

XL	Life Sciences
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XL4: Zoology**Section XL4.1: Animal Diversity**

Systematics and classification of animals, phylogenetic relationships (based on classical and molecular phylogenetic tools).

Section XL4.2: Evolution

Origin and history of life on earth, theories of evolution, natural selection, adaptation, speciation.

Section XL4.3: 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 XL4.4: 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 XL4.5: 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 XL4.6: Gene expression in Eukaryotes

Eukaryotic genome organization and regulation of gene expression, transposable elements.

Section XL4.7: Animal Anatomy and Physiology

Comparative anatomy and physiology, respiratory system, muscular system, circulatory system, digestive system, nervous system, excretory system, endocrine system, reproductive system, skeletal system.

Section XL4.8: Parasitology and Immunology

Nature of parasite, host-parasite relation, protozoan and helminthic parasites, the immune system, cellular and humoral immune response.

Section XL4.9: Development Biology

Gametogenesis, Embryonic development, cellular differentiation, organogenesis, metamorphosis, Model organisms used in developmental biology, genetic and molecular basis of development, stem cells.

Section XL4.10:	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, biodiversity hotspots in India.	
Section XL4.11:	Animal Behaviour
Type of animal behaviours and their evolution, courtship, mating and territoriality, instinct, learning and memory, social behaviour across the animal taxa, communication, pheromones.	