Course specific outcome:

Course	Expected outcome
MLBGCOR02T OR MLBHGEC02T PROTEINS, ENZYMES AND METABOLISM (Theory)	• Understanding the chemical structures, reactions and functions of amino acids. • Development of insight into the world of proteins. • Familiarity with the multifarious functions of proteins. • Introduction to the methods of determination of N-terminal amino acid and C–terminal amino acid of proteins. • Understanding the structures, functions and importance of enzymes in biological reactions. • Introduction to the principles of enzyme kinetics. • Acquiring knowledge on enzyme regulation. • Introduction to the principles of Bioenergetics and mechanisms of oxidative phosphorylation. • Acquiring knowledge on the pathways of carbohydrate, fatty acid and amino acid metabolism. • Getting an idea about synthesis of ATP under aerobic and anaerobic conditions.
MLBGCOR02P OR MLBHGEC02P PROTEINS, ENZYMES AND METABOLISM (PRACTICAL)	• Gaining awareness about basic qualitative reactions of amino acids and proteins. • Estimation of Glycine by Formol Titration. • Quantitative analysis of protein by Lowry Method. • Determination of enzyme activity, calculation of Km and Vmax of enzymes and analysis of enzyme kinetics. • Understanding the principle of separation of amino acids by paper chromatography.
MLBGCOR04T OR MLBHGEC04T PHYSICOCHEMICAL TECHNIQUES (THEORY)	• Analyzing the biophysical principles of diffusion, osmosis and viscosity. • Familiarity with different chromatographic techniques for the isolation of different biological molecules. • Understanding the applications of centrifugation, chromatography and electrophoresis in biological investigations. • Introduction to the principles of UV and Visible spectrophotometry. • Analysis of Proteins and Nucleic Acids using UV and Visible spectroscopy. • Acquiring knowledge on the genome organization of prokaryotes and extrachromosomal elements. • Gaining insight into the mechanisms of genetic recombination in bacteria.

MLBGCOR04P OR MLBHGEC04P PHYSICOCHEMICAL TECHNIQUES (PRACTICAL)	• Measurement of viscosity/fluidity of biological sample by Ostwald viscometer. • Separation of sugars by paper chromatography. • Analysis of proteins by SDS - PAGE. • Determination of bacterial growth using turbidometry.
MLBGDSE03T RECOMBINANT DNA TECHNOLOGY AND FUNDAMENTALS OF IMMUNOLOGY (THEORY)	• Introduction to the concepts of Molecular Cloning. • Getting acquainted with the versatile tools and techniques employed in recombinant DNA technology. • Acquiring basic knowledge on DNA manipulation using restriction and modification enzymes. • Familiarity with the use of cloning and expression vectors. • Getting an idea about the creation of genomic and c-DNA libraries and their applications. • Understanding the principles and applications of different PCR techniques including Real Time PCR. • Gain knowledge on the structure and function of the cells and organs of immune system. • Development of insight into the structure and functions of different classes of immunoglobulins and the importance of humoral, cell-mediated and innate immune responses in combating pathogens. • Understanding the mechanisms involved in different types of hypersensitivity. • Acquaintance with the importance of antigen-antibody interaction in disease and diagnosis. • Familiarity with different vaccination strategies and understanding the importance of conventional vs. recombinant vaccines.
MLBGDSE03P RECOMBINANT DNA TECHNOLOGY AND FUNDAMENTALS OF IMMUNOLOGY (PRACTICAL)	• Understanding the technique of plasmid DNA isolation. • Separation and analysis of plasmid DNA by Agarose Gel Electrophoresis. • Preparation of competent cells using calcium chloride method. • Introducing plasmid DNA into *E.coli* host cell by transformation. • Restriction analysis of plasmid DNA. • Learning the technique of detection of blood group.