

## **COURSE OUTCOMES OF BIOCHEMISTRY**

### **I -YEAR SEMESTER-I**

<b>Code</b>	<b>Course Title</b>	<b>Course Type</b>	<b>HPW</b>	<b>Credits</b>
<b>BS104</b>	<b>Chemistry of Biomolecules</b>	<b>DSC-1A</b>	<b>4T +2P = 6</b>	<b>4+1=5</b>

**After studying this paper, biochemistry graduate students will be able to:**

- ✓ Understand biochemistry at the atomic level, draw molecules and reactions involved with biomolecules.
- ✓ know the various weak acids and bases, biological buffers present in our body
- ✓ Learn the molecular structures of 20 amino acids, differentiating essential and non-essential amino acids, biologically important modified amino acids and their functions.
- ✓ Recognize the structural levels of organization of proteins, 3D structure of proteins, its functions, denaturation (hemoglobin, myoglobin etc.).
- ✓ Understand the difference between monosaccharides, disaccharides and polysaccharides. Storage and structural polysaccharides.
- ✓ Have a clear picture of biomembranes, behavior of amphiphatic lipids in water, formation of micelles, bilayers, vesicles, membrane composition and fluid mosaic model
- ✓ Describe/recognize lipid and porphyrin structures, lipoproteins and functions of prostaglandins.
- ✓ Describe how lipids, cholesterol, prostaglandins etc. are synthesized, emphasizing the genetic defects of lipid metabolism.
- ✓ Understand the relationship between the properties of macromolecules and cellular activities, cell metabolism and chemical composition.
- ✓ Learn the molecular structures of 20 amino acids, differentiating essential and non-essential amino acids, biologically important modified amino acids and their functions.

\*\*\*\*\*

## SEMESTER-II

Code	Course Title	Course Type	HPW	Credits
BS204	Chemistry Of Nucleic Acids & Biochemical Techniques	DSC-1B	4T +2P = 6	4+1=5

**After studying this paper, biochemistry graduate students will be able to:**

- ✓ Understand biochemistry at the atomic level, draw molecules and reactions involved with biomolecules.
- ✓ To know the various structures of DNA ,RNA ,nucleosides and nucleotides.
- ✓ Learn the molecular structures of DNA double helix ,denaturation , biologically importance of RNA and their functions.
- ✓ Recognize the reassociation kinetics,cot curves and their significance.find the T<sub>m</sub> values hyperchromic effect.
- ✓ Understand the difference between colorimetry and spectroscopy,Beer Lamberts law and its limitations.
- ✓ To study the principles involved in fluorimetry and centrifugation.
- ✓ To have a clear picture of principles and instrumentation in TLC,paper chromatography,gel filtration,ion-exchange and affinity chromatography.
- ✓ Describe/recognize photochemical and spectral characteristics of nucleic acids.
- ✓ Understand the relationship between laws of absorption and molar extinction coefficient.

\*\*\*\*\*

## II- YEAR SEMESTER-III

Code	Course Title	Course Type	HPW	Credits
BS 304	Bioenergetics, Biological oxidation and Enzymology	DSC- 1C	4T +2P = 6	4+1=5
BS 301	Computational Biochemistry	SEC -1	2	2

**After studying this paper, biochemistry graduate students will be able to:**

- ✓ Describe structure, functions and the mechanism of action of enzymes.  
Learning kinetics of enzyme catalysed reactions and enzyme inhibitions

and regulatory process. Ability to perform immobilization of enzymes. Exposure of wide applications of enzymes and future potential.

- ✓ Understand the fundamental energetics of biochemical processes, chemical logic of metabolic pathways. Knowing in detail about concepts to illustrate how enzymes and redox carriers and the oxidative phosphorylation machinery occur.
- ✓ Understand the utilization of proton gradient to drive the formation of high energy bonds and high energy compounds.
- ✓ To provide a deeper insight in to the fundamentals of enzyme structure and function and kinetics of soluble and immobilized enzymes. Discussion on current applications and future potential of enzymes.
- ✓ Complete understand of rate of reactions and order of reactions, and inhibitions and their kinetics. To gain knowledge on enzyme catalysis and isoenzymes and and on multienzyme complexes.
- ✓ Understanding the concepts of standard redox potential and the enzymes in biological oxidations. A brief account of Mitochondria and chloroplast structure, ATPase (oxidative phosphorylation) and C3 and C4 cycles in plants.

\*\*\*\*\*

### III - YEAR [ ANNUAL ]

Code	Course Title	Course Type	PW
<b>P-III</b>	<b>Physiology, Immunology and clinical biochemistry</b>	<b>Year wise</b>	<b>3</b>

**After studying this paper, biochemistry graduate students will be able to:**

- ✓ Understand biochemistry and patho physiology associated with performed in Clinical biochemistry laboratory.
- ✓ Have a good knowledge on Nervous & Muscular systems helps in add on courses such Acupuncture, Physiotherapy.
- ✓ Understand the nutritional requirements and the role of food and nutrients in health and disease processes and describing the methods used to carry out nutritional methods.

- ✓ Understand the clinical history perform physical examination, suggest investigations, interprets the results and documentary findings.
- ✓ Learn about the structural features, functions of the components of immune system, emphasizing the mechanisms involved in immune system.
- ✓ To understand how living systems function from molecular and cellular to be systems level emphasizing an integrative approach to study the biological approach of the human body.
- ✓ To understand the relationship between food and a healthy body more specifically emphasizing on how nutrients are digested, absorbed, transported and metabolized, stored and eliminated by the body.

\*\*\*\*\*

### **III - YEAR [ ANNUAL ]**

<b>Code</b>	<b>Course Title</b>	<b>Course Type</b>	<b>HPW</b>
<b>P-IV</b>	<b>Microbiology &amp; Molecular Biology</b>	<b>Year wise</b>	<b>3</b>

**After studying this paper, biochemistry postgraduate students will be able to:**

- ✓ Understand the morphological differences of different microorganisms, identifying industrially and economically useful microorganisms and applying them in different fields.
- ✓ Understand different steps in the central dogma of molecular biology, enzymes involved in synthesis of DNA, RNA and protein.
- ✓ Present hypothesis and select, adapt and conduct molecular and cell-based experiments to either confirm or reject the hypothesis.
- ✓ Exhibit a knowledge base in genetics, cell and molecular biology.
- ✓ Learn gene cloning for the expression of desired gene, amplifying the DNA, which is applied in various genomic level researches.
- ✓ Learn fundamental genetic, biotechnology principles and practices and apply that to analyze and manipulate traits in living organisms.

- ✓ Describe the contents and properties of the most important bioinformatics databases, perform text-and searches, and analyze and discuss the results in light of molecular biological knowledge.
- ✓ Understand the intersection of life and information sciences, using different software's like genomics, proteomics, BLAST, FASTA etc to extract information from large database and applying them at genome level.

\*\*\*\*\*