AYUB MEDICAL COLLEGE ABBOTTABAD

DEPARTMENT OF MEDICAL EDUCATION

MUSCULOSKELETAL MODULE

1ST YEAR MBBS

BLOCK: B (MUSKULOSKELETAL (MSK) I)

DURATION: 8 WEEKS

STUDENT NAME

_____

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1 Module Committee:

s.no	Name	Department	Role
1.	Prof. Dr. Umar Farooq	CEO & Dean	
2.	Prof. Dr. Irfan U. Khattak	DME	Director
	Module Team		
3.	Dr.Sumaira Javed	Anatomy	Block Coordinator/Study Guide Developer
4.	Dr.Rizwana Iqbal	Anatomy	Module Coordinator
5.	Dr Alruba Taimoor	Physiology	Member
6.	Dr Ayesha Awan	Biochemistry	Member

2 What Is A Study Guide?

It is an aid to Inform students how student learning program of the module has been organized, to help students organize and manage their studies throughout the module and guide students on assessment methods, rules and regulations.

2.1 The study guide:

- Communicates information on organization and management of the module.
- This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the module.
- Identifies the learning strategies such as lectures, small group teachings.

2.2 Module objectives.

- Provides a list of learning resources such as books, computer-assisted learning programs, weblinks, and journals, for students to consult in order to maximize their learning.
- Highlights information on the contribution of continuous on the student's overall performance.
- Includes information on the assessment methods that will be held to determine every student's performance.

2.3 Achievement of objectives.

- Focuses on information pertaining to examination policy, rules and regulations.

2.4 Curriculum framework:

- Students will experience integrated curriculum.

3 Recommended List Of Icons

Introduction To Case

For Objectives

Critical Questions

Assessment

Resource Material

4 Table Of Specification

	Subject	Lectures /LGD (No of hours)	SGD/Dissection/Demonstration (No of hours)	Practicals (No of hours)	Tutorials (No of hours)	Percent distribution(hours allocated in TT/Total hours*100)	No of MCQs	No of OSPE stations
1.	Gross Anatomy	9	70			35	71	8+2
2	Histology	7		7×2		09	8	
3	Embryology	5				02	4	
4	Physiology	18		7×2		24	16	2+2
5	Biochemistry	18		7×2		24	16	2+2
6	Orthopedics	3				01		
7	Forensic Medicine	3				01		
8	Pathology	3				01	02	
9	Isamiyat	8				3.5		
10	Pak studies	8				3.5		
11	Radiology	4				1.5		
12	Pharmacology	1				0.5	01	
13	Community Medicine	4				1.5	01	
14	Prime	9				04	01	
15	Computer Lab				7×2	06		
	Subtotal	100	70	42	14		120	18
	Total contact hours	100+70+42+14=226						

5 Organization of Module

5.1 Introduction**:**

Musculoskeletal system Module is designed to provide guidance on introduction to the basics of human musculoskeletal system. Moreover, the module is aligned to the general outcomes required at the exit level, and includes introductory sessions on preventive medicine, communication skills, professionalism, self- management, and developing scholarly skills. The module committee will facilitate the students with any issues that they have, while settling down in the new environment. You will also learn the skills required for practical implications in the field of medicine. Moreover, working within teams will enhance your co-operative and approachable working style.

5.2 Rationale

This module will help the learners better understand the pathology and prevalence of limb-related disorders which they will study in Musculoskeletal II in the coming session of the curriculum. Ultimately this will provide a firm grasp on the underlying mechanisms of the relevant clinical conditions in their ward rotations and clerkships.

5.3 Themes For Musculoskeletal Module

SNO	Theme	Duration
1	Orientation and shoulder pain	2 weeks
2	Weak grip and painful hand	1 week
3	Pain lower limb/limping	2 weeks
4	Bony arches and fracture of foot	1 week
5	Backache	1 week
6	Muscle weakness and fatigue	1 week

6 Learning Objectives

6.1 General Learning Outcomes

By the end of this module the students would be able to;

6.1.1 Knowledge

By the end of this module, students should be able to:

7. Develop an understanding of the fundamental components of the musculoskeletal system.
8. Explain the structure & function of the musculoskeletal (MSK) components of limbs and back.
9. Describe how injury and disease alter the MSK structure & function.
10. Integrate concepts relating to various metabolic processes, their disorders and relevant lab investigations in the study of human MSK system.
11. Describe the role of the limbs (upper/lower) in musculoskeletal support, stability and movements.
12. Describe the development of the limbs & correlate it with organization and gross congenital anomalies of the limbs.
13. Identify the anatomical features of bones, muscles & neurovascular components of the limbs and correlate them with their functions, injuries and clinical problems.
14. Describe the types, formation, stability, function & clinical significance of joints of the upper and lower limb.
15. Describe the basic histology of muscle fibers including its molecular structure (Sarcomere).
16. Explain the mechanism of excitation and contraction of skeletal and smooth muscles.
17. Describe the basis for the use of therapeutic agents to modulate neuromuscular transmission.
18. Describe the general principles of MSK pain management.
19. Describe ergonomics and its principles. Prevention of different MSK disorders.
20. Interpret the mechanism of post-mortem rigidity. (spiral II)
21. Give an overview of pathology of bones, muscles and joints.
22. Explain the role of different minerals, hormones and specific metabolic products related to the musculoskeletal system and correlate them with their relevant clinical metabolic disorders.
23. Interpret the relevant laboratory investigations for diagnosis of common musculoskeletal disorders. (Spiral two)
24. To develop the critical thinking and analysis in the context of various case scenarios pertaining to locomotors system.

6.1.2 Skills

By the end of this module, it is a core objective that students should have acquired the following skills:

1. Demonstrate the anatomical structures of the limbs in a dissected cadaver/Model/prosecuted specimen & X-ray.
2. Demonstrate the provision of first aid measures in case of a limb fracture.
3. Communicate effectively in a team with colleagues and teachers.

6.1.3 Attitude

While not necessarily taught explicitly, students are expected to develop following attitudes throughout the course:

1. Demonstrate respect and care for the cadaver and prosected parts.
2. Demonstrate humbleness and use socially acceptable language during academic and social interactions with colleagues and teachers.
3. Make ethically competent decisions when confronted with an ethical, social or moral problem related to MSKS in professional or personal life.
4. Discuss ethical issues social and preventive aspect of health care in the context of MSK system.
5. To create awareness about the ethical, social and preventive aspect of health care in the context of locomotor system.

