

iUBT298 – Anatomy and physiology

URN – J/617/0230

Guided Learning Hours: 100

Learning outcome	Assessment criteria	Taught content
LO1 Understand the structure, function and pathology of the skeletal system	1.1. The learner will be able to explain the functions of the skeletal system	To include: • Support framework • Provides attachments for muscles • Forms joints to provide movement • Forms erythrocytes in the bone marrow • Stores calcium • Protection
	1.2. The learner will be able to explain the structure of bone tissues	To include: • Compact • Cancellous
	1.3. The learner will be able to explain the types of bone	To include: • Long • Short • Flat • Irregular • Sesamoid • Give examples of where in the body they would be found
	1.4. The learner will be able to explain the position of the bones of the skeleton	To include: • Cranium - Parietal - Frontal - Ethmoid - Sphenoid - Occipital - Temporal

- Facial
 - Nasal
 - Zygomatic
 - Maxilla
 - Lacrimal
 - Turbinator
 - Palatine
 - Mandible
 - Vomer
 - Hyoid
- Vertebrae
 - Cervical
 - Thoracic
 - Lumbar
 - Sacrum
 - Coccyx
- Shoulder Girdle
 - Scapula
 - Clavicle
- Thoracic Cage
 - Ribs
 - Sternum
- Pelvic Girdle
 - Innominate bones
 - Ischium
 - Ilium
 - Pubis
- Upper Limb
 - Humerus
 - Ulna
 - Radius
 - Carpals
 - Scaphoid
 - Lunate
 - Triquetral
 - Pisiform
 - Trapezium
 - Trapezoid
 - Capitate

		▪ Hamate - Metacarpals - Phalanges • Lower Limb - Femur - Tibia - Fibula - Patella - Tarsals ▪ Talus ▪ Calcaneus ▪ Navicular ▪ Cuneiforms (Medial, Intermediate, Lateral) ▪ Cuboid - Metatarsals - Phalanges
	1.5. The learner will be able to explain different types of joints	To include: • Fixed • Slightly moveable • Freely moveable • Ball and socket • Hinge • Pivot • Gliding • Saddle
	1.6. The learner will be able to Identify and explain possible causes of postural deformities	To include: • Kyphosis • Lordosis • Scoliosis
	1.7. The learner will be able to explain and identify the symptoms, causes and effects of diseases and disorders of the skeletal system	To include: • Arthritis - Osteo - Rheumatoid • Gout • Osteoporosis • Stress

LO2 Understand the structure, function and pathology of the muscular system	2.1. The learner will be able to explain the structure and function of the different types of muscle with examples	• Voluntary • Involuntary • Cardiac
	2.2. The learner will be able to explain the structure and function of the various attachments of muscles	• Ligament • Tendon • Fascia
	2.3. The learner will be able to explain the terms used in relation to the muscular system	• Origin • Insertion • Action • Tone • Tension • Fatigue • Flexion • Extension • Abduction • Adduction • Rotation • Supination • Pronation • Dorsiflexion • Plantarflexion • Eversion • Inversion • Circumduction
	2.4. The learner will be able to explain muscular contraction	• How a muscle works • How it provides movement • How a muscle knows when to contract • The source of energy to create a contraction • Different stages of contraction, i.e. tone and relaxation • Over contraction, i.e. causes of muscle tension and muscle fatigue
	2.5. The learner will be able to explain the formation of lactic acid	To include: • Cause and effect
	2.6. The learner will be able to explain the position (with the aid of diagrams) and action of the following muscles	• Trunk/torso - Trapezius - Erector Spinae

