K. T. S. P. Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Teaching Plan (A.Y.2024–2025)

F.Y. B. Sc. Zoology

Course Title: Genetics and Medical Zoology, Course Code: ZOO 101 MJ

Sr. No	Month	Topics	Teacher
1	June	**1) Recapitulation of Mendelian Genetics:** 1.1 Mendel's work: Selection of experimental plant. 1.2 Mendelian Inheritance: Laws of heredity and their practical applications (Monohybrid cross and Dihybrid cross). 1.3 Test cross and back cross.	DNB
2	July	**2) Non-Mendelian Genetics:** 2.1 Concept of Gene Interaction: Intra-allelic interactions and Interallelic interactions. 2.2: Dominance and Co-dominance. 2.3 Inter-allelic interactions: Co-dominance and incomplete dominance (concept of epistasis, complimentary factors (9 : 7), supplementary factors (9 : 3 : 4), inhibitory factors (13 : 3), duplicate dominant genes (factors) (15 : 1). 2.4 Lethal genes in *Mus musculus*.	DNB
3	July	**3) Multiple alleles:** 3.1 Concept and characteristics. 3.2 ABO blood group system, Inheritance of Rh antigen, Erythroblastosis foetalis and their medicolegal importance.	DNB
4	July & Aug	**4) Chromosomes:** 4.1 Introduction: Morphology and types of chromosomes (based on the position of centromere and involvement in sex determination). 4.2 Chromatin, its structure and its types (Euchromatin and Heterochromatin). 4.3 Giant chromosomes (Polytene chromosome and Lamp brush chromosomes). 4.4 Chromosomal Aberrations: Structural (Deletion, duplication, inversion and translocation) and Numerical (Euploidy, monoploidy, polyploidy - auto polyploidy & allopolyploidy and aneuploidy - monosomy, nullisomy, trisomy).	DNB

5	**Aug**	**5) Sex Determination:** 5.1 Genetically controlled sex determination: (Heterogametic males: XX - XY & XX - XO systems, Heterogametic females: ZZ - ZW system), Genetic balance system in Drosophila. 5.2 Parthenogenesis and Gynandromorphism.	**DNB**
6	**Aug & Sept**	**6) Sex-linked Inheritance:** 6.1 Sex-linked inheritance: Characteristics, types (X - linked, Y - linked, and XY - linked). 6.2 Examples of Sex-linked inheritance: Hemophilia, Colour blindness and Hypertrichosis.	**DNB**
7	**Sept**	**7) Introduction to Medical Zoology:** 7.1 Definitions: Parasitology, host, parasite, vector, symbiosis, commensalisms, mutualism, parasitism and zoonosis. 7.2. Branches of medical zoology: Medical Protozoology, Medical Helminthology, Medical Entomology.	**DNB**
8	**Sept**	8**) Epidemic Diseases in Human:** Occurrence, causative organism, symptoms and eradication programs of the following: 8.1 Typhoid. 8.2 Cholera. 8.3 Small pox.	**DNB**
9	**Oct**	**9) Vector Borne Diseases in Human:** Occurrence, causative organism, symptoms and eradication programs of the following: 9.1 Dengue. 9.2 Chicken Guinea. 9.3 Viral Influenza. 9.4 Scabies.	**DNB**
10	**Oct**	**10) Microbial Diseases in Human:** Causative organism and clinical features of the following: 10.1 Tuberculosis. 10.2 Hepatitis. 10.3 AIDS.	**DNB**
11	**Oct**	**11) Investigations and treatments of human physiological disorders:** 11.1 Angiography. 11.2 Angioplasty. 11.3 Dialysis.	**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	June & July	**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	July	**2. Introduction to Group – Protochordata.** 2.1 Salient features of Protochordata. 2.2 Salient features of subphylumswith two example each - Names only. Hemichordata – *Balanoglossus*and*Rhabdopleura,* Urochordata - *Herdmania*and*Salpa,* Cephalochordata –*Branchiostoma*(Amphioxus) and*Asymmetron*.	DNB
3	Aug	**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–*Petromyzon & Myxine* & Gnathostomata–Frog & *Labeo*	DNB
4	Aug & Sept	**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–*Scoliodon* and *Chimaera* & Osteichthyes – *Labeo* and *Catla* 4.3 Types of Scales in Fishes. 4.4 Types of Fins in Fishes.	DNB
5	Sept	**5. Introduction to Class – Amphibia** 5.1 Salient features of Class – Amphibia. 5.2 Introduction to order – Apoda–*Ichthyophis,*Urodela–*Salamandra*(Salamander) and& Annura - *Rana*. 5.3 Parental care in Amphibia.	DNB

6	**Oct**	**6. Study of *Scoliodon*** *Scoliodon* – 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

T. Y. B. Sc. (Zoology)

Course Title: Genetics
Course code: ZO 354

Sr. No	Month	Topics	Teacher
1	June	**1. Introduction to genetics:** 1.1 Classical and Modern concept of Gene, Cistron, Muton, Recon. 1.2 Mendel's laws of Inheritance.	DNB
2	July	**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	July	**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	Aug	**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	Aug & Sept	**5. Population Genetics:** 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.	DNB
6	Sept	**6.1 Karyotype.** 6.2 Genetic disorders, Structural & numerical alterations of chromosomes (chromosomal aneuploidy - Down, Patau, Edward, Turner and Klinefelter syndromes).	DNB

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

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