

Programme Educational Objectives (PEOs):

PEO1-Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.

PEO2-Students are able to classify, identify, use of instruments, sterilization, cultural requirements and to perform different microbiological tests in clinical microbiology lab.

PEO3-Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body

PEO4-The students will be made aware of the composition of blood and methods of estimating different components of blood. Students will be able to know the basic concepts of Hematology & routine clinical investigations of Hematology laboratory.

Programme Specific Outcomes (PSOs):

PSO1: Demonstrate knowledge and understanding of the molecular machinery of living cells.

PSO2: Demonstrate knowledge and understanding of the principles that govern the structures of macromolecules and their participation in molecular recognition.

PSO3: Demonstrate knowledge and understanding of the principles and basic mechanisms of metabolic control and molecular signaling.

PSO4: Use basic laboratory skills and apparatus to obtain reproducible data from biochemical experiments;

PSO5: Implement experimental protocols, and adapt them to plan and carry out simple investigations;

PSO6: Analyse, interpret, and participate in reporting to their peers on the results of their laboratory experiments;

PSO7: Participate in and report orally on team work investigations of problem-based assignments;

PSO8: Build on their knowledge and understanding in tackling more advanced and specialised courses, and more widely to pursue independent, self-directed and critical learning.

PROGRAMME OUTCOMES (POs)

Students graduating with the Master of Biochemistry degree should be able to acquire

PO1 Creative and critical thinking: To assume, inquire and analyse, apply logical principles, validate assumptions, solve problems integrate knowledge and widen perspective: To promote originality of ideas.

PO2 Effective communication: - To enhance qualities like attentiveness, listening, reading, comprehension for better communication.

- To gather information through oral or written formats.

PO3 Professional and ethical behavior: To learn to accomplish tasks with proficiency, skill and teamwork.

- To master academic integrity and intellectual behavior.

PO4 Research inclination: To apply contemporary research methods, skills and techniques for conduction independent inquiry in a chosen scientific discipline.

PO5 Moral maturity and social interaction.

- To develop cognitive ability.
- To elicit and appreciate view of others.
- To promote independence and help reach conclusions in group settings.
- To demonstrate social concern.

PO6 Effective citizenship: To develop equity centered national development.

- To demonstrate the ability to act with an informed awareness of issues.
- To participate in civic life through volunteering.

PO7 Environmental sustainability: To understand the issues of environmental contacts and sustainable development.

PO8 Self-directed and lifelong learning”

To acquire the ability to engage in independent and lifelong learning process

Course Outcomes (CO)

Course Code: BCH-501

Title of the Course: Bioanalytical Techniques

Course Outcomes:

CO1: Demonstrate knowledge in modern analytical techniques.

CO2: Understand the core concepts of all analytical techniques.

CO3: Explain the principles, procedure and applications of all the types of chromatography.

Course Code: BCH-529

Title of the Course: Biological Macromolecules

Course Outcomes:

CO1: Understand the relationship between different biomolecules.

CO2: Describe functions of vitamins.

CO3: Describe the properties of biomolecules

Course Code: BCH-651

Title of the Course: Advanced Cell Biology

Course Outcomes:

CO1: Describe Cell adhesion and extracellular matrix.

CO2: Describe membrane trafficking.

CO3: Explain the Genome Organization.

Course Code: BTY-511

Title of the Course: Molecular Biology

Course Outcomes:

CO1 Explain the structural characterization of prokaryotic and eukaryotic cells.

CO2 Explain the organization of plant and animal cell.

CO3 Describe the structure, ultra structure and functions of all cell organelles – endoplasmicreticulum, Golgi bodies, mitochondria, lysosomes, ribosomes, nucleus.

Course Code: BCH-503

Title of the Course: Bioanalytical Techniques laboratory

Course Outcomes:

CO1 Compare and contrast various types of chromatographic technique.

CO2 Describe the basic, principle, types, procedure and applications of electrophoresis.

CO3 Differentiate between the uses and importance of different types of electrophoresis

Course Code: BCH-530

Title of the Course: Biological macromolecules Laboratory

Course Outcomes:

CO1: Describe different Estimation of proteins

CO2: Estimation of Urea

CO3: Estimation of alkaline and acid phosphatases.

Course Code: BTY-512

Title of the Course: Molecular Biology Laboratory

Course Outcomes:

CO1: Demonstration of DNA protein interaction.

CO2: Gel electrophoresis: Nucleic acid – Protein

CO3: Isolation of genomic DNA from bacteria

Course Code: BCH-655

Title of the Course: Advanced Concepts in Protein Chemistry

Course Outcomes:

CO1: Describe Structure of amino acids and peptide.

