

DEPARTMENT OF BIOCHEMISTRY (PG)

PROGRAM OBJECTIVES:

Biochemistry is an inter disciplinary program that focuses on the chemistry of living systems. It is a discipline in which biological phenomena are analysed in terms of chemistry. Biochemistry operates at molecular level and brings into light the hidden secrets of life. It is an essential part of Life science or Bioscience. It also forms the basis of the Biotechnology industry. More importantly the new and exciting disciplines of Proteomics, Genomics, Genetic engineering and drug design all rely on the knowledge and competency in Biochemistry.

Large number of opportunities await candidates completing M.Sc Biochemistry . One can find opportunities in Pharmaceutical companies, research laboratories, diagnostic centres . Students interested in teaching field can join in teaching profession for courses like B.Pharm, B.Sc, M.Sc Nursing etc.

PROGRAMME OUTCOMES:

Biochemistry is an inter disciplinary program that focuses on the chemistry of living systems. It is a discipline in which biological phenomena are analysed in terms of chemistry.

BIOCHEMISTRY:

PROGRAMME OUTCOMES	PO – 1 It operates at molecular level and brings into light the hidden secrets of life. PO – 2 It is an essential part of Life science or Bioscience. PO – 3 It also forms the basis of the Biotechnology industry. PO – 4 Able to understand the disciplines of Proteomics, Genomics, Bioinformatics, Genetic Engineering and Drug design.
--------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

COURSE OBJECTIVES:

COURSE OUTCOMES AT THE END OF I& II SEMESTERS

<p>P - I BIOMOLECULES</p>	<p>To understand the organic chemical principles in life processes. It helps to understand the structure and function of lipid, DNA, RNA, etc.. To study developments in nutrition involving fats. To understand the industrial application of oils, fats, especially for food detergents and oleo chemicals. To understand biological processes such as protein biosynthesis, DNA replication and RNA biosynthesis. To understand the genetic code, molecular basis of mutation, PCR and nucleic acid sequencing. To understand biological processes. To understand the interaction of small molecules with polymeric molecules. To follow many new developments in the field of molecular biology and medicine.</p>
<p>P - II BIOCHEMICAL TECHNIQUES</p>	<p>CO – 1 To make the students understand basic knowledge and skills in electrophoretic and radio-isotopic techniques and to provide students with hands-on experience in basic biochemical and molecular techniques.</p>
<p>P - III PHYSIOLOGY &BIOENERGETICS</p>	<p>To gain knowledge of acute and chronic physiological changes that occur in the body in response to stress. To gain knowledge about human anatomy and their function of different organs such as heart, lungs, liver, kidney etc., To gain knowledge in bioenergetics, laws of thermodynamics and to describe oxidative phosphorylation etc.,</p>
<p>P - IV ENZYMOLOGY</p>	<p>To introduce students to various theoretical and practical aspects of enzymology and stimulate their interest in learning the structure, function and kinetics of enzymes</p>

	<p>and their role as catalyst and regulation of cell metabolism.</p> <p>To integrate the practical aspects of enzymology with the kinetic theories, to provide a mechanistic overview of enzyme activity and regulation in cells.</p> <p>To prepare students to confidently and competently work with enzyme systems in both academic and industry.</p> <p>To learn the major classes of enzymes and their functions in the cells, role of coenzymes in enzyme catalysed reactions, mechanism of action of some enzymes, to define and describe the properties of enzymes and their regulation of biochemical pathways.</p>
<p>P - I MICROBIOLOGY</p>	<p>To gain basic knowledge in microbiology for their profession preparation, compare and contrast the characteristics for various microbes, viruses, bacteria, protozoans and multicellular parasites.</p>
<p>P – II CELL BIOLOGY& GENETICS</p>	<p>To enable students to understand the structures and purposes of basic components of prokaryotic and eukaryotic cells To explain Mendel’s principles of inheritance and apply these to problems of inheritance, describe the different forms of inheritance patterns, explain modes of inheritance and how sex influenced inheritance and expression of genes.</p>
<p>P – III NTERMEDIARY METABOLISM</p>	<p>It describes all reactions concerned with the storage and generation of metabolic energy required for the synthesis of low molecular weight compounds and energy storage compounds.</p> <p>To give students understanding the reactions involved in the breakdown and building up of biomolecules and afford students opportunity to appreciate the relevance / application of Biochemistry to our daily activity.</p>
<p>P – IV MOLECULAR BIOLOGY</p>	<p>To gain basic knowledge and skills in molecular biology and apply the knowledge, skill awareness to topics such as Translation, Signal Hypothesis, Protein Targetting,</p>

