



GOVERNMENT GENERAL DEGREE COLLEGE, NARAYANGARH

PROGRAMME OUTCOME (PO)

&

COURSE OUTCOME (CO)

(According to Choice Based Credit System)

DEPARTMENT OF PHYSIOLOGY

B. SC.(H)-GENERIC ELECTIVE IN PHYSIOLOGY

(From Academic Session 2018-2019)

PROGRAMME OUTCOME (PO)

(According to Choice Based Credit System)

- 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 exam.

B. SC.(H)-GENERIC ELECTIVE IN PHYSIOLOGY

(From Academic Session 2018-2019)

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 dietitians.
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.

GENERIC ELECTIVE IN PHYSIOLOGY

(from Academic Session 2018-2019)

COURSE OUTCOMES (CO)

(According to Choice Based Credit System)

Phy GE-01T1:

Blood and Immune System and Cardiovascular system

Course Outcomes:

- 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.
- 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

PHYSG GE-01P1:**Blood and immune system and cardiovascular system****Course Outcomes:**

- 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.
- 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.

Phys GE 2 T :**Developmental Biology / Embryology****Course Outcomes:**

- Students will know about the process of Gametogenesis: Spermatogenesis and oogenesis. ,
- Students will know about the structure of sperm and ovum of human.
- Students will know about the Fertilization process of Sea-urchin and mammals.
- Students will know how the human body formed after fertilization.
- Students will know clear concept about cleavage process in mammals. Blastula formation: mammals Morphogenetic movements, Gastrulation, Concept of induction, determination, and differentiation. Organogenesis.

GE2 P: Practical**Course Outcomes:**

- Students can stain ovarian tissue sections and identify Graafian follicle, and Corpus Luteum by studying their structure and get a demonstration of preserved mammalian embryos.

PHYSG GE3T: Community and Public Health

Course Outcomes:

- Students get the basic idea about community health
- Students will know the causes of malnutrition
- Students will know about the risk factors of obesity.
- Students can formulate the Diet Chart of different age groups and different work-loaded persons as a dietician.
- They can make diet charts of pregnant women and athletes.
- Students will know about the composition and nutritional value of different Indian food stuffs.
- They get a basic idea of PCM, marasmus, and kwashiorkor and their prevention, Iron and iodine deficiency symptoms and preventive measures.
- They will become aware of Sound pollution and the effects of sound pollution on human health.

PHYSGGE3P: Community and Public Health Outcomes

Course Outcomes:

- The students can able to perform a diet survey and by this survey, they can also analyze the health status of that area.
- They can able to measure sound level by using the sound level meter.

PHYS GE4P: Nerve –Muscle Physiology, Nervous system, and Sensory Physiology

Course Outcomes:

Nerve-muscle Physiology

- Students will learn about structure of muscle their blood supply, neuromuscular junction
- Students will differentiate Red and white muscles. Skeletal, smooth, and cardiac muscle
- Students will know about the Motor Unit and motor point.
- Students will learn about the mechanism of muscular contraction.
- Students will get knowledge about Properties of nerve fibre : all or none law, rheobase, chronaxie, refractory period etc.
- Students will learn the mechanism of impulse transmission to muscle spindle through nerve fiber.
- Students will learn about Synapse.
- Students will learn about EMG(electromyography)

Nervous System:

- Students will learn about central and peripheral nervous system.
- Students will learn about different parts of the brain and spinal cord.
- Students will learn about different type of Receptors.
- Students will learn about how Reflex mechanism performed by nervous system.
- Students will learn about EEG of brain and their different waves with significance.
- Students will learn about Hypothalamus, reticular system, cerebral cortex.
- Students will learn about Sleep, Hunger, Thirst mechanism.
- Students will learn how brain control of Posterior Pituitary Secretion, Control of Anterior pituitary Secretion, Temperature Regulation, fever etc.
- Students will learn about how brain control movement and posture.
- Students will learn about Neural Basis of instinctual Behavior & Emotions, Limbic system: Sexual Behavior, Fear & Rage, Motivation, Papez circuit.
- Students will learn about neural basis of memory and learning

Special Sense:

- Students will learn about special senses and their receptors.
- Students will learn about Weber – Fechner Law.
- Students will learn about Mechanism of transduction of stimuli from sensory receptors touch, pressure, pain, thermal and kinaesthetic sensation.
- Students will learn about Olfaction and Gustation
- Students will learn about Audition & Equilibrium, Auditory pathways and centres.
- Students will learn about Vision, Light reflex. Accommodation and Visual acuity, Binocular vision.