6.2 Specific learning objectives

Gross anatomy

THEME–I: Orientation				
SNO	**Topics**	**Learning Outcomes**	**Hours**	**MIT**
1	Introduction	1. Define osseous tissue 2. Classify the skeletal system (axial and appendicular) 3. Name and locate different bones of 4. axial and appendicular skeleton 5. Classify bones 6. Describe general features of bones 7. Describe Nerve/blood supply of bone 8. Describe bone marrow and its types 9. Describe ossification and its types 10. Describe surface markings of bones 11. Define fracture, osteoporosis, rickets, osteomalacia 12. Introduction to muscular system 13. Classify the muscles according to the directions of fibers 14. Classify the skeletal muscles according to their action. 15. Types of skeletal muscle fibers(Type1 ,2,3) 16. Describe the nomenclature of skeletal muscles 17. Describe the principle of innervations and nerve supply of muscles 18. Define paralysis, hyperplasia,hypertrophy,mysthena gravis	*01*	*SGD*
2	Introduction to locomotion and upper limb	19. Identify the extent of the upper limb. 20. Identify various regions of upper limb. 21. Describe the division of the regions into compartments. 22. State the contents of compartments of arm, forearm & hand 23. Describe the joints of upper limb. 24. Describe the clinical anatomy of upper limb	*01*	*SGD*
3	Osteology of clavicle	25. Recognize the bone 26. Identify the site of bone 27. State the bony land marks of clavicle: like borders, surfaces & land mark used for bone determination 28. Describe & demonstrate the attachments of	*02*	*SGD*

			muscles.		
		29.	Describe the common fractures of the bone.		
		30.	Identify and describe the salient features of the bones scapula and clavicle		
		31.	Describe the surface anatomy clavicle		
		32.	Describe the radiological anatomy clavicle		
		33.	Describe the applied anatomy clavicle		
4	Osteology of scapula	34.	Recognize the bone.	*02*	*SGD*
		35.	Identify the site of bone.		
		36.	State the bony landmarks of scapula: like borders, surfaces & land mark used for bone determination.		
		37.	Demonstrate the attachment of		
		38.	muscles on scapula		
		39.	Describe the common fractures of the bone.		
		40.	Identify and describe the salient features of the bones scapula.		
		41.	Identify the attachments to scapula		
		42.	Describe the surface anatomy scapula		
		43.	Describe the radiological anatomy scapula.		
		44.	Describe the applied anatomy scapula.		
5	Osteology of humerus	45.	Recognize the bone.	*02*	**SGD**
		46.	Identify the site of bone.		
		47.	State the bony landmarks of humerus: like borders, surfaces & land mark used for bone determination.		
		48.	Demonstrate the attachment of muscles & ligaments.		
		49.	Describe the common fractures of the bone.		
		50.	Identify and describe the salient features of the humerus		
		51.	Identify the attachments to humerus		
		52.	Describe the surface anatomy humerus		
		53.	Describe the radiological anatomy		
		54.	humerus		
		55.	Describe the applied anatomy humerus.		
6	Muscles of the pectoral girdle	56.	Recognize the role of muscles of pectoral region in stabilizing the pectoral girdle.	*02*	**SGD**
		57.	List the muscle of pectoral girdle.		
		58.	Describe & Demonstrate the attachments of muscle of pectoral girdle, nerve supply and actions.		
		59.	Describe the structural organization of the clavi-pectoral fascia.		
		60.	Identify the triangle of auscultation.		

		61. Describe the nerves and blood vessels of this region		
7	Muscles of the shoulder region	62. Recognize the extent of shoulder region. 63. Describe the muscle of shoulder region. 64. List the muscles of shoulder region. *65.* State the detailed structures of each muscle with respect to Origin, Insertion, Nerve supply and Action of muscles with any characteristic features.	*02*	*SGD*
8	The shoulder joint & its movements	66. Classify the type of shoulder joint. 67. Describe the structure of shoulder joint. 68. Name the muscles acting on the joint/rotator cuff muscles. 69. Explain the range of mobility. 70. Describe the movements of shoulder joint. 71. Explain the clinical anatomy of the joint	*01*	*LGD*
9	Brachial plexus	72. Mention the formation of brachial plexus (roots, trunk, division, and cords). 73. Describe the relation of brachial plexus also in connection to clavicle (Supra, retro, infra clavicular parts). 74. State the branches arising the different cords. 75. Draw the brachial plexus. 76. Describe the clinical correlates of the brachial plexus. a. Erb duchane palsy b. Klumpke palsy *c.* Saturday night palsy	*02*	*SGD*
10	Nerves of upper limb	77. Describe the course and branches of nerves of upper limbs. a. Axillary nerve b. Musculocutaneous nerve c. Radial Nerve d. Ulnar Nerve e. Median Nerve 78. Explain the injuries associated with these nerves. 79. Identify the causes and motor and sensory loss associated with nerve injuries of upper limb. *80.* Apply knowledge of gross anatomy to identify the deformities associated with these nerves.	*02*	*SGD*
11	Axilla	81. Describe the position, shape of axilla. 82. Describe the boundaries and content of axilla 83. Describe the boundaries and muscle forming the boundaries of axilla.	*02*	*SGD*

		84.	Describe the formation, course and relations of axillary vessels.		
		85.	Describe arrangement and groups axillary lymph nod		
12	Arm	86.	Describe the compartments of arm and how they are formed.	*01*	*SGD*
		87.	Identify and explain the muscles and their actions found in the arm.		
		88.	Describe the nerve supply of arm.		
		89.	Describe the course of the nerves		
		90.	Identify the branches of the nerves		
		91.	Relate & integrate with the clinical correlations		
		92.	Describe cutaneous supply of arm.		
13	Brachial vessels	93.	Describe the extension, relation and branches of the Brachial artery.	*01*	*SGD*
		94.	Describe the course of the Basilic and cephalic veins		
		95.	Describe and explain the formation and purpose of the scapular anastomosis.		
14	Elbow joint	96.	Identify the type of the joint.	*01*	*LGD*
		97.	State and Identify the muscles acting on the elbow joint.		
		98.	Describe the neurovascular supply of the joint.		
		99.	Describe the carrying angle and applied aspect of the joint.		
		100.	Describe the anastomosis and collateral circulation.		
		101.	Describe formation of anastomosis around elbow joint		
15	Osteology of ulna	102.	Recognize the bone.	*02*	*SGD*
		103.	Determine the side of bone.		
		104.	Identify the features of bone.		
		105.	Identify the muscles attached to bone.		
		106.	Describe the common fractures of the bone.		
		107.	Describe and Identify the salient features of the ulna		
		108.	Identify the attachments to ulna		
		109.	Describe the surface anatomy ulna and the radiological anatomy ulna		
		110.	Describe the applied anatomy ulna		
16	Superficial veins, lymphatic's and lymph nodes	111.	Describe the normal anatomy of veins of upper limb.	*01*	*SGD*
		112.	Differentiate between superficial and deep veins.		
		113.	Describe the features of individual superficial		

	of upper limb	veins of upper limb. 114. Correlate the applied anatomy with the gross anatomy of superficial veins of upper limb. 115. Describe the structure of a lymph node. 116. Identify the groups of lymph nodes. 117. Describe groups and area of drainage of each group of lymph nodes. 118. Describe the commencement, course and termination of superficial lymphatic vessels. 119. Describe the clinical conditions related to lymphatic channels of upper		
17	Cubital fossa	120. Describe the boundaries, the contents and the relationship among structures of Cubital fossa. 121. Demonstrate the surface anatomy of the Cubital fossa. 122. Explain the clinical importance of the Cubital fossa.	*02*	*SGD*
18	Anterior compartment of forearm	123. List the muscles of forearm. 124. State the nerve supply of these muscles. 125. Explain actions of the muscles of anterior compartment of forearm. 126. Describe attachment and functions of flexor retinaculum 127. Identify/Describe muscles of the anterior compartment of the arm (origin, insertion, nerve supply, blood supply, and action)	*02*	*SGD*
19	Posterior compartment of forearm	128. Explain the organization of muscles of posterior compartment of forearm 129. Identify/Describe muscles of the posterior compartment of the arm (origin, insertion, nerve supply, blood supply, and action) 130. State the nerve supply of these muscles. 131. Explain the actions of the muscles of posterior compartment of forearm. 132. Describe the structural organization of the Extensor Retinaculum	*02*	*SGD*
20	Blood vessels & nerves of the forearm	133. Describe the different vessels & nerves in forearm. 134. Describe the location, destination, course & relations of radial and ulnar arteries & their branches in forearm. 135. Describe the deep veins of forearm and their tributaries. 136. Describe the location, destination, course & relations of ulnar, radial and median nerves &	*01*	*SGD*