		- Splenius Capitis - Latissimus Dorsi - Serratus Anterior - Gluteus Maximus - Gluteus Medius - Gluteus Minimus - Psoas - Pectoralis Major and Minor - Rectus Abdominus - Internal Oblique - External Oblique - Transversus Abdominus - Rhomboid Major and Minor - Infraspinatis - Supraspinatis - Teres Major - Teres Minor - Iliacus - Subscapularis - Quadratus Lumborum • Arm - Deltoid - Biceps - Triceps - Brachialis - Coraco Brachialis - Brachioradialis - Pronator Teres - Supinator Radii Brevis - Flexor Carpi Radialis - Extensor Carpi Radialis - Extensor - Carpi Ulnaris - Flexor Carpi Ulnaris - Flexor Carpi Digitorum - Extensor Carpi Digitorum - Muscles of Thenar eminence - Muscles of Hypothenar eminence • Leg/Thigh
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		- Quadriceps ▪ Rectus Femoris ▪ Vastus Lateralis ▪ Vastus Medialis ▪ Vastus Intermedius - Hamstrings ▪ Biceps Femoris ▪ Semimembranosus ▪ Semitendinosus - Adductor Longus - Adductor Magnus - Adductor Brevis - Gracilis - Sartorius - Piriformis - Gluteus Maximus - Gluteus Medius - Gluteus Minimus • Lower Leg - Gastrocnemius - Tibialis Anterior - Peroneus Longus - Flexor Digitorum Longus - Extensor Digitorum Longus - Soleus - Extensor Hallucis Longus • Face, neck and scalp - Orbicularis Oculi - Orbicularis Oris - Masseter - Buccinator - Levator Anguli Oris - Levator Labii Superioris - Depressor Anguli Oris - Depressor Labii Inferioris - Depressor Labii Oris - Mentalis - Zygomaticus
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		- Temporalis - Nasalis - Procerous - Corrugator - Frontalis - Occipitalis - Pterygoids - Triangularis - Trapezius - Sternocleido mastoid - Platysma
	2.7. The learner will be able to explain the cause and effect of the following muscular conditions	• Fibromyalgia (Fibrositis) • Cramp • Muscle Fatigue • Atony • Atrophy • Myositis • Rupture • Spasm • Spasticity • Sprain • Strain • Stress
LO3 Understand the structure, function and pathology of the skin	3.1. The learner will know the structure of the skin	To include: • Epidermis - Stratum Corneum - Stratum Lucidum - Stratum Granulosum - Stratum Spinosum/Malphigian layer - Stratum Germinativum/Basal layer - Melanocytes • Dermis - Blood supply - Lymphatic supply - Hair follicle - Hair - Sebaceous gland

		- Sweat glands ▪ Eccrine ▪ Apocrine - Sensory nerve endings - Dermal Papilla - Collagen - Elastin - Histiocytes - Mast Cells - Fibroblasts - Erector pili muscle • Subcutaneous layer
	3.2. The learner will be able to explain the functions of the skin	To include: • Secretion • Heat Regulation • Absorption • Protection • Elimination • Sensation • Vitamin D formation (7-dehydro-cholesterol) • Keratinisation • Melanin Formation
	3.3. The learner will be able to explain and identify the different skin types	To include: • Dry • Oily • Dehydrated • Sensitive • Combination
	3.4. The learner will be able to explain skin diseases and disorders and when they are contra-indicated to treatment	To include: • Recognition points • Whether congenital, bacterial, viral, fungal or an infestation and whether the condition is contra-indicated • Congenital - Eczema - Psoriasis - Dermatitis • Bacterial

		- Acne Vulgaris - Impetigo - Acne Rosacea - Folliculitis - Boils • Viral - Warts - Verrucas - Herpes simplex - Herpes zoster • Fungal - Tinea corporis - Tinea Pedis • Pigmentation disorders - Vitiligo - Albinism - Chloasma - Ephelides - Lentigo - Moles - Naevae - Port wine stain • General disorders - Broken capillaries - UV damage - Urticaria - Allergic reaction - Comedones - Milia
	3.5. The learner will be able to understand the different skin cancers and their possible causes	To include: • Basal Cell Carcinoma • Squamous Cell Carcinoma • Malignant Melanoma
LO4 Understand the structures and functions of	4.1. The learner will be able to explain the structures of the cell and their functions	To include: • Cell Membrane • Nuclear Membrane

