





BLOCK-2

Musculoskeletal & Locomotion – 1

Study Guide 2026

First Year MBBS

ISLAM MEDICAL COLLEGE

Sialkot – Pakistan

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MODULE-03

MUSCULOSKELETAL & LOCOMTION – 1 GUIDE

MODULE LEAD DETAILS

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Office timing: 08:00 am -3:30pm

University of Health Sciences Vision

UHS is leading university aiming to keep its graduates apt with the ever-emerging global health challenges, evolving educational methodologies and emerging technological advancements to maintain its distinguishable position as a medical University.

Islam Medical College Vision & Mission

Vision

Be a globally recognized center of excellence, where Islam Medical College empowers competent and ethical healthcare professionals through holistic education, innovative teaching, and groundbreaking research

Mission

Islam Medical College is dedicated to comprehensive medical education that instills values of integrity, empathy, and professionalism. We empower our students with knowledge, skills and a patient-centered attitude for lifelong learning

MODULE OVERVIEW

The musculoskeletal system comprises the bones, muscles, cartilage, tendons, ligaments, and other connective tissues that provide the framework, support, and movement of the body. The initial learning activities will help in understanding the normal structure, development, and normal physiological mechanisms of the organs of the system. This will help in better understanding the possible pathological conditions of the system, including common injuries, & diseases, and disorders that affect it, followed by discussion on some important group of drugs used for treatment and/or prevention of these conditions (administration route, mechanism of action and side effects). The impact of musculoskeletal diseases on society and the effect of ageing on occurrence of musculoskeletal diseases will be discussed. Emphasis has been given to incorporate deranged laboratory and imaging findings into the clinical problem solving.

THEMES

- Pectoral Region & Axilla
- Upper limb
- Pelvic Girdle
- Lower Limb

Clinical Relevance (in relation to muscle, bone and joint diseases)

- Congenital anomalies of limb
- Joint Dislocation
- Fracture
- Metabolic bone diseases (osteoporosis, osteomalacia, rickets)
- Myasthenia Gravis
- Multiple Sclerosis

Curriculum Outcomes (PLOs)

The PLOs are articulated in view of the desirable competencies of our graduates. Following are the PLOs of MBBS Program desired to highlight the attributes amongst our graduates after their graduation.

PLO-1 Demonstrate the ability to independently manage non-critical clinical problems (Knowledge, Skill)

PLO-2 Exhibit proficiency in life-saving procedures and the ability to assist in the management of critically ill patients. (Skill)

PLO-3 Adhere to ethical principles and display attributes such as honesty, integrity, and confidentiality. (Attitude)

PLO-4 Conduct research that contributes to the advancement of medical knowledge and brings relevance to healthcare practices (Knowledge, Skill)

PLO-5 Act as an efficient community health promotor by advocating for health promotion and disease prevention. (Skill)

PLO-6 Exhibit comprehensive scientific knowledge in all professional activities. (Knowledge)

PLO-7 Demonstrate clear and efficient written and verbal communication skills to effectively communicate with patients, colleagues and other healthcare professionals. (Skills, Attitude)

PLO-8 Embrace a lifelong learning mind set to maintain expertise, keep up with advancements in medical practices and improve professional development. (Knowledge, Skill)

MODULE LEARNING OUTCOMES

1. Develop an understanding of the fundamental components of the musculoskeletal system. (PLO 6)
2. Explain the development of the structure & function of the musculoskeletal (MSK) components of limbs, back & correlate it with organization and gross congenital anomalies of the limbs. (PLO 4, PLO 6)
3. Identify the anatomical features of bones, muscles & neurovascular components of the limbs with clinical correlation. (PLO 1, PLO 6)
4. Describe how injury and disease alter the MSK structure & function. (PLO 1, PLO 6)
5. Integrate concepts relating to various metabolic processes, their disorders and relevant lab investigations in the study of human MSK system. (PLO 6, PLO 4)
6. Describe the role of the limbs (upper/lower) in musculoskeletal support stability, and movements. (PLO 6)
7. Describe the types, formation, stability, function & clinical significance of joints of the upper and lower limb. (PLO 1, PLO 6)
8. Describe the basic histology of muscle fibers including their molecular structure (Sarcomere). (PLO 6)
9. Explain the mechanism of excitation and contraction of skeletal and smooth muscles. (PLO 6)
10. Discuss the psychosocial impact of musculoskeletal diseases in society. (PLO 3, PLO 5, PLO 7)

SYLLABUS

NORMAL STRUCTURE						
GROSS ANATOMY						
C O D E	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 105				
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL	
UPPER LIMB						
MS-A-001	Describe the topographical anatomy of Pectoral Region	Human Anatomy	Pectoral Region	LGIS/SGD	MCQs/Viva	
	Perform dissection of the Pectoral Region or use models to identify the key structures					
	Describe muscles of the Pectoral Region with their origin, insertion, nerve supply and actions.					
MS-A-002	Describe the cutaneous nerves. and Superficial veins of the Upper Limb.	Human Anatomy	Dermatome s and cutaneous innervation of Upper Limb	LGIS/SGD	MCQs/Viva	
	Describe the extent, attachments, and structures passing through Clavipectoral Fascia	Human Anatomy				
MS-	Define the boundaries of auscultation and state its clinical significance	Integrate with Medicine	Pectoral region &	LGIS/SGD	MCQs/Viva	

A-003	Describe the osteology of the bones in pectoral region. Enumerate the superficial muscles of back, connecting shoulder girdle with vertebral column. Describe the 1. Attachments 2. Nerve supply Actions of Trapezius, Latissimus Dorsi, Rhomboid major and minor. Mention the neurovascular supply of pectoral region and Correlate with important clinical conditions. Describe superficial muscles of the back with their origin, insertion, nerve supply and actions.	Human Anatomy	Back	LGIS/SGD	
MS-A-004	Describe the Osteology of Clavicle (Morphological features, side determination, attachments, ossification) Describe the correlates functions of Clavicle (clavicle fracture, its role in terms of weight transmission of upper limb, compression of neurovascular structures) Describe the Osteology of Scapula (morphological features, attachments, ossification) Determine the side and identify the landmarks of scapula Describe the movements of Scapula associated with movements of Shoulder Girdle	Human Anatomy	Bones of Upper Limb: Clavicle & Scapula	LGIS/SGD	MCQs/Viva

	Tabulate the muscles of scapular region and give their attachments, nerve supply and action				
	Tabulate the attachments, origin, insertion, innervation, and actions of Anterior Axio-appendicular Muscles				
MS-A-005	Describe the Sternoclavicular Joint in terms of articulating surfaces, ligaments, articular disc, nerve supply.	Human Anatomy	Bones of thorax, Joints of Upper Limb: Sternoclavicular Joint	LGIS/SGD	MCQs/Viva
MS-A-006	Develop clear concepts of the topographical anatomy of Axilla and its contents	Human Anatomy	Axila	LGIS/SGD	MCQs/Viva
	Describe the boundaries of Axilla. (Identification of muscles forming the boundaries of axilla)				
	List the contents of Axilla				
	Perform dissection/ Identify the Axilla and its contents				
	Describe Axillary Artery with reference to its 3 parts their relations, branches, and anastomoses	—			
	Describe the formation, tributaries, and drainage of Axillary Vein	Human Anatomy			
	Identify and demonstrate the course/ relation and branches/tributaries of axillary vessels				
	Describe the Axillary Lymph Nodes in terms of location, grouping, areas of drainage and clinical significance				

	Describe the course, relations, root value and distribution of Axillary nerve. Describe the boundaries and contents of quadrangular space			LGIS/SGD	MCQs/Viva
MS-A-007	Describe the Osteology of Humerus (Side Determination, morphological features, attachments, ossification)		Bones of upper limb: Humerus	LGIS/SGD	MCQs/Viva
MS-A-008	Describe the Shoulder Joint under the following headings: Articulation, Type/ Variety, Capsule, Ligaments, Innervation, Blood supply, Movements.	Human Anatomy	Joints of Upper Limb: Shoulder Joint	LGIS/SGD	MCQs/Viva
	Describe the 3 parts of Deltoid Muscle and correlate them with its unique functions. Explain its role in abduction of shoulder joint.				
	Explain mechanism of Abduction of arm				
	Identify and demonstrate the movements of scapula and shoulder joint.				
	Draw and label the arterial anastomosis around shoulder joint				
	Describe, in detail, the Scapula-Humeral Mechanism in relation to movement of abduction. Discuss important clinical conditions				
MS-A-009	Describe Rotator Cuff Muscles, state their Anatomical significance and explain Rotator Cuff Tendinitis	Human Anatomy	Rotator Cuff	LGIS/SGD	MCQs/Viva
	Clinical correlates of shoulder joint. (shoulder joint stability, dislocation and shoulder pain)	Integrate with Surgery			

MS-A-010	Describe the formation of Brachial Plexus; Infra and Supraclavicular parts. Discuss Brachial plexus injuries	Human Anatomy	Nerves of Upper Limb	LGIS/SGD	MCQs/Viva
	Demonstrate and identify the formation of brachial plexus and its branches				
	List the branches of brachial plexus and give their areas of distribution and muscles they innervate				
	Enlist and tabulate the muscles of anterior compartment of arm with their attachments, nerve supply and action. Identify & Describe Musculocutaneous Nerve in terms of its Origin, Course, Termination, Relations, Branches, and distribution. Describe and illustrate the cutaneous innervation of the arm.				
MS-A-011	Describe the Brachial Artery in terms of its course, relations, branches, and distribution	Human Anatomy	Blood Supply of arm	LGIS/SGD	MCQs/Viva
	Tabulate the attachments, innervation, and actions of Triceps brachii as a muscle of Posterior Fascial Compartment of Arm				
	Identify & Describe the Profunda Brachii Artery giving its course, relations, branches, and distribution				
MS-A-012	Describe Cubital Fossa with emphasis on its boundaries, contents, and clinical significance		Muscles of Arm	LGIS/SGD	MCQs/Viva
	Demonstrate surface marking of superficial veins of arm and forearm for IV (Intra venous) injections				
	Demonstrate biceps brachii reflex, triceps reflex				

	and brachioradialis reflex				
MS-A-013	Determine the side and identify the landmarks of radius and ulna. Describe the Osteology of Radius (Side Determination, morphological features, attachments).	Human Anatomy	Bones of Forearm	LGIS/SGD	MCQs/Viva
	Describe the Osteology of Ulna (Side Determination, morphological features, attachments).				
MS-A-014	Describe osseofascial compartment of forearm. Tabulate flexor and pronators muscles of forearm, their attachments, actions and nerve supply. Describe the action of paradox with examples	Human Anatomy	Muscle of Anterior/Flexor Compartment of Forearm	LGIS/SGD	MCQs/Viva
MS-A-015	Tabulate the attachments, innervation, and actions of Extensor Muscles of the Forearm		Muscle of Lateral and Posterior/Extensor Compartment of Forearm	LGIS/SGD	MCQs/Viva
	Tabulate the attachments, innervation, and actions of Lateral Muscles of the Forearm				
MS-A-016	Identify the muscles and nerves of flexor and extensor compartments of forearm		Nerves of Forearm	LGIS/SGD	MCQs/Viva
	Describe and illustrate the cutaneous innervation of the Forearm				MCQs/Viva
	Describe ulnar, median and radial nerves in forearm.				MCQs/Viva

