COURSE OUTCOMES AND PROGRAMME OUTCOMES FOR SEMESTER-I, II, III, IV, V, VI (HONOURS)

Semester-I

Paper Name	Content	Course Outcome	
CC 1 (CELLULAR BASIS OF PHYSIOLOGY)	**Theory :**	Students will learn about the structure of **Body fluid components**, classification, functions of different cell organelles..	**Program Outcome** This course provides a understanding of the human body functions at the cellular, tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning.
	1. Introduction **2. Body fluid components** **3. Organ systems, tissues and cells** **4. Functional morphology of cells** Microscopic structure and functions of eukaryotic endoplasmic reticuli, ribosome, golgi bodies, mitochondria, lysosomes, peroxisomes, cytoskeletal elements and centrosomes. Plasma membrane and subcellular rmembranes		
	Transports accross cell membrane	How many types of transportation are occurred through cell membranes;Students will learn about the ion pumps, ion channels ionophores. Passive transport. Facilitated diffusion, uniport, symport, antiport. Active transport	
	Capillary wall	Students will learn about the types, structure, functions of capillaries	
	Intercellular communication	Students gain knowledge regarding Basic idea of tight junctions, gap junctions and cell adhesion molecules.	
	Cell cycle and **Cell division**	Students will learn about the stages of cell cycle and different stages of **Mitosis** and **Meiosis**	
		Students will learn about the mechanism of	

	Homeostasis	steady states of our life	
	Aging	Students gain knowledge regarding Basic reasons for aging, how to slow aging and the effects of aging on different physiological systems.	
	Practical :	To know the histological structures of Hyaline cartilage, Trachea, Lung, Spleen, Lymph gland, Parotid gland, Bone, Sub maxillary gland, Sublingual gland, Tongue, Oesophagus, Stomach, Duodenum, Jejunum, Ileum, Large intestine, Liver, Kidney, Ureter, Pancreas, Adrenal gland,Thyroidgland,Testis,Ovary,Spinalcord,Cerebralcortex,Cerebellum, Skin, Cardiac muscle, Skeletal muscle, Smooth muscle, Artery, Vein, Uterus..	
	Study and identification of stained section of different mammalian tissues and organs		
CC-2(CHEMISTRY OF BIOMOLECULES)	**Theory :**	Students gain knowledge regarding **:** Moles, Equivalents, Osmoles Students will learn about the Proteolysis of water, pH, acid-base neutralization curves	
	A Study of Units for Measuring Concentration of Solutes **Principles of Dilution, pH, Buffers Bonds and Forces in Biomolecules**		
	Colloids, Properties, Importance	Students gain knowledge regarding classification, properties–optical, electrical, electro kinetic. Biological importance of colloids	
	Surface tension, Specific Gravity	Students gain knowledge regarding Surface tension and Specific Gravity: characteristics, factors influencing and biological applications	
	Viscosity and Resistance	Students gain knowledge regarding Viscosity and Resistance characteristics, factors influencing and biological applications	
	Acids, Bases, Buffers and pH	Students gain knowledge regarding Buffer action: Henderson-Hasselbalch equation. Regulation of pH by blood buffers. Determination of pH– Basic concept of	

		indicators, principle of pH meter- hydrogen electrode and glass electrode	
	Flow and Pressure	Students gain knowledge regarding Diffusion and Osmosis: osmotic pressure–laws	
	Dialysis and Ultracentrifugation	Students gain knowledge regarding Dialysis and ultrafiltration	
	Chromatography and **Electrophoresis**	Students gain knowledge regarding protein seperation	
	Autoradiography , Cell Fractionation and Tracer Techniques	Students gain knowledge regarding cell fractionation	
	Nanoparticles and its application in Physiology	Students will learn about the structures of **Nanoparticles and its application in Physiology**	
	Laminar and Streamline Flow, Poiseuille- Hagen Formula, Laws of Laplace	Students gain knowledge regarding different laws of biophysics including haemodynamics	
	Thermodynamics	Students will learn about the type of surroundings and systems, First Law–Internal energy, enthalpy. Second Law–Entropy, Free energy change, Endergonic and Exergonic reactions, Reversible and Irreversible processes, Equilibrium constant Physiological steady-state, Living body as a Thermodynamic system.	