cells and tissues in the body		• Nucleus • Nucleolus • Cytoplasm • Centrosome • Golgi Apparatus • Mitochondria • Lysosome • Endoplasmic Reticulum • Ribosome • Centrosome • Centromere • Vacuoles • Centrioles • Chromatids
	4.2. The learner will be able to explain the process of mitosis	To include: • Prophase • Metaphase • Anaphase • Telophase
	4.3. The learner will be able to explain the term histology	To include: • Define histology
	4.4. The learner will be able to explain the structure and function of the main types of tissue in the body	To include: • Epithelial tissue - Simple ▪ Squamous ▪ Cuboidal ▪ Ciliated ▪ Columnar - Compound ▪ Transitional ▪ Stratified • Nervous tissue • Muscular tissue - Striated - Non-striated - Cardiac • Connective tissue

		- Areolar - Adipose - Cartilage (white fibrous, yellow elastic, hyaline) - Bone - Blood - Lymph • Membranes - Serous - Mucus - Synovial
	4.5. The learner will be able to explain how substances enter and leave the cell	To include: • Diffusion • Osmosis • Dissolution • Active Transport • Filtration

LO5 Understand the structure, function and pathology of the circulatory system	5.1. The learner will be able to explain the structure and function of blood and its components	To include: • Erythrocytes • Leucocytes • Thrombocytes • Plasma and plasma proteins • Platelets • Describe the vessels in which it is carried - Arteries - Arterioles - Veins - Venules - Capillaries
	5.2. The learner will be able to explain the position of the main arteries and veins of the body	To include: • Main arteries of the head and neck - Innominate - Common Carotid - Internal Carotid - External Carotid - Facial - Occipital

		- Superficial Temporal • Main veins of the head and neck - Posterior External Jugular - Occipital - Superficial Temporal - Maxillary - Anterior Facial - Common Facial - Internal Jugular - External Jugular • Main arteries of the body - Descending Aorta - Left Common Carotid - Left Subclavian - Right Common Carotid - Right Subclavian - Pulmonary - Right Hepatic - Splenic - Right Renal - Superior Mesenteric - Right Iliac - Inferior Mesenteric - Left Iliac - Vertebral - Axillary - Brachial - Right Ulnar - Left Ulnar - Right Radial - Left Radial - Right Deep Palmar Arch - Left Deep Palmar Arch - Right Superficial Palmar Arch - Left Superficial Palmar Arch - External Iliac - Left Femoral - Right Femoral - Left Popliteal
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		- Right Popliteal - Left Anterior Tibial - Right Anterior Tibial - Plantar Arch • Main veins of the body - Inferior vena cava - 4 Pulmonary - Right Hepatic - Splenic - Right Renal - Right Iliac - Left Iliac - Right Axillary - Left Axillary - Right Brachial - Left Brachial - Right Basilic - Left Basilic - Right Cephalic - Left Cephalic - Right Subclavian - Long Saphenous - Left Short Saphenous - Right Short Saphenous - Dorsal Venous Arch - Left Femoral - Right Femoral - Left Popliteal - Right Popliteal - Right Posterior Tibial - Left Posterior Tibial - Right Anterior Tibial - Left Anterior Tibial
	5.3. The learner will be able to explain the structure and function of the heart and the vessels entering and leaving the heart	To include: • Superior Vena Cava • Aortic Arch • Inferior Vena Cava • Aorta • Right Atrium

		• Right Ventricle • Left Atrium • Left Ventricle • Septum • Pulmonary Valve • Pulmonary Artery • Pulmonary Veins • Mitral (Bicuspid) Valve • Tricuspid Valve • Endocardium • Myocardium • Pericardium
	5.4. The learner will be able to explain the pulmonary circulation	To include: • The way in which the blood circulates from the heart to the lungs and back to the heart • Vessels in which the blood is carried • Whether the blood is oxygenated or deoxygenated • Process of gaseous exchange
	5.5. The learner will be able to explain the structure and function of the systemic circulation	• Describe the structure and function of the systemic circulation • Describe the coronary circulation
	5.6. The learner will be able to explain blood pressure and pulse	To include: • Define blood pressure • Factors which produce, maintain and affect blood pressure
	5.7. The learner will be able to explain the conditions of high and low blood pressure	To include: • Causes and effects of hypo and hyper tension • Way in which blood pressure is measured • Way in which blood pressure can be affected by massage
	5.8. The learner will be able to explain the diseases and disorders of the circulatory system	To include the cause and effects of the following: • Anaemia • Varicose veins • Haemophilia • Arteriosclerosis • Atherosclerosis • HIV/AIDS • High blood pressure (hypertension) • Low blood pressure (hypotension)

