Department of Medical Education (DME)

Musculoskeletal -I Module

Study Guide
First Year MBBS 2022 - 2023

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Document Information

Category	**MSK-I Module Study Guide**
Document	Procedure for Control of Documented Information
Issue	1
Rev	00
Identifier	RMU-MR-SOP-52
Status	Final Document
Author(s)	Additional Director Medical Education, Asst. Director Medical Education,
Reviewer(s)	Curriculum Committee.
Approver(s)	Vice Chancellor
Creation Date	01-03-2023
Effective Date	01-03-2023
Control Status	**CONTROLLED**
Distribution	VC, Principle, ISO Committee
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Document Approval

Prepared By	Reviewed By	Approved By
Additional Director Medical Education, Asst. Director Medical Education,	Curriculum Committee	Vice Chancellor

Document Revision History

Author(s)	Date	Version	Description

List of Copy Holders

Document Code	Issue # /Rev.#	Copy #	Copy Holders	Distribution Mode	Signature
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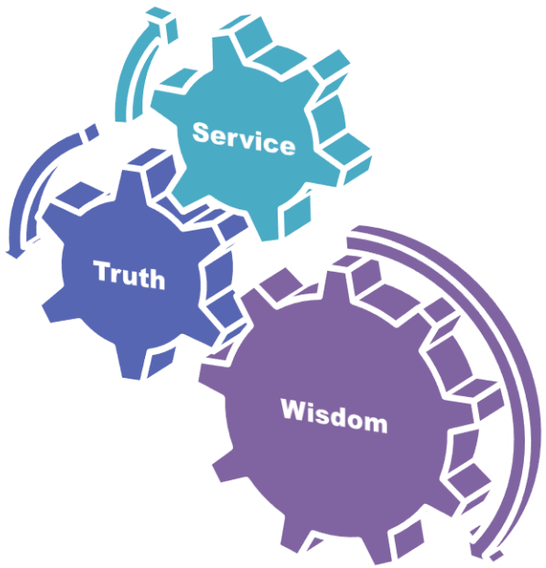
University Moto, Vision, Values & Goals

RMU Motto



Mission Statement

To impart evidence-based research-oriented health professional education in order to provide best possible patient care and inculcate the values of mutual respect, ethical practice of healthcare and social accountability.

Vision and Values

Highly recognized and accredited centre of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are lifelong experiential learner and are socially accountable.

Goals of the Undergraduate Integrated Modular Curriculum

The Undergraduate Integrated Learning Program is geared to provide you with quality medical education in an environment designed to:

- Provide thorough grounding in the basic theoretical concepts underpinning the practice of medicine.
- Develop and polish the skills required for providing medical services at all levels of the Health care delivery system.
- Help you attain and maintain the highest possible levels of ethical and professional conduct in your future life.
- Kindle a spirit of inquiry and acquisition of knowledge to help you attain personal and professional growth & excellence.

First Year MBBS 2023

Study Guide

MSK-I Module

Discipline Wise Details of Modular Content

Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
I	• Anatomy	Skeletal System • Bones • Joints	General Embryology Second Week of Human Development till Placenta & Fetal Membranes	General Histology • Connective Tissue • Cartilage • Bone	Shoulder joint till Hand
	• Biochemistry	• Minerals, Vitamins, Introduction & Classification of Amino Acids			
	• Physiology	• NMJ, Introduction Concept of Motor Unit. Neuromuscular Transmission, Synthesis & Fate of Acetylcholine • Drugs Acting On NMJ, Myasthenia Gravis, Lambart Eaton Syndrome • Structure Of Neurons. Classification Of Neurons & Nerve Fibers • Nernst Potential, RMP • Recording & Propagation of Action Potential & Factors Effecting Nerve Conduction & Hyperpolarized State • Stimulus & Response & Types of Stimuli, Stages of Action Potential			
	• Bioethics & Professionalism	• Islamic concept of Bioethics			
	• Research Club Activity	• Comprehend their role in under “theme and scheme”			
	• Family Medicine	• Approach to a patient with Body aches			
	• Artificial Intelligence/Radiology	• Interpretation of upper limb Radiograph & use of AI			
	• Vertical components	• The Holy Quran Translation Component			
	• Vertical Integration	Clinically content relevant to musculoskeletal-I module • Shoulder Dislocation (Surgery) • Tennis elbow, Fracture of olecranon, Radius and Ulna (Surgery) • Osteoporosis (Medicine) • Osteomalacia, Rickets& Polyarthritis (Medicine) • Accidents (Community Medicine)			