MS-A-017	Describe the Origin, Course, Relations, and branches of Ulnar and radial Artery in Forearm Describe the Origin, Course, Relations and list the tributaries of veins of Forearm. Surface marking of Brachial artery, Cephalic, Median cubital, Basilic Vein, Radial & Ulnar arteries, anterior & posterior interosseous artery		Blood Supply of Forearm	LGIS/SGD	MCQs/Viva
MS-A-018	Identify the Extensor & Flexor Retinacula and describe their attachments and relations	Human Anatomy	Retinacula of Forearm	LGIS/SGD	MCQs/Viva
MS-A-019	Demonstrate the formation of carpal tunnel and identify the contents Describe Carpel Tunnel Syndrome	Human Anatomy- Integrate with surgery	Carpal tunnel syndrome	LGIS/SGD	MCQs/Viva
	Describe the features, attachments, relations and structures passing under Flexor Retinaculum				
MS-A-020	Describe the Origin, Course, Relations, and branches of Ulnar Artery in Forearm	Human Anatomy	Forearm: Blood supply and Venous drainage	LGIS/SGD	MCQs/Viva
	Describe the Origin, Course, Relations and list the tributaries of veins of Forearm				
	Surface marking of Brachial artery, Cephalic, Median cubital, Basilic Vein, Radial & Ulnar arteries, anterior & posterior interosseous artery				
	Describe the Elbow Joint in terms of articular surfaces, type, variety, ligaments, muscles producing movements, blood supply {Anastomosis around elbow joint}, nerve supply and radiological imaging.	Human Anatomy	Joints of Upper Limbs: Elbow Joint	LGIS/SGD	MCQs/Viva

MS-A-021	Describe Carrying Angle and justify its importance in limb movement	Integrate with Surgery			MCQs/Viva
MS-A-022	Describe the Radioulnar Joints in terms of articular surfaces, type, variety, ligaments, muscles producing movements, nerve supply and radiological imaging.	Human Anatomy	Joints of Upper Limbs: Radioulnar Joint	LGIS/SGD	MCQs/Viva
	Describe the wrist joint in terms of articular surfaces, type, variety, ligaments, muscles producing movements, nerve supply and radiological imaging. Demonstrate mechanisms of movements of Pronation & Supination				
MS-A-023	Describe the features of Interosseous Membrane with structures that pierce through it	Human Anatomy	Interosseous membrane	LGIS/SGD	MCQs/Viva
MS-A-024	Describe the features and explain the importance of Fibrous Flexor Sheaths, synovial flexor sheaths and extensor expansion	Human Anatomy	Fascia & Muscles of Hand	LGIS/SGD	MCQs/Viva

MS-A-025	Demonstrate the attachments and actions of the muscles of hand Identify the muscles and neurovasculature of palm. Explain the morphology and tabulate the attachments, innervation and actions of intrinsic muscles of hand. Explain the fascial spaces of palm and pulp space of fingers Describe Dupuytren contracture, mallet finger and buttonhole deformity. Describe hand as a functional unit. (position of hand, movement of thumb and fingers while performing different functions) Discuss cupping of hand and fist formation.	Human Anatomy	Hand & Actions of Muscles of Upper Limb as a functional unit	LGIS/SGD	MCQs/ Viva
MS-A-026	Draw the Radial Artery course, relation and termination in hand with its clinical significance in the region Describe the Ulnar Artery's Course, relation and termination in hand with its clinical significance in the region Describe the formation, branches, and areas of distribution of Superficial and Deep Palmar Arch	Human Anatomy	Blood vessels of forearm and hand	LGIS/SGD	MCQs/ Viva
MS-A-027	Describe the course, relations and branches of Ulnar, Median and Radial Nerves in the Hand	Human Anatomy	Nerves of forearm and hand	LGIS/SGD	MCQs/Viva
MS-A-	Describe the First Carpometacarpal Joint in terms of; Type, Variety, Articular, Surfaces, Ligaments, Relations, Blood Supply, Innervation, movements.			LGIS/SGD	MCQs/Viva
	Demonstrate the movements of the	Human Anatomy	Joints of		

028	1st carpometacarpal joint Describe the Metacarpophalangeal & interpharyngeal Joints in terms of; Type, Variety, Articular Surfaces, Ligaments, Relations, Blood Supply, Innervation & Movements		Hands		
MS-A-029	Palpate the arteries of the upper limb on a subject	Integrate with Medicine	Skills	SGD	OSPE
	Identify the topographical features of upper limb in a cross-sectional model/ specimen.	Integrate with Radiology			
	Demonstrate and identify the anatomical landmarks of upper limb on radiographs/ CT (Computed tomography)/ MRI (Magnetic resonance imaging)				
	Mark the anatomical landmarks and surface marking on a subject/ simulated model				
LOWER LIMB					
COD E	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-A-030	Draw and label the Parts of the hip bone, with its attachments.	Human Anatomy	Hip Bone	SGD	MCQs/Viva
	Describe the parts, attachments of hip bone				
	Identify the parts and bony features of the hip bone, with its attachments, important relations				
	Demonstrate the side determination of hip bone, its bony features, attachments				
	Describe the parts, attachments, side determination of femur				
	Identify the parts and bony features of the femur, with its attachments.				

MS-A-031	Demonstrate the side determination of femur, its bony features, attachments, and important relations (correlate these with fractures)	Human Anatomy	Femur	SGD	MCQs/Viva
	Describe coxa Vara and coxa valga and their clinical significance				
MS-A-032	Describe the extent, attachments, and modifications of Fascia Lata	Human Anatomy	Fascia Lata	LGIS/SGD	MCQs/Viva
	Demonstrate the attachment of fascia Lata, iliotibial tract				
MS-A-033	Describe the cutaneous nerves and vessels of thigh	Human Anatomy	Neurovascular Supply of thigh	LGIS/SGD	MCQs/Viva
	Draw and label the cutaneous nerve supply of thigh and lumbar plexus.				
	Describe the formation, course, relations, tributaries, and termination of the superficial veins				
	Explain the anatomical justification of venesection, varicose veins, and saphenous venous grafts				
	Describe the lymphatic drainage of the region with special emphasis on afferent and efferent of inguinal lymph nodes				
	Identify the superficial and deep lymph nodes				
	Explain the anatomical justification for enlargement of inguinal lymph nodes				
MS-A-034	Describe and identify the Boundaries and contents of femoral triangle	Human Anatomy	Femoral Triangle & Canal	LGIS/SGD	MCQs/Viva
	Draw and label the Boundaries and contents of femoral triangle				
	Identify the femoral sheath with its compartments				
	Describe the formation of femoral sheath and				

	its significance				
	Describe the formation of femoral canal and its contents and significance	Integrate with Surgery			
	Describe the formation and significance of femoral ring				
	Compare and contrast the anatomical features of femoral and inguinal hernias				
MS-A-035	Tabulate the muscles of anterior compartment of thigh with their attachments, nerve supply and actions	Human Anatomy	Muscles of Anterior Compartment of Thigh	LGIS/SGD	MCQs/ Viva
	Demonstrate and identify the muscles of anterior compartment of thigh with their proximal and distal attachments				
	Demonstrate the actions of muscles of anterior compartment of thigh				
	Explain the anatomical basis of psoas abscess	Integrate with Surgery			
MS-A-036	Identify and demonstrate the nerves and vessels of anterior compartment of thigh along with their branches	Human Anatomy	Neurovascular supply of Anterior Compartment of Thigh Adductor	LGIS/SGD	MCQs/ Viva
	Describe the origin, course, relations, branches, distribution, and termination of femoral artery				
	Describe the origin, course, relations, tributaries, area of drainage and termination of femoral vein				
	Describe the origin, course, relations, branches, distribution, and termination of femoral nerve				

	Tabulate the muscles of anterior compartment of thigh with their attachments, nerve supply and actions.		Canal		
MS-A-037	Describe the formation, boundaries, contents of adductor canal	Human Anatomy		LGIS/SGD	
	Identify and demonstrate the boundaries and contents of adductor canal				
MS-A-038	Describe Muscles of medial compartment of thigh with their proximal and distal attachments, innervation and actions		Muscles of Medial Compartment of Thigh	LGIS/SGD	
	Identify the muscles of medial compartment of thigh with their proximal and distal attachments				
	Demonstrate the actions of the muscles of the compartment on self/ subject				
MS-A-039	Describe the origin, course, relations, branches/ tributaries, distribution, and termination of neurovascular structures of medial compartment of thigh		Neurovascular supply of Medial Compartment of Thigh	LGIS/SGD	MCQs/ Viva
	Identify the nerves and vessels of medial compartment of thigh along with their branches				
	Describe and identify the lumbar and sacral plexus and its branches supplying the lower limb				
	Describe the cutaneous nerve supply and lymphatics of the region				
	List the structures passing through the greater and lesser sciatic foramen.	Human Anatomy			
	Describe the muscles of gluteal region with their proximal and distal attachments, innervation, and actions		Gluteal	LGIS/SGD	MCQs/Viva

MS-A-040	Identify the muscles of gluteal region with their proximal and distal attachments	Integrate with Medicine	Human Anatomy	Region		
	Describe the origin, course, relations, branches/ tributaries, distribution, and termination Of neurovascular structures of gluteal region					
	Demonstrate the actions of the muscles of gluteal region					
	Explain the anatomical basis of the consequences of wrongly placed gluteal intramuscular injections Damage to Gluteus medius & minimus due to poliomyelitis					
	Demonstrate and identify the origin, course, relations, branches/tributaries and termination of nerves and vessels of gluteal region					
MS-A-041	Describe the Attachments of muscles of posterior compartment of thigh with the innervation and action	Human Anatomy	Muscles of Posterior Compartment of Thigh	LGIS/SGD	MCQs/ Viva	
	Identify the muscles of posterior compartment of thigh with their proximal and distal attachments					
	Demonstrate the actions of muscles of posterior compartment of thigh					
	Describe the anatomical basis of signs and symptoms of sciatica.					
MS-A-042	Describe the origin, course, relations, branches, distribution, and termination of Profunda femoris	Human Anatomy	Blood supply of Posterior compartment thigh	LGIS/SGD	MCQs/Viva	
	Describe blood supply on back of thigh					
MS-A-043	Describe the origin, course, relations, branches, distribution, and termination of sciatic nerve	Human Anatomy	Sciatic Nerve	LGIS/SGD	MCQs/Viva	

	Describe the anatomical basis, signs and symptoms of compression of or injury to sciatic	Integrate with Surgery			
MS-A-044	Describe the hip joint with its type, articulations, ligaments, stabilizing factors	Human Anatomy	Hip Joint	LGIS/SGD	MCQs/Viva
	Movements, and neuro-vascular supply with clinical significance.				
	Perform the movements of hip joint at various angles and be able to describe the muscles producing the movement. Discuss important associated clinical conditions (Hip dislocation, Arthritis, Hip joint stability and Trendelenburg sign) movements, and neuro-vascular supply with clinical significance.				
MS-A-045	Describe the Boundaries and contents of popliteal fossa. Discuss clinical correlates (Popliteal aneurysm, Palpation of Popliteal artery, semin membranous bursa swelling and Baker's cyst	Human Anatomy	Popliteal Fossa	LGIS/SGD	MCQs/Viva
	Draw and label boundaries and contents of popliteal fossa				
	Identify the boundaries and contents of popliteal fossa				
	Describe the origin, course, relations, branches/tributaries, distribution and termination of popliteal artery and vein				
	Describe parts of tibia and fibula, with their attachments, important relations and side determination			SGD	OSPE

MS-A-046	Identify the parts and bony features of the tibia & fibula, their bony features, attachments, important relations.	Human Anatomy	Knee Joint		
	Draw and label Parts of patella with its attachments			SGD	OSPE
	Describe features of patella, and name the factor responsible for stabilizing Patella				
	Describe the knee joint with its type, articulations, ligaments, movements, and neuro-vascular supply			LGIS/SGD	MCQs/Viva
	Explain the mechanism of locking and unlocking of knee joint with the foot on ground and off the ground Describe the attachments and role of popliteus in locking and unlocking of the knee joint Describe the factors responsible for stability of knee joint. Discuss important associated clinical conditions.				
MS-A-047	Describe the Muscles of anterior, lateral, and posterior compartments of leg with their proximal & distal attachments, innervation, and actions	Human Anatomy	Muscles of leg	LGIS/SGD	MCQs/Viva
	Identify the muscles of anterior, lateral, and posterior compartments of leg with their proximal and distal attachments				
MS-A-048	Describe the origin, course, relations, branches/tributaries and termination of nerves and vessels of anterior, lateral, and posterior compartments of leg- Compartment Syndrome, Foot Drop		Neurovascular supply of Leg	LGIS/SGD	MCQs/Viva
	Describe the cutaneous nerves and veins of leg.				