	Enzymes	Students will learn about the Structures, coenzymes and Prosthetic Groups Classification- EC nomenclature, Concept of apoenzyme, holoenzyme, coenzyme,cofactors and prosthetic group. b. Mechanism of Enzyme Action Mechanism of enzyme action: Activation energy, Enzyme-substrate complex, Transition state and Products.Models of enzyme-substrate interactions. Specificity of enzymes. Kinetics Concept of initial rate, maximum velocity and steady-state kinetics. c. Michaelis Constant Michaelis constant, Michaelis-Menten equation, Graphical representation of hyperbolic kinetics--Lineweaver-Burk plot. Significance of Km and Vmax. d. Modulation of Enzyme Activities Competitive, non-competitive and uncompetitive inhibitions. Regulation of enzyme activities covalent modifications, allosteric modifications–Sigmoid kinetics and Hill equation: K-and M-series, Feed-back inhibition. Rate-limiting enzymes e. Factors controlling Enzyme Activities Factors influencing enzyme-catalyzed reactions: substrate concentration, enzyme concentration, Max pH, temperature. Isoenzymes, Allosteric Enzymes, Pro-enzymes, Ribozymes, Abzymes	
	Practical:		
	Determination of Oncotic Solution Colloidal solutions	Students will learn about the determination of Oncotic Solution Colloidal solutions	
	Determination of Systolic, Diastolic, Pulse and Mean Blood Pressure by non invasive methods	Students will learn about the determination of Systolic, Diastolic, Pulse and Mean Blood	

	(Auscultatorymethod).	Pressure by non invasive methods (Auscultatory method).	
	Determination of enzyme activities	Students will learn about the activities like SOD, CAT, Amylase, Transaminase etc.	

Semester-II

Paper Name	Content	Course Outcome	Program Outcome
CC-3 (PHYSIOLOGY OF NERVE AND MUSCLE CELLS)	**Theory :**		**Program Outcome** This course provides a understanding of the human body functions at the cellular, tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning
	Excitable Tissue: Nerve	Students will learn about the structure of nerve fibre, classification, functions,Cytoskeletal elements and axoplasmic flow, Propagation of nerve impulse in different types of nerve fibers,properties of nerve fibre, degeneration and regeneration in nerve fiber,ionic basis of nerve impulse generation, Thermal changes of nerve during activity, Structure, classification and functions of neuroglia cells.	
	Excitable Tissue: Muscle	How many types of muscles present in our body, their individual structures and properties and how muscles work in our body to do movements.	
	Synaptic and junctional transmission	Students will learn about the Synapses types, structure, synaptic transmission of the impulse, Neurotransmitters, co transmitters and neuromodulators, vi. Synaptic Plasticity and learning, the neuromuscular junction : structure, transmission, end- plate potential, MEPP and post-tetanic potentiation. Motor unit and Motor point.	
	Initiation of impulses in sense organ	Students gain knowledge regarding neurotransmitters and receptors	

	Practical :		
	Isolation and Staining of nerve fibres with node of Ranvier($AgNO_3$) and muscle fibre (H and E)	To know location of node of Ranvier of nerve fibres and structure of muscle fibres by using toad as an experimental animal.	
	Kymographic recording of mechanical responses of gastrocnemius muscle to a single stimulus and two successive stimuli	Students gain knowledge regarding practical application of nerve muscle physiology.	
	Kymographic recording of effect of variation of temperature on single twitch		
	Kymographic recording of effect of variation of load on single twitch		
CC-4(CHEMISTRY OF BIOMOLECULES)	**Theory :**		
	Carbohydrate	Students will learn about the definition, classification, structure and properties of Carbohydrates.	
	Protein and lipid	Students gain knowledge regarding the biochemistry and application of lipids and proteins in daily life.	
	DNA and RNA	To know about the genetic instruction carrier of our body.	
	Practical:		
	Qualitative tests for the identification of physiologically important substances	Students gain knowledge regarding the biochemistry of various substances present in human body	

