

## **BSC BIOCHEMISTRY**

### **PROGRAM OUTCOME**

- PO1. To understand the basic theories and concepts in Biochemistry
- PO2. To apply the principles of Biochemistry
- PO3. To know the role of Biochemistry in society
- PO4. To familiarize with developments in Biochemistry and their application in various fields of Science
- PO5. To develop the skills in the proper handling and the instruments
- PO6. To familiarize with different biomolecules and its analysis
- PO7. To Familiarize with clinical laboratory techniques and their applications.

## **PROGRAM SPECIFIC OUTCOME**

Students who graduate with BSc. Biochemistry will,

PSO1: Have significant knowledge on various aspects of Biochemistry with special reference to biomolecules and enzymes.

PSO2: Expertise in laboratory techniques of basic and clinical Biochemistry, with regard to analysis, separation and estimation of biological samples.

PSO3: Have ability to plan and execute experiments as well as to analyze & interpret data for research through doing the project work

PSO4: Acquire the skills in the proper handling and the instruments

PSO5: Understand the fundamental concepts and principles in Biochemistry

## **Course outcome of BSc. Biochemistry**

### **I SEMESTER**

**Title of paper: Introduction To Biochemistry & Cell Biology**

**Course code: BCH1B01**

The student is exposed to:

CO1: Provide a general introduction to Biochemistry as a discipline and to highlight its foundations.

CO2: Equip the students with the basic knowledge of good laboratory practices.

CO3: Introduce the types of molecular interactions, concepts on acids, bases and solutions, and the physical aspects of Biochemistry

CO4: Understand cell as the basic structural and functional unit of life, structure, and functions of each organelle, transport of molecules across the cell, cellular communications, cell cycle, and cell death.

### **SEMESTER II**

**Title of paper: BIOMOLECULES I**

**Course code: BCH2B02**

CO1: Familiarize the students with the molecules that make up the living system, viz. carbohydrates, amino acids, lipids, vitamins and minerals: their classification, general reactions, structure, cellular functions and daily requirement.

CO2: To make the students recognize the sources of each biomolecule among the food materials in their daily life

### **SEMESTER III**

**Title of paper: BIOMOLECULES II**

**Course code: BCH3B03**

CO1: Introduce the structural features and types of bonds in proteins and nucleic acids, their classification and structural organization. Understand how their structure correlates with their cellular function

CO2: Familiarize with the bioinformatics tools and data analysis. Understand the importance and applications of bioinformatics

**Title of paper: TECHNIQUES IN BIOCHEMISTRY**

**Course code: BCH3B04**

CO1: Introduce the various techniques used in biochemical separation and analysis.

CO2: Give exposure to the instruments used and the principle behind each technique.

CO3: Understand the biochemical importance and applications of the techniques.

**Title of paper: PRACTICAL I**

**Course code: BCH3B05**

CO1: Train the students to make different types of solutions and buffers and correlate theoretical knowledge on the preparation of solutions.

CO2: Equip the students to perform analysis using the instruments in a biochemical laboratory.

CO3: Make them analyze biochemical samples qualitatively

#### **SEMESTER IV**

**Title of paper: ENZYMOLOGY**

**Course code: BCH4B06**

CO1: Introduce enzymes and provide knowledge about their specificity and activity. Understand their classification, nomenclature, catalytic mechanism, kinetics and regulation.

CO2: Give idea on the purification of enzymes from their natural sources, enzymological techniques and applications

**Title of paper: INTERMEDIARY METABOLISM I**

**Course code: BCH4B07**

CO1: Provide the students a detailed understanding of the importance of metabolic pathways in living cells and methods adopted to trace them out.

CO2: Make the students understand the anaerobic phase of carbohydrate metabolism and protein degradation.

**Title of paper: PRACTICAL I**

**Course code: BCH4B08**

CO1: Provide hands on training in spectroscopic analysis and make them verify the principles involved.

CO2: Impart basic practical skills in quantitative estimation of biomolecules and their separation techniques.

## **SEMESTER V**

### **Title of paper: PLANT BIOCHEMISTRY**

#### **Course code: BCH5B09**

CO1: Equip the students with the basic knowledge of plant cell structure and functions

CO2: To give aware on plant metabolism,

CO3: To understand about growth regulators and secondary metabolites and their role in agriculture and medicine.

### **Title of paper: HUMAN PHYSIOLOGY**

#### **Course code: BCH5B10**

CO1: Provide an understanding of the functions of organ systems and their coordination

CO2: To understand about specialized tissues and the hormonal control of various physiological functions of the human body.

### **Title of paper: IMMUNOLOGY & MICROBIOLOGY**

#### **Course code: BCH5B11**

CO1: Provide a general introduction to immunology, types and components of the immune system and diseases associated with immune function.

CO2: Introduce microbiology, microbial culture and sterilization techniques.

### **Title of paper: INTERMEDIARY METABOLISM II**

#### **Course code: BCH5B012**

CO1: To study how oxidation is used as a mechanism of energy release from carbohydrates, lipids and amino acids.

CO2: Understand the aerobic phase of carbohydrate metabolism, fatty acid oxidation and amino acid catabolism, the mechanism by which energy released is stored in high energy molecules and the basics of bioenergetics.

CO3: Provide knowledge about how atmospheric carbon is fixed in plant cells by photosynthesis and photophosphorylation.

**Title of paper: PRACTICAL II (CLINICAL BIOCHEMISTRY AND ENZYMOLOGY)**

**Course code: BCH5B013**

CO1: Make the students familiarize themselves with the various enzymatic and nonenzymatic assays used for the diagnosis of defects in organ function and metabolic disorders.

**Title of paper: INTERMEDIARY METABOLISM III**

**Course code: BCH6B014**

CO1: Explore the biosynthetic pathways of carbohydrates, lipids and amino acids

CO2: Understand nucleic acid biosynthesis and degradation.

**Title of paper: MOLECULAR BIOLOGY AND GENETIC ENGINEERING**

**Course code: BCH6B015**

CO1: Provide basic knowledge on genome organization, the concept of the central dogma, and processes involved in gene expression and its regulation.

CO2: Study the mutational changes in genetic material and how the systems repair them.

CO3: Understand the principles and techniques in genetic engineering and the fundamentals of genetics.

**Title of paper: CLINICAL & NUTRITIONAL ASPECTS OF BIOCHEMISTRY**

**Course code: BCH6B016**

CO1: Furnish knowledge on the basics and principles of clinical laboratory maintenance, clinical samples and their analysis, routine clinical assays, organ function tests and their clinical significance.

CO2: Understand biochemical aspects of certain pathological conditions, especially those due to

abnormal metabolism.

CO3: Study the role of diet for healthy living, principles of nutrition and food safety.

**Title of paper: PRACTICAL III**

**Course code: BCH6B018**

CO1: Equip the students with practical experience on the basic techniques in molecular biology, immunology and nutritional biochemistry.

**Title of paper: Project**

**Course code: BCH6B019**

CO1: To familiarize students with research methodology

CO2: Make them aware of how to collect relevant bibliographic material from different sources, how to organize it into a suitable form (Introduction, Backgrounds, material and methods, results, conclusion, Bibliography etc.) and how to make it into a written project report.

CO3: Familiarize them to present the project work.