	Draw and label the cutaneous nerve supply and dermatomes of leg				
MS-A-049	Identify the extensor, flexor, and peroneal retinacula and demonstrate the structures related to them		Flexor, Extensor, and peroneal Reticula	LGIS/SGD	MCQs/Viva
	Describe the attachments, relations, and structures passing under cover of, extensor, peroneal, and flexor retinacula				
	Identify and demonstrate the nerves and vessels of anterior, lateral, and posterior compartments of leg along with their branches				
	Describe the formation of noncalcaneous (Achilles tendon)				
MS-A-050	Describe the articulations, muscles and nerve supply and movements at Tibiofibular joints	Human Anatomy	Tibio-fibular Joint	SGD	MCQs/Viva
MS-A-051	Describe the ankle joint with its type, articulations, ligaments, movements, and nerve supply	Human Anatomy	Ankle Joint	SGD	MCQs/Viva
	Describe the factors stabilizing the ankle joint.				
	Discuss important associated clinical conditions.				
	Identify and demonstrate the articulating surfaces and ligaments of ankle joint				
MS-A-052	Describe the formation, attachments, and clinical significance of plantar aponeurosis	Human Anatomy	Plantar Fascia	LGIS/SGD	MCQs/Viva
	Explain the anatomical basis of the signs and symptoms of plantar fasciitis.	Integrate with Orthopedics			
	Identify the parts and bony features, attachments, and important relations of the articulated foot				

MS-A-053	Describe the muscles of the dorsum and sole of foot with their proximal & distal attachments, innervation and actions emphasizing the role of interossei and lumbricals.	Human Anatomy	Muscles of foot	LGIS/SGD	MCQs/Viva
	Draw and label the muscles of the layers of sole of foot				
	Demonstrate and identify the muscles and tendons with their proximal and distal attachments in the sole of foot				
MS-A-054	Describe the interphalangeal, subtalar and midtarsal joints with their types, articulation, movements, ligaments.	Human Anatomy	Small Joints of foot	SGD	,MCQs/Viva
MS-A-055	Describe the formation, components, stabilizing and maintaining factors of the arches of foot	Integrate with Orthopedics	Arches of foot	LGIS/SGD	MCQs/Viva
	Describe the clinical significance of arches of foot with respect to flat foot, claw foot.				
MS-A-056	Describe the fibrous flexor sheaths, extensor expansions and synovial flexor sheaths	Human Anatomy	Retinacula of foot	LGIS/SGD	MCQs/Viva
MS-A-057	Describe the origin, course, relations, branches/tributaries, distribution, and termination of plantar vessels	Human Anatomy	Neurovascular supply of foot	LGIS/SGD	MCQs/Viva
	Identify the nerves and vessels on the foot along with their branches				
	Describe the cutaneous nerves of foot				
	Draw and label the cutaneous nerve supply and dermatomes of foot				
	Identify the nerves and vessels in the sole of foot along with their branches				

	Describe the palpation of dorsalis pedis artery & explain the clinical significance of dorsalis pedis artery				
MS-A-058	Describe the surface anatomy, course, relations, tributaries, and communications of the superficial veins of the lower limb	Human Anatomy	Arterial and Venous drainage of lower limb	LGIS/SGD	OSPE/Viva
	Draw a concept map of the superficial veins of lower limb				
	List the factors favoring venous return of the lower limb				
MS-A-059	Explain the anatomical basis of the formation, and signs and symptoms of deep venous thrombosis	Integrate with Surgery	Human Gait	LGIS	MCQs/Viva
	Discuss Clinical correlations of Lower Limb Arteries (palpation of femoral, popliteal, posterior tibial & dorsalis pedis arteries, collateral circulation, intermittent claudication, occlusive arterial disease)	Integrate with Medicine			
					MCQs/Viva
MS-A-060	Draw a concept map of the lymphatic drainage of lower limb	Human Anatomy	Lymphatic drainage of lower limb	SGD	MCQs/Viva
MS-A-061	Draw and label the cutaneous nerves & dermatomes of the lower limb Discuss clinical correlates of Lower limb nerves (Femoral nerve injury, Sciatic Nerve injury, Common fibular, tibial & obturator nerve injury) Describe the anatomical basis of knee jerk, ankle jerk, and plantar reflex	Human Anatomy	Cutaneous dermatomes & nerve supply of lower limb	LGIS/SGD	OSPE/Viva

MS-A-062	Demonstrate the surface marking of nerves and vessels of lower limb	Integrate with Radiology	Topographical and radiological anatomy of lower limb	SGD	OSPE
	Demonstrate the surface marking of bony landmarks of lower limb				
	Identify the topographical features of lower limb in a cross-sectional model				
	Demonstrate and identify the features of bones and joints of lower limb on radiograph/ CT scan/ MRI				
MS-A-063	Describe the common fractures of the following bone with the risk factors, clinical presentations, and management: 1. Clavicle 2. Humerus 3. Radius 4. Ulna 5. Small bones of hand 6. Hip bone 7. Femur 8. Tibia 9. Fibula 1. Small bones of foot	Orthopedics and trauma	Bone Fracture	LGIS	MCQs

MS-A-064	Describe the dislocations of the following joints with the risk factors and clinical presentations, and brief management: Shoulder joint 1. Elbow joint 2. Interphalangeal joint of hand 3. Hip joint 4. Knee joint 5. Ankle joint	Orthopedics and trauma	Joint Dislocation	LGIS	MCQs
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EMBRYOLOGY & POST-NATAL DEVELOPMENT

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 06			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-A-065	Describe the development of skeletal muscle and innervation of axial skeletal Muscles-developmental basis of myotome	Human Embryology	Development of Muscles	LGIS	MCQs/ Viva
	Briefly discuss the development of cardiac and smooth muscle (Detail to be covered in respective modules later).				
MS-A-066	Describe the process of limb development and limb growth	Human Embryology	Development of Limb	LGIS	MCQs/Viva
MS-A-067	Describe the embryological basis of cutaneous innervation of limb	Human Embryology	Development of Nerve supply of limbs	LGIS	MCQs/ Viva
	Describe the embryological basis of blood supply of limbs and concept of axial artery				

MS-A-068	Describe the embryological basis of congenital anomalies related to muscular system.	Human Embryology	Congenital anomalies of limbs	LGIS	MCQs/Viva
	Describe the clinical presentations and embryological basis of; i. Amelia ii. Meromelia iii. Phocomelia iv. Cleft Hand and Foot v. Polydactyly, Brachydactyly, Syndactyly i. Congenital club foot	Integrate with Paediatrics		LGIS	MCQs/Viva
MS-A-069	Describe the developmental process of cartilage and bone	Human Embryology	Development of Cartilage	LGIS	MCQs/Viva
	Describe the process of histogenesis of cartilage and bone				

MICROSCOPIC ANATOMY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 06			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMEN T TOOL
MS- A- 070	Describe the microscopic structure and ultramicroscopic structure of skeletal muscle	Histology	Histology of Muscles	LGIS	MCQs/Viva
	Explain the basis of myasthenia gravis.	Integrate with Medicine			
	Describe the microscopicand ultramicroscopic structure of cardiac muscle	Histology			
	Describe the microscopicand ultramicroscopic structure of smooth muscle				
	Compare and contrast the histological features of three types of muscle tissue				

MS-A-071	Describe Myosatellite Cells & their role in regeneration of muscle, hyperplasia, and hypertrophy of muscle fiber	Histology/ Integrate with Pathology	Functional Histology	LGIS	MCQs/Viva
	Explain the histopathological basis of leiomyoma	Histopathology			
MS-A-072	Describe the light and electron microscopic structure of bone cells Describe the light and electron microscopic structure of compact and spongy bone	Histology	Histology of Osseous tissue	LGIS	MCQs/Viva
	Describe the histological justification for osteoporosis, Osteopetrosis	Integrate with Pathology			
	Describe the histological basis for bone repair after fractures.				
MS-A-073	Compare and contrast the microscopic features of compact and spongy bone	Histology	Histology of Bone	LGIS	MCQs/ Viva
	Explain the characteristic features of ossification (Intramembranous & Endochondral ossification)				
	Describe the zones seen in an epiphyseal growth plate				
MS-A-074	Describe the metabolic role of bone -	Integrate with Medicine	Function al Histolog y of Bone	LGIS	MCQs/ Viva
	Describe the clinical presentation of osteoporosis, osteopenia	Integrate with Orthopedics			
MS-	Describe the microscopic and ultramicroscopic structure of all types of cartilage	Histology	Histology of	LGIS	MCQs/Viva
	Compare and contrast the structure of cartilage and bone matrix				

A-075	Tabulate the differences between three types of cartilage		Cartilage		
MS-A-076	Describe the histological basis for bone & Cartilage growth and repair	Histology	Mechanism of Bone growth	LGIS	MCQs/ Viva

NORMAL FUNCTION

MEDICAL PHYSIOLOGY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 32			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-P-001	Explain the Physiological basis of membrane potential	Medical Physiology	Diffusion/ Equilibrium Potentials	LGIS/ SGD	MCQs/ Viva
	Explain diffusion potentials of Na & K				
MS-P-002	Define Nernst potential		Nernst potential	LGIS/SGD	MCQs/Viva
	Explain Physiological Basis of Nernst potential				
	Write the Nernst equation.				
	Calculate Nernst potential for Na & K				
MS-P-003	Explain the effects of altering the concentration of Na ⁺ , K ⁺ , Ca on the equilibrium potential for that ion		Goldman Equation	LGIS/SGD	MCQs/ Viva
	Describe the normal distribution of Na ⁺ , K ⁺ , Ca and Cl ⁻ across the cell membrane				
	Explain physiological basis of Goldman equation				
	Clarify the role of Goldman equation in generation of Resting Membrane Potential (RMP).				
	Describe the Physiological basis of generation of RMP.				

MS-P-004	Explain the effects of hyperkalemia and Hypokalemia on the Resting Membrane Potential (RMP)	Medical Physiology Integrate with Anesthesiology	Resting Membrane Potential in Neurons	LGIS/SGD	MCQs/Viva
	Name the membrane stabilizers				
	Explain the physiological basis of action of Local Anesthetics.				
MS-P-005	Describe the Physiological anatomy of Neurons	Medical Physiology	Neurons	LGIS/SGD	MCQs/Viva
	Discuss the axonal transport				
	Enlist & give functions of Neuroglial cells				
	Explain process of myelination in Central Nervous System (CNS) & Peripheral Nervous System (PNS)				
MS-P-006	Classify neurons functionally.		Classification of Neurons & Fibers	LGIS/SGD	
	Classify nerve fibers according to Erlanger & Gasser Classification				
	Enlist properties of nerve fibers.				
MS-P-007	Discuss Components of ANS (Autonomic nervous system)		Autonomic nervous system	LGIS/SGD	MCQs/Viva
	Explain the physiological anatomy of sympathetic and parasympathetic nervous system				
	Describe the types of adrenergic and cholinergic receptors and their functions				
	Explain the effects of sympathetic and parasympathetic on various organs/ system of body				
	Define Action Potential		Action	LGIS/SGD	MCQs/Viva
	Enlist the properties of action potential				
	Describe the ionic basis of an action potential.				

