. D. N. Bihade**



**T. Y. B. Sc. (Zoology)**

**Course Title: Genetics**

**Course code: ZO 354**

<b>Sr. No</b>	<b>Month</b>	<b>Topics</b>	<b>Teacher</b>
1	Aug	<b>1. Introduction to genetics:</b> 1.1 Classical and Modern concept of Gene, Cistron, Muton, Recon. 1.2 Mendel's laws of Inheritance.	<b>DNB</b>
2	Aug	<b>2 Exceptions to Mendelian Inheritance:</b> 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.	<b>DNB</b>
3	Sept	<b>3. Gene Mutation:</b> 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.	<b>DNB</b>
4	Sept	<b>4. Sex-determination:</b> 4.1 Introduction. 4.2 Types of sex determination: -XX-XY, ZZ-ZW, XX-XO and Parthenogenesis, Hypodiploidy. 4.3 Gynandromorphism.	<b>DNB</b>
5	Oct	<b>5. Population Genetics:</b> 5.1 Basic Concepts in population genetics: Mendelian population, gene pool, gene / allele, Frequency, chance mating (Panmictic mating). 5.2 Hardy Weinberg law and its equilibrium.	<b>DNB</b>
6	Oct	6.1 Karyotype. 6.2 Genetic disorders, Structural & numerical alterations of chromosomes (chromosomal aneuploidy - Down, Patau, Edward, Turner and Klinefelter syndromes).	<b>DNB</b>



7	Nov	<b>7. Sex linked inheritance in human:</b> 7.1 Colour – blindness. 7.2 Haemophilia. 7.3 Hypertrichosis.	<b>DNB</b>
8	Nov	<b>8. Application of genetics:</b> 8.1 Genetic counselling. 8.2 Diagnostics & breeding technology.	<b>DNB</b>



**Prof. D. N. Birkhade**

