DEPARTMENT OF PHYSIOLOGY

Unit: General Including Blood

General Physiology		
Code	**S. No.**	**Lecture Topic**
PY1.1 PY1.2	Lecture-1	Describe the structure and functions of a mammalian cell, Describe and discuss the principles of homeostasis
PY1.3 PY1.4 PY1.5	Lecture-2	Describe intercellular communication, Describe apoptosis – programmed cell death Describe and discuss transport mechanisms across cell membranes
PY1.6 PY1.7 PY1.8	Lecture-3	Describe the fluid compartments of the body, its ionic composition & measurements, Describe the concept of pH & Buffer systems in the body, Describe and discuss the molecular basis of resting membrane potential and action potential in excitable tissue
Lecture Topic : Blood		
PY2.1 PY2.2	Lecture-1	Describe the composition and functions of blood components, Discuss the origin, forms, variations and functions of plasma proteins
PY2.3 PY2.4	Lecture-2	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin, Describe RBC formation (erythropoiesis & its regulation) and its functions
PY2.5 PY2.6 PY2.7	Lecture-3	Describe different types of Anaemias, Jaundice Describe WBC formation (granulopoiesis) and its regulation Describe the formation of platelets, functions and variations
PY2.8 PY2.9	Lecture-4	Describe the physiological basis of hemostasis & anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura), Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion
PY2.10	Lecture-5	Define and classify different types of immunity. Describe the development of immunity and its regulation

Physiology Lecture of: Nerve Muscle Physiology

Code	Sr.No.	Lecture Topic
PY3.1 PY3.2	Lecture-1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines
PY3.3 PY3.4 PY3.5 PY3.6	Lecture -2	Describe the types, functions & properties of nerve fibers Describe the degeneration and regeneration in peripheral nerves. Describe the structure of neuro-muscular junction and transmission of impulses, Discuss the action of neuro-muscular blocking agents Describe the pathophysiology of Myasthenia gravis
PY3.7 PY3.8	Lecture -3	Describe the different types of muscle fibers and their structure, Describe action potential and its properties in different muscle types (skeletal & smooth)
PY3.9 PY3.10	Lecture -4	Describe the molecular basis of muscle contraction in skeletal and in smooth muscles, Describe the mode of muscle contraction (isometric and isotonic)
PY3.11 PY3.12	Lecture -5	Explain energy source and muscle metabolism Explain the gradation of muscular activity
PY3.13	Lecture -6	Describe muscular dystrophy: myopathies

Physiology Lecture of: GIT

Code	Sr.No.	Lecture Topic
PY4.1 PY4.2	Lecture-1	Describe the structure and functions of digestive system Describe the composition, mechanism of secretion, functions, and regulation of saliva secretion
PY4.2	Lecture -2	Describe the composition, mechanism of secretion, functions, and regulation of gastric secretion, Describe the composition, mechanism of secretion, functions, and regulation of pancreatic secretion and bile secretion
PY4.3	Lecture -3	Describe GIT movements, regulation and functions. Describe defecation reflex. Explain role of dietary fibre
PY4.4 PY4.5	Lecture -4	Describe the physiology of digestion and absorption of nutrients Describe the source of GIT hormones, their regulation and functions
PY4.6 PY4.7	Lecture -5	Describe the Gut-Brain Axis Describe & discuss the structure and functions of liver and gall bladder
PY4.8	Lecture -6	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests
PY4.9	Lecture -7	Discuss the physiology aspects of: peptic ulcer, gastro- esophageal reflux disease Discuss the physiology aspects of: vomiting, diarrhea, constipation, Adynamic ileus, Hirschsprung's disease

Physiology Lecture of: Cardio Vascular System

Code	S. No.	Lecture Topic
PY5.1	Lecture-1:	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.
PY5.2	Lecture-2:	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions
PY5.3 PY5.4	Lecture-3:	Discuss the events occurring during the cardiac cycle, Describe generation, conduction of cardiac impulse
PY5.5 PY5.6	Lecture-4:	Describe the physiology of electrocardiogram (E.C.G), its applications and the cardiac axis, Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction
PY5.7	Lecture-5 :	Describe and discuss hemodynamics of circulatory system
PY5.8	Lecture-6 :	Describe and discuss local and systemic cardiovascular regulatory mechanisms
PY5.9	Lecture-7:	Describe the factors affecting heart rate& its regulation Describe the factors affecting of cardiac output & its regulation
PY5.9	Lecture-8	Describe the factors affecting blood pressure& its regulation
PY5.10	Lecture-9	Describe & discuss regional circulation including microcirculation, lymphatic circulation
PY5.10	Lecture-10	Describe & discuss regional circulation including coronary, cerebral
PY5.10	Lecture-11	Describe & discuss regional skin, foetal, pulmonary and splanchnic circulation
PY5.11	Lecture-12	Describe the patho-physiology of shock, syncope and heart failure Describe the patho-physiology of heart failure

