K. T. S. P. Mandal's

Hutatma Rajguru Mahavidyalaya, Rajgurunagar.

Department of Zoology

Teaching Plan (A.Y.2021–2022)

T.Y. B. Sc. (Zoology)
Course Title: Developmental Biology
Course code: ZO 355

Sr. No	Month	Topics	Teacher
1	Oct	**1. Fundamentals of Developmental Biology:** 1.1 Definition and scope. 1.2 Concepts in Developmental Biology: Growth, Differentiation, Dedifferentiation, Cell determination, Cell communication, Morphogenesis, Induction and Regeneration.	DRB
2	Oct	**2. Theories of Developmental Biology:** 2.1 Preformation. 2.2 Pangenesis. 2.3 Epigenesis. 2.4 Axial gradient. 2.5 Germplasm.	DRB
3	Nov	**3. Gametogenesis:** 3.1 Spermatogenesis & Structure of sperm with respect to human. 3.2 Oogenesis & Structure of ovum with respect to human. 3.3 Types of eggs.	DRB
4	Nov & Dec	**4.Fertilization:** 4.1 Concept and types. 4.2 Chemotaxis. 4.3 Sperm penetration: Acrosome reaction, Capacitation & Decapacitation. 4.4 Activation of ovum: Fertilization cone. 4.5 Prevention of polyspermy: Fast block & Slow block. 4.6 Significance of fertilization.	DRB
5	Dec	**5. Cleavage and Blastula:** 5.1 Planes and symmetry of cleavage. 5.2 Types of cleavage. 5.3 Significance of cleavage. 5.4 Definition and types of Blastula.	DRB

6	Jan	**6. Gastrulation:** 6.1 Definition and Concept. 6.2 Basic cell movements in gastrulation: Epiboly, Emboly, Convergence, Invagination, Ingression & Involution with reference to frog. 6.3 Concept of Organizer : Primary, Secondary and Tertiary.	DRB
7	Jan	**7. Chick Embryology:** 7.1 Structure of Hen's egg. 7.2 Fertilization and cleavage in Chick. 7.3 Formation of primitive endoderm. 7.4 Primitive streak development. 7.5 Head process and regression of Primitive streak.	DRB

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T.Y. B. Sc.
Course Title: Medical & Forensic Zoology
Course Code: ZO-361

Month	Title	Teacher Name
March	**Introduction to medical zoology and its importance :**	**DRB**
March & April	**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.	**DRB**
April	**Urine Analysis:** 3.1 Physical characteristics, abnormal constituents, renal failure, renal calculi, dialysis.	**DRB**
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.	**DRB**
May	**Infectious Diseases:** 5.1 Causes, Types, Symptoms, Complications, Diagnosis and Prevention of Tuberculosis and Hepatitis.	**DRB**
May	**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.	**DRB**
May	**Forensic Medicine:** 7.1 Introduction to Forensic Medicine: Definitions of Forensic Medicine. 7.2 Medical Jurisprudence. 7.3 Medical evidence documentations.	**DRB**
June	**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 & 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. 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.	**DRB**

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F.Y. B.Sc. Semester I
Course Title: Animal Ecology
Course Code: ZO – 112

Month	Topics	Teacher Name
Sept & Oct	**Introduction to Ecology** 1.1ConceptsofEcology, Environment, Population, Community, Ecosystem, Biosphere, Autecology and synecology.	DRB
Oct & Nov	**Ecosystem** 2.1 Types of ecosystems: Aquatic (Freshwater, estuarine, Marine and terrestrial (Forest, Grassland and Desert) 2.2 Structure and Composition of Ecosystem (Abiotic components and biotic components. 2.3 Food chain: Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Eco logical pyramids: Number, Biomass, and Energy. 2.4 Concept of Eutrophication in lakes and rivers.	DRB
Dec	**Population** 3.1Characteristic of population: Density, Natality, Mortality, Fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion. 3.2Exponential and logistic growth, 3.3 Population regulation–density-dependent and independent factors. Population interactions, Gause's Principle with laboratory and field interactions, 3.4 Quadrate ,line and belt transect methods.	DRB
Jan	**Community** 4.1Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Ecotone and edge effect; Ecological Succession with one example.	DRB
Jan	**Animal interactions** 5.1 Introduction to Animal interactions 5.2 Types of Animal interactions with at least to suitable examples of each 5.2.1-Competition:Interspecificandintraspecific5.2.2-BeneficialAssociations: Commensalism (remora fish on shark, Cattle egrets on livestock),Mutualism (Termite and Trichonympha, bees and flowers, cleaning symbiosis in fish by prawns. 5.3 Antagonistic associations: Parasitism (Ascaris and man, lice and humans),Prey predation (Lion and deer).	DRB

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F. Y. B. Sc. Semester II
Course Title: Cell biology
Course Code: ZO122

Month	Title	Teacher Name
April	**Introduction:** 1.1 Introduction cell biology, 1.2 Cell as basic unit of life. 1.3 Importance of Cell Biology and its applications in industry. **Overview of Cells** 1.3 Introduction to Prokaryotic and Eukaryotic cells. 1.4 Structure and function of Prokaryotic *(E. coli)* 1.5 Structure and function of Eukaryotic cells (Animal and Plant Cell)	**DRB**
April	**Techniques in Cell Biology:** 3.1 Introduction 3.2 Microscopy: Basic Principle, Simple, Compound and applications of Electron Microscope. 3.3 Stains and dyes: Types of Stain: Acidic, basic and neutral. Dye (Preparation and chemistry of dyes not expected) 3.4 Micrometry.	**DRB**
May	**Plasma Membrane:** 4.1Introduction 4.2 Structure of plasma membrane: Fluid mosaic model. 4.3Transport across membranes: Active and Passive transport, Facilitated transport, exocytosis, endocytosis, phagocytosis – vesicles and their importance in transport. 4.4 Other functions of Cell membrane in brief Protection, cell recognition, shape, storage, cell signalling. 4.5 Cell Junctions: Tight junctions, gap junctions, Desmosomes.	**DRB**
May	**Nucleus: Structure and function** 5.1Introduction to Nucleus 5.2 Structure of Nucleus: Nuclear envelope, Nuclear pore complex, Nucleoplasm, Nucleolus 5.3 Chromatin: Eu-chromatin and Hetro-chromatin, nature and differences. 5.4 Functions of nucleus apparatus, Lysosomes and vacuoles.	**DRB**
June	**Endomembrane System** 6.1 Introduction 6.2 Structure, location and Functions: Endoplasmic Reticulum, Golgi **Mitochondria and Peroxisomes** 7.1 Introduction	**DRB**

