

Vidyasagar Metropolitan College
Department of Physiology

Programme Outcomes

1. Gain ability to apply basic principles of bio-chemistry and bio-physics to physiological systems"
2. Understand the functions of important physiological systems like the cellular, metabolic, cardio-vascular, respiratory, endocrinological, nervous, excretory and reproductive systems
3. Understand how these separate systems interact to generate integrated physiological responses to challenges such as exercise, fasting, certain environmental changes, stress etc. to maintain homeostasis
4. Understand the mechanisms of techniques and instrumentations used to assess health and disease
5. Gain knowledge of nutrition, xenobiotics, pollutants in the maintenance of health and prevention of diseases.
6. Be able to perform and analyze experiments and prepare reports of the findings/
7. Able to learn community-based survey, interpretation of the data and its social implications.
8. Able to employability skills necessary for careers in teaching, and professions allied to medicine and industry.

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Course Outcomes

Sem.	Paper Name	Course Outcome
1	CC1- CELLULAR BASIS OF PHYSIOLOGY, GENETICS & ENZYMES	THIS COURSE WOULD ENABLE THE STUDENTS 1.ABOUT THE BASIC CELLULAR STRUCTURE AND THEIR FUNCTIONS IN DETAILS 2.TO GIVE AN IDEA ABOUT THE NATURE AND MECHANISM OF ACTION OF ENZYMES
1	CC2- BIOPHYSICAL PRINCIPLES AND CHEMISTRY OF BIOMOLECULE S	THIS COURSE WOULD ENABLE THE STUDENTS 1.TO APPLY BASIC PHYSICAL AND CHEMICAL PRINCIPLES IN BIOLOGICAL SYSTEMS 2.TO UNDERSTAND WORKING PRINCIPLES OF BIOMEDICAL INSTRUMENTS. 3.TO LEARN THE CHEMISTRY AND PROPERTIES OF IMPORTANT BIOMOLECULES IN DETAILS.
2	CC3- CELL SIGNALLING & NERVE- MUSCLE PHYSIOLOGY	THE COURSE WOULD DEVELOP 1.A MOLECULAR UNDERSTANDING OF THE COMPLEX SYSTEM OF COMMUNICATION GOVERNING BASIC CELLULAR ACTIVITIES 2.STRUCTURE AND FUNCTIONAL PROPERTIES AND MECHANISM OF EXCITATION OF NERVE AND MUSCLE
2	CC4- NERVOUS SYSTEM	1.TO UNDERSTAND STRUCTURES AND FUNCTIONS OF THE BRAIN AND THE SPINAL CORD 2.TO THE MODERN CONCEPT OF PAIN, SLEEP, LEARNING, MEMORY, EMOTION AND MOLECULAR MECHANISM OF ACTION OF NEUROTRANSMITTERS. 3.THE COURSE ENABLES STUDENTS TO UNDERSTAND THE IMAGING TECHNIQUES OF CT SCAN AND MRI IN THE DETECTION OF DISEASES.
3	CC-5 BLOOD AND BODY FLUIDS	AT THE END OF THIS COURSE STUDENTS SHOULD BE ABLE 1.TO UNDERSTAND THE STRUCTURES AND FUNCTIONS OF DIFFERENT COMPONENTS OF BLOOD AND BODY FLUIDS 2.TO UNDERSTAND THE PATHOPHYSIOLOGY OF COMMON HAEMATOLOGICAL DISORDERS
3	CC-6 CARDIOVASCU LAR SYSTEM	THE STUDENTS WOULD BE ABLE 1.TO DESCRIBE STRUCTURE AND FUNCTIONS OF HEART AND BLOOD VESSELS AND REGULATION OF THEIR ACTIVITIES UNDER VARYING PHYSIOLOGICAL CONDITIONS. 2.TO UNDERLYING PRINCIPLES OF COMMON DIAGNOSTIC TESTS OF DIFFERENT CARDIOVASCULAR DISORDERS. 3.GAIN HANDS ON TRAINING ON MEASUREMENT OF BLOOD PRESSURE, AND INTERPRET THE ECG