Physiology Lecture of: Respiration

Code	Sr. No.	Lecture Topic
PY6.1 PY6.2	Lecture-1	Describe the functional anatomy of respiratory tract Describe the mechanics of normal respiration, pressure changes during ventilation
PY6.2	Lecture-2	, Describe the, lung volume and capacities
PY6.2	Lecture-3	Describe alveolar surface tension, compliance, airway resistance Describe the ventilation, V/P ratio, diffusion capacity of lungs
PY6.3	Lecture-4	Describe and discuss the transport of respiratory gases: Oxygen
PY6.3	Lecture-5	Describe and discuss the transport of respiratory gases: Carbon dioxide
PY6.3	Lecture-6	Regulation of respiration
PY6.4	Lecture-7	Describe and discuss the physiology of high altitude Describe and discuss the physiology of deep sea diving
PY6.5	Lecture-8	Describe and discuss the principles of artificial respiration, oxygen therapy, acclimatization and decompression sickness
PY6.6	Lecture-9	Describe and discuss the pathophysiology of hypoxia Describe and discuss the pathophysiology of dyspnoea, cyanosis asphyxia; drowning, periodic breathing
PY6.7	Lecture-10	Describe and discuss lung function tests & their clinical significance

Physiology Lecture of: Renal System

Code	Sr.No.	Lecture Topic
PY7.1	Lecture-1	Describe structure and function of kidney
PY7.2	Lecture -2	Describe the structure and functions of juxta glomerular apparatus and role of renin-angiotensin system
PY7.3	Lecture -3	Describe the mechanism of urine formation involving processes of filtration, determinants and regulation of GFR
PY7.3	Lecture -4	Describe the mechanism of urine formation involving processes tubular reabsorption & secretion
PY7.3	Lecture -5	Describe the mechanism of urine formation involving concentration and diluting mechanism – the Counter Current Mechanism - Multiplier
PY7.3	Lecture –6	Describe the mechanism of urine formation involving concentration and diluting mechanism – the Counter Current Mechanism - Exchanger
PY7.3	Lecture - 7	Describe the mechanism of urine formation - Diuretics & their Mechanism of action
PY7.4	Lecture -8	Describe & discuss the significance & implication of Renal clearance
PY7.5	Lecture -9	Describe the renal regulation of fluid and electrolytes & acid-base balance
PY7.6	Lecture -10	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities
PY7.7	Lecture -11	Describe artificial kidney, dialysis and renal transplantation
PY7.8	Lecture -12	Describe & discuss Renal Function Tests
PY7.9	Lecture- 13	Describe cystometry and discuss the normal cystometrogram

Physiology Lecture of Endocrine:

Code	Sr.No.	Topic
PY8.1	Lecture-1	Describe the physiology of bone and calcium metabolism
PY8.2	Lecture-2	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **parathyroid** gland
PY8.2	Lecture-3	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **pituitary** gland **hypothalamus**
PY8.2	Lecture-4	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **pituitary** gland -II
PY8.2	Lecture-5	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **thyroid** gland-I
PY8.2	Lecture-6	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **thyroid** gland-II
PY8.2	Lecture-7	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **thyroid** gland-III
PY8.2	Lecture-8	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **adrenal** gland – Cortex-I
PY8.2	Lecture-9	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **adrenal** gland – Cortex-II
PY8.2	Lecture -10	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **adrenal** gland- Medulla
PY8.2	Lecture-11	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **pancreas- I**
PY8.2	Lecture-12	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **pancreas** -II
PY8.2	Lecture-13	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of **pancreas** -III
PY8.3	Lecture-14	Describe the physiology of Thymus & Pineal Gland (Circadian Rhythm)
PY8.4	Lecture-15	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas
PY8.5	Lecture-16	Describe the metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome
PY8.6	Lecture-17	Describe & differentiate the mechanism of action of steroid, protein and amine hormones

Physiology Lecture (Reproduction)

Code	Sr.No.	Topic
PY9.1	Lecture-1	Describe and discuss sex determination; and practical implication of sex determination, Describe and discuss sex differentiation and their abnormities
PY9.2	Lecture -2	Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association
PY9.3	Lecture -3	Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness
PY9.4	Lecture -4	Describe female reproductive system: (a) functions of ovary and its control, Describe female reproductive system: (b) menstrual cycle - hormonal and ovarian changes, Describe female reproductive system: (b) menstrual cycle - hormonal, and uterine changes
PY9.5	Lecture -5	; Describe and discuss the physiological effects of sex hormones
PY9.6	Lecture -6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages
PY9.7 PY9.8	Lecture -7	Describe and discuss the effects of removal of gonads on physiological functions, Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it
PY9.9	Lecture -8	Interpret a normal semen analysis report including a. (a) sperm count, b. (b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the results
PY9.10	Lecture -09	Discuss the physiological basis of various pregnancy tests
PY9.11	Lecture -10	Discuss the hormonal changes and their effects during perimenopause and menopause
PY9.12	Lecture -11	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility

