SUBJECT NO-BT21105, SUBJECT NAME- Biochem. Reaction Engg. and Bioenergetics

LTP- 3-1-0,CRD- 4

SYLLABUS :-

Biochemical Reaction Engineering; Kinetics of homogeneous reactions; reaction mechanism; Temperature dependency from Arrhenius law; Theoretical prediction of rate constant: Interpretation of batch kinetic data; Kinetics of enzyme catalyzed reactions in free and immobilized states: Michaelis-Menten equation and its various modifications. Effects of External mass transfer in immobilized enzyme systems; analysis of intra-particle diffusion and reaction; Kinetics of substrate utilization, product formation and biomass production: Monod growth model and its various modifications; structured and unstructured kinetic rate models; Thermal death kinetics of cells and spores; medium and air sterilization.

Chemical mechanisms of biological energy conversion in mitochondria and chloroplasts, Experimental studies and theories photosynthesis energy transfer kinetics; Cytochrome c oxidase (Cytochrome Oxidase Oxygen Heme) or photosystem II (Photosystem II Manganese Oxygen); bacteriorhodopsin proton pumping); DNA base recognition and replication fidelity; Gibbs Free Energy; Protein folding and stability; Ligand binding; Protein-Protein and Protein-DNA interactions; Osmosis, Dialysis; Donnan Effect; Practical techniques e.g.: Isothermal Calorimetry (ITC); Spectroscopy; Fluorescence and Scanning Microscopy; X-ray diffraction