APPLIED PHYSIOLOGY

PLACEMENT: I SEMESTER

THEORY: 3 Credits (60 hours)

DESCRIPTION: The course is designed to assists student to acquire comprehensive knowledge of the normal functions of the organ systems of the human body to facilitate understanding of physiological basis of health, identify alteration in functions and provide the student with the necessary physiological knowledge to practice nursing.

COMPETENCIES: On completion of the course, the students will be able to

1. Develop understanding of the normal functioning of various organ systems of the body.
2. Identify the relative contribution of each organ system towards maintenance of homeostasis.
3. Describe the effect of alterations in functions.
4. Apply knowledge of physiological basis to analyze clinical situations and therapeutic applications.

COURSE OUTLINE

T – Theory

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/ Learning Activities	Assessment Methods
I	4 (T)	Describe the physiology of cell, tissues, membranes and glands	**General Physiology – Basic concepts** • Cell physiology including transportation across cell membrane • Body fluid compartments, Distribution of total body fluid, intracellular and extracellular compartments, major electrolytes and maintenance of homeostasis • Cell cycle • Tissue – formation, repair • Membranes and glands – functions • Application and implication in nursing	• Review – discussion • Lecture cum Discussion • Video demonstrations	• Quiz • MCQ • Short answer
II	6 (T)	Describe the physiology and mechanism of respiration Identify the muscles of respiration and examine their contribution to the mechanism of breathing	**Respiratory system** • Functions of respiratory organs • Physiology of respiration • Pulmonary circulation – functional features • Pulmonary ventilation, exchange of gases • Carriage of oxygen and carbon-dioxide, Exchange of gases in tissue • Regulation of respiration • Hypoxia, cyanosis, dyspnea, periodic breathing • Respiratory changes during exercise • Application and implication in nursing	• Lecture • Video slides	• Essay • Short answer • MCQ
III	8 (T)	Describe the functions of digestive system	**Digestive system** • Functions of the organs of digestive tract • Saliva – composition, regulation of secretion and functions of saliva • Composition and function of gastric juice, mechanism and regulation of gastric secretion • Composition of pancreatic juice, function, regulation of pancreatic secretion	• Lecture cum Discussion • Video slides	• Essay • Short answer • MCQ

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/ Learning Activities	Assessment Methods
			• Functions of liver, gall bladder and pancreas • Composition of bile and function • Secretion and function of small and large intestine • Movements of alimentary tract • Digestion in mouth, stomach, small intestine, large intestine, absorption of food • Application and implications in nursing		
IV	6 (T)	Explain the functions of the heart, and physiology of circulation	**Circulatory and Lymphatic system** • Functions of heart, conduction system, cardiac cycle, Stroke volume and cardiac output • Blood pressure and Pulse • Circulation – principles, factors influencing blood pressure, pulse • Coronary circulation, Pulmonary and systemic circulation • Heart rate – regulation of heart rate • Normal value and variations • Cardiovascular homeostasis in exercise and posture • Application and implication in nursing	• Lecture • Discussion • Video/Slides	• Short answer • MCQ
V	5 (T)	Describe the composition and functions of blood	**Blood** • Blood – Functions, Physical characteristics • Formation of blood cells • Erythropoiesis – Functions of RBC, RBC life cycle • WBC – types, functions • Platelets – Function and production of platelets • Clotting mechanism of blood, clotting time, bleeding time, PTT • Hemostasis – role of vasoconstriction, platelet plug formation in hemostasis, coagulation factors, intrinsic and extrinsic pathways of coagulation • Blood groups and types • Functions of reticuloendothelial system, immunity • Application in nursing	• Lecture • Discussion • Videos	• Essay • Short answer • MCQ
VI	5 (T)	Identify the major endocrine glands and describe their functions	**The Endocrine system** • Functions and hormones of Pineal Gland, Pituitary gland, Thyroid, Parathyroid, Thymus, Pancreas and Adrenal glands. • Other hormones • Alterations in disease • Application and implication in nursing	• Lecture • Explain using charts	• Short answer • MCQ
VII	4 (T)	Describe the structure of various sensory organs	**The Sensory Organs** • Functions of skin • Vision, hearing, taste and smell • Errors of refraction, aging changes • Application and implications in nursing	• Lecture • Video	• Short answer • MCQ

Unit	Time (Hrs)	Learning Outcomes	Content	Teaching/ Learning Activities	Assessment Methods
VIII	6 (T)	Describe the functions of bones, joints, various types of muscles, its special properties and nerves supplying them	**Musculoskeletal system** • Bones – Functions, movements of bones of axial and appendicular skeleton, Bone healing • Joints and joint movements • Alteration of joint disease • Properties and Functions of skeletal muscles – mechanism of muscle contraction • Structure and properties of cardiac muscles and smooth muscles • Application and implication in nursing	• Lecture • Discussion • Video presentation	• Structured essay • Short answer • MCQ
IX	4 (T)	Describe the physiology of renal system	**Renal system** • Functions of kidney in maintaining homeostasis • GFR • Functions of ureters, bladder and urethra • Micturition • Regulation of renal function • Application and implication in nursing	• Lecture • Charts and models	• Short answer • MCQ
X	4 (T)	Describe the structure of reproductive system	**The Reproductive system** • Female reproductive system – Menstrual cycle, function and hormones of ovary, oogenesis, fertilization, implantation, Functions of breast • Male reproductive system – Spermatogenesis, hormones and its functions, semen • Application and implication in providing nursing care	• Lecture • Explain using charts, models, specimens	• Short answer • MCQ
XI	8 (T)	Describe the functions of brain, physiology of nerve stimulus, reflexes, cranial and spinal nerves	• **Nervous system** • Overview of nervous system • Review of types, structure and functions of neurons • Nerve impulse • Review functions of Brain-Medulla, Pons, Cerebrum, Cerebellum • Sensory and Motor Nervous system • Peripheral Nervous system • Autonomic Nervous system • Limbic system and higher mental Functions-Hippocampus, Thalamus, Hypothalamus • Vestibular apparatus • Functions of cranial nerves • Autonomic functions • Physiology of Pain-somatic, visceral and referred • Reflexes • CSF formation, composition, circulation of CSF, blood brain barrier and blood CSF barrier • Application and implication in nursing	• Lecture cum Discussion • Video slides	• Brief structured essays • Short answer • MCQ • Critical reflection

Note: Few lab hours can be planned for visits, observation and handling (less than 1 credit lab hours are not specified separately)