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MSK-I Module Team

Module Name : MSK-I Module
Duration of module : 05 Weeks
Coordinator : Dr. Maria Tasleem
Co-coordinator : Dr. Urooj Shah
Reviewed by : Module Committee

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
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14.	Focal Person Community Medicine	Dr. Afifa Kulsoom
15.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar

Module Task Force Team		
1.	Coordinator	Dr. Maria Tasleem (Assisstant Professor of Anatomy)
2.	DME Focal Person	Dr. Sidra Hamid
3.	Co-coordinator	Dr. Urooj Shah (Demonstrator of Anatomy)
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5.	Co-coordinator	Dr. Faiza Zafar (Senior Demonstrator of Biochemistry)

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5.	Editor	Muhammad Arslan Aslam

Module II – MSK-I Module

Rationale: This module deals with locomotor system. This module describes the structural organization, functions, and congenital anomalies of musculoskeletal system. It explains the mechanism of neuromuscular transmission, its biochemical basis and the importance of Ca++ in the body. It depicts structure and function of joints in upper and lower limb. It elaborates identification of common fractures of long bones on radiograph.

Module Outcomes

At the end of this module the student should be able to:

Knowledge

- Explain the development & structure of musculoskeletal system.
- Explain the physiological and biochemical factors affecting Neuro Muscular transmission.
- Apply the knowledge of the basic sciences to understand common fractures.
- Appreciate concepts & importance of
  Artificial Intelligence
  Family Medicine
  Biomedical Ethics
  Research.

Skills

- Dissect limbs to demonstrate regional Anatomy and relationships of various structures to each other.
- Identify histological features of connective tissue and muscles under microscope.
- Perform practicals on estimation of calcium and protein chemistry.

Attitude

- Demonstrate **a professional attitude, team building spirit, good communication skills** and cadaveric handling.

This module will run in 5 weeks duration. Instructional strategies are given in the time table and learning objectives are given in the study guides. Study guides will be uploaded on the university website. Good luck!

SECTION - I

Terms & Abbreviations

Contents

- Domains of Learning
- Teaching and Learning Methodologies/Strategies
    - Large Group Interactive Session (LGIS)
    - Small Group Discussion (SGD)
    - Self-Directed Learning (SDL)
    - Case Based Learning (CBL)
    - Problem- Based Learning (PBL)
    - Skill Labs/Practicals (SKL)

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- Table1. Domains of learning according to Blooms Taxonomy
- Figure 1. Prof Umar's Model of Integrated Lecture
- Table2. Standardization of teaching content in Small Group Discussions
- Table 3. Steps of taking Small Group Discussions
- Figure 2. PBL 7 Jumps Model

Table1. Domains Of Learning According to Blooms Taxonomy

Sr. #	Abbreviation	Domains of learning
1.	C	**Cognitive Domain:** knowledge and mental skills.
	• C1	Remembering
	• C2	Understanding
	• C3	Applying
	• C4	Analyzing
	• C5	Evaluating
	• C6	Creating
2.	P	**Psychomotor Domain:** motor skills.
	• P1	Imitation
	• P2	Manipulation
	• P3	Precision
	• P4	Articulation
	• P5	Naturalization
3.	A	**Affective Domain:** feelings, values, dispositions, attitudes, etc
	• A1	Receive
	• A2	Respond
	• A3	Value
	• A4	Organize
	• A5	Internalize

Teaching and Learning Methodologies / Strategies

Large Group Interactive Session (LGIS)

The large group interactive session is structured format of Prof Umar Model of Integrated lecture. It will the followed for delivery of all LGIS. The lecturer will introduce a topic or common clinical condition and explains the underlying phenomena through questions, pictures, videos of patients, interviews and exercises, etc. Students are actively involved in the learning process.