			their branch.		
21	Radio-ulnar joint	137. 138. 139. 140. 141.	Recognize the details of Radio-ulnar joint. Describe and explain the movements occurring on Radio-ulnar joint. Name the muscles acting in pronation and supination. Describe the nerve supply and blood supply of Radio-ulnar joint. Describe clinical problems related to Radio-ulnar joints.	*01*	*LGD*
22	Surface anatomy of upper limb	142.	Demonstrate the surface markings for various arteries of upper limb	*01*	*SGD*
Theme II					
1	Osteology of radius & hand	143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157.	Recognize the bones of forearm & hand Determine side of bones. Identify the features of bones. Identify the muscles attached to bones. Describe the ossification of bones Explain the clinical significance of bones. Describe the common fractures of the bone. Describe and Identify the salient features of the radius Identify the attachments to radius Describe the surface anatomy radius and the radiological anatomy radius Describe the applied anatomy radius Describe and Identify the salient features bones of hand Identify the attachments to bones of hand Describe the surface anatomy main bones of hand and the radiological anatomy of main bones Describe the applied anatomy main bones of hand including carpal tunnel and fractures	*02*	*SGD*
2	Muscles of hand	158. 159. 160. 161. 162. 163.	Recall the structure and functions of palmar aponeurosis. Describe the attachments, nerve supply & actions of muscles of hand. Describe the thenar Muscles. Correlate the movements of thumb with hand anatomy. Identify the anatomical snuffbox. Relate applied with gross anatomy of few structures of hand	*02*	*SGD*

		164. Enumerate, describe and identify the small muscles of the hand 165. Describe Surface anatomy of important muscles of hand 166. Identify structures on transverse MRI hand taken at various levels 167. Describe relevant clinical anatomy of important muscles 168. Identify/Describe joints of the hand and fingers (intercarpal joints, carpometacarpal and intermetacarpal joints, carpometacarpal joint of the thumb, and metacarpophalangeal joints 169. Describe surface , radiological and clinical anatomy of important joints		
3	Vessels & nerves of the hand	170. Identify different vessels in hand. 171. Describe the location, destination course relations of radial and ulnar arteries in hand. 172. State the branches of radial and ulnar arteries in hand. 173. Describe the formation of superficial and deep palmar arch, veins of hand and their tributaries. 174. Describe the nervous supply of the hand.	*02*	*SGD*
4	Wrist joint	175. Recognize the details of wrist joints. 176. Describe and explain the movements occurring on wrist joints. 177. Name the muscles acting in pronation and supination. 178. Describe the nerve supply and blood supply of wrist joints. 179. Describe wrist joint, nerve supply and blood supply. 180. Describe clinical problems related to Wrist joints.	*01*	*LGD*
5	Spaces of the palm	181. Identify the different spaces of the hand on both palmar and dorsal aspects. 182. Describe the clinical importance of these spaces	*02*	*SGD*
Theme III				
1	Introduction to lower limb	183. Recognize different parts of lower limb. 184. Describe regions of lower limb. 185. List the bones of lower limb. 186. Describe the vessels and nerves of lower limb. 187. Identify different land marks in different regions of lower limb	*01*	*SGD*
2	Hip bone	188. Identify the different parts of the bone. 189. Describe side determination.	*02*	*SGD*

		190. Describe muscle attachments. 191. Describe ligamentous attachments. 192. Describe the different bones articulating with the hip bone 193. Identify the different parts of the bone. 194. Describe the common fractures of the bone. 195. Identify and describe the salient features of the bones of hip bone 196. Identify the attachments of hip bone 197. Describe the surface anatomy of hip bone 198. Describe the radiological anatomy of hip bone 199. Describe the applied anatomy of hip bone.		
3	The hip joint and movements	200. Describe the characteristics features of synovial joint 201. Describe the Articular surfaces of hip joint 202. Identify the capsule of hip joint 203. Describe the synovial membrane, cavity & fluid of hip joint 204. Enumerate the ligaments of hip joint & describe their attachments 205. Describe the movements possible at hip joint 206. Describe the clinical correlates of the hip joint 207. Describe surface and radiological anatomy (X-rays and MRI) and clinical of hip joints	*01*	*LGD*
4	Gluteal region	208. Describe the boundaries of gluteal 209. region 210. Describe bones and ligaments of gluteal region 211. Describe the different structures entering and leaving gluteal region 212. Describe muscles of the gluteal region. 213. Describe Vessels of the gluteal region. 214. Describe nerves of the gluteal region. 215. Describe about certain clinical correlates regarding gluteal region 216. Describe Surface anatomy of important muscles 217. Identify structures on transverse MRI of gluteal region taken at various levels 218. Describe clinical anatomy of important muscles	*02*	*SGD*
5	Femur	219. Identify different parts of the femur 220. Determine the side of the bone 221. Identify the surfaces and borders of the bone 222. Describe the common fractures of the bone. 223. Describe the attachments of the different muscles and ligaments on the bone 224. Desribe the arterial supply of the bone	*02*	*SGD*

		225. Relate to the general idea about fractures of femur and other clinical conditions Identify and describe the salient features of the bones of hip bone 226. Describe the surface anatomy of femur 227. Describe the radiological anatomy of femur 228. Describe the applied anatomy of femur		
6	Nerves of lower limb and their injuries	229. Identify the names of nerves and their main branches innervating lower limb 230. Identify the nerves closely related to 231. a bone or other structure of lower limb 232. Recognize the main nerves commonly vulnerable to injury 233. Identify the main area and loss of 234. function if particular nerve is injured 235. Define and understand terms neuritis, anesthesia, par aesthesia, paralysis,neuralgia, sciatica	*01*	*SGD*
7	Superficial vessels and lymphatic's of lower limb	236. Enumerate and describe the superficial arteries of lower limb 237. Name and Describe superficial veins of lower limb 238. List and Describe the superficial lymphatic vessels and lymph nodes of lower limb	*02*	*SGD*
8	Deep fascia of thigh, iliotibialtract and superficial vessels	239. Describe the arrangement of deep fascia in thigh 240. Describe how the iliotibial tract participates in walking and running 241. Describe the location of saphenous opening and its relations 242. Describe the great saphenous vein. 243. Describe clinical correlates of saphenous vein	*01*	*SGD*
9	Muscles of the anterior fascial compartment of thigh	244. Describe the muscles of anterior compartment of thigh. 245. Describe the nerve supply of anterior compartment. 246. Describe the action of these muscles	*01*	*SGD*
10	Nerves and vessels of anterior compartment of thigh	247. Describe the nerve supply of the anterior compartment of thigh. 248. Describe the blood supply and the venous drainage of anterior compartment of thigh 249. Describe the action of these muscles	*01*	*SGD*
11	The medial compartment	250. Describe the muscles of medial compartment of the thigh. 251. Describe the nerve supply of these muscles.	*02*	*SGD*