CO2: Describe the Proteins in signal transduction.

CO3: Determination of protein structure.

Course Code: BCH-526

Title of the Course: Genetics and Genomics

Course Outcomes:

CO1: Describe the laws of inheritance.

CO2: Describe the different methods of gene transfer (transformation, transduction and conjugation).
CO3: Explain the DNA repair mechanism.

Course Code: BCH-516

Title of the Course: Intermediary Metabolism

Course Outcomes:

CO1: Discuss the overall concept of cellular metabolism-Anabolic and catabolic reaction,energy production, energy release and storage etc.

CO2: Explain the pathways of glucose breakdown and synthesis and their regulation.

CO3: Explain the glycogen synthesis and breakdown and its regulation.

Course Code: BCH-523

Title of the Course: Principles of Cell Signaling

Course Outcomes:

CO1: Describe Cell Death Signaling.

CO2: Describe Small G proteins.

CO3: Visual transduction.

Course Code: BCH-527

Title of the Course: Genetics and Genomics Laboratory

Course Outcomes:

CO1: Preparation of mitotic and meiotic spreads and analysis of various stages of cell division.

CO2: Analysis of molecular polymorphism in parental lines.

CO3: Extraction of genomic DNA from plants by CTAB method.

Course Code: BCH-658

Title of the Course: Advanced Concepts in Protein Chemistry Laboratory

Course Outcomes:

CO1: Determination of K_m & V_{max} of the enzymes.

CO2: Describe the mechanism of action of enzyme.

CO3: Compare methods of isolation and purification of enzymes.

Course Code: BCH-541

Title of the Course: Computational Techniques and Biostatistics

Course Outcomes:

CO1: Understand and explain types and methods of data collection

CO2: Describe and use the tool like correlation, regression, ANOVA—t test, Z test, chi square test.

CO3: Understand and explain the concept, type and applications of probability.

Course Code: BCH-601

Title of the Course: Biochemical and Environmental Toxicology

Course Outcomes:

CO1: Describe the types of toxins in body and the response of body against them

CO2: Describe the two phases of xenobiotics.

CO3: Describe the effect of toxins on various organs of body (lung, liver, kidney)

Course Code: BCH-625

Title of the Course: Concepts in Immunology

Course Outcomes:

CO1: Classify immunity on various bases.

CO2: Describe the origin, development, structure and functions of B and T lymphocytes.

CO3: Explain the role of MHC and HLA in organ transplantation

Course Code: BCH-627

Title of the Course: Regulation of Gene Expression

Course Outcomes:

CO1: Explain the DNA repair mechanism.

CO2: Describe Gene Expression Central dogma.

CO3: Describe regulation of gene expression.

Course Code: BCH-542

Title of the Course: Computational Techniques for Biologists Laboratory

Course Outcomes:

CO1: Describe Analysis of DNA and protein sequences.

CO2: Describe Manipulation of genome sequences.

CO3: Predict 2D and 3D structures of different Proteins sequences as well as their functions.

Course Code: BCH-626

Title of the Course: Concepts in Immunology Laboratory

Course Outcomes:

CO1: Discuss various immune techniques based on agglutination and precipitation (immune diffusion, immune electrophoresis, immune fluorescence, RIA and ELISA).

CO2: Describe the origin, development, structure and functions of B and T lymphocytes

CO3: To perform western blotting as well as their functions.

Course Code: BCH-603

Title of the Course: Clinical Biochemistry

Course Outcomes:

CO1: Understand the concept biological fluids and Importance of collecting these fluids.

CO2: Develop skills to collect biological fluids like (Blood, Urine , CSF) and analyses them.

CO3: Describe Diabetes Mellitus and various test done to detect Diabetes Mellitus.

Course Code: BCH-607

Title of the Course: Nutritional Biochemistry

Course Outcomes:

CO1: Describe the types, procedure and significance of calorimeter.

CO2: Discuss calorific action of food, SDA, thermal equivalents of oxygen and energy requirements of humans.

CO3: Explain BMR and enumerate the factors affecting it.

Course Code: BCH-604

Title of the Course: Clinical Biochemistry Laboratory

Course Outcomes:

CO1: Describe Isolation and estimation of serum cholesterol.

CO2: Gel Electrophoresis of serum proteins.

CO3: Experiments on blood.

Course Code: BCH-615

Title of the Course: Dissertation

Course Outcomes

CO1: Gain knowledge and understand a good research methodology in research

CO2: Explain respective research in proper scientific way with experimental results.

CO3: To learn advanced techniques related to respective research and future research problems.