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Every Good Work

SACRED HEART COLLEGE (AUTONOMOUS)

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A Don Bosco Institution of Higher Education, Founded in 1951 * Affiliated to Thiruvalluvar University, Vellore * Autonomous since 1987

Accredited by NAAC (4th Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

Name of the Programme: M.Sc. Bio chemistry

S No	Title of the Paper	Course Code	Course Objectives	Course Outcomes	Relevance
1	CELL DYNAMICS	BC709	<ul style="list-style-type: none">To learn the prokaryotic and eukaryotic cellular organization and acquire knowledge on cell cycle and cell division.To understand the communication and transport across the cell membrane.To know the histopathology techniques and staining methods.To understand the membrane proteins and their interactions with other cellular components.To explain the molecular basis of apoptosis and	<ul style="list-style-type: none">Acquire broad knowledge on prokaryotic and eukaryotic cellular organization, cell cycle and cell division.Define and provide an understanding of the structure of cell and function of various subcellular organelles.Examine the theory and practice of histological techniques and staining of tissues using routine and specialized techniques.Learn the basic concepts on the membrane proteins and their interactions with other cellular components.Determine the transport mechanisms across biological membranes and learn	Global developmental needs

			necrosis	the concept and mechanism of ATP synthesis. <ul style="list-style-type: none"> • Compile the information on cell aging and cell death mechanisms. 	
2	BIOMOLECULES	BC710	<ul style="list-style-type: none"> • To understand the nature of various biomolecules present in living cells. • To get exposed to key contributions of scientists such as G.N. Ramachandran and Watson - Crick etc. in order to create scientific interest amongst students in life processes. • To learn the properties of carbohydrates, proteins, lipids, cholesterol, DNA, RNA, glycoproteins and glycolipids and their importance in biological systems. • To understand the organic chemical principles in life processes. • To develop skills to determine amino acid and nucleotide sequences of proteins and DNA respectively. 	<ul style="list-style-type: none"> • Describe the role of biomolecules in biosystem • Summarize the Carbohydrates— classification, structure and functions • Categorize the proteins based on its structure and function • Determine the structure and functions of Nucleic acids • Perceive Lipids based on its structure and functions • Identify the Water soluble and Fat soluble Vitamins 	Global developmental needs

3	HUMAN PHYSIOLOGY AND NUTRITION	BC711	<ul style="list-style-type: none"> • To understand the composition and functions of Blood and Plasma. • To know the process of gaseous exchange in tissues and lungs, respiratory adaption to high altitude. • To understand the nerve physiology and muscle physiology. • To gain insight into digestive system and renal physiology. • To gain awareness on nutritional requirements and energy measurements. 	<ul style="list-style-type: none"> • Describe the structure of major human organs and explain their role in the maintenance of healthy individuals. • Correlate the process of gaseous exchange in tissues and lungs, respiratory adaption to high altitude. • Measure the heart function and learn the circulatory system • Determine the muscular system and excretory system • Classify the nutritional requirement for different age people, during pregnancy and Lactation • Compile the energy measurements, BMR, SDA, RNI and RDA 	Global developmental needs
4	ADVANCED ENZYMOLGY	BC810	<ul style="list-style-type: none"> • To acquire fundamental knowledge on enzymes and their importance in biological reactions. • To understand the ability to difference between a chemical catalyst and biocatalyst. • To know the mechanism of enzyme and its importance in biological reactions. 	<ul style="list-style-type: none"> • Describe the structure, classification and functions of enzymes • Analyze the kinetics of enzyme and chemical catalyzed reactions • Assess the mechanism of enzyme action and enzyme inhibitory and regulatory process. • Summarize the isolation and purification of enzymes • Identify the enzyme immobilization methods and their applications 	Global developmental needs

			<ul style="list-style-type: none"> To learn the kinetics of enzyme catalyzed reactions and enzyme inhibitory and regulatory process. To understand the role of enzymes in clinical diagnosis and industries 	<ul style="list-style-type: none"> Determine the applications of enzymes and their future potential 	
5	INTERMEDIARY METABOLISM	BC811	<ul style="list-style-type: none"> To determine the biochemical reactions, central metabolic pathways and kinetics of energy and homeostasis of metabolism. To learn the importance of lipids as storage molecules and as structural component of biomembranes. To understand the importance of high energy compounds, electron transport chain, and synthesis of ATP under aerobic and anaerobic conditions. To acquire knowledge related to the role of TCA cycle in central carbon metabolism, importance of anaplerotic reactions 	<ul style="list-style-type: none"> Observe the basic concepts of Bioenergetics, mechanisms of oxidative phosphorylation and photophosphorylation Analyze how various biomolecules are metabolized inside the body in order to produce energy for various functions and how various metabolic pathways regulate growth and development of living beings Determine the composition and structure of biomembranes, transport mechanisms across biological membranes and learn the concept and mechanism of ATP synthesis. Justify the role of high energy compounds, how carbohydrates serve as energy source to power various functions, interplay of regulatory networks in the body, hormonal 	Global developmental needs

