DEPARTMENT OF BIOTECHNOLOGY				*CLASS: II B.Sc. Biotechnology*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
IV	Add-on	21U4LAD2	Enzyme Technology	2	2	50	50	100

Course Objectives

1	To focus on the enzyme structure and its function.
2	To provide students with an understanding about the enzyme kinetics.
3	To understand the methods of immobilization and its applications.

Unit	Description	Hours
I	**Enzymes an overview**- Historical aspects, Structure and properties,classification and nomenclature,Sources of enzyme, Active site, active centre	6
II	**Mechanism of action of enzymes-** lock and key model induced fit theory, factors affecting enzyme action, Determination of protein structure-active site prediction.	6
III	**Enzyme purification**-strategies in enzyme purification ,choice of source,methods of homogenization, ammonium sulphate precipitation,methods of separation-centrifugation, gel filtration,dialysis and ultrafiltration ,Ion-exchange chromatography, electrophoresis, Iso-electrifocussing. Affinity chromatography, separation based on polarity –salting- in and salting –out,Test for purity,test for catalytic activity.	6
IV	**Enzyme kinetics**-Michaelis –Menten plot,LB plot, Hanes Woolf plot, Briggs-Haldane plot, Eadie-Hofstee plot, Significance of K_m and K_{cat},Mechanism of enzyme catalysis-acid base, covalent and metal ion catalysis. Effect of temperature, pH, substrate, inhibitors-reversible and irreversible inhibition on enzyme activity,Types of multisubstrate reaction. Allosteric enzyme - MWC model and KNF model, Isozymes.	6
V	**Enzyme immobilization, engineering and applications -** immobilised enzyme definition and properties, types of immobilization-entrapment, encapsulation, adsorption,crosslinking,applications of immobilised enzymes. Enzyme engineering – lysozyme, subtilisin, Asparginase. Enzyme applications - enzymes in starch industries, alcoholic beverages, bread making, cheese making, detergent, clarification of fruit juices, desizing fabrics, meat tenderizing,dehairing of hides, recovering of silver. Enzymes as Biosensor.	6

Books for study

1. Price NC. Fundamentals of enzymology – the cell and molecular biology of catalytic proteinsm. 3rd edition. Oxford University press.
2. Prasad NK. 2011. Enzyme technology -Pacemaker of Biotechnology ,PHI learning Pvt Ltd.
3. Palanivelu P. 2007. Enzymes, Ribozymes and DNAzymes 21st century publications.