		• High cholesterol • Hepatitis A,B & C • Coronary thrombosis • Septicaemia • Haemorrhoids • Phlebitis • Thrombus • Leukaemia • Aneurism • Stress
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LO6 Understand the structure, function and pathology of the lymphatic system	6.1. The learner will be able to explain the structure and functions of the lymph	Formation and composition of lymph and its function to include: • Leucocytes • Lymphocytes • Waste products
	6.2. The learner will be able to explain the structure and function of the lymphatic system	To include: • Lymphatic capillaries • Lymphatic vessels • Lymphatic nodes • Lymphatic ducts • Describe the way in which Lymph is moved around the body
	6.3. The learner will be able to explain the structure and function of lymphatic tissue	Describe the structure and function of all lymphatic tissue and the areas in which it can be found in the body: • Spleen • Lymph nodes • Tonsils • Peyer's Patches • Appendix
	6.4. The learner will be able to explain the position of the lymph nodes of the body	To include: • Superficial and deep cervical • Submandibular • Thoracic duct • Right lymphatic duct • Axillary • Supratrochlear • Inguinal

		• Popliteal • Superficial and deep cervical • Anterior auricular • Posterior auricular • Occipital
	6.5. The learner will be able to explain the interrelationship between the circulatory/ lymphatic systems and the muscular, digestive and immune systems	To include: • Way in which blood becomes tissue fluid • Way in which excess tissue fluid is picked up by the lymphatic capillaries • Route which the lymph takes before it returns to the circulatory system
	6.6. The learner will be able to explain the diseases and disorders of the lymphatic system	To include: • Oedema/Water retention • Hodgkin's disease • Lymphoedema

LO7 Understand the structure, function and pathology of the neurological system	7.1. The learner will be able to explain the structure and functions of the nervous system	To include: • Neurone • Motor Neurone • Sensory Neurone • Mixed Nerve • Dendrite • Axon • Synapse • Neurilemma • Nodes of Ranvier • White Matter • Grey Matter • Myelin Sheath • End Feet/Axon Terminals • Ganglia • Reflex Arc
	7.2. The learner will be able to explain the structure and functions of the Central Nervous System (CNS), the Peripheral and the Autonomic Nervous System (ANS)	To include: • Central Nervous System - Brain - Spinal Cord

		• Peripheral Nervous System - 31 pairs of spinal nerves - 12 pairs of cranial nerves • Autonomic Nervous System - Sympathetic - Parasympathetic
	7.3. The learner will be able to explain the effect of stress on the nervous system	• The way in which stress affects the fear, fight, flight syndrome • Effects of stress on the sympathetic and parasympathetic nervous systems • Possible diseases and disorders caused by stress
	7.4. The learner will be able to explain briefly the structure and function of the brain and spinal cord	To include: • Brain - Meninges ▪ Pia ▪ Arachnoid ▪ Dura mater - Cerebrospinal Fluid - Cerebrum - Cerebellum - Pons varolii - Medulla Oblongata - Hypothalamus - Brain Stem • Spinal cord - White Matter - Grey Matter - Dura, Arachnoid and Pia - Mater - Cerebrospinal Fluid
	7.5. The learner will be able to explain how a nerve impulse is created	To include: • Changes in temperature, pressure and chemicals • Potassium and sodium ions
	7.6. The learner will be able to explain the position and function of the spinal and cranial nerves	To include: • 8 cervical • 12 thoracic • 5 lumbar • 5 sacral