PHYS GE4P: Nerve –Muscle Physiology, Nervous system, and Sensory Physiology

Course Outcomes:

- Students will learn about Isolation and Staining of nerve fibers with node(s) of Ranvier (AgNO₃).
- Students will learn about the Staining of skeletal and cardiac muscles by Haematoxylin and eosin stain.
- Students will learn about the Measurement of hand grip strength.
- Students will learn about the Determination of visual acuity by Snellen's chart Landolt's chart.
- Students will learn about the Determination of colour blindness by Ishihara chart
- Students get a Demonstration of the Kymograph, Induction coil, and Key used to study mechanical responses of skeletal muscle. Kymographic recording of mechanical responses of gastrocnemius muscle to a single stimulus and two successive stimuli. Kymographic recording of the effects of variations of temperature and load (after-load) on single muscle twitch. Calculation of work done by the muscle. Determination of nerve conduction velocity.

- Students can perform and know the signification of Experiments on superficial (plantar) and deep (knee jerk) reflex.
- Students can perform and know the signification of Reaction time by stick drop test.
- Students can perform and know the signification of Short term memory test (shape, picture word).
- Students can perform and know the signification of two point discrimination test.
- Students will learn about the principle of fixation and Staining and identification of fixed endocrine glands and nervous tissue.

PHYS GE4T:

Excretory System & Body Temperature Regulation

Course Outcomes:

Renal Function & Micturition:

- Students will get a concept about Kidney and renal system.
- Students will get concepts about Juxta Glomerular Apparatus, GFR, counter-current mechanism, Water Excretion, Acidification of the Urine & Bicarbonate Excretion, Regulation of Na⁺ & Cl⁻ Excretion, Renal Circulation, Diuretics.
- Students will know about disorders of Renal Functions.
- Students will know about the Non-excretory function of the kidney.

Skin and Body temperature regulation:

- Students will know about the structure of skin. Color of the skin.
- Students will know about the sweat gland, Ecrine gland & and apocrine glands.
- Students will know about the regulation of sweat secretion.
- Students will know about the role of body temperature regulation by sweating.
- Students will know about the heat loss and heat gain process.

- Students will know about the Regulation of body temperature: the role of a Higher center and the mechanism of regulation. Hypothermia and Hyperthermia.
- Students will know about the Physiological basis of fever.
- Students will know about Cold stress & and heat stress, how the body Acclimatizes to colds.
- They can know about the triple response of the skin.

PHYSGGE4P: Excretory System & Body Temperature Regulation

Course Outcomes:

- Students will know about the Identification of normal and abnormal constituents of urine.
- Students will test Urinary deposits and quantitative analysis of albumin and urea.
- Students can scientifically record Body Temperature in different portions (core and peripheral) and they can get an idea about body temp. regulation in different temp. exposure.

Generic Elective in Physiology (from Academic Session 2022-2023)

Phy GE-01T1: Introduction to physiology and basic biophysical principles, biomolecules, digestive system and metabolism, Blood and Cardiovascular system, Respiratory System

Course Outcomes:

- Student will get the concept of cell tissue organs.
- Students will be able to know how the cell functioning and communicate to each other.
- Students will make the concept on different cellular organelles and their specific functions.

