



I Semester Syllabus

ZOOLOGY

(w.e.f. 2023-24 Admitted Batch)

23BSC11 INTRODUCTION TO CLASSICAL BIOLOGY

Hours/Week: 5

Credits:4

Unit1: Introduction to systematics, taxonomy and ecology.

- 1.1 Systematics– Definition and concept, Taxonomy –Definition and hierarchy.
- 1.2 Nomenclature– ICBN and ICZN, Binomial and trinomial nomenclature.
- 1.3 Ecology– Concept of ecosystem, Biodiversity and conservation.
- 1.4 Pollution and climate change.

Unit 2: Essentials of Botany.

- 2.1 The classification of plant kingdom.
- 2.2 Plant physiological processes (Photosynthesis, Respiration, Transpiration, phytohormones).
- 2.3 Structure of flower–Micro and macro sporogenesis, pollination, fertilization and structure of mono and dicot embryos.
- 2.4 Mushroom cultivation, floriculture and landscaping.

Unit 3: Essentials of Zoology

- 3.1 The classification of Kingdom Animalia and Chordata.
- 3.2 Animal Physiology –Basics of Organ Systems & their functions, Hormones and Disorders
- 3.3 Developmental Biology –Basic process of development (Gametogenesis, Fertilization, Cleavage and Organogenesis)
- 3.4 Economic Zoology –Sericulture, Apiculture, Aquaculture

Unit4: Cell biology, Genetics and Evolution

- 4.1 Cell theory, Ultrastructure of prokaryotic and eukaryotic cell, cell cycle.
- 4.2 Chromosomes and heredity–Structure of chromosomes, concept of gene.
- 4.3 Central Dogma of Molecular Biology.
- 4.4 Origin of life

Unit 5: Essentials of chemistry

- 5.1 Definition and scope of chemistry, applications of chemistry in daily life.
- 5.2 Branches of chemistry

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23BSC12 INTRODUCTION TO APPLIED BIOLOGY**Hours/Week: 5****Credits:4****Unit 1: Essentials of Microbiology and Immunology**

- 1.1 History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur, Robert Koch and Joseph Lister.
- 1.2 Groups of Microorganisms–Structure & characteristics of Bacteria, Fungi, Archaea & Virus.
- 1.3 Applications of microorganisms in–Food, Agriculture, Environment and Industry.
- 1.4 Immune system–Immunity, types of immunity, cells and organs of immune system.

Unit 2: Essentials of Biochemistry

- 2.1 Biomolecules I– Carbohydrates Lipids.
- 2.2 Biomolecules II–Amino acids & Proteins.
- 2.3 Biomolecules III–Nucleicacids-DNA and RNA.
- 2.4 Basics of Metabolism–Anabolism and Catabolism.

Unit 3: Essentials of Biotechnology

- 3.1 History, scope and significance of biotechnology. Applications of Biotechnology in Plant, Animal, Industrial and Pharmaceutical sciences.
- 3.2 Environmental Biotechnology– Bioremediation and Biofuels, Biofertilizers and Biopesticides.
- 3.3 Genetic engineering– Gene manipulation using restriction enzymes and cloning vectors; Physical, chemical and biological methods of gene transfer.
- 3.4 Transgenic plants–Stress tolerant plants (biotic stress–BT cotton, abiotic stress–salt tolerance). Transgenic animals – Animal and disease models.

Unit 4: Analytical Tools and techniques in biology– Applications

- 4.1 Applications in forensics–PCR and DNA fingerprinting
- 4.2 Immunological techniques– Immunoblotting and ELISA.
- 4.3 Monoclonal antibodies–Applications in diagnosis and therapy.
- 4.4 Eugenics and Gene therapy

Unit 5: Biostatistics and Bioinformatics

- 5.1 Data collection and sampling. Measures of central tendency –Mean, Median, Mode.
- 5.2 Measures of dispersion– range, standard deviation and variance. Probability and tests of significance.
- 5.3 Introduction, Genomics, Proteomics, types of Biological data, biological databases- NCBI, EBI, Gen Bank; Protein 3D structures, Sequence alignment
- 5.4 Accessing Nucleic Acid and Protein databases, NCBI Genome Workbench
- 5.3 Chemical bonds–ionic, covalent, non-covalent– Vander Waals, hydrophobic, hydrogen bonds.
- 5.4 Green chemistry