		• 1 coccygeal • 5th, 7th & 11th cranial nerves - Facial - Trigeminal - Accessory
	7.7. The learner will be able to briefly explain the Olfactory system	To include: • Nose • Olfactory Membranes (contain smell-sense cells) • Olfactory Plexus
	7.8. The learner will be able to explain the causes and effects of diseases and disorders of the nervous system	To include: • Neuritis • Bell's Palsy • Neuralgia • Parkinson's Disease • Stress • Myalgic Encephalomyelitis (ME) • Cerebral Palsy • Multiple Sclerosis • Sciatica • Motor Neurone Disease

LO8 Understand the structure, function and pathology of the endocrine system	8.1. The learner will be able to explain the position of the main Endocrine glands, hormones secreted and the result of hypo and hyper secretion of each	To include: • Pituitary • Posterior Lobe - Oxytocin - Antidiuretic hormone (ADH or vasopressin) • Anterior lobe - Prolactin - Human growth Hormone (HGH) - Thyroid Stimulating Hormone (TSH) - Adrenocorticotrophic hormone (ACTH) - Luteinising Hormone (LH) - Follicle Stimulating Hormone (FSH) - Interstitial Cell Stimulating Hormone (ICSH) - Melanin Stimulating Hormone (MSH) • Thyroid gland - Thyroxin
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		- Triiodothyronine - Calcitonin • Parathyroids - Parathormone • Thymus - Secretion of T Lymphocytes • Pineal - Releases melatonin • Islets of Langerhans - Insulin - Glucagon - Glycogen • Adrenal medulla - Adrenalin - Noradrenalin • Adrenal cortex - Mineralocorticoids - Glucocorticoids - Sex hormones • Ovaries - Oestrogen - Progesterone • Testes - Testosterone
	8.2. The learner will be able to explain the effects of hormones on the body	• To include knowledge of the effects of specific hormones on the body at puberty, pregnancy, menopause and the menstrual cycle
	8.3. The learner will be able to explain the interrelationship of the endocrine system with other systems	To include: • Nervous system • Circulatory system • Digestive system • Reproductive system • Skin
	8.4. The learner will be able to explain the causes and effects of various endocrine diseases and disorders	To include: • Addison's syndrome • Amenorrhoea • Cushing's syndrome • Pre-menstrual Syndrome

		• Polycystic Ovarian Syndrome • Stress • Diabetes Mellitus • Diabetes Insipidus • Endometriosis
LO9 Understand the structure, function and pathology of the respiratory system	9.1. The learner will be able to explain the structure of the respiratory system and the function of each organ	To include: • Nose • Nasal cavity • Larynx • Pharynx • Trachea • Bronchi • Bronchioles • Alveoli • Lungs • Pleura (visceral, parietal, pleural cavity) • Diaphragm • Intercostals
	9.2. The learner will be able to explain external respiration, i.e. the process and mechanism of breathing	To Include: • Inhalation and the organs involved • Expiration and the organs involved • Process of diffusion in the alveoli
	9.3. The learner will be able to explain internal respiration	• Exchange of gases between the cells and the circulatory system
	9.4. The learner will be able to explain the chemical control of the respiration	To include: • Position, function and role of the chemo-receptors
	9.5. The learner will be able to explain nervous control of respiration	To include: • Role of the brain, i.e. the pons varolii and medulla oblongata in the process of respiration
	9.6. The learner will be able to explain the structure and function of the pulmonary circulation	To include: • Structure and function of the heart • Pulmonary artery • Pulmonary vein • Lungs

		• Pulmonary alveoli • Process of gaseous exchange
	9.7. The learner will be able to explain the interrelationship of the respiratory system with other systems of the body	To include: • Circulatory system • Nervous system • Muscular system
	9.8. The learner will be able to explain the causes and effects of diseases and disorders of the respiratory system	To include: • Bronchitis • Emphysema • Pleurisy • Pneumonia • Tuberculosis • Asthma • Rhinitis • Hay fever • Stress • Sinusitis