SEMESTER-III

Paper Name	Content	Course Outcome	Program Outcome
CC-5 CIRCULATING BODY	**Theory :**		**Program Outcome**
		Students gain knowledge regarding the Formed	This course provides a understanding of the human body functions at the cellular,

FLUIDS	Blood	elements of blood– origin, formation, functions and fate. Blood volume –normal values, regulation and determination by dye and radioisotope methods.	tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning
	Bone Marrow , White Blood Cells, Immune Mechanisms, Platelets	Students gain knowledge regarding the different physiological activities of blood.	
	Red Blood Cells	Students gain knowledge regarding Haemoglobin– Structure, reactions, biosynthesis and catabolism. Foetal haemoglobin. Abnormal haemoglobins- Sickle-cell anemia and Thalassemia. Different types of anaemia and their causes.	
	Blood Types	Students gain knowledge regarding the Blood group – ABO and Rh. Erythroblastosisfoetalis. Blood transfusion and its hazards.	
	Plasma, Hemostasis	Students gain knowledge regarding Plasmaproteins– normal values, origin and functions. Hemostasis– factors, mechanism, anticoagulants, procoagulants. Disorders of hemostasis. Hemophilia, thrombosis and embolism	
	Lymph	Students gain knowledge regarding Lymph and tissue fluids– formation, circulation, functions and fate. Lymphatic organs- histological structures and functions of lymph gland and spleen.	
	Practical :		
	1.Preparation and staining of blood film with Leishman's stain. **2.** Identification of the blood corpuscles. **3.** Differential count of WBC.	Students gain knowledge regarding **determination** Identification measurement of blood cells and derivatives	

	4. Total count of RBC and WBC. **5.** Bleeding time and clotting time **6.** Hemoglobin estimation **7.** Preparation of haemin crystals **8.** Preparation and staining of bone marrow. **9.** Measurement of diameter of megakaryocyte. **10.** Reticulocyte staining **11. .**Blood group determination.		
CC 6: CIRCULATION	**Theory :**		
	Origin of the Heartbeat & the Electrical Activity of the heart	Students gain knowledge regarding the Origin & Spread Of Cardiac Excitation Cardiac action potential. Origin and propagation of cardiac impulse. **T**he Electrocardiogram, Electrocardiography – the normal electrocardiogram, electrocardiographic leads,vectorial analysis, the vectorcardiogram, the mean electrical axis of heart. The His bundle electrogram. Cardiac Arrhythmias, Cardiac Arrhythmias – Normal cardiac rate. Myocardial Infarctions. Cardioplegic solutions. Electrocardiographic Findings in Other Cardiac & Systemic Diseases, hypertrophy and cardiac myopathy	
	The Heart as a Pump	Students gain knowledge regarding the Anatomy of the heart. Properties of cardiac muscle. Cardiac Innervation. Stannius ligature.	

		Mechanical Events of the Cardiac Cycle, The cardiac cycle- pressure and volume changes. Heart sounds. Murmurs. Cardiac Output – measurement by application of Fick's principle and dye dilution method, factors affecting. Starling's law of heart.	
	Dynamics of Blood & Lymph Flow	Students gain knowledge regarding Anatomic Considerations Functional morphology of arteries, arterioles, capillaries, venules and veins, sinusoids. General pattern of circulation and significance of branching of blood vessels. Biophysical Considerations Hemodynamics of blood flow. Arterial & Arteriolar Circulation ,Capillary Circulation ,Lymphatic Circulation & Interstitial Fluid Volume,Venous Circulation	
	Cardiovascular regulatory Mechanisms	Students gain knowledge regarding the Local Regulatory Mechanisms Cardiac and vasomotor centers, baroreceptors and chemoreceptors, cardiac and vasomotor reflexes. Substances Secreted by the Endothelium ,Systemic Regulation by Hormones ,Systemic Regulation by the Nervous System , Cardiovascular homeostasis–neural and chemical control of cardiac functions and blood vessels.	
	Circulation Through special Regions	Students gain knowledge regarding the Coronary, cerebral, pulmonary and cutaneous circulation	
	Cardiovascular Homeostasis in Health & Disease	Compensation for Gravitational Effects, Exercise, Inflammation & Wound Healing, Shock RTI and atherosclerosis, Hypertension The pulse – arterial and venous. Blood pressure– its measurement and factors affecting. Heart Failure, stroke	