MS-P-008	Explain the phases of action potential.		Potentia l of Neuron s		
	Explain the effects of hyperkalemia and Hypokalemia on the action potential.				
	Draw monophasic action potential.				
	Explain absolute and relative refractory period				
MS-P-009	Explain the role of other ions in action potential.		Role of other ions in action potential	LGIS/ SGD	MCQs/ Viva
	Elaborate the effect of hypocalcemia on neuron excitability.				
MS-P-010	Explain Physiological basis& properties of Graded potential		Local/ Grade potenti als	LGIS/SGD	MCQs /Viva
	Draw & explain Physiological basis & properties of compound action potential.				
	Contrast between action potential and graded potential				
	Describe the ionic basis of excitatory Post Synaptic Potential (EPSP), Inhibitory Post Synaptic Potential (IPSP), End Plate Potential (EPP).				
MS-P-011	Classify and explain Physiological basis of different types of synapses	Medical Physiology	Synapse	LGIS/SGD	MCQs/Viva
	Elaborate how signal transmission takes place across chemical synapse				
MS-P-012	Explain the mechanism of conduction of Nerve impulse in myelinated and unmyelinated nerve fibers.		Conductio n of Nerve Impulse	LGIS/SGD	MCQs/Viva
	Elaborate significance of saltatory conduction				
	Enlist the types of nerve injury		Nerve	LGIS/SGD	MCQs/Viva
	Explain Wallerian degeneration.				
	Describe the process of regeneration of nerve				

MS-P-013	fiber.		Degeneration		
	Describe the causes, features & pathophysiology of Multiple sclerosis, GB syndrome.	Medical Physiology Integrate with Medicine			
MS-P-014	Discuss the physiological anatomy of skeletal muscles.	Medical Physiology	Skeletal muscle	LGIS/SGD	MCQs/Viva
	Discuss the physiological anatomy of skeletal, smooth, and cardiac muscles.				
	Describe the structure of Sarcomere				
MS-P-015	Differentiate between isometric and isotonic contraction by giving examples.			LGIS/SGD	MCQs/Viva
	Compare the fast and slow muscle fibers.		Characteristics of whole muscle contraction	LGIS/SGD	MCQs/Viva
MS-P-016	Explain the mechanism of summation and Tetanization.	Medical Physiology	Mechanics of muscle contraction	LGIS/SGD	MCQs/Viva
	Describe staircase effect/Treppe phenomena				
	Discuss the mechanism of skeletal muscle fatigue.				
	Explain the remodeling of skeletal muscle to match the function. Describe the development of macro motor units in poliomyelitis.				
	Explain the physiological basis of rigor mortis	Medical Physiology Integrate with Forensic Medicine			
	Describe the physiological anatomy of Neuro Muscular Junction (NMJ)	Medical Physiology		LGIS/SGD	MCQs/Viva
	Mechanism of Neuromuscular transmission &				

MS-P-017	generation of End Plate Potential		Neuromuscular junction		
	Explain features, pathophysiology & treatment of myasthenia Gravis	Medical Physiology Integrate with Medicine		LGIS/SGD	MCQs/Viva
	Describe the enhancers or blockers of neuromuscular transmission at the neuromuscular junction.	Medical Physiology			
	Discuss the steps/ events of excitation contraction coupling in skeletal muscle.	Medical Physiology			
MS-P-018	Differentiate between types of smooth muscles.	Medical Physiology	Smooth Muscle	LGIS/SGD	MCQs/Viva
	Describe mechanism of smooth muscle contraction in comparison to skeletal muscle.				
	Explain the physiological anatomy of neuromuscular junction of smooth muscle				
	Explain the excitatory and inhibitory transmitters secreted at Neuro Muscular Junction (NMJ) of smooth muscles.				
	Explain the depolarization of multiunit smooth muscles without action potentials.				
	Explain the local tissue factors and hormones that can cause smooth muscle contraction without action potential.			LGIS/SGD	MCQs/Viva
	Explain the regulation of smooth muscle contraction by calcium ions.				
	Explain membrane potential and action potentials in smooth muscles.				
	Explain the phenomena of stress relaxation and reverse stress relaxation in smooth muscles.				
	Explain the LATCH mechanism				

	Describe the significance of LATCH mechanism.				
	Explain the nervous and hormonal control of Smooth Muscle Contraction.				
MEDICAL BIOCHEMISTRY					
C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 30			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-B-001	Classify carbohydrates along with the structure and biomedical importance of each class	Biochemistry	Classification carbohydrates	LGIS/SGD	MCQs/Viva
MS-B-002	Explain the isomerization of carbohydrates	Biochemistry	Carbohydrates	LGIS/SGD	MCQs/Viva
MS-B-003	Describe the physical and chemical properties of carbohydrates	Biochemistry	Extracellular matrix	LGIS/SGD	MCQs/Viva
	Differentiate between proteoglycan and glycoproteins				
	Describe the components of extracellular matrix: 1. Describe structure, functions and clinical significance of glycosaminoglycans 2. Discuss structure and functions of Fibrous proteins (collagen and Elastin) 3. Interpret diseases associated with them on basis of sign/symptoms and data 4. Interpret the importance of vitamin C in collagen synthesis 5. Describe sources, active form, functions and deficiency diseases of vitamin C	Biochemistry			
	1. Identify the defects in collagen synthesis based on given data (Osteogenesis Imperfecta)			LGIS/SGD	MCQs/Viva

	Interpret genetic basis of Duchene muscular dystrophy Explain the transport and uptake of glucose in cells, steps of glycolysis and citric acid cycle along with enzymes, co enzymes and cofactors involved	Biochemistry			
MS-B-004	Discuss the provision of energy to the muscles and cells through glycolytic pathway and TCA cycle	Biochemistry	Glycolysis and Tricarboxylic acid cycle (TCA)	LGIS/SGD	MCQs/ Viva
MS-B-005	Describe the digestion and absorption of proteins Discuss the uptake of amino acids by cells Define amino acid pool and nitrogen balance. Explain ATP -dependent & ATP independent systems of protein degradation.	Biochemistry	Protein Digestion & Transport across cell	LGIS/SGD	MCQs/ Viva
MS-B-006	Explain following reactions with enzymes involved in it: 1. Transamination 2. Deamination decarboxylation 3. Deamidation 4. Trans deamination. 1. Oxidative deamination.	Biochemistry	Reactions involve in catabolism	LGIS/SGD	MCQs/ Viva
MS-B-007	Explain the role of pyridoxal phosphate, glutamate, glutamine, alanine and discuss the mechanism of transport of ammonia to liver	Biochemistry	Transportation of ammonia to liver	LGIS/SGD	MCQs/ Viva
MS-B-008	Illustrate steps of urea cycle with enzymes and its importance Discuss ammonia intoxication	Biochemistry	Urea cycle	LGIS/SGD	MCQs/ Viva

MS-B-009	Interpret different types of hyperammonemia on basis of sign symptoms and data				
MS-B-010	Discuss the metabolism of aliphatic, aromatic, branched chain, sulfur containing, hydroxyl group containing amino acids with the products formed and enzymes and vitamins involved in them	Biochemistry	Protein metabolism	LGIS/SGD	MCQs/Viva
MS-B-011	Interpret the following on basis of given data: 1. Phenylketonuria 2. Tyrosinemia 3. Albinism 4. Homocystinuria 5. Maple syrup urine disease 6. Alkaptonuria	Biochemistry	Inborn errors of amino acid metabolism	LGIS/SGD	MCQs/Viva

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

THEORY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 4+7=11			
		DISCIPLINE	TOPIC	TEACHING/LEARNING	ASSESSMENT TOOLS
MS-Ph-001	Explain the mechanism by which drugs can stimulate NMJ.	Pharmacology & Therapeutics	Drugs acting on Neuromuscular Junction (NMJ)	LGIS	MCQs
	Explain the mechanism by which drugs can block NMJ.				
MS-Ph-002	Discuss briefly the therapeutic effect of drugs used in myasthenia gravis.		Drugs in Myasthenia Gravis	LGIS	MCQs
MS-Ph-003	Discuss briefly the therapeutic effect of drugs used as local anesthetics.		Local Anesthetics	LGIS	MCQs

MS-Pa-001	Describe the hyperplasia, hypertrophy, and atrophy of muscle fiber	Pathology	Muscle remodeling	LGIS	MCQs
	Explain the histopathological basis of leiomyoma				
MS-Pa-002	Describe the histological basis of Duchenne Muscular Dystrophy.		Diseases of Muscle	LGIS	MCQs
MS-Pa-003	Describe the clinical presentation and histological justification for osteoporosis, osteopetrosis		Diseases of Bone	LGIS	MCQs
	Briefly enlist the steps of repair.				
MS-Pa-004	Describe the histological basis for bone repair after fracture and cartilage growth and repair		Disease of Cartilage	LGIS	MCQs

AGING

THEORY

C O D E	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04			
		DISCIPLINE	TOPIC	TEACHING / LEARNING	ASSESSMENT TOOLS
MS-Ag-01	Discuss the effect of age on bone fragility and its implications with management.	Geriatrics/ Medicine/ Biochemistry	Bone	LGIS	MCQs
MS-Ag-02	Discuss the effect of age on loss of cartilage resilience and its implications and management		Cartilage	LGIS	MCQs
MS-Ag-03	Discuss the effect of age on Muscular strength and its implications and management		Muscle	LGIS	MCQs

MS-Ag-04	Explain the protective effect of estrogen (female sex hormone) on bone mineral density and relate it to increased prevalence of postmenopausal fractures in women.		Effect of estrogen on BMD	LGIS	MCQs
DISEASE PREVENTION AND IMPACT					
C O D E	COMMUNITY MEDICINE & BEHAVIORAL SCIENCE	TOTAL HOURS = 14+3=17			
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC	TEACHING / LEARNING	ASSESSMENT TOOLS
MS-CM-001	Explain causes of low back pain Describe prevention of low back pain	Community Medicine and Public Health	Back Pain	LGIS	MCQs
MS-CM-002	Describe work related musculoskeletal disorders in addition with its burden/epidemiology		Work related Musculoskeletal disorders	LGIS	MCQs
	Identify risk factors of Musculoskeletal disorders MSD at workplace Describe prevention of exposure to risk factors related to workplace				
MS-CM-003	Describe MSD related to mobile addition with its burden/epidemiology Describe MSD related to mobile usage (Text neck, Trigger thumb, DeQuervain Syndrome, Carpel Tunnel Syndrome) Identify risk factors related to MSD due to excessive mobile usage. Describe the preventive strategies for mobile addiction-related MSD.	Community Medicine and Public Health	MSD related to mobile usage	LGIS	MCQs

MS-CM-004	Describe the application of ergonomics in MSD related to the above disorders.	Community Medicine and Public Health	Ergonomics	LGIS	MCQs
MS-CM-005	Describe the concept of non-communicable Musculoskeletal diseases		Noncommunicable disease	LGIS	MCQs
MS-CM-006	Identify the risk factors in the community for Osteoporosis		Risk factor assessment of Musculoskeletal diseases	LGIS	MCQs
	Learn and apply interventions to prevent the risk factors for various musculoskeletal diseases in the community.				
MS-BhS-001	Identify and deal with the various psychosocial aspects of Musculoskeletal conditions (such as Osteoarthritis, Osteomyelitis, Rheumatoid arthritis, Gout, chronic back pain, psychosomatic complaints) and Neuromuscular conditions (Muscular dystrophy, Myasthenia Gravis, Sclerosis) on Individual, Family and Society	Behavioral Sciences	Psychosocial factors influencing chronic illnesses	LGIS	MCQs
MS-BhS-002	Identify the psychosocial risk factors as mediating factors between illness and its effect.		Psychosocial Impact of Disease and its management	LGIS	MCQs
	Discuss the role of psychological variables like coping, social support, and other health cognitions in mediating between illness and its effect.				