(w.e.f. 2023-2024 Admitted Batch)

B.Sc ZOOLOGY HONOURS

(23ZOO21MAJOR/MINOR)

ANIMAL DIVERSITY-I BIOLOGY OF NON-CHORDATES

Periods:60 Max. Marks:100

UNIT - I

- 1.1 Whittaker's five kingdom concept and classification of Animal Kingdom.
- 1.2 Protozoa General Characters and classification up to classes with suitable examples
- 1.3 Protozoa Locomotion
- 1.4 Protozoa reproduction

UNIT –II

- 2.1 Porifera General characters and classification up to classes with suitable examples
- 2.2 Canal system in sponges
- 2.3 Coelenterata General characters and classification up to classes with suitable examples
- 2.4 Polymorphism in coelenterates.

Unit – III

- 3.1 Platyhelminthes General characters and classification up to classes with suitable examples
- 3.2 Parasitic Adaptations in helminthes
- 3.3 Nematelminthes General characters and classification up to classes with suitable examples
- 3.4 Life cycle and pathogenicity of Ascaris lumbricoides

Unit – IV

- 4.1 Annelida General characters and classification up to classes with suitable examples
- 4.2 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost
- 4.3 Arthropoda General characters and classification up to classes with suitable examples
- 4.4 Peripatus - Structure and affinities

Unit – V

- 5.1 Mollusca General characters and classification up to classes with suitable examples
- 5.2 Pearl formation in Pelecypoda
- 5.3 Echinodermata General characters and classification up to classes with suitable examples Water vascular system in star fish
- 5.4 Hemichordata General characters and classification up to classes with suitable examples Balanoglossus - Structure and affinities

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PENUGONDA-534 320, West Godavari District., (A.P.)

(w.e.f. 2023-2024 Admitted Batch) B.Sc ZOOLOGY HONOURS

(23ZOO22MAJOR-2)

COURSE 4: CELL & MOLECULAR BIOLOGY

Theory

Credits: 3

3 hrs/week

SYLLABUS:

UNIT – I Cell Biology-I

- 1.1. Definition, history, prokaryotic and eukaryotic cells, virus, viroids, mycoplasma
- 1.2 Electron microscopic structure of animal cell.
- 1.3 Plasma membrane –Models and Fluid mosaic model
- 1.4 Transport functions of plasma membrane-Active – passive- facilitated.

UNIT – II Cell Biology-II

- 2.1 Structure and functions of Golgi complex & Endoplasmic Reticulum
- 2.2 Structure and functions of Lysosomes & Ribosomes
- 2.3 Structure and functions of Mitochondria & Centriole
- 2.4 Structure and functions of Nucleus & Chromosomes

UNIT – III Cell Biology-III

- 3.1 Cell Division- mitosis, meiosis
- 3.2 Cell cycle – stages- check points- regulation
- 3.3 Abnormal cell growth- cancer- apoptosis
- 3.4 Bio energetics- Glycolysis-Krebs cycle-ETS

UNIT IV: Molecular Biology-I

- 4.1 Central Dogma of Molecular Biology
- 4.2 Basic concepts of - DNA replication–Overview (Semi-conservative mechanism, Semi-discontinuous mode, Origin & Propagation of replication fork)
- 4.2 Transcription in prokaryotes – Initiation, Elongation and Termination, Post-transcriptional modifications (basics)
- 4.4 Translation – Initiation, Elongation and Termination

UNIT V: Molecular Biology-II

- 5.1 Gene Expression in prokaryotes (Lac Operon); Gene Expression in eukaryotes
- 5.2 Biomolecules- Carbohydrates (Glucose- structure-properties- biological importance only)
- 5.3 Biomolecules- Protein (Amino acid- structure- properties- biological importance only)
- 5.4 Biomolecules- Lipids (Fatty acid- structure - properties- biological importance only)