	Practical :		
	Preparation of Amphibian Ringer solution Kymographic recording of movements of perfused heart of toad. Study of the effects of changes in perfusion fluid pressure, changes in temperature, excess calcium and potassium ion concentration, acetylcholine, adrenaline on the on the movement of heart	Students gain knowledge regarding the practical of cardiovascular physiology and effects of various pharmacological substances on heart of toad.	
CC7: FUNCTIONS OF THE NERVOUS SYSTEM	**Theory :**		
	Reflexes	Students will learn about the Monosynaptic Reflexes: The Stretch Reflex,Polysynaptic Reflexes: The Withdrawal Reflex,General Properties of Reflexes	
	Cutaneous, Deep and Visceral Sensation	Students will learn about the Ascending and descending tracts: origin, courses, termination and functions.Lower and upper motor neurones. Functions of the spinal cord with special reference to functional changes following hemisection and complete section of spinal cord. Brown-Sequard syndrome, Spinal animal. Pain production, perception and regulation. Referred pain, Pathways Touch Proprioception, Temperature, Pain, Other Sensations	
	Arousal Mechanism, Sleep and the Electrical Activity of the Brain	Students will learn about theThe Reticular Formation & the Reticular Activating System, reticular formation: organization, connection and functions of ascending and descending reticular formation. Physiological basis of sleep and wakefulness,The Thalamus & the Cerebral Cortex, Evoked Cortical Potentials	

		The Electroencephalogram ,Physiological Basis of the EEG, Consciousness, & Sleep Interpretation of abnormal EEG pattern .	
	Control of Posture and Movement	Students will learn about theGeneral Principles,Corticospinal&Corticobulbar System,Anatomy & Function Posture and its regulation Decerebrate rigidity, Decorticate rigidity, Postural reflexes and regulation of Posture Basal Ganglia Cerebellum, Movement disorders	
	The Autonomic Nervous System	Students gain knowledge regarding Anatomic Organization of Autonomic Outflow - Chemical Transmission at autonomic Junctions, responses of Effector Organs to Autonomic Nerve Impulses, Cholinergic and Adrenergic Discharge	
	Neural Basis of Instinctual Behaviour and Emotions	Students gain knowledge regarding Anatomic Considerations, Limbic Functions Limbic system: structure, connections and functions. Physiology of emotion. Sexual Behavior, Fear & Rage Motivation	
	Higher Functions of the Nervous System	Students gain knowledge regarding learning & Memory Higher functions of nervous system: conditioning, learning, short-term and long- term memory. Speech and Aphasia. Asymmetrical organization of certain cognitive functions-split brain Functions of the Neocortex Electrophysiology of brain: spontaneous electrical activity of brain, EEG and ECoG, evoked potential, DC potential. Isolated cortex. Disorders relating learning and memory	
	Practical :		

	1. Experiments on superficial (plantar) and deep (knee jerk) reflex **2.** Measureme nt of grip strength **3.** Reaction time by stick drop test **4.** Short term memory test (shape, picture word) **5.** Two point discrimination test	Students will learn about the practical of neural physiology and effects of various tests on nervous system. .	
SEC-1 A: DETECTION OF FOOD ADDITIVES/ ADULTERANTS	**Theory**		
	Qualitative tests for Food Adulteration	Students gain knowledge regarding impurities which are added to food for business purpose.	