PRACTICAL

HISTOLOGY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 08			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOLS
MS-A-077	Draw and label the histology of skeletal muscle	Histology	Histology of Muscles	Practical	OSPE
	Draw and label the histology of smooth muscle				
	Draw and label the histology of cardiac muscle				
MS-A-078	Draw and label the histological picture of compact bone	Histology	Histology of Bones	Practical	OSPE
	Draw and label the histological picture of spongy bone				
MS-A-079	Draw and label the microscopic structure of hyaline cartilage	Histology	Histology of Cartilage	Practical	OSPE
	Draw and label the microscopic structure of elastic cartilage				
	Draw and label the microscopic structure of fibro cartilage				

PHYSIOLOGY					
C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=02			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-P-019	Demonstrate and categorize the following movements: Pushing against the wall, Biceps curls, squats, yoga chair pose, standing on toes, running on an inclined treadmill, yoga tree pose, deadlift as isotonic and isometric skeletal muscle contraction.	Physiology	Locomotion	Practical	OSPE
MS-P-020	Interpret the graph of local/action potential/compound action potential from the recording of nerve fibers, & nerve trunk.	Physiology	Nerve Fibers	Practical	OSPE
MS-P-021	Interpret the graph of local/action potential from the recording of skeletal, & smooth muscles.	Physiology	Muscles	Practical	OSPE
MS-P-022	Interpret the graph of frequency summation and tetanization	Physiology			
BIOCHEMISTRY					
C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=04			
		DISCIPLINE	TOPIC	TEACHING/ LEARNING	ASSESSMENT TOOL
MS-	Estimate total proteins by kit method.		Total	Practical	OSPE

B-012		Biochemistry	proteins		
MS-B-013	Estimate serum albumin level. Calculate serum globulin level.		Albumin/globulin	Practical	OSPE

PHARMACOLOGY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=03			
		DISCIPLINE	TOPIC	TEACHING/LEARNING	ASSESSMENT TOOLS
MS-Ph-004	Label the diagram of the neuromuscular junction showing non depolarizing/depolarizing blockage.	Pharmacology	NMJ Blockers	Practical	
	Enumerate drugs for Myasthenia Gravis.				
	Label the diagram to show the effect of Neostigmine in the treatment of Myasthenia Gravis				
	Identify Ampules of neuromuscular blocking agents (e.g., Succinylcholine and Atracurium) and local anesthetics (or their pictures) with their MOA, clinical uses and adverse effects.				

PATHOLOGY

C O D E	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=02			
		DISCIPLINE	TOPIC	TEACHING/LEARNING	ASSESSMENT TOOLS

MS-Pa-005	Identify the salient gross and microscopic features of Leiomyoma.	Pathology	Leiomyoma	Practical	OSPE
MS-Pa-006	Identify the salient gross and microscopic features of steps of bone healing (Pictorial) with factors and complications affecting bone healing.		Bone healing	Practical	OSPE

WEEKLY TIMETABLES

MSK Module Schedule (1st Year MBBS)

WEEK- 01/08

Day/Date	8:00 - 08:50	08:50 - 9:40	9:40 - 10:30	10:30 - 11:20	11:20 - 12:10	12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 11/5/26	PERL LGIS	Biochem LGIS	BLOCK-1 Post Paper Discussion		SGD (Physio/Bio)	Osteology Anat	Lunch/ prayer Break	Quran	Anat SGD
Tuesday 12/5/26	Practical (Anat, Bio, Physio)		Embryo LGIS	Physio LGIS	SGD (Physio/Bio)	Osteology Anat		Expository	Anat SGD
Wednesday 13/5/26	Practical (Anat, Bio, Physio)		Anat LGIS	Biochem LGIS	Physiology LGIS	Osteology Anat		CFRC/Skill Lab	Anat SGD
Thursday 14/5/26	Practical (Anat, Bio, Physio)		Anat LGIS	Biochem LGIS	Physiology LGIS	Osteology Anat		Community Med LGIS	Anat SGD
Friday 15/5/26	8:00-8:50 Community Med		8:50 -10:30 Anat Dissection Table		10:30-11:20 Histo LGIS	11:20-12:10 Physio LGIS		12:10-1:00 BS LGIS	Pathology LGIS

WEEK- 02/08

Day/Date	8:00 - 08:50	08:50 - 9:40	9:40 - 11:20		11:20 - 12:10	12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 18/5/26	PERL LGIS	Biochem LGIS	Weekly Assessment		SGD (Physio/Bio)	Osteology Anat	Lunch/ prayer Break	Pak/Islamiyat LGIS	Anat SGD
Tuesday 19/5/26	Practical (Anat, Bio, Physio)		Embryo GIS	Physio LGIS	SGD (Physio/Bio)	Osteology Anat		Expository	Anat SGD
Wednesday 20/5/26	Practical (Anat, Bio, Physio)		Anat LGIS	Biochem LGIS	Physiology LGIS	Osteology Anat		CFRC/Skill Lab	Anat SGD
Thursday 21/5/26	Practical (Anat, Bio, Physio)		Anat LGIS	Physio LGIS	11:20- 12:10 Biochem LGIS	Osteology Anat		Community Med LGIS	Anat SGD
Friday 22/5/26	8:00-8:50 Community Med		8:50-10:30 Anat Dissection Table		10:30-11:20 Histo LGIS	11:20-12:10 Physio LGIS		12:10-1:00 BS LGIS	Pathology LGIS

WEEK- 03/08								
Day/Date	8:00 - 8:50	8:50 - 9:40	9:40 - 11:20	11:20 - 12:10	12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 25/5/26						Lunch/ prayer Break		
Tuesday 26/5/26	EID HOLIDAYS							
Wednesday 27/5/26								
Thursday 28/5/26								
Friday 29/5/26								

WEEK- 03/08								
Day/Date	8:00 - 8:50	8:50 - 9:40	9:40 - 11:20	11:20 - 12:10	12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 1/6/26	PERL LGIS	Biochem LGIS	Weekly Assessment	SGD (Physio/Bio)	Osteology Anat	Lunch/ prayer Break	Quran LGIS	Anat SGD
Tuesday 2/6/26	Practical (Anat, Bio, Patho)		Embryo LGIS	Physio LGIS	SGD (Physio/Bio)	Osteology Anat	Expository	Anat SGD
Wednesday 3/6/26	Practical (Anat, Bio, Patho)		Anat LGIS	Biochem LGIS	Physiology LGIS	Osteology Anat	CFRC/Skill Lab	Anat SGD
Thursday 4/6/26	Practical (Anat, Bio, Patho)		Anat LGIS	10:30- 12:10 Integrated CBL		Osteology Anat	Community Medicine LGIS	Anat SGD
Friday 5/6/26	8:00-8:50		8:50-10:30		10:30-11:20	11:20-12:10	BS LGIS	Pathology LGIS
	Community Med		Anat Dissection Table		Histo LGIS	Physio LGIS		
					Osteology Anat			

WEEK-04/08										
Day/Date	8:00 - 8:50	8:50 – 9:40	9:40 - 11:20		11:20 - 12:10		12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 8/6/26	PERL LGIS	Biochem LGIS	Weekly Assessment		SGD (Physio/Bio)		Osteology Anat	Lunch/ prayer Break	Pak/Islamiayt LGIS	Anat SGD
Tuesday 9/6/26	Practical (Anat, Bio, Patho)		Anat LGIS	Physio LGIS	SGD (Physio/Bio)		Osteology Anat		DSL	Anat SGD
Wednesday 10/6/26	Practical (Anat, Bio, Patho)		Anat LGIS	Biochem LGIS	Physiology LGIS		Osteology Anat		CFRC/Skill Lab	Anat SGD
Thursday 11/6/26	Practical (Anat, Bio, Patho)		Anat LGIS	Physio LGIS	11:20- 12:10		Osteology Anat		CM LGIS	Anat SGD
					Biochem LGIS					
Friday 12/6/26	8:00-8:50		8:50-10:30		10:30-11:20	11:20-12:10	12:10-1:00	Pharma LGIS	Pathology LGIS	
	Community Med		Anat Dissection Table		Histo LGIS	Physio LGIS	Osteology Anat			

WEEK- 07/08										
Day/Date	8:00 - 8:50	8:50-9:40	9:40 - 11:20		11:20 - 12:10		12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 27/7/26	DSL	Biochem LGIS	Weekly Assessment		SGD (Physio/Bio)		Osteology Anat	Lunch/ prayer Break	DSL	Anat SGD
Tuesday 28/7/26	Practical (Anat, DSL, Pharma)		Anat LGIS	Physio LGIS	SGD (Physio/Bio)		Osteology Anat		Aging	Anat SGD
Wednesday 29/7/26	Practical (Anat, DSL, Pharma)		Anat LGIS	Biochem LGIS	Physio LGIS		Osteology Anat		CFRC/Skill Lab	Anat SGD
Thursday 30/7/26	Practical (Anat, DSL, Pharma)		Anat LGIS	10:30 - 12:10 Integrated CBL			Osteology Anat		CM LGIS	Anat SGD
Friday 30/7/26	8:00-8:50		8:50-10:30		10:30-11:20	11:20-12:10	12:10-1:00		1:30-2:10	2:10 - 3:00
	Community Med		Anat Dissection Table		Anat LGIS	DSL	Osteology Anat		Pharma LGIS	Pathology LGIS
WEEK- 08/08										
Day/Date	8:00 - 8:50	8:50-9:40	9:40 - 11:20		11:20 - 12:10		12:10-1:00	1:00-1:30	1:30-2:10	2:10 - 3:00
Monday 3/8/26	BLS Workshop						Osteology Anat	Lunch/ prayer Break	DSL	Anat SGD
Tuesday 4/8/26	BLS Workshop						Osteology Anat		Aging	Anat SGD
Wednesday 5/8/26	BLS Workshop						Osteology Anat		CFRC/Skill Lab	Anat SGD
Thursday 6/8/26	BLS Workshop						Osteology Anat		DSL	Anat SGD
Friday 7/8/26	8:00-8:50		8:50-10:30		10:30-11:20	11:20-12:10	12:10-1:00		1:30-2:10	2:10 - 3:00
	BLS Workshop						Osteology Anat		DSL	DSL

ASSESSMENT TOOLS

Students will be assessed by the following methods

1. Weekly Assessments

Weekly assessments will be conducted on Monday.

2. Assignments/ PBLs:

Assignments /PBLs will be given monthly.