	of thigh	252. Describe the actions of the muscles of medial compartment of thigh 253. Describe the vessels of medial compartment of the thigh		
12	Popliteal fossa	254. Describe the boundaries of popliteal fossa. 255. Describe the contents of the popliteal fossa. 256. Describe some clinical correlates regarding popliteal fossa	*01*	*LGD*
13	Femoral triangle and its contents	257. Describe the boundaries of femoral 258. triangle 259. List the contents of femoral triangle 260. Describe the femoral sheath & canal 261. Describe the clinical correlates of the Femoral triangle. 262. Describe the location, boundaries and contents of adductor canal	*01*	*LGD*
14	Tibia bone	263. Describe the division of tibia bone in 3 parts 264. Identify the surfaces and borders of 265. tibia 266. Describe the attachments of muscles on the tibia bone 267. Describe the ossification of tibia and its primary and secondary ossification centers 268. Describe the common fractures of the bone. 269. Identify and describe the salient features of the bone of leg 270. Identify the attachments to the bone of the leg 271. Describe the surface anatomy of leg 272. Describe the radiological anatomy of leg 273. Describe the applied anatomy of leg	*02*	*SGD*
15	Fibula & bones of foot	274. Determine the side of bone. 275. Describe the bony features along with its different attachments on the fibula. 276. Name and describe the tarsal bones and their arrangement 277. Name and describe the metatarsal bones and phalangeal bones. 278. Describe the common fractures of the bone. 279. Describe the muscles of the sole of the foot (origin, insertion, nerve supply, blood supply, and action) 280. Describe the muscles of the dorsum of the foot (origin, insertion, nerve supply, blood supply, and action) 281. Describe Surface anatomy of important muscles	*02*	*SGD*

		282. Identify structures on transverse MRI of foot taken at various levels 283. Describe clinical anatomy of important muscles		
16	Anterior and lateral compartment of leg	284. identify the boundaries of the compartments of leg 285. State the muscles of anterior and lateral compartment of leg 286. Describe the vessels of anterior and lateral compartment of leg 287. Describe the nerves of lateral and anterior compartment of leg 288. Describe action of these muscles	*02*	*SGD*
17	Posterior compartment of leg	289. Explain the muscles of posterior Compartment of leg. 290. Describe nerve supply of these muscles. 291. Explain the actions of the muscles of posterior compartment of leg	*02*	*SGD*
18	Knee joint	292. Describe the type of knee joint 293. Describe the articular surfaces of this joint 294. Describe the articular capsule 295. Describe the synovial membrane and the synovial cavity 296. Enumerate the ligaments of knee joint 297. Describe the bursa around the knee joint 298. Describe the blood and nerve supply of the knee joint 299. Describe the mechanism of locking and unlocking of knee joint. 300. Describe surface and radiological anatomy (Xrays and MRI) and clinical of knee joints	*01*	*LGD*
19	Surface anatomy of lower limb	301. Demonstrate the surface anatomy of arteries of lower limb. 302. Demonstrate the surface anatomy of superficial & deep veins lower limb. 303. Demonstrate the surface anatomy of nerves of lower limb	*01*	*LGD*
THEME IV				
1	Muscles and neurovascular supply of the foot	304. Describe the dorsal muscles of foot. 305. Describe the origin and insertion of planter muscles of foot. 306. Describe their nerve supply and actions. 307. Describe vascular and nervous supply of sole and dorsum of foot 308. Describe their course through foot 309. Describe relationships	*02*	*SGD*

		310. Identify and describe the salient features of the bone of foot 311. Identify the attachments to the bone of the foot 312. Describe the surface anatomy of foot 313. Describe the radiological anatomy of foot 314. Describe the applied anatomy of foot		
2	Arches of foot	315. Describe the arches of foot 316. Describe the factors responsible for their maintenance of the arches of the foot 317. Recognize the injury when it occurs and be able to evaluate plantar fasciitis. 318. Describe about counselling regarding the rehabilitation for plantar fasciitis	*02*	*SGD*
THEME V				
1	Typical spinal nerve	319. Define a spinal nerve. 320. Recognize the spinal nerve as a part of PNS. 321. Enumerate the spinal nerves in different regions 322. Identify their location and site of emergence. 323. Identify various components of a typical spinal nerve. 324. Recall the fate of rami. 325. Associate the rami communicans with typical spinal nerve 326. Recall the distribution of gray rami	*0.5*	*SGD*
2	Vertebral column	327. Describe the muscles of back (origin, 328. insertion, nerve supply, blood supply,and action) 329. Describe Surface anatomy of important muscles 330. Identify structures on CT/MRI of vertebral column taken at various levels 331. Describe clinical anatomy of important muscles	*01*	*LGD*
3	Lumbo sacral plexus, cutaneous nerves	332. Describe the formation of lumbar Plexus. 333. List the branches of lumber plexus with their root values. 334. Describe relation of the nerves with Psoas major muscle. 335. List the structures supplied by lumbar plexus. 336. Describe the formation of sacral plexus. 337. Describe the composition and relations of sacral plexus. 338. List the branches of this plexus	*0.5*	*SGD*
EMBRYOLOGY				
THEME I				
1	Somitogenesis	339. Define the process of gastrulation. 340. Describe the development of mesoderm. 341. Describe the process of somitogenesis.	01	LGD

		342.	Describe the formation of cartilage		
2	Development of bone , cartilage and joints	343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359.	Describe histogenesis of Bone Describe the Intramembranous Ossification Describe the Endochondral Ossification Describe the Ossification of limb bones Describe the development of joints Describe the development of cartilage Describe developmental events of fibrous joints Describe developmental events of cartilaginous joint Describe developmental events of synovial joints Describe important congenital correlates Describe the Endochondral Ossification Describe the Ossification of limb bones Describe the development of joints Describe the development of cartilage Describe developmental events of fibrous joints Describe developmental events of cartilaginous joint Describe developmental events of synovial joints Describe important congenital correlates	01	LGD
3	Development of upper limb	360. 361. 362. 363.	Describe the early stages of upper limb development Describe the development of upper limb buds Describe the final stages of upper limb development Describe and explain the anomalies of the upper limb	01	LGD
4	Development of muscles	364. 365.	Describe the development of skeletal muscle. Describe the development of Myotomes and derivatives of epaxial divisions of myotomes and derivatives of hypaxial divisions of myotomes	01	LGD
			THEME III		
1	Development of lower limb	366. 367. 368. 369.	Describe the early stages of lower limb development Describe the development of lower limb buds Describe the final stages of lower limb development Describe and explain the anomalies of the lower limb	01	LGD
			HISTOLOGY		
			THEME I		
1	Bone histology	370. 371.	Define and identify compact and spongy bone Describe and identify bone matrix (organic and inorganic component)	02	LGD