SEMESTER-IV

Paper Name	Content	Course Outcome	Program Outcome
CC-8 (ENERGY BALANCE , METABOLISM AND NUTRITION)	**Theory :**		This course provides a understanding of the human body functions at the cellular, tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning
	Carbohydrate metabolism	Students gain knowledge regarding the biochemical pathways, regulation and energetics of carbohydrate metabolism.	
	Protein metabolism	Students gain knowledge regarding the biochemical pathways, regulation and energetics of protein metabolism.	
	Fat and Cholesterol metabolism	Students gain knowledge regarding the biochemical pathways, regulation and energetics of lipid metabolism.	
	Integration of carbohydrate fat and protein metabolism	Students gain knowledge regarding the biochemical pathways of electron transport chain..	
	Nutrition	Students gain knowledge regarding the nutritional aspects and food style	
	Practical :		
	Quantitative estimation of glucose, sucrose, amino nitrogen, lactose,	Students gain knowledge regarding measurement of amount of substances in solution	
CC-9 (GASTROINTESTINAL FUNCTION)	**Theory :**		
	Digestion and absorption	Students gain knowledge regarding the biochemical pathways, enzymatic activities and absorptive functions of various food stuffs.	
	Regulation of gastrointestinal function	Students gain knowledge regarding the gastrointestinal physiology and pathology like ulcer, gallstone etc.	
	Practical :		

	Kymographic recording of normal movements of rat's intestine in Dale's apparatus Effects of hypoxia, acetylcholine and adrenaline on normal intestinal movements	Students gain knowledge regarding the practical of gastrointestinal physiology and effects of various pharmacological substances on intestine of rat.	
CC-10 (RESPIRATION)	**Theory :**		
	Pulmonary function	Students will learn about the anatomy of the Lungs, mechanics of breathing, gas Exchange in the lungs and pulmonary Circulation.	
	Gas transport between the lungs and the tissues	Students will learn about the mechanism of oxygen Transport and carbon Dioxide Transport.	
	Regulation of respiration	Students will learn about the neural control of Breathing, chemical Control of Breathing and nonchemical Influences on Respiration.	
	Respiratory adjustments in health and disease	Students will learn about the effects of exercise, various Forms of Hypoxia, Oxygen Treatment, Respiratory Abnormalities and Artificial Respiration	
	Practical :		
	Measurement of peak expiratory flow rate	Students will learn about the capacity of lung	
	Measurement of oxygen saturation by pulse oxymeter before and after exercise	Students will learn about the oxygen level in blood during rest and exercise	
	Measurement of forced expiratory volume (FEV) in first second	Students will learn about the lung volume.	
SEC-2A OR 2B(CLINICAL BIOCHEMISTRY OR HEMATOLO	**SEC-2A,Practical :**		
	Photo-cholorimetric estimation of blood constituents	Students gain knowledge regarding the practical of blood constituents and ratios of human subjects.	
	Measurement of blood glucose, blood		

GICAL TEACHNIQUES)	inorganic phosphate, serum total protein, serum albumin globulin ratio, serum amylase.		
	or		
	SEC-2B,Practical :		
	Preparation of blood smear and identification of cells	Students gain knowledge regarding the practical of blood constituents and ratios of human subjects along with LFT.	
	Determination of haematocrit value, MCV, MCH, MCHC, bleeding time, clotting time		
	Measurement of haemoglobin in blood, preparation of serum, estimation of SGPT and SGOT		

Semester-v

Paper Name	Content	Course Outcome	ProgrammeOutcome
	Theory :		
CC 11: SPECIAL SENSES	Vision	Students will learn about the structure of eye, image formation, neural pathway of vision, error in visual process.	This course provides a understanding of the human body functions at the cellular, tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning
	Hearing & Equilibrium	Students will learn about the structure of ear, mechanism of hearing, vestibular function, neural pathway of hearing.	
	Smell & Taste	Students will learn about the structure of nose and tongue	
	Practical :		
	Principles of fixation and staining	To know the process of fixation and staining.	
	Staining and identification of fixed endocrine glands and nervous tissue	To know the histological structure of these tissues	
	Determination of visual acuity by Snellen's chart / Landolt's C chart	Students will learn about the visual acuity test	
	Determination of colour blindness by	Students will learn about the visual test	