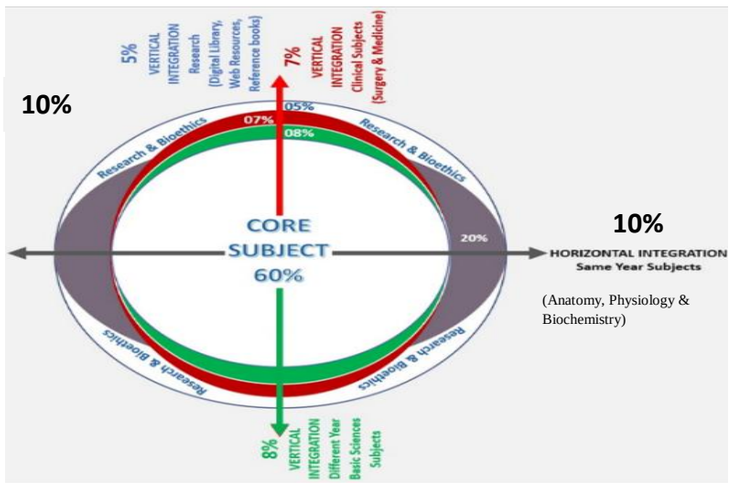


Figure 1. Prof Umar's Model of Integrated Lecture

Small Group Discussion (SGD)

This format helps students to clarify concepts acquire skills and attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics or power point presentations. Students exchange opinions and apply knowledge gained from lectures, SGDs and self study. The facilitator role is to ask probing questions, summarize and help to clarify the concepts.

Table 2. Standardization of teaching content in Small Group Discussions

S. No	Topics	Approximate %
1	Title Of SGD	
2	Learning Objectives from Study Guides	
3	Horizontal Integration	5%+5%=10%
4	Core Concepts of the topic	60%
5	Vertical Integration	20%
6	Related Advance Research points	3%
7	Related Ethical points	2%

Table 3. Steps of Implementaion of Small Group Discussions

Step 1	Sharing of Learning objectives by using students Study guides	First 5 minutes
Step 2	Asking students pre-planned questions from previous teaching session to develop co-relation (these questions will be standardized)	5minutes
Step 3	Students divided into groups of three and allocation of learning objectives	5minutes
Step 4	ACTIVITY: Students will discuss the learning objectives among themselves	15 minutes
Step 5	Each group of students will present its learning objectives	20 min
Step 6	Discussion of learning content in the main group	30min
Step 7	Clarification of concept by the facilitator by asking structured questions from learning content	15 min
Step 8	Questions on core concepts	
Step 9	Questions on horizontal integration	
Step 10	Questions on vertical integration	
Step 11	Questions on related research article	
Step 12	Questions on related ethics content	
Step 13	Students Assessment on online MS teams (5 MCQs)	5 min
Step 14	Summarization of main points by the facilitator	5 min
Step 15	Students feedback on the SGD and entry into log book	5 min
Step 16	Ending remarks	

Self Directed Learning (SDL)

- Self- directed learning is a process where students take primary charge of planning, continuing, and evaluating their learning experiences.
- Time Home assignment
- Learning objectives will be defined
- Learning resources will be given to students = Textbook (page no), web site
- Assessment:

  i Will be online on LMS (Mid module/ end of Module)

  ii.OSPE station

Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific scenarios that typically resemble real world examples.
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on

  i. To provide students with a relevant opportunity to see theory in practice

  ii. Require students to analyze data in order to reach a conclusion.

  iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

Problem Based Learning (PBL)

- Problem-based learning (PBL) is a student-centered approach in which students learn about a subject by working in groups to solve an open-ended problem.
- This problem is what drives the motivation and the learning.