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3	CC-7 RESPIRATORY SYSTEM	THE STUDENT SHOULD BE ABLE 1.TO DESCRIBE STRUCTURE AND FUNCTIONS OF RESPIRATORY ORGANS AND REGULATION OF THEIR ACTIVITIES UNDER VARYING PHYSIOLOGICAL CONDITIONS. 2.TO UNDERSTAND PATHOPHYSIOLOGY OF VARIOUS RESPIRATORY DISORDERS. 3.TO DEVELOP SKILLS OF SPIROMETRY AND PNEUMOGRAPHIC EXPERIMENTS AND ITS INTERPRETATION
4	CC-8 DIGESTION AND METABOLISM	THE STUDENTS SHOULD BE ABLE TO 1.EXPLAIN THE STRUCTURE, FUNCTION ALONG WITH THEIR PATHOPHYSIOLOGICAL CONDITIONS OF DIFFERENT PARTS OF THE DIGESTIVE TRACT AND REGULATION OF SECRETION OF DIGESTIVE JUICES 2.GAIN AN IN DEPTH KNOWLEDGE OF DIFFERENT PATHWAYS OF CARBOHYDRATE, PROTEIN, LIPID AND NUCLEIC ACIDS METABOLISM AND THEIR INTERRELATIONSHIPS 3.GAIN THE TECHNICAL KNOWLEDGE OF DEMONSTRATING THE EFFECTS OF SYMPATHETIC AND PARASYMPATHETIC NERVOUS SYSTEM ON THE MOVEMENT OF INTESTINE IN A MAMMALIAN MODEL AND QUANTITATION OF AMINO ACID IN SOLUTIONS
4	CC-9 MOLECULAR BIOLOGY	THE STUDENTS SHOULD GAIN 1.IN DEPTH KNOWLEDGE ABOUT DNA, RNA AND PROTEIN SYNTHESIS AND THEIR ABNORMALITIES 2.CONCEPT OF GENE EXPRESSION AND ITS REGULATIONS 3.CONCEPT OF RECOMBINANT DNA TECHNOLOGY, GENETICALLY MODIFIED ORGANISMS AND GENE THERAPY 4.KNOWLEDGE OF MOLECULAR BIOLOGY TECHNIQUES SUCH AS CHROMATOGRAPHY, ELECTROPHORESIS, ULTRACENTRIFUGATION, RIA, ELISA, WESTERN, NORTHERN, SOUTHERN BLOTTING TECHNIQUES AND POLYMERASE CHAIN REACTION (PCR) 5.SKILL OF COLORIMETRIC ESTIMATION AND CHROMATOGRAPHIC SEPARATION OF MOLECULES OF BIOMEDICAL IMPORTANCE LIKE SERUM PROTEIN, BLOOD GLUCOSE, UREA AND AMINO ACIDS
4	CC-10 NUTRITION AND DIETETICS PUBLIC HEALTH	THE STUDENTS ARE 1.ENRICHED WITH THE KNOWLEDGE ABOUT DIETARY SOURCES, DAILY REQUIREMENTS AND FUNCTIONS OF MACRO AND MICRONUTRIENTS OF FOODS 2.ENRICHED WITH THE KNOWLEDGE OF PRINCIPLE OF NUTRITIONAL MANAGEMENT OF DIET OF ADULT MEN AND WOMEN, PREGNANT AND LACTATING