	Ishihara chart		
CC 12: ENDOCRINOLOGY	**Theory :**		
	The Thyroid Gland	Students will learn about the structure of thyroid gland; synthesis, transport, physiological function of thyroid hormones; hypo and hyper-secretion of thyroid hormones.	
	Endocrine Functions of the Pancreas & the Regulation of Carbohydrate Metabolism	Students will learn about the structure of endocrine pancreas; synthesis, transport, physiological function of pancreatic hormones; regulations of their secretions; hypo and hyper-secretion of pancreatic hormones.	
	The Adrenal Medulla & Adrenal Cortex	Students will learn about the structure of adrenal cortex; synthesis, transport, physiological function of adrenal hormones; regulations of their secretions; hypo and hyper-secretion of adrenal hormones.	
	Hormonal Control of Calcium Metabolism & the Physiology of Bone	Structure of bone; physiological functions and metabolism of calcium, phosphate, vitamin-D; The Parathyroid glands and its secretory effects on Calcium Metabolism; hypo and hyper-secretion of calcium, phosphate and vitamin-D.	
	The Pituitary Gland	Students will learn about the structure of anterior and posterior pituitary gland, name and physiological function and regulations of secretion of their secretory hormones and hypo and hyper-secretion of those hormones.	
	Endocrine Functions of the Kidneys, Heart, & Pineal Gland	The Endocrine Function of Renin-Angiotensin System, Erythropoietin, Atrial Natriuretic Peptide and secretory hormone of Pineal Gland; brief idea about Human chronobiology and biological rhythms.	
	Practicals:		
	Study of the effects of oxytocin on uterine contraction	Students gain knowledge regarding practical application of normal contraction of uterus and effect oxytocin on uterine contraction which is seen during parturition of mammals by using rat	

		as an experimental animal.	
	Study of the effects of adrenaline on intestinal / uterine movements	Students gain knowledge regarding practical application of normal contraction of uterus and intestine organ and effect adrenaline drug on uterine/ intestinal contraction by using rat as an experimental animal.	
DSE 1B : MICROBIOLOGY AND IMMUNOLOGY	**Theory :**		
	Bacteria	Students will learn about the structure and classification of bacteria, their growth curve; brief idea about sterilization and pasteurization.	
	Overview of Immune System	Students gain knowledge regarding different types of immune-competent cells and their actions, structures of immunoglobulins; vaccination and immunization programme.	
	Practicals:		
	Gram staining of bacteria and identification of Gram positive and Gram negative bacteria.	Students gain knowledge regarding practical procedure of identification of Gram positive and Gram negative bacteria.	
	Demonstration: Spore Staining, Radial immune-diffusion.	Students gain knowledge regarding spore.	
DSE 2B: SPORTS AND EXERCISE PHYSIOLOGY	**Theory :**		
	Importance of regular exercise in health and wellbeing	Students will learn about the Significance of exercise in daily life	
	Basic concept of Bioenergetics, Energy sources during exercise (Phosphagen, Anaerobic system and Aerobic system).	Students will learn about the different types of energy sources.	
	Cardio-respiratory responses during different grades of exercise	Students will learn about the changes of cardiovascular system occurs during exercise.	
	Concept of excess post exercise oxygen consumption (EPOC), physiological fatigue and recovery.	Students will learn about different physiological terms which are used in sports physiology.	
	Aerobic work Capacity: Measurement, physiological factors and applications	Students will learn about the	
	Training	Students will learn about the principles of physical training, Training to improve aerobic	

		and anaerobic power. Effect of overtraining and detraining.	
	Nutritional supplements and ergogenic aids.	Students will learn about theSupplements scientific equipment which is fruiful to sports persons an	
	Sports injury and its' management	Students will learn about the causes, symptoms and their managements of different types of sports injuries.	
	Basic idea sports rehabilitation and sports medicine	Students will learn about the medicines which are used by sports persons for their healthy life.	
	Practicals:		
	Measurement of blood pressure before and after different grades of exercise.	To know the differences between before and after exercise blood pressure	
	Recording of recovery heart-rate after standard exercise.	To know the differences between before and after exercise heart rate.	
	Determination of Physical Fitness Index by Harvard Step Test (Modified)	To know the physical fitness forMuscular work & theability to recover from the work	
	Determination of VO2max by Queen College step test	To know body's ability to deliver **oxygen** to muscles	
	Measurement of body fat percentage	To know the fat percentage of a person.	
	Six minute walk test.		
	Determination of endurance time by hand grip dynamometer	To know the gripstrength of a hand.	
	Pneumographic recording of effect of talking, laughing, coughing, breath holding and hyperventilation	To know the breathing rate during different types of physical activities.	