	7.2 Mitochondria: ultrastructure and function of mitochondrion.	
June	7.3 Peroxisomes **Cell Division** 7.1 Introduction 7.2 Cell cycle (G1, S, G2, M phases), 7.3 Mitosis. 7.4 Meiosis.	**DRB**

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S. Y. B. Sc. Semester I
Course Title - Applied Zoology I
Course Code - ZO - 232

Month	Topics	Teacher Name
Oct	**1) Sericulture:** 1.1 An introduction to Sericulture, Study of different types of silk moths, their distribution, Taxonomic position and varieties of silk produced in India : Mulberry, Tassar, Eri and Muga silk moths. 1.2 External Morphology and life cycle of *Bombyx mori.*	DRB
Nov	1.3 Cultivation of mulberry : **a)** Varieties for cultivation, **b)** Rain fed and irrigated mulberry cultivation- Fertilizer schedule, Pruning methods and leaf yield. 1.4 Harvesting of mulberry : **a)** Leaf plucking, **b)** Branch cutting, **c)** Whole shoot cutting. 1.5 Silk worm rearing : **a)** Varieties for rearing, **b)** Rearing house, **c)** Rearing techniques, **d)** Important diseases and pests.	DRB
Dec	1.6 Preparation of cocoons for marketing. 1.7 Post harvest processing of cocoons : **a)** Stiffling, sorting, storage, deflossing and riddling, **b)** Cocoon cooking, reeling equipment and rereeling, washing and polishing. 1.8 Biotechnological and biomedical applications of silk.	DRB
Jan	**2) Agricultural Pests and their control:** 2.1 An introduction to Agricultural Pests, types of pests (agricultural, store grain, veterinary). 2.1 Major insect pests of agricultural importance (Marks of identification, life cycle, nature of damage and control measures). **a)** Jowar stem borer, **b)** Red cotton bug, **c)** Brinjal fruit borer, **d)** Mango stem borer, **e)** Blister beetle, **f)** Rice weevil, **g)** Pulse beetle, **h)** Tick.	DRB

Feb	2.3 Non insect pests: Rats, Crabs, Snails, and Squirrels 2.4 Pest control practices in brief: Cultural control, Physical control, Mechanical control, Chemical control, Biological control, Pheromonal control, Autocidal control and Concept of IPM in brief. 2.5 Plant protection appliances: Shoulder type Rotary duster, Knapsack sprayer, Cynogas Pump.	DRB

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S. Y. B. Sc. Semester II
Course Title - Applied Zoology II
Course Code - ZO-242

Month	Title	Teacher Name
April	**Apiculture:** 1.1 An introduction to Apiculture, Systematic position, Study of habit, habitat and nesting behaviour of *Apisdorsata*, *Apisindica*, *Apis florae* and *Apis mellifera*. 1.2 Life cycle, Colony organization and Division of labour. 1.3 Bee behaviour and communication (Round Dance and Wag-Tail Dance). 1.4 Bee keeping equipments : **a)** Bee box (Langstroth type), **b)** Honey extractor, **c)** Smoker, **d)** Bee-veil, **e)** Gloves, **f)** Hive tool, **g)** Bee Brush, **h)** Queen excluder	**DRB**
May	1.5 Bee keeping and seasonal management. 1.6 Bee products (composition and uses) : **a)** Honey, **b)** Wax, **c)** Bee Venom, **d)** Propolis, **e)** Royal jelly, **f)** Pollen. 1.7 Diseases and enemies of Bees : **a)** Bee diseases - Protozoan (Nosema), Bacterial (American foul brood), Viral (Sac brood), Fungal (Chalk brood). **b)** Bee pests - Wax moth (Greater and Lesser), Wax beetle. **c)** Bee predators - GreenBee eater, King crow, Wasp, Lizard. 1.8 Bee pollination and management of bee colonies for pollination.	**DRB**
May & June	**2. Fisheries :** 2.2 An introduction to fisheries and its types (in brief): Freshwater fisheries, Marine fisheries, Brackish water fisheries. 2.3 Habit, habitat and culture methods of following freshwater forms : **a)** Rohu (*Labeo rohita*) , **b)** Catla (*Catla catla*) , **c)** Mrigal (*Cirrhinus mrigala*). 2.3 Harvesting methods of following marine forms: **a)** *Harpodon*, **b)** Mackerel, **c)** Pearl oyster.	**DRB**
June	2.4 Crafts and Gears in Indian Fishery: **a)** Crafts – Catamaran, Machwa, Dinghi. **b)** Gears – Gill net, Dol net, Rampani net, Cast net. 2.5 Fishery byproducts: **a)** Fish meal, **b)** Fish flour, **c)** Fish Liver oil, **d)** Fish manure, **e)** Fish fin soup. 2.6Fish preservation technique: **a)** Chilling, **b)** Freezing, **c)** Salting, **d)** Drying, **e)** Canning	**DRB**

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