		372. Describe and identify cells of boney tissue i.e. (osteoprogenitor, osteoblasts, osteoclast, and osteocytes) 373. Describe and identify periosteum and endosteum 374. Describe and identify the microscopic structure of bone i.e. (primarybone, secondary bone and haversian system) 375. Describe Functions of various bone cells 376. Describe important Functions and its role in calcium metabolism		
	Histology of cartilage	377. Describe the General properties of cartilage 378. Describe the Different types of cartilage 379. Describe the Hyaline, Elastic and Fibrocartilage 380. Explain the growth of cartilage 381. Identify types of cartilages on microscopy, including distinctive features of each. 382. Describe the structural basis. 383. Classify and distinguish three types of cartilages 384. Describe the microscopic structure of hyaline cartilage 385. Describe the microscopic structure of Elastic cartilage 386. Describe the microscopic structure of fibrous cartilage 387. Describe important functional correlates of three types of cartilages	02	LGD
3	Classification & histology of bone	388. Recognize bone and its functions and ncomposition. 389. Differentiate between woven bone and lamellar bone. 390. Differentiate between compact bone and spongy bone. 391. Describe the applied aspect of bone 392. Identify three types of bone on microscopy, including distinctive features of each. 393. Describe the structural basis of classification.	01	LGD
4	Histology of muscles	394. Identify three types of muscles on microscopy, including distinctive features of each muscle fiber. 395. Describe the structural basis of muscle striations. 396. Recognize the structural elements that produces muscle contraction and brings the movement of a body part.	02	LGD

		397. Recognize the function and organization of the connective tissue in muscle. 398. Classify and distinguish three types of muscles 399. Describe the microscopic structure of 400. skeletal muscle 401. Describe important functional correlates of skeletal, smooth 402. Describe the microscopic structure of 403. smooth muscle 404. Identify/Describe the microscopic structure of cardiac muscle fiber 405. Describe important functional correlates of cardiac muscle fiber		
Physiology				
Theme 1-orientation				
1	Skeletal vs smooth muscle	406. Differentiate between skeletal muscle and smooth muscle.	0.5	LGD
2	Mechanism of muscle contraction	407. Describe the general mechanism of muscle contraction. 408. Describe the molecular mechanism of muscle contraction	0.5	LGD
3	Energetics of muscle Contraction	409. Describe the energetics of muscle contraction.	01	LGD
4	Terms related to MSK	410. Describe the following terms related to MSK a. Excitable tissue b. Stimulus c. Threshold d. Depolarization e. Hyperpolarization f. Presynaptic potential g. Post synaptic potential h. Goldmann Equation i. Nernst Equation	0.5	LGD
5	Describe the important terms	411. Describe the following a. Motor unit b. Summation c. Tetanization d. Staircase effect e. Skeletal muscle tone f. Muscle fatigue g. Agonist h. Antagonists i. Coactivation of agonist and antagonis	0.5	LGD

6	Excitation contraction coupling in skeletal muscles	412. 413. 414. 415. 416.	Discuss the process of excitation contraction coupling in skeletal muscles. Explain Transverse tubule-sarcoplasmic reticulum system Describe Release of Calcium ions by sarcoplasmic reticulum Explain Role of Calcium pump Describe Excitatory pulse of Ca+	01	LGD
7	Muscle action potential	417.	Describe the muscle action potential.	0.5	LGD
8	Excitation contraction coupling	418.	Describe excitation contraction coupling of skeletal muscle.	0.5	LGD
			THEME VI		
1	Physiologic anatomy ofthe skeletal muscle fiber	419.	Explain the physiologic anatomy of the skeletal muscle fiber. a. Skeletal muscle fiber b. Sarcolemma c. Myofibrils d. I band e. A band f. Z disk g. M line h. Sarcomere i. Titin microfilament molecules j. Sarcoplasm k. Sarcoplasmic reticulum	01	LGD
2	Characteristics of whole muscle contraction	420. 421. 422. 423. 424. 425. 426.	Identify the characteristics of whole muscle contraction. Compare isotonic and isometric exercises. Compare and contrast slow and fast muscle fibers. Describe the mechanics of skeletal muscle contraction. Describe muscle tone and muscle fatigue. Describe lever systems of the body and positioning of a body part. Describe remodeling of muscle to match function.	01	LGD
3	Neuromuscular junction	427. 428.	Describe the transmission of impulses from nerve endings to skeletal muscle fibers. Explain the physiologic anatomy of the neuromuscular junction	0.5	LGD
4	Neuromuscular Transmission	429. 430.	Explain the mechanism of transmission of impulses from nerve endings to muscle fibers Explain Formation and Secretion of acetylcholine	0.5	LGD

		at nerve terminals 431. Describe Action of acetylcholine at postsynaptic membrane 432. Describe Degradation/Destruction of released acetylcholine 433. Describe End plate potential 434. Describe Fatigue of junction		
5	Neuromuscular drugs	435. Describe the physiologic basis of the drugs used in the neuromuscular disorders (Drugs that enhance or block the transmission at neuromuscular junction) 436. Enlist the excitatory and inhibitory transmitter substances secreted at the smooth muscle neuromuscular junction 437. Drugs that stimulate the muscle fiber by acetylcholine like action 438. Drugs that stimulate neuromuscular junction by inactivating acetylcholinesterase 439. Drugs that block transmission at the neuromuscular junction 440. Enlist the excitatory and inhibitory transmitter substances secreted at the smooth muscle neuromuscular junction	01	LGD
6	Myasthenia gravis	441. Describe the pathophysiology of myasthenia gravis	01	LGD
7	Smooth muscle	442. Classify smooth muscles 443. Describe the physiologic anatomy of the smooth muscle neuromuscular junction	0.5	LGD
8	Skeletal Muscle fiber	444. Discuss in detail types of muscles and arrangement of skeletal muscle fibers.	0.5	LGD
9	Contraction of smooth muscle	445. Describe the contractile mechanisms in smooth muscles 446. Describe excitation and contraction of smooth muscle. 447. Identify the types of smooth muscles. 448. Describe the chemical and physical basis for smooth muscle contraction. 449. Compare smooth and skeletal muscle contraction. 450. Chemical basis of smooth muscle contraction 451. Physical basis of smooth muscle contraction 452. Explain how the calcium ions regulate the contraction. 453. Regulation of smooth muscle contraction by the calcium ions	01	LGD

		454. Enlist the excitatory and inhibitory transmitter substances secreted at the smooth muscle neuromuscular junction		
10	Nervous and hormonal control of smooth muscle contraction	455. Describe the nervous and hormonal control of smooth muscle contraction	01	LGD
11	Resting Membrane Potential	456. Enumerate the intracellular and extracellular concentrations of sodium, potassium, chloride and calcium ions in a resting/normal cell. 457. Describe the characteristics of major membrane ion channels and their role in the membrane potential 458. Describe the resting membrane potential in a cell/nerve fiber	01	LGD
12	Muscle Remodeling	459. Describe following a. Muscle hypertrophy b. Muscle atrophy c. Muscle hyperplasia d. Rigor mortis e. Muscle dystrophy f. Recovery of muscle contraction in poliomyelitis	01	LGD
13	Membrane potentials and action potentials in smooth muscles	460. Describe the membrane potentials and action potentials in smooth muscles. 461. Describe Spike potentials 462. Describe Action potentials with plateaus 463. Describe Role of calcium channels in generating the smooth muscle action potential 464. Describe Slow wave potentials 465. Describe Excitation of visceral smooth muscle by muscle stretch 466. Describe Depolarization of multi-unit smooth muscle without action potentials	01	LGD
14	Control of smooth muscle contraction	467. Describe the mechanism nervous, hormonal and local control of smooth muscle contraction.	0.5	LGD
15	Smooth muscle and skeletal muscle contraction	468. Compare the smooth muscle 469. contraction and skeletal muscle contraction	0.5	LGD
16	Skeletal muscle contraction	470. Describe the three sources of energy for muscle contraction 471. Compare isometric and isotonic contractions 472. Compare characteristics of fast and slow muscle	01	LGD

