

# Zoology

## DEGREE STANDARD

### UNIT I

Non - Chordata:- General organisation - Classification with diagnostic features upto classes.  
Protozoa:- Structure, reproduction and life history of Amoeba Paramecium, Trypanosoma, Plasmodium, Monocystis, Leishmania - locomotion, nutrition, economic importance. Porifera: Sponges canal system, skeleton, reproduction and economic importance.  
Coelenterata:- Diploblastic organization - life history of Obelia and Aurelia, Metagenesis - Polymorphism in Hydrozoa Corals and Coral formation - relationships of Cnidaria and Acnidaria.  
Helminthes:- Structure and life history of Planaria, Fasciola, Taenia, Ascaris and Wuchereria - parasitic adaptations - Helminths in relation to man.  
Annelida:- Neries, earthworm and leech - Coelom and metamerism - modes of life in polychaetes.  
Onychophora:- Structure, affinities and distribution of Peripatus.  
Arthropoda:- Prawn, Scorpion and Cockroach - Larval forms and parasitism in Crustacea - Mouth parts, vision, respiration and excretion Metamorphosis and social life in insects.  
Mollusca:- Freshwater mussel, pila, sepia - oyster culture and pearl formation.  
Echinodermata:- General organisation - Water vascular system Larval forms and affinities.

### UNIT II

Prochordata:- Amphioxus, Palanoglossus - Ascidian retrogressive Metamorphosis, neoteny and affinities.  
Chordata:- General Organisation - Characters, Outline classification Upto class level.  
Pisces:- Locomotion, migration, respiration, economic importance structure and affinities of dipnoi.  
Amphibia:- Origin of Amphibians - Parental care - South Indian amphibians.  
Reptiles:- Origin - Conquest of land - adaptations to live on land adaptive radiation - Temporal Vacuities - identification of poisonous and non-poisonous snakes - poison apparatus - south Indian examples.  
Birds:- Origin - flight adaptations - mechanism of flight - double respiration - migration - Flightless birds, their structure and distribution.  
Mammals:- Dentition, skin derivatives - distribution - adaptive radiation - Protothria and Metatheria, their Phylogenetic relationship - South Indian examples.

### UNIT III

Cell and Molecular Biology:- Cellular Organelles - Structure and function - Plasma membrane, mitochondria, golgi bodies, endoplasmic reticulum and ribosomes - Nucleolus and nucleus - Chloroplast - Cell division (Mitosis & meiosis) - Chromosomes - DNA structure and function, replication of DNA, Genetic code - RNA and protein synthesis. Gene expression - Recombinant DNA, Genetic cloning - Genetic engineering, its uses in agriculture, biology and medicine - Sex chromosomes and sex determination.

### UNIT IV

Genetics:- Laws of inheritance - Linkage, principle of gene mapping multiple alleles, blood groups - mutation (Natural and induced) Sex Linked and Sex Limited inheritance - Chromosome number and form ploidy - cytoplasmic inheritance - Karyotypes - Normal and abnormal genetic disorder - Bio-chemical genetics - regulation of gene expression in prokaryotes and Eukaryotes - population genetics - Eugenics. Mean, Median and standard deviation.

### UNIT V

Bio Chemistry:- Structure of carbohydrates, amino acids, proteins lipids - Glycolysis and krebs cycle - oxidation, reduction - oxidative phosphorylation - energy conservation and release, cyclic AMP, ATP enzymes - mechanism Hormones, their classification biosynthesis and function.  
Physiology:- With reference to mammals, digestion, nutrition, balanced diet in man - assimilation, intermediary/metabolism. Composition of blood - Coagulation, Transport of oxygen, Carbon dioxide, Blood pigments, Mechanism of respiration, Muscles, mechanism of muscle contraction, Temperature regulation, Acid base balance and homeostasis, Nerve impulses and conduction, neurotransmitters. Receptors, photo, phono and chemoreception. Nephron and urine formation, Endocrine glands, ovary and pituitary organs and their inter relationship, Physiology of reproduction in humans, Normal

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development in insects and pheromones. Bioluminescence, Biological rhythms, Physiology of immune response Antigens - Immunoglobulins, humoral and cell mediated immunity. T & B cells, mechanism of antibody formation - AIDS.

### UNIT VI

Development Biology:- Gametogenesis - fertilization - type of eggs - blastulation and gastrulation in Amphioxus, frog and chick morphogenetic movements - organized potency, organogenesis with reference to heart, eye kidney brain - Formation and fate of extra embryonic membranes in chick. Placenta, types, functions, Regeneration - Aging and senescence - metamorphosis in Frog - Cancerous growth.

### UNIT VII

Environmental Biology:- Biotic and abiotic factors, their role, Intra and interspecific association. Biogeochemical cycles. Ecosystem, concept and components - energy flow, food chain, food web, trophic levels. Ecological succession, Community structure - Stratification. Population and Population dynamic - Habitat, ecology, adaptations in marine fresh water and terrestrial habitats. Wild life, need for conservation management and methods of conservation. Sanctuaries with special reference to Tamil Nadu. Pollution - air, water and land - Perspective policy planning for the environment.

### UNIT VIII

Evolution:- Origin of life - Evolutionary thought - Contributions of Lamarck Darwin and De Vries - present status of Darwinism and Lamarckism - modern synthetic concept - Hardy Weinberg Law - Polymorphism and mimicry in evolution. Speciation, species concept - Isolation mechanisms and their role, role of hybridization in evolution. Fossils and Fossilization Origin and evolution of man - Culture evolution and Biochemical evolution.

### UNIT IX

Animal distribution: Zoogeographical distribution - Continental and island fauna - Continental drift - Discontinuous distribution adaptive radiation. Natural resources and their conservation. Alternative sources of energy.

### UNIT X

Economic Zoology:- Parasitism and Commensalism - Protozoan Parasites and diseases, helminth parasites and diseases of man and domestic animals - Beneficial and destructive insects Insect pests on crops and stored products - Control methods. Sericulture, apiculture, poultry, pisciculture and induced breeding, Shell fisheries, Aquaculture practices in Tamil Nadu and their impact on the environment and on agriculture.