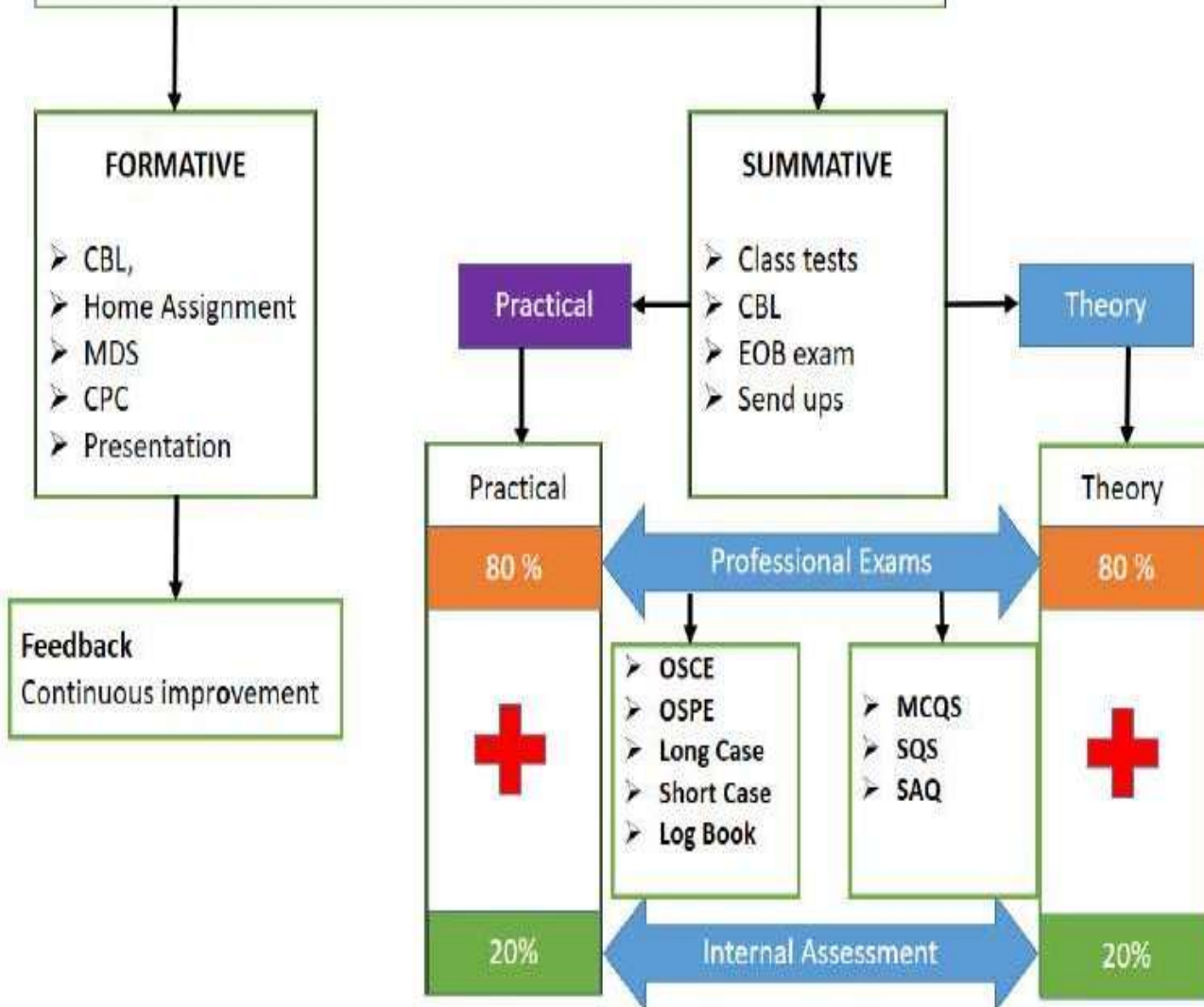
3. Block exam:

At the end of block an exam will be conducted comprising of theory (MCQs & SEQs) and practical/ OSPE content.

4. Departmental quizzes, presentations & group projects:

Above mentioned can be the assessment tools for different departments on their will.

Assessment



UHS BLOCK-2 EXAM MARKS DISTTRIBUTIONS:

Theme	Subject	Written Exam		Oral/Practical/Clinical Exam			
		MCQ (1 mark)	Marks	OSPE (8 marks each observ ed)	OSCE (5 marks each observ ed)	OSVE (14 marks each observ ed)	Marks
Normal Structure	Anatomy applied/clinical	55	55	05	-	01	54
Normal Function	Physiology applied/clinical	27	27	02	-	01	30
	Biochemistry applied/clinical	23	23	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	06	-	-	-	-
	Behavioral Sciences	04	04	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	15	15	01	-	-	08
	Pharmacology	10	10	01	-	-	08
CFRC	CF-I	-	-	-	01	-	05
PERLs	PERLs-I	-	-	-	01	-	05
Total		140	140	11 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

RECOMMENDED SOURCES

Anatomy

- Snell's Clinical Anatomy 10th ed.
- Langman's Medical Embryology 12th ed
- Medical Histology by Laiq Hussain Siddiqui 8th edition.
- General Anatomy by Laiq Hussain Siddiqui 6th edition.

Biochemistry

- Harpers illustrated Biochemistry (latest edition). Rodwell.V.W MCGrawHill publishers.
- Lippincott illustrated Review (latest edition). Kluwer.W.
- Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.

Pathology

- Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.
- Robbins and Cotran Pathological Basis of Disease. Kumar, V., Abbas, A. and Aster, J. Latest Edition
- Richard Mitchall, Vinary Kumar, Abul K. Abbas and Nelson Fausto Robbins and Cotran, Pocket
- Companion to Pathologic basis of diseases, Saunder Harcourt.
- Walter and Israel. General Pathology. Churchill Livingstone.
- Robbins & Kumar, Medical Microbiology and Immunology Levinson.

General Medicine

- Principles and Practice of Medicine by Davidson (latest edition)
- Clinical Medicine by Parveen J Kumar & Michael Clark
- Oxford Handbook of Medicine
- Macleod's Clinical Examination book
- Medicine and Toxicology by C.K. Parikh
- Hutchison's Clinical Methods by Michael Swash. 21st edition

Pharmacology And Therapeutics

- Katzung and Trevor's Pharmacology: Examination and Board Review- 15th Edition
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 16th Edition-
- Current Medical Diagnosis and Treatment- reference book –Edition-2024
- Basic and Clinical Pharmacology by Bertram G Katzung (case scenarios only) - 15th Edition
- Basic and Clinical Pharmacology by Katzung, McGraw-Hill. 16th Edition.
- Pharmacology by Champe and Harvey, Lippincott Williams & Wilkins 8th Edition.
- Katzung Basic and Clinical pharmacology, Lippincot Illustated reviews.

- Clinical Pathology Interpretations by A. H. Nagi

Behavioural Sciences

- Handbook of Behavioural Sciences by Prof. Mowadat H.Rana, 3rd Edition
- Medical and Psychosocial aspects of chronic illness and disability 6th edition by Donna R.Falvo and Beverly E.Holland,
- Integrating behavioral sciences in healthcare, Asma Humayun,2003, 1st edition

Community medicine

- Parks Textbook of Preventive and Social Medicine. K. Park
- Public Health and Community Medicine by Ilyas Ansari
- MSDS manual of Government of Punjab
- Text book of Community Medicine by Park J E. Latest Edition

Surgery

- Bailey & Love's Short Practice of Surgery (latest edition)
- Browse's Introduction to the Symptoms & Signs of Surgical Disease 4th Edition
- Bailey & Love Short Practice of Surgery, Clinical Surgery pearls by Dayananda Babu RACS for Surgical Audits.

Patient Safety

- Patient Safety Curriculum Guide: Multi Professional Guide

Microbiology

- Levinson's review of Microbiology
- Medical Microbiology and Immunology by Levinson and Jawetz

Pediatrics Medicine

- Nelson Textbook of Pediatrics
- Basis of Pediatrics by Pervez Akbar Khan

Gynecology

- Gynecology by Ten Teachers

Infection Control

- National Guidelines Infection Prevention and control, National Institute of Health Pakistan Biosafety
- Biosafety in Microbiological and Biomedical Laboratories, 6th Edition (CDC, USA)
- WHO Laboratory Biosafety Manual, Fourth Edition, And Associated Monographs
- WHO safe management of wastes from healthcare facilities chapter 7 -8 page 77-99, 105-125)

Family medicine

- Oxford Handbook of General Practice, 5th Edition

Orthopedics

- Apley and Solomon's System of Orthopaedics and Trauma by Ashley Blom (Editor) Rheumatology
- Davidson's Principles and Practice of Medicine
- Clinical Medicine by Parveen J Kumar & Michael Clark
- Hutchison's Clinical Methods by Michael Swash

Radiology

- Aids to Radiological Differential Diagnosis by Chapman S. and Nakielny R. 4th edition. Elsevier Science Limited; 2003.

Forensic Medicine

- Knight's Forensic Pathology by Barnard Knight 3rd edition
- G. Principles and Practice of Forensic Medicine by Prof. Nasib R. Awan, 2nd edition
- Forensic DNA Typing – 2nd Edition, Author: John M. Butler
- Parikh's Text book of Medical Jurisprudence, Forensic Medicine and Toxicology by C.K. Parikh 6th Ed., CBS Publisher.
- Gun Shot Wounds 2nd edition by V.J. De Maio
- Knight B. Simpson's Forensic Medicine.
- Knight and Pekka. Principles of Forensic Medicine

Forensic Pathology

- Forensic pathology 2nd edition by V.J. De Maio CRC press Boca Raton London New York Washington DC

Toxicology

- Principles of clinical toxicology 3rd edition Thomas . Gossel CRC press Taylor and Francis group

Forensic Sciences

- Fundamentals of Forensic Science- 3rd Edition: Author: Max M Houck, Jay A. Siegel
- Text Book of forensic medicine and toxicology Principles and Practice 5th edition by Krishan Vig

Biomedical ethics

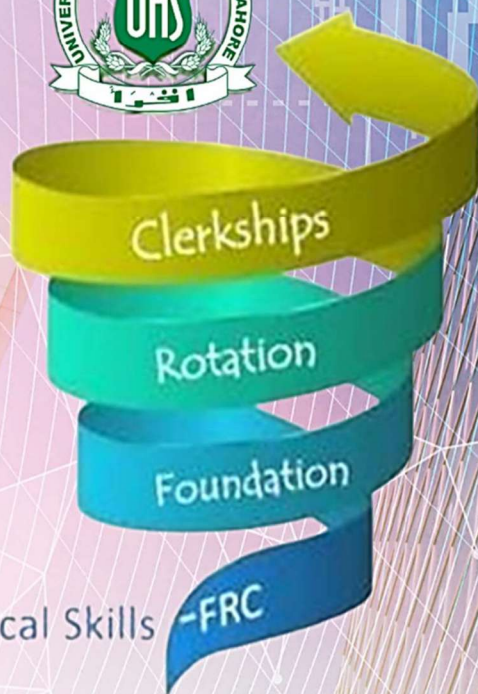
- Principles of Biomedical ethics, 8th edition by Tom. L. Beauchamp, James F. Childress.

Evidence Based Medicine

VOLUME:01

C-FRC

**CLINICAL-FOUNDATION
ROTATION CLERKSHIPS**



**Modular Integrated
Curriculum 2K23**



YEAR-01



Clinical Skills

-FRC

C-FRC-01

YEAR-01

Clinical Foundation

A 3D graphic featuring a white, pill-shaped button with the text "BLOCK-02" in bold, dark blue capital letters. The button is set against a blue background that includes a curved, ribbon-like shape above it and a blue circular base below it.

BLOCK-02

MUSCULOSKELETAL AND LOCOMOTION MODULE

Objectives	Skill	Miller's Pyramid Level Reflected
Measure body temperature using a mercury/digital thermometer	Body temperature	Shows
Examine the wrist joint for functionality	Wrist joint examination	Shows
Examine strength of the upper limb	Upper limb strength and power examination	Shows
Examine strength of the lower limb	Lower limb strength and power examination	Shows
Examine the knee joint for functionality	Knee joint examination	Shows
Examine the shoulder joint for functionality	Shoulder joint examination	Shows
Examine the hip joint for functionality	Hip joint examination	Shows
*Identify common fractures showing in x rays of upper limb	X ray common fractures Upper limb	Knows how

- ❖ These skills are at the 'Knows how' level of the miller's pyramid, meaning thereby that students need not perform them themselves but may develop a perception regarding them by observing performance/working on simulated patients/facilitation with videos.

