

TEACHING PLAN THEORY													
Competency No	Competencies	CO Code	Relevant PSO										
			1	2	3	4	5	6	7	8	9	10	11
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	CO 1,2	1		1			1		1		1	1
BI2.1	Explain fundamental concepts of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors. Enumerate the main classes of IUBMB nomenclature.	CO 2,3	1	1		1				1		1	
BI2.2	Observe the estimation of SGOT & SGPT	CO 3,11		1	1			1	1		1		1
BI2.3	Describe and explain the basic principles of enzyme activity	CO 2,3		1		1				1		1	1
BI2.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	CO 2,3	1		1			1		1			1
BI2.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions.	CO 2,3,11	1			1			1		1		1
BI2.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	CO 2,3,11		1	1			1		1		1	
BI2.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions.	CO 2,3,11,12				1			1		1		1
BI3.1	Discuss and differentiate monosaccharides, di-saccharides and polysaccharides giving examples of main carbohydrates as energy fuel, structural element and storage in the human body	CO 1,2,4	1		1			1			1		1
BI3.2	Describe the processes involved in digestion and assimilation of carbohydrates and storage.	CO 1,2	1		1				1		1		1
BI3.3	Describe and discuss the digestion and assimilation of carbohydrates from food.	CO 1,2,4,5	1	1		1				1		1	
BI3.4	Define and differentiate the pathways of carbohydrate metabolism, (glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt).	CO 1,2,3,4,5		1	1			1	1		1		1
BI3.5	Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.	CO 1,2,6		1		1				1		1	1
BI3.6	Describe and discuss the concept of TCA cycle as a amphibolic pathway and its regulation.	CO 1,3,4	1		1			1		1			1
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	CO 1,2,3	1			1			1		1		1
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	CO 1,2,3		1	1			1		1		1	
BI3.9	Discuss the mechanism and significance of blood glucose regulation in health and disease.	CO 2,3,11				1			1		1		1
BI3.10	Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism.	CO 1,2,3,5	1		1			1			1		1
BI4.1	Describe and discuss main classes of lipids (Essential/non-essential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions.	CO 1,2,3,5	1		1			1		1			1
BI4.2	Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	CO 1,2,3,5	1			1			1		1		1
BI4.3	Explain the regulation of lipoprotein metabolism & associated disorders.	CO 1,2,3,5		1	1			1		1		1	
BI4.4	Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	CO 1,2,3,5				1			1		1		1
BI4.5	Interpret laboratory results of analytes associated with metabolism of lipids	CO 1,2,3,5	1		1			1		1		1	1
BI4.6	Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis.	CO 1,2,3,5	1		1				1		1		1
BI4.7	Interpret laboratory results of analytes associated with metabolism of lipids.	CO 1,2,3,5	1	1		1			1			1	
BI5.1	Describe and discuss structural organization of proteins.	CO 1,2,3,6		1	1			1		1			1
BI5.2	Describe and discuss functions of proteins and structure-function relationships in	CO 1,2,3,6		1		1			1		1		1
BI5.3	Describe the digestion and absorption of dietary proteins.	CO 1,2,3,5,6	1		1			1		1			1
BI5.4	Describe common disorders associated with protein metabolism.	CO 1,2,3,5,6	1			1			1		1		1
BI5.5	Interpret laboratory results of analytes associated with metabolism of proteins.	CO 1,2,3,5,6		1	1			1		1		1	
BI6.1	Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states.	CO 1,2,5				1			1		1		1
BI6.2	Describe and discuss the metabolic processes in which nucleotides are involved.	CO 1,2,3,5,8,9	1		1			1			1		1
BI6.3	Describe the common disorders associated with nucleotide metabolism.	CO 1,2,3,5,8,9	1		1				1		1		1
BI6.4	Discuss the laboratory results of analytes associated with gout & Lesch Nyhan syndrome.	CO 2,3,5,6,11,12	1	1		1				1		1	