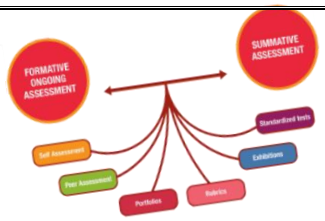
		fibers. 473. Sources of energy for muscle contraction 474. Compare isometric and isotonic contractions 475. Compare characteristics of fast and slow muscle fibers		
Biochemistry				
THEME I				
1	Connective tissues	Explain in detail the biochemistry of connective tissues.	01	LGD
2	Glycosaminoglycan	Discus the role of glycosaminoglycan (GAG) in the formation of the connective tissues, cartilage, skin, blood vessels and tendons	01	LGD
3	Collagen	Describe the chemical structures of cellular matrix of collagen and elastin	01	LGD
Theme II				
1	Role of calcium and phosphorus	476. Explain the role of calcium and phosphorous in formation of cellular matrix and bone	01	LGD
2	Vitamins	Vitamins and their role 477. Define vitamins 478. Classify vitamins 479. Differentiate between Fats and water soluble vitamins 480. Describe role of Vitamin A 481. Explain the role of Vitamin D 482. Describe the role of Vitamin E 483. Describe the role of water soluble vitamins	01	LGD
3	Introduction to minerals	484. Define Minerals, 485. Define major and minor minerals 486. Describe classification of minerals	01	LGD
Theme-III				
1	Sodium, potassium and chlorine in biology	487. Discuss RDA, serum Levels 488. Enlist sources of Sodium, Potassium and chlorine, 489. Describe functions 490. Discuss absorption excretion, 491. Describe disorders related to increase and decrease in amount of Sodium, Potassium and chlorine	01	LGD
Theme IV				
1	Role of vitamin c & D	492. Describe the role of Vitamin C and Vitamin D in the formation of connective tissues and bones.	01	LGD
2	Iodine in Biology	493. Discuss RDA, serum Levels Iodine 494. Enlist sources of 495. Describe functions	01	LGD

		496. Discuss absorption excretion, 497. Describe disorders related to increase and decrease in amount of Iodine		
THEME V				
1	Phosphorus and Magnesium in biology	498. Discuss RDA, serum Levels 499. Enlist sources of Phosphorus and Magnesium 500. Describe functions 501. Discuss absorption excretion, 502. Describe disorders related to increase and decrease in amount of Phosphorus and Magnesium	01	LGD
2	Sulphur in biology	503. Discuss RDA, serum Levels 504. Enlist sources of Sulphur 505. Describe functions 506. Discuss absorption excretion, 507. Describe disorders related to increase and decrease in amount of sulphur	01	LGD
3	Copper and cobalt in biology	508. Discuss RDA, serum Levels Copper and cobalt 509. Enlist sources of 510. Describe functions 511. Discuss absorption excretion, 512. Describe disorders related to increase and decrease in amount of Copper and cobalt	01	LGD
THEME VI				
1	Hormonal regulation	513. Explain the hormonal regulation of 514. calcium and phosphorous to maintain 515. musculoskeletal system	01	LGD
2	Sodium, potassium and chlorine in biology	516. Discuss RDA, serum Levels 517. Enlist sources of Sodium, Potassium and chlorine, 518. Describe functions 519. Discuss absorption excretion, 520. Describe disorders related to increase and decrease in amount of Sodium, Potassium and chlorine	01	LGD
3	Calcium in Biology	521. Discuss RDA, serum Levels 522. Enlist sources of Calcium 523. Describe functions 524. Discuss absorption excretion, 525. Describe disorders related to increase and decrease in amount of Calcium	01	LGD
4	Fluoride and Lithium in biology	526. Discuss RDA, serum Levels Fluoride 527. Enlist sources of 528. Describe functions 529. Discuss absorption excretion,	01	LGD

		530. Describe disorders related to increase and decrease in amount of Fluoride 531. Brief description on role of lithium in biology		
5	Molybdenum, Selenium, Zinc, chromium,manganese,silicon, vanadium in biology	532. Enlist sources of 533. Describe functions 534. Discuss absorption excretion, 535. Describe disorders related to increase and decrease of the said elements	01	LGD
6	Toxic element Aluminum , Arsenic, Antimony, Boron, Bromine, Cadmium, Cesium, Germanium, Lead, Mercury, Silver, Strontium	536. Discuss different effects of toxic elements	01	LGD
Pathology				
THEME IV				
1	Introduction to Bone pathology	537. Define and differentiate osteopenia, osteoporosis, osteomalacia 538. Define osteomyelitis 539. Enlist various forms of arthritis	03	LGD
Forensic medicine(THEME IV)				
1	Injury	540. Define injury on medico legal basis. 541. Classify injury. 542. Define mechanical injury 543. Classify mechanical injury 544. Describe mechanisms of injury. 545. Interpret the nature (manner) of injury.	02	LGD
2	Wound	546. Define wound. 547. Define hurt. 548. Identify factors affecting appearance of wound	01	LGD
Community medicine				
THEME V				
1	Back pain	549. Explain the causes of low back pain 550. Describe the prevention of low back pain 551. Describe the causes & prevention of msd related to child labor	01	LGD
THEME VI				
1	MSK diseases	552. Explain the risk factors for different types of msd's 553. Describe the preventive measures for different types of risk factors for msd's	01	LGD
2	Epidemiology and prevention of MSD	554. Describe work related msd's 555. Identify risk factors of msd at workplace 556. Describe prevention of exposure to risk factors	02	LGD

			related to workplace. 557. Describe the preventive strategies and safety guidelines in order to reduce the incidence of msds related to work place. 558. Describe the burden /epidemiology of work related msd's 559. Describe application of ergonomics in the prevention of work related msd's		
RADIOLOGY					
1	Hand (THEME II)	560.	Identify structures on transverse MRI hand taken at various levels	01	LGD
2	Gluteal region (theme III)	561.	Identify structures on transverse MRI of gluteal region taken at various levels	01	LGD
3	Foot (THEME III)	562.	Identify structures on transverse MRI of foot taken at various levels	01	LGD
4	Knee joint (THEME III)	563.	Describe radiological anatomy (Xrays and MRI) of knee joints	0.5	LGD
5	Vertebral column (THEME V)	564.	Identify structures on CT/MRI of vertebral column taken at various levels	0.5	LGD
Practicals					
BIOCHEMISTRY					
1	Detection of Sulphur containing amino acids	565. 566.	Define Sulphur containing amino acids their structure and types Lead Sulphate test	04	
2	Detection of Cyclic amino Acids	567. 568. 569.	Define Cyclic amino Acids Understand their structure and types Xanthoproteic Test	06	
3	Salt Saturation Test	570.	Perform Salt Saturation Test	04	
HISTOLOGY PRACTICALS					
1	Muscle histology	571.	Histological composition of smooth muscle and skeletal muscle	06	
2	Bone histology	572.	Microscopic anatomy of spongy and compact bone	04	
3	Cartilage histology	573.	Histological composition of hyaline,elastic and fibrocartilge	04	

MIT:mode of information transfer. E.g. lecture, SGD, DSL, Practical, skill lab etc



7 Examination and Methods of Assessment:

7.1 Instruction:

- Dress code. Student should follow the prescribe dress code during accedamic hours.
- In collage premises student should disply collage I D card, security has the right to check the I D card and deny entry in collage premises if student fails to produce it.
- Ragging is strictly prohibited and anybody involved will be reported to the ragging commission for neccesry action.
- 75% attandence is mandatory for the student to sit in the final examination.
- Any student breaking or damaging the collage/Hospital property shell be required to pay the cost.
- Student should read and observe rules and regulation of collage as given in prospectus.

