

DEPARTMENT OF PHYSIOLOGY
GOVERNMENT GENERAL DEGREE COLLEGE, KALIGANJ

PROGRAMME OUTCOME & COURSE OUTCOME


PROGRAMME NAME: BSc Physiology Honours

PROGRAMME OUTCOME:

- ☐ PO1. **Critical Thinking.** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
- ☐ PO2. **Effective Communication.** Ability to speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
- ☐ PO3. **Social Interaction.** Elicit views of others, mediate disagreements and help reach conclusions in group settings.
- ☐ PO4. **Effective Citizenship.** Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
- ☐ PO5. **Ethics.** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- ☐ PO6. **Environment and Sustainability.** Understand the issues of environmental contexts and sustainable development.
- ☐ PO7. **Self-directed and Life-long Learning.** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

PROGRAMME SPECIFIC OUTCOMES:

- ☐ PSO1. The syllabus will equip all undergraduate students with knowledge on basic physiological mechanisms for the set point control of different physiological variables in healthy human beings with special references to their implications in pathogenesis of disease and the physiological basis of their management.
- ☐ PSO2. The ultimate goal of the syllabus is that the students at the end are able to secure a job. The syllabus has also been framed in such a way that the basic skills of subject are taught to


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the students, and everyone might not need to go for higher studies and the scope of securing a job after graduation will increase.

- ❑ **PSO3.** The objective of framing this syllabus is to give the students a holistic understanding of the subject giving substantial weightage to both the core content and techniques used in Physiology. The course content also lists new practical exercises, so that the students get a hands-on experience of the latest techniques that are in current usage both in the advanced research laboratories and in Industry.

COURSE OUTCOMES

SEMESTER-I

COURSE TITLE (CC-1): CELLULAR BASIS OF PHYSIOLOGY

CO1. Ability to describe the components of body fluid, organ systems, tissues, cells; and the functional morphology of the cells.

CO2. Ability to explain the mechanism of intracellular signal transduction pathways with their morphology and the processes of cell cycle and cell division.

CO3. Ability to explain the functions and structure of cells including related to the metabolic reactions that occur in cells.

CO4. Ability to describe the process of passive and active transport across a cell membrane.

CO5. Ability to discuss intercellular communications, homeostasis and aging.

CO6. Ability to identify the stained sections of different mammalian tissues and organs.

COURSE TITLE (CC-2): BIOLOGICAL PHYSICS AND ENZYMES

CO1. Ability to explain measuring concentration of solutes like moles, equivalents, osmoles, principle of dilution, pH, buffers, bonds and forces in biomolecules, colloids, surface tension, specific gravity, viscosity and resistance etc.

CO2. Ability to describe the process of dialysis, ultracentrifugation, chromatography, electrophoresis and autoradiography.

CO3. Ability to explain in details about the nanoparticles and it's application in Physiology.

CO4. Ability Understand the laws of Laplace and laws of thermodynamics, and its application in Physiology.


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CO5. Ability to explain the structure of enzyme, coenzymes, Prosthetic Groups, mechanism of enzyme action, kinetics, Michaelis constant, enzyme inhibition, modulation of enzymes activities, factors regulating enzyme activities, Isoenzymes, Allosteric enzymes, Pro- enzymes, Ribozymes, Abzymes and concept of rate limiting enzymes.

CO6. Ability to measure the blood pressure by non-invasive methods (Auscultatory Methods).

SEMESTER-II

COURSE TITLE (CC-3): PHYSIOLOGY OF NERVE AND MUSCLE CELLS

CO1. Ability to describe the structure and properties of nerve cells and glial cells, measurement of electrical events of nerve cells, properties of mixed nerves, types & functions of different nerve fiber.

CO2. Ability to explain the structures, properties, electrical events & contractile responses of cardiac, skeletal and smooth muscle.

CO3. Ability to describe the principal neurotransmitter system; anatomical and functional aspect of synapse; electrical and chemical events occurs at synapses.

CO4. Ability describes the sense organs & receptors specially electrical & ionic events in receptors.

CO5. Ability to prepare the sciatic nerve innervated gastrocnemius muscle of toad.

CO6. Ability to prepare kymographic recordings of the effects of variations temperature and load (after-load) on single muscle twitch.

COURSE TITLE (CC-4): CHEMISTRY OF BIO-MOLECULES

CO1. Ability to describe the classification, structure, properties and functions of carbohydrates.

CO2. Ability to describe the classification, structure, properties and functions of proteins.

CO3. Ability to describe the classification, structure, properties and functions of lipids.

CO4. Ability to explain the structure, types and function of DNAs.

CO5. Ability to explain the structure, types and function of RNAs.

CO6. Ability to qualitative tests for the identification of physiologically important substances Uric Acid, Glucose, Galactose, Fructose, Sucrose, Lactose, Albumin, Gelatin, Peptone, Starch, Dextrin, Urea etc.

SEMESTER-III

COURSE TITLE (CC-5): CIRCULATING BODY FLUIDS

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CO5. Ability to explain the Higher Functions of the Nervous System: Conditioned Reflexes , Learning, & Related Phenomena.

CO6. Ability to determine the grip strength and superficial (plantar) and deep (knee jerk) reflex.

SEMESTER-IV

COURSE TITLE (CC-8): ENERGY BALANCE, METABOLISM AND NUTRITION

CO1. Ability to explain the Energy metabolism and Carbohydrate metabolism.