Place a “√” in case box if step/task is performed satisfactorily, an “X” if it is not performed satisfactorily, or **N/O** if not observed.

Satisfactory: Performs the step or task according to the standard procedure or guidelines

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Date Observed: _____

CHECKLIST FOR BODY TEMPERATURE (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)		
STEP/TASK			
GETTING READY: Before proceeding further, check if the patient has recently taken cold or hot food/drink or smoked. Dip the thermometer in antiseptic (spirit) and wipe dry. If analogue thermometer, shake it until the normal temperature is pushed below 35°C. If digital thermometer, switch it on and it will show the room temperature on the display.			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
THE PROCEDURE: 1. Explain the procedure to the patient and get a verbal consent to proceed. 2. Keep the thermometer bulb/probe under the patient's tongue. Ask the patient to close the lips firmly around the thermometer but without biting it			

3. Keep it in place for at least 2 minutes.			
4. Read the temperature as soon as you pull out the instrument			
5. After use, clean the instrument with antiseptic and wipe it off			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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CHECKLIST FOR WRIST JOINT EXAMINATION (Some of the following steps/tasks should be performed simultaneously.)		CASES (Minimum 3 Entries)		
STEP/TASK				
THE PROCEDURE:				
1. Explain the procedure to the patient and get a verbal consent to proceed.				
2. Adequately expose hands and wrists of the patient				
3. before starting with the examination, inquire about pain in any area.				
4. Observe both hands and wrists for any asymmetry, scars, and muscle wasting				
5. Palpate the wrists for evidence of any joint line irregularities or tenderness				
6. Ask patients to perform wrist extension “put the palms of your hands together and extend your wrists fully “. normal range of movement is 90 degrees				
7. Ask the patient to perform wrist flexion “put the backs of your hands together and flex your wrist fully”, normal range of motion id 90 degrees				
8. Ask the patient to fully relax and allow you to move their hand and wrist for them. Warn them that in case any pain is felt they should report immediately.				
9. Repeat movements 6 and 7 passively.				

SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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Date Observed: _____

CHECKLIST FOR EXAMINATION OF UPPER LIMB STRENGTH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
THE PROCEDURE:			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Ensuring privacy, adequately expose the arms of the patient			
3. Before starting the testing for power and strength, for each muscle group check: a. appearance of the muscle (wasted, highly developed or normal) b. Feel tone of muscle (flaccid, normal, clinic)			
4. Observe both hands and wrists for any asymmetry, scars, and muscle wasting			
5. Starting with the deltoids, ask the patient to raise both their arms in front of them simultaneously as strongly as then can while the examiner provides resistance to this movement. Compare the strength of each arm.			
6. Ask the patient to extend and raise both arms in front of them as if they were carrying a pizza. Ask the patient to keep their arms in place while they close their eyes and count to 10. Normally their arms will remain in place.			
7. Test the biceps muscle flexion by holding the patient's wrist from above and instructing them to "flex their hand up to their shoulder". Provide resistance at the wrist. Repeat and			

compare to the opposite arm.

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8. Ask the patient to extend their forearm against the examiner's resistance. Make certain that the patient begins their extension from a fully flexed position because this part of the movement is most sensitive to a loss in strength. This tests the triceps. Note any asymmetry in the other arm			
9. Test the strength of wrist extension by asking the patient to extend their wrist while the examiner resists the movement. This tests the forearm extensors. Repeat with the other arm.			
10. Examine the patient's hands and test the patient's grip by having the patient hold the examiner's fingers in their fist tightly and instructing them not to let go while the examiner attempts to remove them. Normally the examiner cannot remove their fingers. This tests the forearm flexors and the intrinsic hand muscles. Compare the hands for strength asymmetry			
11. Test the intrinsic hand muscles once again by having the patient abduct or "fan out" all of their fingers. Instruct the patient to not allow the examiner to compress them back in. Normally, one can resist the examiner from replacing the fingers			
12. Test the strength of the thumb opposition by telling the patient to touch the tip of their thumb to the tip of their little finger. Apply resistance to the thumb with your index finger. Repeat with the other thumb and compare.			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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CHECKLIST FOR EXAMINATION OF LOWER LIMB STRENGTH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
THE PROCEDURE:			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Ask the patient to lie down and raise each leg separately while the examiner resists. Repeat and compare with the other leg. This tests the iliopsoas muscles.			
3. Test the adduction of the legs by placing your hands on the inner thighs of the patient and asking them to bring both legs together. This test the adductors of the medial thigh.			
4. Test the abduction of the legs by placing your hands on the outer thighs and asking the patient to move their legs apart. This tests the gluteus maximus and gluteus minimums.			
5. Test the extension of the hip by instructing the patient to press down on the examiner's hand which is placed underneath the patient's thigh. Repeat and compare to the other leg. This tests the gluteus maximus			
6. Test extension at the knee by placing one hand under the knee and the other on top of the lower leg to provide resistance. Ask the patient to "kick out" or extend the lower leg at the knee. Repeat and compare to the other leg. This tests the quadriceps muscle.			
7. Test flexion at the knee by holding the knee from the side and applying resistance under the ankle and instructing the patient to pull the lower leg towards their buttock as hard as possible. Repeat with the other leg. This tests the hamstrings			
8. Test dorsiflexion of the ankle by holding the top of the ankle			

and have the patient pull their foot up towards their face as hard as possible. Repeat with the other foot. This tests the muscles in the anterior compartment of the lower leg. Holding the bottom of the foot, ask the patient to "press down on the gas pedal" as hard as possible. Repeat with the other foot and compare. This tests the gastrocnemius and soleus muscles in the posterior compartment of the lower leg			
9. Ask the patient to move the large toe against the examiner's resistance "up towards the patient's face. This tests the extensor hallucis longus muscle.			
POST PROCEDURE:			
1. 'Wash your hands, thank the patient'			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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Unsatisfactory: Unable to perform the step or task according to the standard procedure or guidelines

Date Observed: _____

CHECKLIST FOR EXAMINATION OF LOWER LIMB STRENGTH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
THE PROCEDURE:			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Ensure adequate exposure of the knee joints while maintaining patient privacy.			
3. Inspect the alignment of both legs, both paellas. Check for varus/vulgus deformities, swellings. Inspect skin for any scars, plaques, erythema.			
4. Check swelling at level of joints			
5. simultaneously assess and compare knee joint temperature using the back of your hands.			
6. Measure quadriceps with an inch tape 20 cm diameter above the tibial tuberosity and compare with other side.			
7. Ask the patient regarding any pan and discomfort and then start examining normal side of patient (in supine position)			
8. Flex the knee to (0 degrees, then feel along the joint line (quadriceps tendon → patella → patella tendon → tibial tuberosity → tibial plateau → femoral epicondyles and over course of medial collateral ligament and lateral collateral ligament → popliteal fossa) for ant swelling/ thickness/tenderness			
9. Test active then passive movements, keeping one hand on the knee to feel for crepitus. 1. Flexion (140°) 2. Extension (0°)			

10. Passively raise leg at ankle and look for knee hyperextension			
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11. Perform the patellar tap: with patients knee fully extended, empty the suprapatellar pouch by sliding your left hand down the thigh to the upper border of the patella.			
12. Keep your left hand in position and use right hand to press downwards on the patella with your fingertips. if there is fluid present you will feel a distinct tap as patella bumps against femur			
POST PROCEDURE:			
1. 'Wash your hands, thank the patient'			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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Date Observed: _____

CHECKLIST FOR EXAMINATION OF HIP JOINT EXAMINATION (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
THE PROCEDURE:			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Ensure adequate exposure of the legs while maintaining patient privacy. Provide a covering sheet for the patient. (Students examining patients of an opposite gender must be with a chaperone.)			
3. Ask the patient if they have any pain before proceeding			
4. Inspect the joint and legs for any deformity, scarring or swelling			
5. Ask the patient to walk to the end of the examination room and then turn and walk back whilst you observe their gait			
6. Ask patient to lie down for next part pf the examination.			

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7. With the patient still positioned supine on the clinical examination couch simultaneously assess and compare hip joint temperature using the back of your hands.			
8. Palpate the greater trochanter of each leg for evidence of tenderness			
9. To assess apparent leg length, measure and compare the distance between the umbilicus and the tip of the medial malleolus of each limb.			
10. To assess true leg length, measure from the anterior superior iliac spine to the tip of the medial malleolus of each limb.			
11. For active hip flexion Place your hand under the lumbar spine to detect masking of restricted hip joint movement by the pelvis and lumbar spine and ask the patient to <i>"bring your leg to your chest as much as you can"</i>			
12. For active hip extension ask the patient to extend their leg so that it lies flat on the bed.			
13. Perform passive hip flexion, Whilst supporting the patient's leg, flex the hip as far as you are able, making sure to observe for signs of discomfort.			
14. For passive hip internal rotation, Flex the patient's hip and knee joint to 90° and then rotate their foot laterally.			
15. For passive hip external rotation, flex the patients hip and knee joint to 90° and rotate the foot medially			
16. To perform passive hip abduction: a. With the patient's legs straight and flat on the bed, use one of your hands to hold the ankle of the hip being assessed and place your other hand over the contralateral iliac crest to stabilize the pelvis. b. Move the patient's ankle laterally to abduct the hip until the pelvis begins to tilt.			
17. To perform passive hip adduction: a. With the patient's legs straight and flat on the bed, use one of your hands to hold the ankle of the hip being assessed and place your other hand over the contralateral iliac crest to stabilize the pelvis. b. Move the patient's ankle medially to adduct the hip until the pelvis begins to tilt.			
18. To perform passive hip extension, ask the patient to lie in a prone position, use one hand to hold the ankle and the other should be placed on the pelvis.			
19. Thank and reassure the patient			

SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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Date Observed: _____

CHECKLIST FOR EXAMINATION OF SHOULDER JOINT EXAMINATION (Some of the following steps/tasks should be performed simultaneously.)		CASES (Minimum 3 Entries)		
STEP/TASK				
THE PROCEDURE:				
1. Explain the procedure to the patient and get a verbal consent to proceed.				
2. Ensure adequate exposure of the shoulder and arm and provide blanket to patient for the time when they are not being examined.				
3. Position the patient standing for initial inspection and ask the patient if they have any pain before proceeding for examination.				
4. Perform a brief general inspection looking for scars, alignment, and muscle wasting				
5. Assess and compare shoulder joint temperature using the back of your hands.				
6. Palpate the various components of the shoulder girdle, noting any swelling, bony irregularities, and tenderness.				
7. To check for external rotation and abduction, ask the patient to put their hands behind their head and point their elbows out to the side				
8. To check internal rotation and adduction, ask the patient to place each hand behind their back and reach as far up their spine as they are able to				
9. For active shoulder flexion instruct the patient to raise their arms forward until they're pointing up towards the ceiling.				
10. For active shoulder extension, ask the patient to stretch their arms behind them				