- 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.
- 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).
- Students will know about the different metabolism pathway like Glycolysis, TCA cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, and their role in energy production.
- Students will get the concept of role of different vitamins and their availability/sources.
- Students will know the structure of our (human) digestive tract/ alimentary canal.
- Students will know about the accessory gland which helps in digest like salivary glands, liver and pancreas.
- Students will know how and where the foods digest and how it absorbed and produces energy.
- Students will make the concept of hungry and appetite mechanisms.
- 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 concept about the blood clotting mechanism.
- Students will know how our body make the defence mechanism to virus, bacteria and fungus.
- By studying the cardiovascular system students can able to make the idea about heart and its structure and cardiac cycle and its role in circulate blood supply throughout body.
- Students can make scene how the junctional tissue is responsible for rhythmic heart beats.
- Students can gathering the information about bradycardia , tachycardia, ECG

- Students will know about the Respiratory process how gaseous exchanges performed through lungs.

Phy GE-01P: Physiology 1

Course Outcomes:

- Students will know about the process of qualitative analysis of carbohydrates- glucose, fructose, sucrose, and starch, protein- albumin, gelatin, acetone, bile salts, glycerol, HCL, and lactic acid
- Students will learn about the Staining of squamous epithelium skeletal and cardiac by Methylene Blue stain.
- By studying permanent slides they can know about the histological structure of different types mammalian tissues such as lung, liver, pancreas, stomach, small intestine, large intestine, tongue, artery, vein
- By practicing of TC of WBC, DC of WBC, Haemoglobin estimation, Haemin crystal, BT, CT & Blood group students can performed the haematological lab test of an human patients.

Phy GE-02T: Physiology II (Nerve –Muscle Physiology, Nervous system, and Sensory Physiology)

Course Outcomes:

Nerve-muscle Physiology and nervous system

- Students will learn about structure of muscle their blood supply, neuromuscular junction
- Students will differentiate Red and white muscles. Skeletal, smooth, and cardiac muscle
- Students will know about the Motor Unit and motor point.

- Students will learn about the mechanism of muscular contraction.
- Students will get knowledge about Properties of nerve fibre : all or none law, rheobase, chronaxie, refractory period etc.
- Students will learn the mechanism of impulse transmission to muscle spindle through nerve fiber.
- Students will learn about Synapse.
- Students will learn about EMG(electromyography)
- Students will learn about central and peripheral nervous system.
- Students will learn about different parts of the brain and spinal cord.
- Students will learn about different type of Receptors.
- Students will learn about how Reflex mechanism performed by nervous system.
- Students will learn about ANS and CSF.

Endocrinology and Reproductive Physiology:

- Students will learn about Hormones - classification.
- Students will learn about Hormone receptor and cell signalling.
- Students will learn about Positive and negative feedback mechanism.
- Students will learn about Hypothalamo - Hypophysial axis.
- Students will learn about why Pituitary gland called as master gland.
- Students will learn about Thyroid gland, Parathyroid gland, Adrenal Cortex.
- Students will learn about spermatogenesis, spermiogenesis and oogenesis.
- Students will learn about fertilization and implantation.
- Students will learn about Parturition and Lactation

Excretory Physiology

- Students will get concept about Kidney and renal system.
- Students will get concept about Juxta Glomerular Apparatus, GFR, counter-current mechanism, Water Excretion, Acidification of the Urine & Bicarbonate Excretion, Regulation of Na⁺ & Cl⁻ Excretion, Renal Circulation, Diuretics.
- Student will know about disorders of Renal Functions.
- Student will know about Non-excretory function of kidney.
- Students will know about the structure of the skin. Colour of the skin.
- Students will know about the sweat gland, Eccrine gland & apocrine glands.
- Students will know about over and under-nutrition
- Students get a basic idea about community health
- Students will know the causes of malnutrition
- Students can understand the concept of a balanced Diet and know the significance of Dietary fibers.

Phy GE-02P: Physiology II

Course Outcomes:

- By studying permanent slide they can know about the histological structure of different type mammalian tissues as Spinal cord, cerebrum, cerebellum, thyroid gland, adrenal gland, pancreas, testes, ovary, kidney
- Some of the common anthropometric measurements used by researchers include head circumference, calf circumference, chest circumference height, weight, MUAC, body mass index (BMI), waist-to-hip ratio
- Students will test abnormal constituents of urine.

- 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.

Phy GE-03T: Same as PhyGE 01T

Phy GE-03P: Same as PhyGE 01P

GGDC, Narayangarh