GOVERNMENT GENERAL DEGREE COLLEGE, NARAYANGARH

PROGRAMME OUTCOME (PO)

&

COURSE OUTCOME (CO)

(Based on Curriculum & Credit Framework for Undergraduate Programmes (CCFUP), 2023 & NEP, 2020)

DEPARTMENT OF PHYSIOLOGY

B. SC.(H)-MINOR IN PHYSIOLOGY

(w.e.f. Academic Session 2023-2024)

PROGRAMME OUTCOMES (PO)

(Based on Curriculum & Credit Framework for Undergraduate Programmes (CCFUP), 2023 & NEP, 2020)

- By studying Physiology a student can gather information on how his/her body functions and works.
- The students learn how multiple cells form a tissue, multiple tissues form an organ and multiple organs make a body and this body is controlled by the brain with nervous and endocrine systems.
- The students learn how the nervous system (brain) is responsible for thinking, speech, sleep and emotion.
- The students learn how after a scene (impulse) we react.
- The students learn how the endocrine system is responsible for body development and specific functions like sex separation, metabolism etc.
- The students learn how Blood nourishes the body and makes connected to each other.
- The students learn how lungs purify the blood by expiratory out CO2 and inspiratory in O2.
- The students learn how we metabolize different types of foods through the digestive tract.
- The students learn how kidneys extract toxic elements from the body.
- The students learn how the skin is responsible for body temperature control.
- The students learn how our immune system functions against pathogens.
- The students learn how vitamins work in our body.
- The students learn how a fertilized cell can form a multi-cellular human body.
- By studying physiology students can make diet charts and could evolve as dieticians.
- By studying this physiology syllabus students can prepare themselves in CSIR- UGC NET, GAET, SLET, ICMR, TIFR. Exam. They also go for the School Service Commission examination.

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PROGRAMME SPECIFIC OUTCOME (PSO)

By the end of the program, students will be able to:

1. Gain in-depth knowledge of human body functions, including the roles of cells, tissues, organs, and systems, and their integration in maintaining homeostasis.
2. Understand key physiological processes such as nervous system control, endocrine regulation, respiratory gas exchange, digestive metabolism, and immune defense mechanisms.
3. Utilize knowledge of physiology to develop diet plans, contribute to health and nutrition science, and work as professional dieticians.
4. critical thinking and research skills, enabling students to analyze physiological data, design experiments, and derive conclusions applicable to health and disease contexts.
5. Build a strong foundation in physiology to excel in competitive exams (CSIR-UGC NET, GAET, SLET, ICMR, TIFR) and pursue advanced studies or careers in health sciences and related fields.

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COURSE OUTCOMES (CO)

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SEMISTER -I

MI - 1T: Introduction to Physiology-I

[Blood, body fluid and Fundamental concept of immune System, Cardiovascular System, Physiology of Respiratory System]

Course contents:

Unit-I : Blood, body fluid and immune System

- By studying the blood vascular system students will know how blood makes nourish our body.
- Students will make concept about the homeostasis maintained by blood.
- They will know about different blood cell and their physiological role.
- Students will make a concept about the blood clotting mechanism.
- Students will know how our body makes the defense mechanism against viruses, bacteria and fungi.
- Students will know about innate and adaptive immunity, Antigens and antibodies.
- They will get an idea of how vaccines were prepared and their physiological role in preventing disease.
- Students will know about HIV, and different autoimmune diseases like Arthritis, Graves disease, Myasthenia Graves etc.

Unit-II: Cardiovascular System:

- By studying the cardiovascular system students can come up the ideas about the heart and its structure and cardiac cycle and its role in circulating blood supply throughout the body.
- Students can make a scene of how the junctional tissue is responsible for rhythmic heartbeats.
- Students can gather information about artificial pacemakers, bradycardia, tachycardia, ECG

Unit-III: Respiratory System:

- By studying the respiratory system students can come up the ideas about the structure and the function of respiratory tract and respiratory organs.
- Students will make concept about the respiratory muscles and their innervations, mechanism of respiration, regulation of respiration, mechanics of breathing, role of respiratory centers, central and peripheral chemoreceptors.
- Students can gather information about artificial respiration, Respiratory failure. High altitude sickness. Different lung volume and capacities; Lung Function Tests. Hypoxia: Types and causative factors; Oxygen treatment, O2toxicity; Asphyxia: definition, cause, sign and symptoms.

MI - 1P: Introduction to Physiology-I (Practical)

Hematology:

- By practicing of TC of WBC, DC of WBC, Haemoglobin estimation, Haemin crystal, BT, CT & Blood group students can perform the haematological lab test of a human patient.

Human Experiment:

- Students can able measurement of HR, screening of PFI, Step Test.
- Students can detect BP: systolic, diastolic, mean arterial blood pressure, pulse pressure of a human subject.

SEMISTER -II

MI-2T : Introduction to Physiology -II

[Cellular Physiology, Biophysical Principles, Basic concept of Biochemistry, Overview of digestive system and metabolism]

Course Contents:

Unit-I: Cellular Physiology:

- Students will know the electron microscopic structure & functions of structure of plasma membrane - Bio-chemical components, their arrangement, membrane asymmetry & fluidity, Functions, Fluid mosaic model. Membrane transport: active & carrier mediated transport; Mechanism of exocytosis and endocytosis, Structure functions & control of ion channels.
- Students will make the concept of artificial membrane: liposome and its functions.
- Students will know the electron microscopic structure and functions of the organelles of eukaryotic cells,such as smooth and rough ER, Golgi complex, Lysososome, Nucleus, Peroxisomes, Mitochondria,Ribosomes – cytoribosomes and mitoribosomes

Unit II: Biophysical Principles:

- Students will be able to know the Physiological importance of: Diffusion, Osmosis, Dialysis, Ultrafiltration, Surface tension, Absorption, Absorption, pH and buffers in human body.
- Students will be able to know the role of enzymes in our body and their regulation.

Unit III: Basic concept of Biomolecules:

- By studying this students will get the concept how different biochemical compounds make our body, giving energy and protecting our body from illness.
- Students will get the concept on Carbohydrates, lipid & proteins (Their structure, metabolism and biological role).

Unit IV: Overview of digestive system and metabolism:

- Students will know the structure of our (human) digestive tract/ alimentary cannel.
- Students will know about the accessory gland which helps in digest like salivary glands, liver and pancreas.
- Students will know how the foods digest and how it absorbed and produces energy.
- Students will know about the different metabolism pathway like Glycolysis, TCA cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, and their role in energy production.

MI-2P: Introduction to Physiology-II (Practical)

- Student will gain an understanding of compound microscope and learn how to handle it.
- Students will learn about the Staining of squamous epithelium, ciliated & columnar epithelium, skeletal muscle fibre (Rat/ Goat) by Methylene Blue stain.
- Students will be able to analyze and measure the PH of various solutions using pH indicators and meter.
- Students will learn how to prepare various buffer solutions.