LO10 Understand the structure, function and pathology of the digestive system	10.1. The learner will be able to explain the structure and function of the organs and accessory organs of the digestive system	To include: • Alimentary canal • Salivary glands • Tongue • Teeth • Mouth • Epiglottis • Oesophagus • Stomach • Small intestine (Jejunum, Ileum, Duodenum) • Appendix • Large intestine • Rectum • Anus • Accessory organs • Liver • Gall bladder • Pancreas
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	10.2. The learner will be able to explain the function of digestion	To include: • Peristalsis • Ingestion • Digestion • Absorption • Defecation
	10.3. The learner will be able to explain the process by which food stuffs are broken down as they pass through the alimentary canal during the digestive process	To include: • Action of Rennin, hydrochloric acid and pepsin in the stomach • Action of pancreatic juice, i.e. trypsin and trypsinogen, lipase, amylase on peptones, fats and polysaccharides • Action of bile on fat • Action of intestinal juice – maltase, sucrase, lactase on disaccharides
	10.4. The learner will be able to explain the process of absorption of nutrients	To include: • Process of absorption of nutrients by the villi and lacteals contained in the small intestine
	10.5. The learner will be able to explain the structure and function of the digestive system	To include: • Enzyme • Proteins • Peptones • Polypeptides • Amino acids • Carbohydrates • Disaccharides • Monosaccharides • Fats • Fatty acids
	10.6. The learner will be able to explain the interrelationship of the digestive system with other systems of the body	To include: • Circulatory • Endocrine • Lymphatic • Muscular • Nervous
	10.7. The learner will be able to explain the causes and symptoms of diseases and disorders of the digestive system	To include: • Appendicitis • Cirrhosis of the liver

		• Jaundice • Heartburn • Irritable bowel syndrome (IBS) • Ulcer • Hernia • Stress • Anorexia Nervosa • Bulimia • Constipation • Gall stones • Diabetes Mellitus • Coeliac's disease
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LO11 Understand the structure, function and pathology of the urinary system	11.1. The learner will be able to explain the structure and function of the organs of the urinary system	To include: • Kidney (cortex and medulla) • Pelvis • Ureter • Bladder • Urethra
	11.2. The learner will be able to explain the process of filtration.	To include: • Functions of the Bowman's capsule • Filtration • Re-absorption • Secretion/ Micturition
	11.3. The learner will be able to explain the composition of urine	To include: • 2% urea • 96% water • 2% other substances, e.g. ammonia, sodium, potassium, phosphates, chlorides, sulphates, and excess vitamins • Colour is formed from bilirubin (bile pigment)
	11.4. The learner will be able to explain urine production	To include: • Cold and hot weather • Activity and inactivity • Stress

	11.5. The learner will be able to explain the interrelationship of the urinary system with other body systems	To include: • Circulatory system • Endocrine system • Skeletal system • The skin
	11.6. The learner will be able to explain the causes and effects of the disorders and diseases of the urinary system	• Cystitis • Kidney stones • Nephritis • Diabetes Insipidus

LO12 Understand the structure, function and pathology of the reproductive system	12.1. The learner will be able to explain the structure and function of the male reproductive system	To include: • Prostate • Testes • Testicular vessels • Penis • Scrotum
	12.2. The learner will be able to explain the structure and function of the female reproductive system	To include: • Uterus • Fallopian tubes • Cervix • Ovary • Vagina • Labia
	12.3. The learner will be able to explain the menstrual cycle	To include: • Three phases - Menstrual - Proliferative - Secretory • Formation of the Graafian Follicle • Formation of the Corpus Luteum
	12.4. The learner will be able to explain the structure and function of the breast	To include: • Fatty tissue • Ducts • Nipple • Areola

		• Lobules
	12.5. The learner will be able to explain the causes and effects of the diseases and disorders of the reproductive system	To include: • Ectopic pregnancy • Amenorrhoea • Dysmenorrhoea • Pre-menstrual syndrome • Polycystic ovarian syndrome • Endometriosis • Mastitis • Stress

Document History

Version	Issue Date	Changes	Role
v1	01/05/2018	First published	Qualifications Manager
v2	30/08/2019	Amended product coding	Qualifications and Regulation Co-ordinator
v3	16/06/2026	Rebranding	Development Administrator