



DRAVIDIAN UNIVERSITY
Centre for Off-Campus Education & Research
Syllabus for M.Phil/Ph.D Biotechnology
Paper II: Broad Field

UNIT – I

Chemistry of carbohydrates – Definition and classification of carbohydrates. Outlines of structures of important mono di, and polysaccharides. Chemical reactions of sugars and carbohydrates. Structural organization of proteins. Classification of Enzymes, structural polymorphism of DNA and RNA types

UNIT – II

Microscopy – light, phase contrast, fluorescent and electron microscopy. Chromatography – paper, thin layer, gas-liquid, HPLC, molecular sieve and affinity chromatography techniques. electrophoresis, SDS-PAGE - Isoelectric focusing, immuno-electrophoresis, blotting techniques -UV – visible spectrophotometry,

UNIT – III

Metabolism of carbohydrates – Glycolysis, TCA cycle, glyoxalate cycle, gluconeogenesis, HMP shunt Identification of genetic material as DNA or RNA. Replication of DNA – models for replication of DNA, molecular mechanism of replication, enzymology of replication, DNA replication and reverse transcriptase. DNA damage and repair mechanisms. Protein synthesis in prokaryotes and eukaryotes, genetic code and gene concept.

UNIT – IV

Immunity – natural and acquired; specific and non-specific; Primary and Secondary organ of immune system –thymus, spleen, lymph nodes, bursa fabricus, other types of lymphoid tissues. Cells of the immune systems; B and T lymphocytes, neutrophils, macrophages, plasma cells, eosinophils and basophils. production of polyclonal antibodies and monoclonal antibodies. Antigen and antibody reactions labeled antibody techniques (RIA and ELISA) immunodetection of viral antigens.

UNIT – V

Nucleic acid hybridization and PCR; DNA sequencing- Chemical method of Maxam and Gilbert, Sanger's dideoxy chain termination and primer walking methods; Immobilized enzymes, methods and applications in industry. Downstream Processing and product recovery: Mass cultivation of commercially valuable algae like *Spirulina* and edible Mushrooms. Cultivation of marine macro-algae for agar, alginates and other products of commercial importance.