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		<p>WOMEN</p> <p>3.ABLE TO ACQUIRE HANDS-ON EXPERIENCE OF CONDUCTING A DIET SURVEY AND QUALITATIVE ANALYSIS OF DIFFERENT FOODS</p>
5	CC-11 SPECIAL SENSES	<p>THE STUDENTS ARE ABLE TO</p> <p>1.DESCRIBE THE VARIOUS STEPS IN THE BIOLOGICAL TRANSDUCTION OF DIFFERENT TYPES OF EXTERNAL STIMULI LIKE LIGHT, SOUND, CHEMICALS INTO NERVE IMPULSE BY SENSE ORGANS OF VISION, AUDITION, GUSTATION AND OLFACTION</p> <p>2.EXPLAIN THE PATHOPHYSIOLOGY OF DISEASES ASSOCIATED WITH VISION, HEARING, TASTE AND SMELL</p> <p>3.PERFORM THE COMMON DIAGNOSTIC TESTS TO ASSESS THE PATHOPHYSIOLOGICAL CONDITIONS OF SPECIAL SENSE ORGANS LIKE THE VISUAL ACUITY TEST, TESTS FOR DEAFNESS, COLOUR BLINDNESS ETC.</p>
5	CC-12 ENDOCRINOLOGY	<p>THE STUDENTS ARE ABLE TO</p> <p>1.UNDERSTAND THE STRUCTURE AND FUNCTIONS OF DIFFERENT ENDOCRINE GLANDS AND REGULATION OF SECRETION OF HORMONES</p> <p>2.CHEMISTRY AND FUNCTIONS OF VARIOUS HORMONES WITH DISEASES RELATING TO HYPO-HYPER SECRETION CONDITIONS SUCH AS DIABETES, DWARFISM, HYPER AND HYPOTHYROIDISM ETC</p> <p>3.GAIN SKILL OF HISTOLOGICAL STAINING AND IDENTIFY STAINED SECTIONS OF DIFFERENT TISSUES</p>
6	CC-13 REPRODUCTIVE PHYSIOLOGY & DEVELOPMENTAL BIOLOGY	<p>THE STUDENTS ARE ABLE TO</p> <p>1.UNDERSTAND THE STRUCTURE AND FUNCTIONS OF MALE AND FEMALE REPRODUCTIVE ORGANS</p> <p>2.GAIN KNOWLEDGE OF PHYSIOLOGY OF PREGNANCY, PARTURITION, LACTATION</p> <p>3.DESCRIBE OF DIFFERENT STAGES OF EMBRYONIC DEVELOPMENT SUCH AS FERTILIZATION, BLASTULATION, IMPLANTATION AND GASTRULATION AND THE PROCESS OF ORGANOGENESIS OF HUMAN EMBRYO</p> <p>4.IDENTIFY STAINED SECTIONS OF DIFFERENT TISSUES</p>