7.2 Internal assessment:

- Total 10% (24 marks)
- Formative Assessment; (assessment for learning) includes quizzes, surprise test, assignment,substages, presentation.the marks obtained in each cattegry has weightage in internal assessment. this help teacher to identify the areas where student need improvement.
- Summative assessment;. This includes, module test(MCQs, OSPE) which will be taken at the end of module.conducted on university exam pattern, consist of 120 MCQs. Total marks 10% in theory and 10% inpractical.this will be submitted to the university before final examination. Substages will be conducted every 2 weeks during the course, end of block exam will be conducted after 8 weeks consist of Anatomy,Biochemistry,and physiology,pharmacology, Pathology, community medicine,PRIME, Radiology, course.

7.3 University exam:

- Exam has 90% (210) marks in total
- Consist of MCQs paper B having 120 MCQs and OSPE which has 90 marks.

Final distribution of MCQs for year-1 (MSK module)paper B

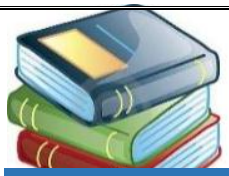
Subject	No. of MCQs
Gross Anatomy	71
Histology	8
Embryology	4
Physiology	16
Biochemistry	16
PRIME including Research	1
Pharmacology	1
Pathology	2
Community medicine	1
Total	**120**

Final distribution of OSPE stations for year-1 (MSK module)

Subject	MSK module	Viva stations	Total OSPE stations (for final exam*)
Gross Anatomy	9	2	8
Histology	4		
Embryology	0		
Physiology	2	2	2
Biochemistry	3	2	2
Total	18	6	12+6 (viva)=18

*out of total of 18 OSPE stations, 12 will be allocated for final exam plus 6 viva stations.

A minimum of 18 stations will be used in final exams.



8 Learning Opportunities and Resources

8.1 Instruction

Following are the resource material, student can also use books recommended by subject specialist.

8.2 Books:

Gross anatomy	Netter's Atlas of Huma Anatomy 7th edition. Grey anatomy 4th edition. Snell's clinical Anatomy by regions 10th edition **Last's Anatomy 10th edition**
Embriology	Langman's Medical Embriology 14th edition The Developing Human by keith L Moore 10th edition
Histology	Liaqhussain basic histology. Difore Atlas of Histology.
Physiology	Guyton's "Text book of medical physiology 13th edition. Ganong's "Review of medical physiology" 26th edition.
Biochemistry	Lipponcot's biochemistry 7th edition. Herper's biochemistry 31th edition.
Pharmacology	Ketzung's Basic and clinical pharmacology 13th edition.
Pathology	Robin's basic pathology 10th edition.
Community medicine	Essential of Community Medicine.

8.3 Website:

1. **TeachMe Anatomy** *(most comprehensive)*
2. **Innerbody Resear ch** *(easiest to use)*
3. **Get Body Smart** *(best visuals)*
4. **AnatomyZone** *(most interactive)*
5. **UMich Anatomy** *(best for gross/lab anatomy)*

8.4 Articles:

- 1.Patel M, Varacallo M. Anatomy, Shoulder and Upper Limb, Arm Nerves. 2021 Sep 18. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan–. PMID: 31613515.
- 2.Jung Kim H, Hyun Park S. Sciatic nerve injection injury. J Int Med Res. 2014 Aug;42(4):887-97. doi: 10.1177/0300060514531924. Epub 2014 Jun 11. PMID: 24920643

9 Timetables

AYUB MEDICAL COLLEGE, ABBOTTABAD

First **Year MBBS** Class Session 2026

Block-B (MUSCULOSKELETAL)

WEEK 1

D A Y S	8.00-9.00AM	9.00-10.00AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Action potential)	**Biochemistry** Dr Sofia (Fat soluble vitamins)	**Forensic medicine** Dr Inamurehman	PRAYER BREAK	**PRACTICALS** Batch A. Anatomy (Bone) Dr Guleshehwar Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Biochemistry)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Goldmann equation)	**Biochemistry** Dr Sarwat (Minerals)	**Pathology** Dr Sabana Malik		**PRACTICALS** Batch A. Tutorial (Biochemistry) Batch B. Anatomy(Bone) Dr Gul Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Prime** Dr (Ayesha saleem)	**Embryology** Dr Robina shaheen	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Biochemistry) Batch C. Anatomy (Bone) Dr Gul Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Skeletal muscle contraction)	**Biochemistry** Dr nadia Protein and amino acids	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Biochemistry) Batch D. Anatomy (Bone)Dr Gul
FRIDAY	8.00……9.00AM	9.00…..10.00 AM	**Pak studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla			H A L F D A Y
	Histology Bone histology DR Sumaira Javed	**Prime** Dr (Ayesha saleem)					

WEEK 2

D A Y S	8.00-9.00 AM	9.00-10.00 AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (energetics of muscle contraction)	**Biochemistry** Dr Sofia (Fat soluble vitamins)	**Forensic medicine** Dr Inamurehman	**PRAYER BREAK**	**PRACTICALS** Batch A. Anatomy (Bone) Dr. Gul Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (muscle tone and fatigue)	**Biochemistry** Dr Sarwat (Minerals)	**Pathology** Dr Sabana Malik		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (Bone)Dr Gul Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**SDL** (Library)	**Embryology** Dr Robina Shaheen	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy (Bone) Dr Gul Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (lever systems of body)	**Biochemistry** Dr nadia (Protein and amino acids)	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (Bone)Dr Gul
FRIDAY	**8.00……9.00AM** **Histology** Bone histology Dr.Sumaira Javed	**9.00…..10.00AM** **Prime** Dr (Ayesha saleem)	**Pak Studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla			**H A L F D A Y**

WEEK 3

D A Y S	8.00-9.00AM	9.00-10.00AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (remodelling of muscle)	**Biochemistry** Dr Sofia (Fat soluble vitamins)	**Forensic medicine** Dr Inamurehman	**PRAYER BREAK**	**PRACTICALS** Batch A. Anatomy (muscle)Dr Gul Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (neuromuscular junction)	**Biochemistry** Dr Sarwat (Minerals)	**Pathology** Dr Sabana Malik		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (muscle) Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		Orthopedic Dr younas (fractures of upper limb)	**Embryology** Dr Robina Shahhen	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy(muscle)dr GUL Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (transmission of impulse at NMJ)	**Biochemistry** Dr nadia (Protein and amino acids)	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (muscle) Dr Gul
FRIDAY	**8.00……9.00AM** **Histology** Bone histology Dr Sumaira Javed	**9.00…..10.00 AM** **Prime** Dr (Ayesha Saleem)	**Pak studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla			**H A L F D A Y**

