

Syllabus for GATE-XL (Zoology)

Zoology

- **Section 1 - Animal Diversity** : Distribution, systematics and classification of animals, phylogenetic relationships (based on classical and molecular phylogenetic tools).
- **Section 2 - Evolution** : Origin and history of life on earth, theories of evolution, natural selection, adaptation, speciation.
- **Section 3 - Genetics** : Basic Principles of inheritance, molecular basis of heredity, sex determination and sex-linked characteristics, cytoplasmic inheritance, linkage, recombination and mapping of genes in eukaryotes, population genetics, genetic disorders, roles of model organisms in understanding genetic principles.
- **Section 4 - Biochemistry and Molecular Biology** : Nucleic acids, proteins, lipids and carbohydrates; replication, transcription and translation, Krebs cycle, glycolysis, enzyme catalysis, hormones and their actions, roles of vitamins and minerals.
- **Section 5 - Cell Biology** : Basic principles of cellular microscopy, structure of cell, cytoskeletal organization, cellular organelles and their structure and function, cell cycle, cell division, chromosomes and chromatin structure.
- **Section 6 - Gene expression in Eukaryotes** : Eukaryotic genome organization and regulation of gene expression, transposable elements.
- **Section 7 - Animal Anatomy and Physiology** : Comparative physiology, the respiratory system, Muscular system, circulatory system, digestive system, the nervous system, the excretory system, the endocrine system, the reproductive system, the skeletal system.
- **Section 8 - Parasitology and Immunology** : Nature of parasite, host-parasite relation, protozoan and helminthic parasites, the immune response, cellular and humoral immune response.
- **Section 9 - Development Biology** : Gametogenesis, Embryonic development, cellular differentiation, organogenesis, metamorphosis, Model organisms used in developmental biology, genetic and molecular basis of development, stem cells.
- **Section 10 - Ecology** : The ecosystem, Animal distribution, ecological niche and its contribution to ecological diversity, the food chain, population dynamics, species diversity, zoogeography, biogeochemical cycles, conservation biology, ecotoxicology.
- **Section 11 - Animal Behaviour** : Type of behaviours, courtship, mating and territoriality, instinct, learning and memory, social behaviour across the animal taxa, communication, pheromones, evolution of behavior in animals.