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6	CC-14 EXCRETORY PHYSIOLOGY, ENVIRONMENTAL POLLUTANTS & HUMAN HEALTH	THE STUDENTS ARE ABLE TO 1.UNDERSTAND THE STRUCTURE-FUNCTION RELATIONSHIP OF NEPHRON AND ITS ROLE IN MAINTENANCE OF HOMEOSTASIS 2.UNDERSTAND THE BASIS OF RENAL FUNCTION TESTS TO ASSES KIDNEY FUNCTION 3.GAIN KNOWLEDGE OF ROLE OF SKIN AS AN EXCRETORY ORGAN AND ITS ROLE IN REGULATION OF BODY TEMPERATURE 4.GAIN KNOWLEDGE OF VARIOUS TYPES OF ENVIRONMENTAL POLLUTANTS AND THEIR EFFECTS ON HUMAN HEALTH 5.IDENTIFY THE NORMAL AND ABNORMAL CONSTITUENTS OF URINE WITH THEIR PATHOPHYSIOLOGICAL SIGNIFICANCE
3	SEC A1 HAEMATOLOGICAL TECHNIQUES	THE STUDENTS WOULD GAIN IN DEPTH KNOWLEDGE OF 1.THE BIOCHEMICAL BASIS OF ABO AND RH BLOOD GROUPS AND ITS IMPORTANCE IN BLOOD TRANSFUSION AND THE HAZARDS OF BLOOD TRANSFUSION 2.THEY WOULD BE ABLE TO DEFINE, DETERMINE AND EXPLAIN PATHOPHYSIOLOGICAL SIGNIFICANCE OF DIFFERENT HEMATOLOGICAL INDICES LIKE TC, DC, ESR, ARNETH COUNT, PCV, MCV, MHC, MCHC, BLEEDING TIME, CLOTTING TIME AND PROTHROMBIN TIME. 3.HEMATOLOGICAL DISORDERS LIKE THALASSAEMIA AND ANAEMIA
4	SEC B1DETECTION OF FOOD ADDITIVES /ADULTERANT S AND XENOBIOTICS	THE STUDENTS WOULD BE ABLE TO 1.LEARN ABOUT CHEMICAL CONTAMINANTS AND ADULTERANTS IN FOOD IN GENERAL AND THEIR IMPACTS ON HUMAN HEALTH 2.LEARN ABOUT THE TESTS IDENTIFYING SPECIFIC FOOD ADULTERANTS 3.UNDERSTAND THE CONCEPT OF XENOBIOTICS AND MECHANISMS OF DETOXIFICATION OF XENOBIOTICS BY THE HUMAN BODY
5	DSE A2- MICROBIOLOG Y & IMMUNOLOGY	THE STUDENTS WOULD BE ABLE 1.TO GAIN KNOWLEDGE OF STRUCTURE, METABOLISM, REPRODUCTION OF MICROORGANISMS, SPECIFICALLY OF VIRUS & BACTERIA. 2.TO GAIN KNOWLEDGE ABOUT ARTIFICIAL CULTURE TECHNIQUES PRACTICED IN LABORATORIES. 3.TO KNOW ABOUT THE BENEFICIAL ASPECTS OF BACTERIOLOGY IN THE FOOD INDUSTRY 4.TO GAIN KNOWLEDGE OF IMMUNE SYSTEM AND CAN EXPLAIN THE MECHANISMS OF DEVELOPMENT OF DISEASES. 5.TO EXPLAIN THE UNDERLYING PRINCIPLES OF VACCINATION AND IMMUNIZATION PROTOCOLS.

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		6.TO DEVELOP SKILLS OF BACTERIOLOGICAL STAINING AND IMMUNOLOGICAL TECHNIQUES.
5	DSE B1- WORK, EXERCISE & SPORTS PHYSIOLOGY	THE STUDENTS WOULD BE ABLE TO 1.UNDERSTAND HOW THE BODY FUNCTIONS IN DIFFERENT WORKING CONDITIONS AND ITS RELATIONSHIP WITH ENERGETICS AND THE MUSCULAR SYSTEMS INVOLVED 2.GAIN KNOWLEDGE ABOUT THE BODY MOVEMENTS, TRAINING PRINCIPLES AND THEIR APPLICATION TO IMPROVE PERFORMANCE AND PREVENT INJURIES IN ATHLETES 3.GAIN HANDS ON EXPERTISE IN DETERMINING PHYSICAL FITNESS, MOTOR FITNESS, MAXIMUM OXYGEN CONSUMPTION AND BODY TYPING WHICH WILL BE HELPFUL IN IDENTIFICATION OF ATHLETIC TALENTS
6	DSE A4: COMMUNITY AND PUBLIC HEALTH	AT THE END OF THIS COURSE STUDENTS WOULD BE ABLE 1.TO SUGGEST DIETARY MANAGEMENT OF DIFFERENT METABOLIC CONDITIONS OF THE BODY 2.TO KNOW THE PROBLEMS OF INFERTILITY AND MODER DAY TECHNIQUES TO SOLVE THE PROBLEM. 3.TO GAIN KNOWLEDGE OF POPULATION CONTROL, IMMUNIZATION, NUTRITION RELATED DISORDERS AND THEIR SOCIAL IMPLICATIONS 4. TO EXPLIN EPIDEMIOLOGY OF DISEASES AND THEIR PREVENTION 5.TO CONDUCT FIELD SURVEYS ON PHYSIOLOGICAL, ANTHROPOMETRIC AND EPIDEMIOLOGICAL PARAMETERS
6	DSE B4: TOXICOLOGY AND PHARMACOLOGY	THE STUDENTS WOULD GAIN KNOWLEDGE ABOUT 1.A BASIC CONCEPT OF TOXINS, ITS IMPACT ON HUMAN BODY AND THE PROCESS OF BIOTRANSFORMATION BY THE BODY. 2.A BASIC CONCEPT OF DRUGS WITH ITS MECHANISM OF ACTION AND REMOVAL OF DRUG BY THE BODY 3.MECHANISM OF ACTION OF DIFFERENT CATEGORIES OF DRUGS LIKE SEDATIVES, DIURETICS, NEUROMUSCULAR BLOCKERS, ADRENERGIC AGONIST AND ANTAGONISTS ETC. 4.GAIN HANDS ON SKILL ON USE OF AGONIST AND ANTAGONIST OF ADRENOCEPTORS AND CHOLINOCEPTORS ON ANIMAL HEART.