SEMESTER-VI

Paper Name	Content	Course Outcome	Program Outcome
CC-13(REPRODUCTION)	**THEORY:**		
	Introduction	Students will learn about the human reproductive system	**Program Outcome** This course provides a understanding of the human body functions at the cellular, tissue, organ and system levels. It also provides how diseases disrupt normal physiology. It integrates knowledge from different biological disciplines like biochemistry, biophysics, anatomy, histology,sports physiology, nutrition, microbiology, immunology, molecular biology, providing a comprehensive view of the body's functioning
	Sex differentiation and development	Students will learn about the mechanism of human Sex differentiation and development	
	Pituitary gonadotropins and prolactin	Students will learn about the role of Pituitary gonadotropins and prolactin in various human reproductive process	
	The male reproductive system	Students will learn about the anatomy of male reproductive system, mechanism of spermatogenesis	
	The female reproductive system	Students will learn about theanatomy of female reproductive system, mechanism of oogenesis, menstrual cycle	
	Pregnancy	Students will learn about the various changes during pregnancy	
	Lactation	Students will learn about the mechanism of lactation	
	Physiological concept of planned family	Students will learn about the various family planning process and its mechanism	
	PRACTICAL:		
	Study of estrous cycle	Students will learn about theestrous cycle in rat	
	Staining and identification of kidney and ureters,estimation of estrogen by spectrophotometric method	Students will learn about the histological structures of kidney and ureters	
	Pregnancy test from human urine by kit method		
CC-14(FORMATION AND EXCRETION OF URINE)	**THEORY:**		
	Introduction	Students gain knowledge regarding renal physiology.	
	Function of Malpighian corpuscles and renal tubule and counter current mechanism	Students gain knowledge regarding Formation, dilution of urine and various physiological functions of kidney.	

	Water excretion		
	Acidification of the urine and bicarbonate excretion		
	Regulation of Na+ and Cl- excretion		
	Diuretics		
	Disorder of renal function		
	Filling of the bladder	Students gain knowledge regarding micturition process.	
	Emptying of the bladder		
	Non-excretory function of kidney	Students gain knowledge regarding various physiological functions of kidney	
	PRACTICAL:		
	Identification of normal and abnormal constituents of urine.	Students gain knowledge regarding the practical of urine constituents	
DSE 3A: HUMAN NUTRITION AND DIETETICS	Constituents of food and their significance.	Students gain knowledge regarding various aspects of daily consumed foodstuffs	
	Basal metabolic rate -factors, determination by Benedict-Roth apparatus.	Students gain knowledge regarding measurement of Basal metabolic rate	
	Respiratory quotient. Specific dynamic action.	Students gain knowledge regarding various aspects of nutritional status	
	Basic concept of energy and units. Calorific value of foods. Body calorie requirements – adult consumption unit		
	Dietary requirements of carbohydrate, protein, lipid and other nutrients.	Students gain knowledge regarding various aspects of Dietary requirements of foods	

	Balanced diet and principles of formulation of balanced diets for growing child, adult man and woman, pregnant woman and lactating woman.	Students gain knowledge regarding dietary requirements and formulation	
	Nitrogen balance, essential amino acids, biological value of proteins.	Students gain knowledge regarding various aspects of nutritional study	
	Supplementary value of protein.		
	Protein efficiency ratio and net protein utilization of dietary proteins.		
	Dietary fibres.	Students gain knowledge regarding importance of fibres	
	Vitamins.	Students gain knowledge regarding importance of vitamins	
	Principle of diet survey.	Students gain knowledge regarding importance of survey	
	Composition and nutritional value of common food stuffs.	Students gain knowledge regarding importance of nutritional values	
	Physiology of starvation and obesity.	Students gain knowledge regarding physiology of starvation and obesity	
	Sources and physiological significances of vitamins and minerals.	Students gain knowledge regarding importance of vitamins and minerals	
	Space nutrition.	Students gain knowledge regarding physiology of nutritional aspects in space.	
