



SAM GLOBAL UNIVERSITY

Established under Govt. of M.P. & Recognized by UGC
Address: Gram- Agariya Chopda, Dist. Raisen (M.P.)
Website: www.samglobaluniversity.ac.in

Subject: Biotechnology

Unit 1. Cellular & Molecular Biology: Cell diversity; Chemical equilibrium and energetics; Cell theory; Cell organelles; Cell cycle and cancer biology; Prokaryotic and Eukaryotic transcription; RNA polymerases; Gene expression in bacteria and eukaryotes.

Unit 2. Immunology: Immunology-fundamental concepts and anatomy of the immune system Components of innate and acquired immunity; Organs and cells of the immune system; Major Histocompatibility Complex - MHC genes; Antigen- antibody interactions; Autoimmunity; Types of autoimmune diseases.

Unit 3. Microbiology & Industrial Applications: Microbial culture and its characteristics; culture media and its types; Batch culture; fed-batch; continuous kinetics; Host–Pathogen interactions; pathogenicity and virulence; exotoxins and endotoxins; Basic principles in bioprocess technology; Primary and secondary metabolites; Biotechnologically important products.

Unit 4. Genetics & Genetic Engineering: DNA Structure and properties; Cloning Vectors and methodology; Transduction and Transformation; Types of genetic diseases; Role of genetics in medicine; Complex inheritance-genetic and environmental variation.

Unit 5. Proteins & Enzymes: Peptides & proteins; Forces stabilizing native protein conformation; Primary, Secondary, Super-secondary, Tertiary and quaternary structure. Enzymes: Features of enzyme catalyzed reaction; Kinetics of single and multi-substrate reactions; Enzyme inhibition.

Unit 6. Genomics & Proteomics: Introduction Structural organization of genome in Prokaryotes and Eukaryotes; Organelle DNA-mitochondrial; chloroplast; DNA sequencing-principles and translation to large scale projects. Proteomics: Protein analysis; 2-D electrophoresis of proteins; Peptide fingerprinting; LC/MS-MS for identification of proteins and modified proteins; MALDI-TOF; SAGE and Differential display proteomics.

Unit 7. Plant Biotechnology: Transgenic Plants: Mechanisms of DNA transfer; Viral vectors and their applications. Vector Transformation techniques; Terminator gene technology; Metabolic engineering and industrial products: Plant secondary metabolites; Molecular marker-assisted selection.

Unit 8. Bioprocess Engineering & Technology: Basic principle of Biochemical Engineering; Isolation; screening and maintenance of industrially important microbes; Concepts of basic mode of fermentation processes Bioreactor designs; Process wastes-whey; molasses; starch substrates and other food wastes for bioconversion to useful products.