			<p>and redox balance.</p> <ul style="list-style-type: none"> To gain insights into metabolic engineering for the production of useful biomolecules. 	<p>regulation of metabolism, etc.</p> <ul style="list-style-type: none"> Recognize the role of lipids as storage molecules, role of TCA cycle in central carbon metabolism, importance of anaplerotic reactions, and redox balance occurring in the cells. Integrate how metabolism can be related with issues in lifestyle, health and disease 	
6	ELECTIVE II - ADVANCED ENDOCRINOLOGY	BC812A	<ul style="list-style-type: none"> To learn the basic aspects of hormones and endocrine glands. To provide in depth knowledge about chemical structures of hormones. To understand the classification of hormones. To identify about the functions of hormones. To compile information about new diseases associated with hormones 	<ul style="list-style-type: none"> Demonstrate the basic aspects of hormones, glands, chemical classification and functions. Exhibit the daily secretion of hormones and abnormal values. Acquire knowledge about Reproductive Endocrinology. Make inferences of Neuroendocrine integration in homeostasis. Make judgments about Pathophysiology of Hormones. Compile information about new diseases associated with hormones. 	Global developmental needs

7	MOLECULAR BIOLOGY	BC911	<ul style="list-style-type: none"> • To learn the basic information about Mendelian genetics and the basic aspects of molecular theories. • To understand the process of DNA replication involving the roles of various DNA polymerases and other proteins with special reference to the events in prokaryotes and eukaryotes. • To Gain the insights on the various kinds of DNA repair and major diseases resulting from defective DNA repair • To acquire the knowledge on various kinds of DNA recombination and a detailed understanding of the process of Holliday recombination • To acquire the knowledge related to major features of chloroplast and mitochondrial DNA. 	<ul style="list-style-type: none"> • Observe the basic information about Mendelian genetics and the basic aspects of molecular theories. • Analyse the processes involved in replication and the role of DNA polymerases. • Determine the composition, structure and types of RNAs and its mechanisms. • Justify the role of peptides and protein molecules produced during translation process. • Recognize the role of proteins during gene expression and its regulations. • Integrating mol. Bio mechanism with clinical concepts 	<p>Global developmental needs</p>
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8	IMMUNOLOGY	BC912	<ul style="list-style-type: none"> • To gain acquaintance on the organs involved in the immune system, antigens and different types of antibody. • To acquire knowledge on types of immunity, immune response and complement system. • To gain knowledge about different vaccines and the importance of different immunological techniques. • To acquire knowledge about the MHC complex, transplantation immunology and tumor immunology. • To comprehend the complications of hypersensitivity, Autoimmune diseases and Immunodeficiency disorders 	<ul style="list-style-type: none"> • Anatomy of Lymphoid organs, immune cells and its associated theories • Discuss the Types of Immunity, Immune response and Complement system. • Focus on different vaccines and the importance of different immunological techniques. • Compile the MHC complex and Transplantation immunology • Explores the properties of tumor cells, Immune surveillance and tumor antigens. • Outline the complications of hypersensitivity, Autoimmune diseases and Immunodeficiency disorders. 	<p>Global developmental needs</p>
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9	ADVANCED CLINICAL BIOCHEMISTRY	BC1009	<ul style="list-style-type: none"> • To learn about the specimen: composition, collection and various clinical methods. • To gain the knowledge about metabolic disorders associated with carbohydrate and lipids. • <input type="checkbox"/> To familiarize with the renal disorders linked with protein metabolism and non-protein nitrogenous constituents. • To understand the functions of liver and its associated disorders. • To understand the oxidative stress and damage to the macromolecules. 	<ul style="list-style-type: none"> • Express the various methods in collection and analysis of clinical specimens like blood and urine. • Determine the clinical defect of numerous disorders linked to carbohydrate and lipoprotein metabolism. • Examine the type of renal disorder based on the concentration of blood substances like urea, creatinine and uric acid. • Categorize the disorder associated with serum enzymes like Acid phosphatase, Streptokinase, Asparaginase, Isocitrate dehydrogenase, Ceruloplasmin, CK and LDH. • Evaluate the types of jaundice by the level of serum conjugated and unconjugated bilirubin. • Compile the effect of free radicals and role of enzymatic and non-enzymatic antioxidants on the macromolecules. 	Global developmental needs
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10	ELECTIVE IV - PLANT: BIOCHEMISTRY AND MOLECULAR BIOLOGY	BC1011A	<ul style="list-style-type: none"> • To explain and understand the Biochemistry of photosynthetic system. • To learn and understand the basics of plant cell and its physiology. • To create awareness on Plant diseases and their metabolism. • To impart basic knowledge on plant biotechnology. • To develop sound knowledge on biochemical events associated with growth regulators and herbicide. 	<ul style="list-style-type: none"> • Acquire broad knowledge on Photosynthesis, Cyclic and non-cyclic photophosphorylation and Calvin cycle. • Infer the different types of plant hormones, Symbiotic and Non-symbiotic nitrogen fixation. • Integrate about stress physiology and secondary metabolites • Recall the basic concepts of plant physiology, Biochemistry of seed democracy and phytochromes. • Outline the DNA Polymorphism and plant genetic engineering. • Provide the information on plant vectors, plasmid, biodegradable plastics and fruit ripening. 	Global developmental needs
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