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BI6.5	Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	CO 2,3,6		1	1		1	1		1		1	
BI6.6	Describe the biochemical processes involved in generation of energy in cells.	CO 2,3,5		1		1			1		1		1
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	CO 1,2,7,11	1		1		1		1			1	
BI6.8	Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.	CO 2,7,11,12	1			1		1		1			1
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	CO 1,2,5,6,11		1	1		1		1		1		
BI6.10	Enumerate and describe the disorders associated with mineral metabolism.	CO 1,2,5,6,11				1		1		1			1
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	CO 1,2,5,6,11	1		1		1			1		1	1
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	CO 1,2,5,6,11	1		1		1		1			1	
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	CO 1,2,3,5,6	1			1		1		1			1
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	CO 1,2,3,5,6,11,12		1	1		1		1		1		
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	CO 1,2,3,5,6				1		1		1			1
BI7.1	Describe the structure and functions of DNA and RNA and outline the cell cycle.	CO 1,2,6,8,9	1		1		1			1		1	1
BI7.2	Describe the processes involved in replication & repair of DNA and the transcription & translation mechanisms.	CO 1,2,6,8,9	1		1			1		1		1	1
BI7.3	Describe gene mutations and basic mechanism of regulation of gene expression.	CO 1,2,6,8,9	1	1		1				1		1	
BI7.4	Describe applications of molecular technologies like recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis.	CO 1,2,6,8,9		1	1		1	1		1		1	
BI7.5	Describe the role of xenobiotics in disease	CO 1,2,6,8,9	1		1		1		1			1	
BI7.6	Describe the anti-oxidant defence systems in the body.	CO 1,2,6,8,9	1			1		1		1			1
BI7.7	Describe the role of oxidative stress in the pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis.	CO 6,7,9,11,12		1	1		1		1		1		
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre.	CO 1,2,4,5				1		1		1			1
BI8.2	Describe the types and causes of protein energy malnutrition and its effects.	CO 1,2,3,4,5,7,11	1		1		1			1		1	1
BI8.3	Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	CO 6,7,9,11,12	1		1			1		1		1	1
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity.	CO 1,2,3,4,5,7,11	1	1		1			1		1		
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables.(macro-molecules & its importance)	CO 1,2,3,4,5,7,11		1	1		1	1		1		1	
BI9.1	List the functions and components of the extracellular matrix (ECM).	CO 1,2,3,4,5,7,11		1		1			1		1		1
BI9.2	Discuss the involvement of ECM components in health and disease.	CO 1,2,3,4,5,7,11	1		1		1		1			1	
BI9.3	Describe protein targeting & sorting along with its associated disorders.	CO 1,2,3,4,5,7,11	1			1		1		1			1
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation. Also focus on p53 & apoptosis	CO 1,2,3,5,6,8,9,10		1	1		1		1		1		
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	CO 1,2,3,5,6,8,9,10				1		1		1			1

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BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	CO 1,2,3,5,6,8,9,10	1		1		1			1			1		1	1
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	CO 1,2,3,5,6,8,9,10	1		1				1		1				1	1
BI10.5	Describe antigens and concepts involved in vaccine development.	CO 1,2,3,5,6,8,9,10	1	1		1				1			1			
BI11.1	Describe commonly used laboratory apparatus and equipments, good safe laboratory practice and waste disposal.	CO 2,10,11,12		1	1			1	1		1				1	
BI11.2	Describe the preparation of buffers and estimation of pH.	CO 2,7,11,12		1		1				1			1			1
BI11.3	Describe the chemical components of normal urine.	CO 2,7,11,12				1			1		1					1
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	CO 2,7,11,12	1		1			1			1				1	1
BI11.5	Describe screening of urine for inborn errors & describe the use of paper chromatography	CO 2,7,11,12	1		1			1		1					1	
BI11.6	Describe the principles of colorimetry	CO 2,7,11,12	1			1			1		1					1
BI11.7	Demonstrate the estimation of serum creatinine and creatinine clearance	CO 2,3,5,7,11,12		1	1			1		1			1			
BI11.8	Demonstrate estimation of serum proteins, albumin and A:G ratio	CO 2,3,5,7,11,12				1			1		1					1
BI11.9	Demonstrate the estimation of serum total cholesterol and HDL- cholesterol	CO 2,3,5,7,11,12	1		1			1			1				1	1
BI11.10	Demonstrate the estimation of triglycerides	CO 2,3,5,7,11,12	1		1				1		1				1	1
BI11.11	Demonstrate the estimation of triglycerides	CO 2,3,5,7,11,12	1	1		1				1			1			
BI11.12	Demonstrate the estimation of serum bilirubin	CO 2,3,5,7,11,12		1	1			1	1		1				1	
BI11.13	Demonstrate the estimation of SGOT/ SGPT	CO 2,3,5,7,11,12	1		1			1		1			1	1		
BI11.14	Demonstrate the estimation of alkaline phosphatase	CO 2,3,5,7,11,12	1			1			1		1					1
BI11.15	Describe & discuss the composition of CSF	CO 2,3,5,7,11,12		1	1			1		1			1			
BI11.16	Observe use of commonly used equipments/techniques in biochemistry laboratory including: •pH meter •Paper chromatography of amino acid •Protein electrophoresis•TLC, PAGE •Electrolyte analysis by ISE•ABG analyzer•ELISA•Immunodiffusion•Autoanalyser•Quality control•DNA isolation from blood/ tissue	CO 2,3,5,7,11,12				1			1		1					1
BI11.17	Explain the basis and rationale of biochemical tests done in the following conditions: - diabetes mellitus,- dyslipidemia,- myocardial infarction,- renal failure, gout, - proteinuria, - nephrotic syndrome, - edema, - jaundice,	CO 2,3,5,7,11,12	1		1			1			1		1	1	1	1