11. For active shoulder abduction, ask the patient to raise their arms out to the sides in an arc like mono until their hands touch above their head			
12. For active shoulder adduction, ask the patients to keep their arms straight and move them across the front of their body to the opposite side.			
13. For active internal rotation, ask the patient to place each hand behind their back and reach as far up the spine as they can.			
14. To check scapular movement, ask patient to abduct their shoulder while you simultaneously palpate inferior pole of the scapula.			
15. To judge passive movements, ask the patient to fully relax and allow you to move their arms for them. Go through steps 7-14 by moving the patients arm through those movements.			
16. Thank and reassure the patient			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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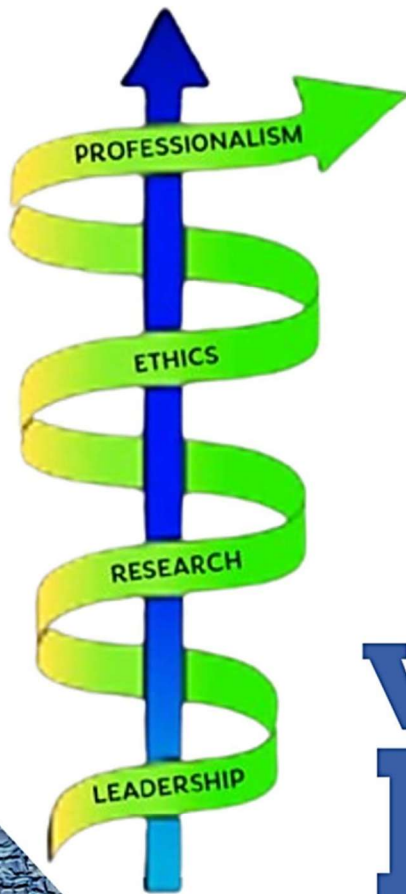
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Date Observed: _____

CHECKLIST FOR UPPER LIMB X-RAY (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
THE PROCEDURE: 1. Observe the ABC's: a. Alignment and joint space b. Bone texture c. Cortices 2. Changes in alignment will suggest a fracture/ complete or partial dislocation 3. Describe the position of the fragment distal to the fracture site 4. Look around the outline of each bone to see any step in the cortex as it may indicate a fracture 5. Once a fracture is identified, describe which bone is involved and where the fracture is located (proximal/middle distal)/ 6. Recognize a fracture extending all the way through the bone as a complete fracture.			

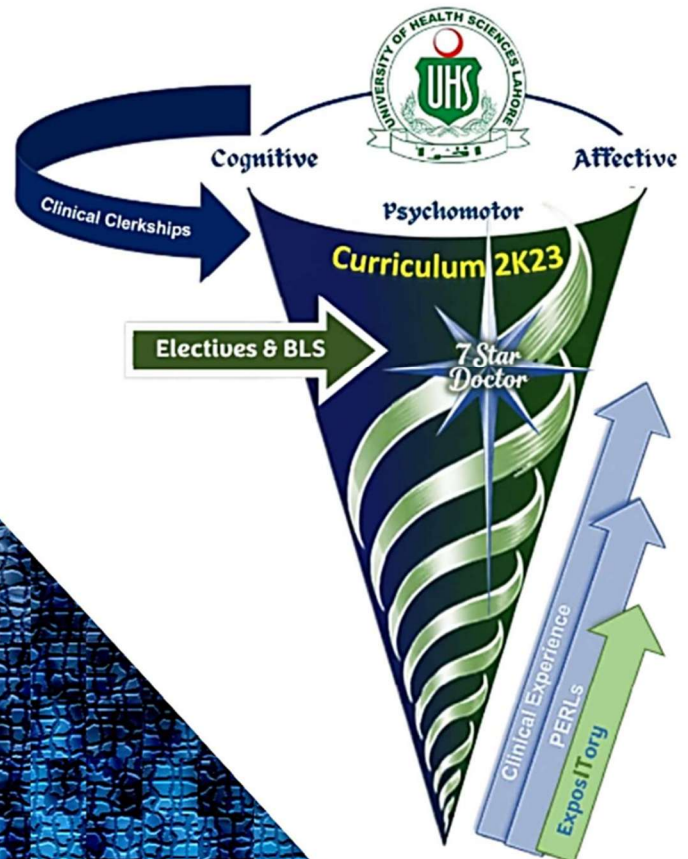
7. Identify type of complete fracture accordingly: a. Transverse: fracture at right angles to the shaft b. Oblique: fracture at an angle to the shaft c. Spiral: caused by twisting injury d. Comminuted: 2 or more bone fragments e. Impacted: fractured bone forced together			
8. Recognize an incomplete fracture as one not involving the whole cortex. 9. Types of incomplete fractures include: a. Torus/Buckle: a bulge in the cortex b. Bowing: associated bend in the bone shaft c. Greenstick: bending of the shaft with a fracture on the convex surface Salter-Harris: involving the growth plate 10. Identify an open fracture as having a puncture of the skin or an open wound identify closed fractures as not having any skin opening. 11. Identify closed fractures as not having any skin opening.			
SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

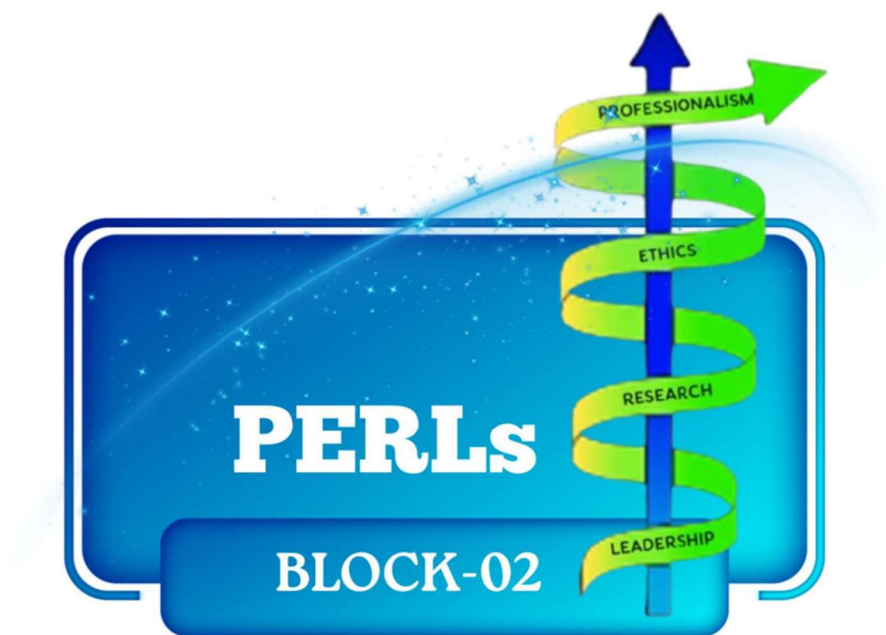


Modular Integrated Curriculum 2K23

MBBS Year-1

Volume-1 PERLs-1





MUSCULOSKELETAL AND LOCOMOTION-I

**Proposed Sequence of Topics Mentioned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block*

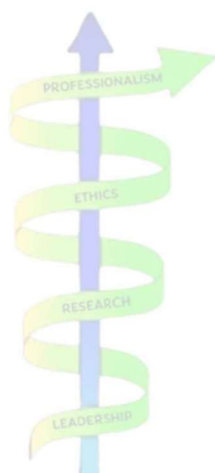
Total Hours = 06

***Research (R)** in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.

Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
PERLs-1-014	Professionalism	Respect for the Human Body/Remain	Understand the ethical and professional significance of respecting the human body, especially in medical education settings such as anatomy labs, and appreciate the contributions of body donors to medical science.	Write a Code of Conduct of professional behaviours in Anatomy Hall, Laboratories /museums with human tissue/remains.
PERLs-1-015	Ethics	Virtues of a Medical Professional	- Analyse the key virtues expected from healthcare providers, including compassion, courage, integrity, humility, patience, altruism, professional responsibility, trustworthiness, and honesty, and their role in ethical medical practice. - Reflect on a case or scenario where healthcare professionals demonstrated one or more of these virtues, discussing how these traits influenced patient care and outcomes.	Write a reflective entry on a case or scenario where healthcare professionals demonstrated one or more of these virtues, discussing how these traits influenced patient care and outcomes
PERLs-1-016	Leadership	Written and Electronic Communication Skills	Appreciate effective written and electronic communication skills, focusing on clarity, professionalism, and	Submit a sample professional email or electronic communication (e.g., a message to a

			accuracy in both academic and clinical contexts, including emails and electronic health records. Students will practice composing a clear and professional email to a faculty member or peer, ensuring correct format, tone, and content.	faculty member) that demonstrates clarity, appropriate tone, and adherence to communication protocols.
PERLs-1-017	Leadership	Giving Feedback	- Appreciate the importance of giving constructive feedback - Discuss the principles using techniques like the Sandwich Technique and “2 Stars and a Wish” to promote improvement while maintaining positive communication. - Practice giving feedback to a peer using the Sandwich Technique (positive- constructive- positive) or ‘2 Stars and a Wish’ (two positive aspects and one area for improvement) during a group activity or simulated scenario.	Submit the feedback given to you by your peer during class activity with the identification of areas for improvement and an action plan.
PERLs-1-018	Research	Research Manuscript	- Discuss the basic structure of a research manuscript using the IMRAD format (Introduction, Methods, Results, and Discussion) and its importance in scientific communication. - Identify the components of a research manuscript using the IMRAD structure. - Apply knowledge of IMRAD by submitting	

			an original article to the portfolio, labelling its key components.	C2K23 Year-01
PERLs-1-019	Ethics	Patient Autonomy in decision making	- Define patient autonomy and understand its foundational role in medical ethics, recognizing that every patient has the right to make informed decisions regarding their own healthcare. - Describe necessary components of informed decision-making, including the provision of accurate information, understanding of risks and benefits, patient comprehension, and the patient's ability to voluntarily make choices free from coercion. - Appreciate the responsibilities of healthcare providers in ensuring that patients receive all necessary information and support to make autonomous decisions, including effective communication and respecting cultural, religious, or personal values.	Submit a reflective case study analyzing how patient autonomy was handled in a clinical situation. Discuss whether the patient was fully informed, how their preferences were respected, and the role of healthcare providers in ensuring the patient's right to make decisions about their own care.



MODULE COORDINATORS

PHYSIOLOGY

Dr. Maham Tahir

Assistant Professor Physiology

Office: AP Office Physiology, Academic block 1, Ground Floor

Office Hours: Monday to Friday from 0800 Hours till 1530 Hours

BIOCHEMISTRY

Dr. Umber Naeem

Assistant Professor Biochemistry

Office: AP Office Biochemistry Academic block 1, First Floor

Office Hours: Monday to Friday from 0800 Hours till 1530 Hours

PATHOLOGY

Dr. Usman Elahi

Lecturer Pathology

Office: Pathology, Academic block 2, Ground Floor

Office Hours: Monday to Friday from 0800 Hours till 1530 Hours

COMMUNITY MEDICINE

Dr. Zain-ul-Islam

Lecturer Community Medicine

Office: Community Medicine, Academic block 2, First Floor

Office Hours: Monday to Friday from 0800 Hours till 1500 Hours

BEHAVIOUR SCIENCES

Dr. Fatima Mudassir

Lecturer Behavioural Sciences

Office Hours: Monday to Friday from 0830 Hours till 1500 Hours

PHARMACOLOGY

Dr. Azan

Assistant Professor Pharmacology

Office: AP Office Pharmacology, Academic block 2, Ground Floor

Office Hours: Monday to Friday from 0800 Hours till 1530 Hours

CFRC

C2K23 Year-01

Dr. Zara

Senior Registrar Medicine

Office: Medicine Deptt. Islam Teaching hospital

Office Hours: Monday to Saturday from 0800 Hours till 1400 Hours

PEARL

Dr. Marium

Lecturer Medical Education

Office: Medical Education Deptt. Academic Block 3

Office Hours: Monday to Friday from 0800 Hours till 1530 Hours

IMPORTANT NOTE

**To be able to sit in Annual Exam
85 % attendance and at least 50 % in internal
assessment is mandatory**

DISCLAIMER

This module guide may be subject to changes, and students should stay updated through official communication channel