CO2. Ability to elucidate the Protein metabolism and Fat and cholesterol metabolism.

CO3. Ability to describe the different kind of vitamins and minerals; and their functions.

CO4. Ability to explain the basal metabolic rate (BMR), respiratory quotient (RQ), recommended dietary allowances (RDA), specific dynamic action (SDA), net protein utilization (NPU), Biological value of proteins.

CO5. Ability to determine the quantitative estimation of glucose, sucrose and amino nitrogen.

CO6. Ability to Estimate the percentage quantity of lactose in milk.

COURSE TITLE (CC-9): GASTROINTESTINAL FUNCTION

CO1. Ability to explain the digestion and absorption of carbohydrates, proteins, nucleic acids and lipids.

CO2. Ability to elucidate the Absorption of Water, electrolytes, vitamins and minerals.

CO3. Ability to describe the regulation of gastrointestinal function with special reference to gastrointestinal hormones and digestive functions of the stomach.

CO4. Ability the explain the exocrine portion of the pancreas, structure and functions of liver & biliary System, and small intestine.

CO5. Ability to record normal movements of rat's intestine in Dale's apparatus kymographically.

CO6. Ability to record the effects of hypoxia, acetylcholine and adrenaline on normal intestinal movements kymographically.

COURSE TITLE (CC-10): RESPIRATION

CO1. Ability to explain the anatomy of the lungs, mechanics of breathing, gas exchange in the lungs and pulmonary circulation.

CO2. Ability to elucidate the gas transport between the lungs and the tissues.

CO3. Ability to describe the neural and chemical control of breathing.

CO4. Ability the explain the respiratory adjustments in health & disease with special reference to hypoxia, hypercapnia, hypocapnia, artificial respiration and oxygen treatment.

CO5. Ability to Measure the peak expiratory flow rate which is a reliable indicator of ventilation adequacy as well as airflow obstruction.

CO6. Ability to measure the oxygen saturation by pulse oxymeter before and after exercise.

SEMESTER-V

COURSE TITLE (CC-11): SPECIAL SENSES

CO1. Ability to describe the image-forming mechanism (accommodation and visual acuity), the photoreceptor mechanism, visual pathway, colour vision and other aspects of visual functions.

CO2. Ability to elucidate the structure and mechanism of hearing, vestibular function, receptors & pathways of olfaction and physiology of olfaction .

CO3. Ability to describe the receptor organs & pathways of taste and physiology of taste.

CO4. Ability to explain the different clinical aspect of special senses.

CO5. Ability to determine the visual acuity by Snellen's chart and colour blindness by Ishihara chart.

CO6. Ability to explain and perform practically about the process of fixation and staining, staining and identification of fixed tissues.

COURSE TITLE (CC-12): ENDOCRINOLOGY

CO1. Ability to explain the structure of thyroid gland, formation & secretion of thyroid hormones, transport of thyroid hormones, effects of thyroid hormones and regulation of thyroid secretion.


CO2. Ability to elucidate the endocrine functions of the pancreas & the regulation of carbohydrate metabolism with special references to Structure, biosynthesis, & secretion of Insulin, effects of insulin, mechanism of action, regulation of insulin and glucagon secretion and other islet cell hormones.

CO3. Ability to explain the structure, function, mechanism of hormone secretion, regulation of hormone secretion of adrenal medulla & adrenal cortex and pituitary gland.

CO4. Ability to explain the endocrine functions of the kidneys, heart, & pineal gland and human chronobiology.

CO5. Ability to record the effects of oxytocin on uterine contraction kymographically.

CO6. Ability to record the effects of adrenaline on intestinal / uterine movements kymographically.


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SEMESTER-VI

COURSE TITLE (CC-13): REPRODUCTIVE FUNCTION

CO1. Ability to explain the process of sex differentiation & development, science behind chromosomal sex, embryology of the human reproductive system and details about aberrant sexual differentiation.

CO2. Ability to elucidate the process of puberty, precocious & delayed puberty, process of menopause, functions of pituitary gonadotropins & prolactin.

CO3. Ability to describe the structure, process of gametogenesis & ejaculation, endocrine function of the testes, control of testicular function, abnormalities of testicular function.

CO4. Ability to explain the stages of menstrual cycle, secretion and functions of ovarian hormones, control of ovarian function, abnormalities of ovarian function.

CO5. Ability to explain the process of pregnancy, structure and functions of placenta, breast development and process of Lactation, physiological concepts of family planning.

CO6. Ability to identify the phases of estrus cycle by analyzing the vaginal smear of rats.

COURSE TITLE (CC-14): FORMATION AND EXCRETION OF URINE

CO1. Ability to describe the structure and functions of juxta Glomerular apparatus, function of malpighian corpuscles and renal tubule, physiology of counter-current mechanism.

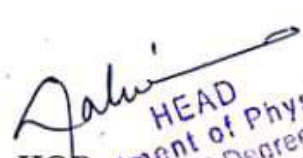
CO2. Ability to elucidate the process of water excretion, acidification of the urine & bicarbonate excretion, regulation of Na^+ & Cl^- excretion.

CO3. Ability to explain the process of renal circulation, types and physiology of diuretics, disorders of renal functions.

CO4. Ability to describe the process of filling of the bladder and emptying of the bladder.

CO5. Ability to explain the non-excretory function of kidney.

CO6. Ability to identify the normal and abnormal constituents of urine.


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