	Molecular Chaperones, Genetic Code etc.,.
--	-------------------------------------------

COURSE OUTCOMES AT THE END OF III & IV SEMESTERS

P - I PLANT BIOCHEMISTRY & HUMAN NUTRITION	<p>To help students to gain knowledge about the electron transport in higher plants and its relation with the carbon fixation pathways It provides an integrated overview of the physiological requirements and functions of protein, energy and the major vitamins and minerals that are determinants of health and disease in human populations.</p> <p>It provides an overview of the major and micro nutrients relevant to human health, discuss the scientific rationale for defining nutritional requirements in healthy individuals and population with reference to specific conditions such as pregnancy, lactation and old age and to discuss nutrition related diseases such as cardiovascular diseases, obesity, protein energy malnutrition in a global context.</p>
P – II IMMUNOLOGY	<p>It provides an emphasis on the mechanisms involved in immune system development and responsiveness, structure of T-cells, B-cells, receptors of T-cells, B-cells, introductory lectures serve to describe and differentiate between natural defensive mechanism and adaptive immunity.</p>
P – III REGULATION OF GENE EXPRESSION & GENETIC ENGINEERING	<p>To acquire basic knowledge on organisation and maintenance of the genome and on control of gene expression. To understand the processes that govern cell cycle and control mechanisms of cell death and renewal; to recognise the scheme of the cell-cell interactions and cell signalling; to relate the irregularities in the genome and basic cell processes to the development of cancer; to acquire the principals and practical applications of the basic methods in molecular biology and genetic engineering.</p>
P – IV INDUSTRIAL BIOTECHNOLOGY	<p>To gain knowledge in the exploitation of enzymes, microorganisms, and plants to produce energy, industrial chemicals and</p>

	<p>consumer goods.</p> <p>To understand the industrial paradigm based on the expectation that renewable plant-derived carbohydrates, lipids and other compounds can displace a significant fraction of petroleum and other fossil fuels that are currently the raw material and energy basis of modern industrial societies.</p> <p>To develop biotechnology approaches that will yield 'green' industrial processes that are cost effective and sustainable.</p> <p>To enhance problem solving skills of students through industry oriented projects.</p> <p>To provide a firm foundation in the principles underlying modern biotechnology techniques.</p> <p>It also helps students to attract them to join various industries.</p>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>P - I CLINICAL BIOCHEMISTRY & ENDOCRINOLOGY</p>	<p>To gain knowledge in chemical and biochemical mechanisms of the body in relation to diseases mostly through the analysis of body fluids such as blood or urine.</p> <p>It also provides an understanding to structures and function of endocrine glands</p>
---------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>P – II GENOMICS,PROTEOMICS & BIOINFORMATICS</p>	<p>To gain knowledge in molecular biology this is a requisite for lab biologists or lab managers.</p> <p>It gives an introduction and historical perspective to the field of bioinformatics.</p>
---------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>P – III APPLIED BIOCHEMISTRY</p>	<p>To gain basic knowledge on major biomolecules, enzymes, hormones and nutrients and of fundamental chemical principles involved in body mechanism.</p> <p>To study basic principles of biochemical sensor design.</p> <p>To describe the variants of the techniques including isoelectric focusing, rocket immunoelectrophoresis and polyacrylamide gel electrophoresis.</p>
--------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

