

Course No.	Title of the Course	Course Structure	
BTBTC16	Enzymology	3L - 0T - 2P	
COURSE CONTENT:			Number of Class (Tentative)
Enzymes: Introduction and scope, Nomenclature, Mechanism of Catalysis, Industrial applications.			05
Enzyme Kinetics: Single substrate steady state kinetics, King-Altman's method, Inhibitors and activators, multi-substrate systems, Effect of pH and temperature, Allosteric enzymes.			10
Immobilization of Enzymes: Advantages, Carriers, adsorption, covalent coupling, cross-linking and entrapment methods, Micro-environmental effects			05
Enzyme Reactors: reactors for batch/continuous enzymatic processing, Choice of reactor type: idealized enzyme reactor systems, Mass Transfer in Enzyme Reactors: Steady state analysis of mass transfer and biochemical reaction in enzyme reactors.			10
Bio-process Design: Physical parameters, reactor operational stability, Immobilized cells.			05
Challenges and future trends: Enzyme catalysis in organic media, Catalytic antibodies and non-protein biomolecules as catalysts, Biocatalysts from Extreme Thermophilic and Hyperthermophilic Archaea and Bacteria.			05

List of Practical	
Name of experiments	Number of Class (Tentative)
1. Assays for Enzymes	01
2. Substrate specificity and efficiency of enzymatic catalysis	01
3. Kinetics of enzyme catalyzed reactions.	01
4. Preparation of immobilized enzymes.	01
5. Microenvironmental effects in immobilized enzymes.	01
6. Mass transfer and biochemical reactions in continuous flow enzyme reactors.	01
SUGGESTED READINGS: <ol style="list-style-type: none"> 1. R.C.B. Currell, V.D. Mieras, "Biotechnological Innovations in Chemical Synthesis", Butterworth Heinemann. 2. I.H. Segel, "Enzyme Kinetics: Behavior and Analysis of Rapid Equilibrium and Steady- State Enzyme Systems", Wiley-Interscience. 3. M.F. Chaplin and C. Bucke, "Enzyme Technology", Cambridge University Press. 4. R.A. Copeland, "Enzymes: A Practical Introduction to Structure, Mechanism, and Data Analysis", John Wiley and Sons Inc. 5. H. Uhlig, "Industrial Enzymes and their Applications", John Wiley and Sons Inc. 6. M. Roberts, N.J. Turner and A.J. Willetts, "Introduction to Biocatalysis using Enzymes and Micro-Organisms", S. Publisher: Cambridge University Press. 7. C. Branden and J. Tooze, "Introduction to Protein Structure", Garland. 8. T.E. Creighton, "Proteins – Structure and Molecular properties" W.H. Freeman and Company. 9. A. Fersht, "Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding", W.H. Freeman and Company. 	