Physiology Lecture of Central Nerves System (CNS)

Code	Lecture. No.	Lecture Topic
PY10.1	Lecture-1	Describe and discuss the organization of nervous system
PY10.2	Lecture-2	Describe and discuss the functions and properties of receptors
PY10.2	Lecture-3	Describe and discuss the functions and properties of synapse
PY10.2	Lecture-4	Describe and discuss the functions and properties of reflex
PY10.3	Lecture-5	Describe and discuss somatic sensations & sensory tracts
PY10.4	Lecture-6	Describe and discuss motor tracts
PY10.4	Lecture-7	Describe and discuss mechanism of maintenance of tone, control of body movements & posture
PY10.4	Lecture-8	Describe and discuss mechanism of maintenance equilibrium & vestibular apparatus
PY10.5	Lecture-9	Describe and discuss structure and functions of reticular activating system
PY10.5	Lecture-10	Describe and discuss structure and functions of autonomic nervous system (ANS) - Sympathetic
PY10.5	Lecture-11	Describe and discuss structure and functions of autonomic nervous system (ANS) - Parasympathetic
PY10.6	Lecture-12	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances
PY10.7	Lecture-13	Describe and discuss functions of cerebral cortex and their abnormalities
PY10.7	Lecture-14	Describe and discuss connection & functions of basal ganglia
PY10.7	Lecture-15	Describe and discuss disease of basal ganglia
PY10.7	Lecture-16	Describe and discuss functions of thalamus and their abnormalities
PY10.7	Lecture-17	Describe and discuss physiological anatomy and connections of hypothalamus.
PY10.7	Lecture-18	Describe and discuss functions of hypothalamus and their abnormalities
PY10.7	Lecture-19	Describe and discuss physiological anatomy – Division and connection of cerebellum
PY10.7	Lecture-20	Describe and discuss cerebellum functions and lesions
PY10.7	Lecture-21	Describe and discuss Cerebral Hemisphere (Cerebrum)
PY10.7	Lecture-22	Describe and discuss functions of limbic system and their abnormalities
PY10.8	Lecture-23	Describe and discuss behavioral and EEG characteristics during sleep and mechanism responsible for its production
PY10.9	Lecture-24	Describe and discuss the physiological basis of memory, learning and speech
PY10.10	Lecture-25	Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element)- Neurotransmitters

Physiology Lecture of : Special Senses

Code	Sr.No.	Lecture Topic
PY10.13	Lecture-1	Describe and discuss perception of smell
PY10.13 PY10.14	Lecture -2	Describe and discuss perception of taste sensation Describe and discuss patho-physiology of altered smell and taste sensation
PY10.15	Lecture -3	Describe and discuss functional anatomy of ear and auditory pathways
PY10.15 PY10.16	Lecture -4	Describe and discuss physiology of hearing Describe and discuss pathophysiology of deafness. Describe hearing tests
PY10.17	Lecture -5	Describe and discuss functional anatomy of eye Describe and discuss physiology of image formation & refractive errors
PY10.17	Lecture -6	Describe and discuss physiology of vision including colour vision, Describe and discuss physiology of colour blindness, physiology of pupil and light reflex
PY10.18 PY10.19	Lecture -7	Describe and discuss the physiological basis of lesion in visual pathway Describe and discuss auditory & visual evoke potentials

Physiology Lecture of: Integrated Physiology

Code	Sr.No.	Lecture Topic
PY11.1	Lecture-1	Describe and discuss mechanism of temperature regulation
PY11.2	Lecture -2	Describe and discuss adaptation to altered temperature (heat and cold)
PY11.3	Lecture -3	Describe and discuss mechanism of fever, cold injuries and heat stroke
PY11.4	Lecture -4	Describe and discuss cardio- respiratory and metabolic adjustment during exercise; physical training effects
PY11.5	Lecture -5	Describe and discuss physiological consequences of sedentary lifestyle
PY11.6	Lecture -6	Describe physiology of Infancy
PY11.7	Lecture -7	Describe and discuss physiology of aging; free and antioxidants
PY11.8	Lecture -8	Discuss & compare cardio- respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different environmental conditions (heat and cold)
PY11.9	Lecture -9	Interpret growth charts
PY11.10	Lecture -10	Interpret anthropometric assessment of infants
PY11.11	Lecture -11	Discuss the concept, criteria for diagnosis of Brain death and its implication
PY11.12	Lecture -12	Discuss the physiological effects of meditation
PY11.13	Lecture -13	Obtain history and perform general examination in the volunteer / simulated environment
PY11.14	Lecture -14	Demonstrate Basic Life Support in a simulated environment