Week 4

D A Y S	8.00-9.00AM	9.00-10.00AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (acetylcholine)	**Biochemistry** Dr Sofia (Fat soluble vitamins)	**Radiology** Dr Ghayyur	PRAYER BREAK	**PRACTICALS** Batch A. Anatomy (muscle) Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Fatigue of NMJ)	**Biochemistry** Dr Sarwat (Minerals)	**Pharmacology** Dr maha (NSAIDs)		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (muscle) Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Orthopedic** Dr Younas (fracture of upper limb)	**Embryology** Dr Robina Shaheen	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy (muscle) Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Drugs acting on NMJ)	**Biochemistry** Dr nadia Protein and amino acids	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (muscle) dr Gul
FRIDAY	**8.00……9.00AM** **Histology** Muscle histology Dr Sumaira Javed	**9.00…..10.00AM** Prime Dr (Ayesha saleem)	**Pak studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla			**H A L F D A Y**

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WEEK 5

D A Y S	8.00-9.00AM	9.00-10.00AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (myasthenia gravis)	**SDL** (Library)	**Radiology** Dr Ghayyur	PRAYER BREAK	**PRACTICALS** Batch A. Anatomy (Cartilage)Dr Gul Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-DrRamla		**Physiology** Dr Alruba (smooth muscle classification)	**Biochemistry** Dr Sarwat (Minerals)	**Community Medicine** Dr Sobia		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (Cartilage) Dr Gul Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**SDL** (Library)	**Embryology** Dr Robina Shaheen	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy (Cartilage)Dr Gul Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba	**Biochemistry** Dr nadia (Protein and amino acids)	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (Cartilage) Dr Gul
FRIDAY	**8.00……9.00AM**	**9.00…..10.00AM**	**Pak Studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid			**H A L F D A Y**

	Histology Muscle histology Dr Sumaira Javed	**Prime** Dr (Ayesha saleem)		Batch B-Dr Obaid Batch C-Dr Ramla		

WEEK 6

D A Y S	8.00-9.00AM	9.00-10.00AM	10.00-11.00AM	11.00AM-12.00PM	12.00 - 12.45PM	12.45-1.15PM	1.15-3.00PM
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (smooth muscle contraction)	**SDL** (Library)	**Radiology** Dr. Ghayyur	PRAYER BREAK	**PRACTICALS** Batch A. Anatomy (muscle) dr GUL Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (nervous and hormonal control)	**Biochemistry** Dr Sarwat (Minerals)	**C. Medicine** Dr Sobia		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (muscle) dr Gul Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**SDL** (Library)	**Gross Anatomy** Dr Sara Jadoon	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy (muscle) Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Physiology** Dr Alruba (Muscle remodelling)	**Biochemistry** Dr nadia (Protein and amino acids)	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (muscle)
	8.00……9.00AM	**9.00…..10.00A**	**Pak studies**	**DISSECTION (ANATOMY)**			

FRIDAY		**M**		Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**H A L F D A Y**
	Histology Cartilage histology Dr Sumaira Javed	Prime Dr (Ayesha saleem)				

WEEK 7

D A Y S	**8.00-9.00AM**	**9.00-10.00AM**	**10.00-11.00AM**	**11.00AM-12.00PM**	**12.00 - 12.45PM**	**12.45-1.15PM**	**1.15-3.00PM**
MONDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**C. medicine** Dr Sobia	**SDL** (Library)	**Radiology** Dr. Ghayyur	**PRAYER BREAK**	**PRACTICALS** Batch A. Anatomy (muscle) Dr Gul Batch B. Physiology Batch C. Biochemistry Batch D. Tutorial (Computer Lab)
TUESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Orthopedic** Dr younas (fracture of lower limb)	**Biochemistry** Dr Sarwat (Minerals)	C. medicine Dr Sobia		**PRACTICALS** Batch A. Tutorial (Computer Lab) Batch B. Anatomy (muscle)Dr Gul Batch C. Physiology Batch D. Biochemistry
WEDNESDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**SDL** (Library)	**Gross Anatomy** Dr Sara Jadoon	**Islamiyat**		**PRACTICALS** Batch A. Biochemistry Batch B. Tutorial (Computer Lab) Batch C. Anatomy (muscle) Dr Gul Batch D. Physiology
THURSDAY	**DISSECTION (ANATOMY)** Batch A-Dr Shahid Batch B-Dr Obaid Batch C-Dr Ramla		**Prime** Dr (Ayesha saleem)	**Biochemistry** Dr nadia (Protein and amino acids)	**Gross Anatomy** Dr Sara Jadoon		**PRACTICALS** Batch A. Physiology Batch B. Biochemistry Batch C. Tutorial (Computer Lab) Batch D. Anatomy (muscle)Dr Gul
FRIDAY	**8.00……9.00AM**	**9.00…..10.00AM**	**Pak Studies**	**DISSECTION (ANATOMY)** Batch A-Dr Shahid			**H A L F D A Y**

	Histology Cartilage histology Dr Sumaira Javed	**Prime** Dr (Ayesha saleem)		Batch B-Dr Obaid Batch C-Dr Ramla		

10 For inquiry and troubleshooting

Please contact

Dr Sumaira Javed

Email: sumairaziaa@gmail.com

11 Course Feedback Form

Course Title: _____

Semester/Module _____ Dates:_____

Please fill the short questionnaire to make the course better.

Please respond below with 1, 2, 3, 4 or 5, where 1 and 5 are explained.

THE DESIGN OF THE MODLUE

A. Were objectives of the course clear to you? Y ☐ N ☐

B. The course contents met with your expectations
l. Strongly disagree 5. Strongly agree ☐

C. The lecture sequence was well-planned
l. Strongly disagree 5. Strongly agree ☐

D. The contents were illustrated with
l. Too few examples 5. Adequate examples ☐

E. The level of the course was
l. Too low 5. Too high ☐

F. The course contents compared with your expectations
l. Too theoretical 5. Too empirical ☐

G. The course exposed you to new knowledge and practices
l. Strongly disagree 5. Strongly agree ☐

H. Will you recommend this course to your colleagues?
l. Not at all 5. Very strongly ☐

THE CONDUCT OF THE MODLUE

A. The lectures were clear and easy to understand
l. Strongly disagree 5. Strongly agree ☐

B. The teaching aids were effectively used
l. Strongly disagree 5. Strongly agree ☐

C. The course material handed out was adequate
l. Strongly disagree 5. Strongly agree ☐

D. The instructors encouraged interaction and were helpful
l. Strongly disagree 5. Strongly agree ☐

E. Were objectives of the course realized? Y ☐ N ☐

F. Please give overall rating of the course

90% - l00% ( ) 60% - 70% ( )

80% - 90%	( )		50% - 60%	( )	
70% - 80%	( )		below 50%	( )	

Please comment on the strengths of the course and the way it was conducted.

Please comment on the weaknesses of the course and the way it was conducted.

Please give suggestions for the improvement of the course.

Optional – Your name and contact address:

Thank you!!