Swami Ramanand Teerth Marathwada University Nanded

CBCS Syllabus for M.Sc. First Year
Faculty of Science and Technology
Semester – II
Subject: Microbiology
Paper Name:ENZYME TECHNOLOGY
Paper Number: MB – 204(ELECTIVE)

Credits: 04 **Periods: 45**

Unit I: Extraction and Purification of Microbial Enzyme (12)

Importance of Enzyme purification, Different sources of enzyme, Extracellular and Intracellular enzyme, Physical and Chemical methods used for cell disintegration, Enzyme fractionation by precipitation (using Temperature, Salt, Solvent, pH etc.), Liquid-liquid extraction, Ionic Exchange, Gel electrophoresis, Affinity chromatography and other special purification methods, Enzyme crystallization technique, Criteria of purity of enzyme, Pitfalls in working with pure enzyme.

Unit II: Enzyme Kinetics and Enzyme Inhibition (11)

Enzyme kinetics: Steady state kinetics, Brigs Haldane equation, Michaelis Menten equation, The Monod-Wyman-Changeux (MWC) Model, the Koshland-Nemethy-Filmer (KNF) Model.

Irreversible, Reversible, competitive, Noncompetitive and Uncompetitive Inhibition with suitable examples and their kinetics studies, Allosteric regulation, Types of allosteric regulation and their significance in metabolic regulation and their kinetics study (Hills equation).

Unit III: Enzyme as a biocatalyst and Enzyme Engineering (10)

Structure of active sites, Role of Ionizable group in catalysts, Study on vitamins and co-enzymes: Structure and functions with suitable examples, Metallo enzymes and Metal ions as co-factors and enzyme activators. Chemical modification and site directed mutagenesis to study structure –function relationship of industrially important enzyme.

Unit IV: Immobilization and Applications of Microbial enzymes (12)

Properties of Immobilized enzyme, Methods of immobilisation: Adsorption, Covalent bonding, Entrapment and Membrane confinement. Analytical, Therapeutic and Industrial applications of Immobilised enzymes.

Microbial enzymes in Textiles, Leather, Wood Industries and Detergent, Enzymes in clinical diagnosis, Enzyme sensors for clinical processes and environment analysis, Enzymes as therapeutic agents, Extremozymes, Solventogenic enzymes.