GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Declared as Deemed to be University u/s 3 of UGC Act, 1956)
Visakhapatnam │ Hyderabad │ Bengaluru
Accredited by **NAAC** with **A++** Grade
Website: www.gitam.edu

GITAM SCHOOL OF SCIENCE
Department of Biotechnology
PhD in Science: Biotechnology
PhD Entrance Test Syllabus - 2024-2025

PhD in Science: Biotechnology

Unit I - Prokaryotic and Eukaryotic cells. Ultra-structure and functions of Cell organelles. Cell Cycle and its regulation Cell-cell interaction. Classification of bacteria and virus. Bacterial staining techniques. Bacterial growth curve. Microbiology of Soil and water. Clinically important bacteria and viruses. Bacterial recombination. Principles of Mendelian inheritance, Linkage and crossing over.

Unit II - Classification, structure, properties, functions of Biomolecules-carbohydrates, lipids, amino acids, proteins, nucleic acids and vitamins. Enzymes-factors affecting enzyme activity, Enzyme inhibition, Coenzymes, metalloenzymes, allosteric enzymes, isoenzymes and ribozyme. Techniques of chromatography, electrophoresis, and centrifugation.

Unit III - Nature of Genetic material, organization of Genetic material in prokaryotes and eukaryotes, DNA replication, transcription and translation in prokaryotes and eukaryotes. Inhibitors of Protein synthesis. DNA sequencing by chemical and enzymatic methods. Gene transfer Techniques. Reporter gene assay, selection and expression of r-DNA clones. PCR. Construction of genomic libraries and C-DNAlibraries. Molecular markers (RFLP and RAPD) and their applications.

Unit IV - Plant Tissue culture. Phytohormones. Plant secondary metabolites. Basic techniques of animal cells, and tissue cultures. Stem cells – Embryonic and Adult stem cells. Application of stem cells. Concepts of immune response. Production of Transgenic Animals and plants. Cells and organs of the immune system. Antigens and antibodies - generation of antibody diversity. Antigen-antibody interactions, Immunodiffusion, Immuno electrophoresis ELISA, and Western blotting.

Unit V - Scientific data description, tabulation and graphical representation. Measures of centraltendency and dispersion - mean, median, mode, range, standard deviation, variance. Types of errors and level of significance. Tests of significance - F and T -tests, chi-square tests, ANOVA. Simple linear regression and correlation.