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Mapping/Co-relation Program Outcome(PO) & Course Outcome(CO)

Department : Physiology Academic Session : 2022-23									
CO Details		PO Details							
Sl No.	Course Name	PO1 (At the end of the course in physiology students are expected to: 1. gain ability to apply basic principles of bio-chemistry and bio-physics to physiological systems)	PO2 (understand the functions of important physiological systems like the cellular, metabolic, cardio-vascular, respiratory, endocrinological, nervous, excretory and reproductive systems)	PO3 (understand how these separate systems interact to generate integrated physiological responses to challenges such as exercise, fasting, certain environmental changes, stress etc. to maintain homeostasis)	PO4 (understand the mechanisms of techniques and instrumentations used to assess health and disease)	PO5 (gain knowledge of nutrition, xenobiotics, pollutants in the maintenance of health and prevention of diseases.)	PO6 (be able to perform and analyze experiments and prepare reports of the findings/)	PO7 (able to learn community-based survey, interpretation of the data and its social implications.)	PO8 (able to employability skills necessary for careers in teaching, and professions allied to medicine and industry)
1	CC1- CELLULAR BASIS OF PHYSIOLOGY, GENETICS & ENZYMES								
2	CC2- BIOPHYSICAL PRINCIPLES AND CHEMISTRY OF BIOMOLECULES								

3	CC3- CELL SIGNALLING & NERVE-MUSCLE PHYSIOLOGY		✓	✓			✓		
4	CC4- NERVOUS SYSTEM		✓	✓	✓		✓		✓
5	CC-5 BLOOD AND BODY FLUIDS		✓				✓		✓
6	CC-6 CARDIOVASCULAR SYSTEM		✓	✓	✓		✓		✓
7	CC-7 RESPIRATORY SYSTEM		✓	✓	✓		✓		✓
8	CC-8 DIGESTION AND METABOLISM		✓	✓			✓		
9	CC-9 MOLECULAR BIOLOGY				✓		✓		✓
10	CC-10 NUTRITION AND DIETETICS PUBLIC HEALTH					✓	✓	✓	✓
11	CC-11 SPECIAL SENSES		✓			✓			✓
12	CC-12 ENDOCRINOLOGY		✓	✓					
13	CC-13 REPRODUCTIVE PHYSIOLOGY & DEVELOPMENTAL BIOLOGY		✓						

14	CC-14 EXCRETORY PHYSIOLOGY, ENVIRONMENTAL POLLUTANTS & HUMAN HEALTH		✓	✓		✓	✓		
15	SEC A1 HAEMATOLOGICAL TECHNIQUES		✓						✓
16	SEC B1DETECTION OF FOOD ADDITIVES /ADULTERANTS AND XENOBIOTICS		✓	✓		✓			
17	DSE A2- MICROBIOLOGY & IMMUNOLOGY		✓				✓	✓	✓
18	DSE B1- WORK, EXERCISE & SPORTS PHYSIOLOGY		✓	✓					✓
19	DSE A4: COMMUNITY AND PUBLIC HEALTH					✓			✓
20	DSE B4: TOXICOLOGY AND PHARMACOLOGY	✓		✓		✓	✓	✓	✓