The 7- Jump-Format of PBL (Masstricht Medical School)	
Step 7	Syntheise & Report
Step 6	Collect Information from outside
Step 5	Generate learning Issues
Step 4	Discuss and Organise Ideas
Step 3	Brainstorming to Identify Explanations
Step 2	Define the Problem
Step 1	Clarify the Terms and Concepts of the Problem Scenario
Problem- Scenario	

Figure 2. PBL 7 Jumps Model

Practical Sessions/Skill Lab (SKL)

Practical Session/ Skill Lab (SKL)	
Demonstration/ power point presentation 4-5 slide	10-15 minutes
Practical work	25-30 minutes
Write/ draw and get it checked by teacher	20-25 minutes
05 mcqs at the end of the practical	10 minutes
At the end of module practical copy will be signed by head of department	
At the end of block the practical copy will be signed by Head of Department Dean Medical education department QEC	

SECTION – II

Learning Objectives, Teaching Strategies & Assesssments

Contents

- Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)
- Large Group Interactive Session:
  - Anatomy (LGIS)
  - Physiology (LGIS)
  - Biochemistry (LGIS)
- Small Group Discussions
  - Anatomy (SGD)
  - Physiology (SGD)
  - Biochemistry (SGD)
- Self Directed Topic, Learning Objectives & References
  - Anatomy (SDL)
  - Physiology (SDL)
  - Biochemistry (SDL)
- Skill Laboratory
  - Anatomy
  - Physiology
  - Biochemistry

Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)

Anatomy Large Group Interactive Session (LGIS)

Topic	Learning Objectives At the end of session students should be able to	C/P/A	Teaching Strategy	Assessment Tool
	Embryology			
Second week of Human Development (Formation of Bilaminar Embryonic Disc)	• Describe formation of Amniotic Cavity, embryonic disc and Umbilical vesicle	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss development of chorionic sac	C1		
	• Outline the process of implantation	C1		
	• Describe changes in Gravid Endometrium	C1		
	• Understand the Bio-physiological aspects of gravid endometrium	C2		
	• Discuss clinical aspects of implantation	C3		
	• Able to read relevant research article	C3		
	• Know to use Digital Library	C3		
Gastrulation (Formation of three germ layers Establishment of Body Axis and Fate Map 3rd week)	• Discuss process of gastrulation with special reference to primitive streak	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe the fate of primitive streak	C1		
	• Discuss establishment of body axis	C1		
	• Draw fate map and discuss its importance in future development	C1		
	• Understand the Biophysiological aspects of gastrulation	C2		
	• Describe congenital abnormalities associated with gastrulation	C3		
Notochord Formation (3rd week)	• Define notochord	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Delineate different stages of notochord formation	C1		
	• Discuss the importance of notochord in development of central nervous system	C2		
	• Describe role of notochord in development of axial Skeleton	C1		
	• Describe the fate of notochord	C1		
	• Correlate clinical aspects of notochord formation	C3		
	• Able to read relevant research article	C3		

Neurulation (3rd week)	• Define neurulation	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe formation of neural plate and neural tube	C1		
	• Discuss neural crest formation	C2		
	• Enlist derivatives of neural crest cells	C1		
	• Understand the bio-physiological aspects of Neurulation	C2		
	• Discuss neural tube defects	C3		
	• Discuss different types of spina bifida	C3		
	• Discuss the importance of folic acid in the prevention of spina bifida	C2		
Development and Differentiation of Somites	• Enumerate three germ layers and their derivatives	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe different divisions of mesoderm	C1		
	• Describe development of somites and their differentiation	C1		
	• Explain different stages of somite development	C1		
	• Understand the Biophysiological aspects of Somite differentiation	C2		
	• Correlate clinical aspects of somite differentiation	C3		
	• Able to read relevant research article	C3		
	• Know to use Digital Library	C3		
Early Development of Cardiovascular System & highlights of 4th-8th week	• Describe early development of cardiovascular system and chorionic villi	C1	• LGIS	SAQs MCQs VIVA
	• Discuss development of intraembryonic coelom	C1		
	• Define angiogenesis and vasculogenesis.	C1		
	• Correlate clinical aspects of angiogenesis	C3		
	• Summarize the main developmental events and changes in external form of the embryo during the 4th to 8th weeks	C1		
Folding of Embryo	• Enlist different phases of embryonic development	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe folding of the embryo in median plane	C1		
	• Describe folding of the embryo in horizontal plane	C1		
	• Discuss results of folding	C1		
	• Discuss Omphalocele and Gastroschisis	C3		
Fetal period	• Describe different criteria for fetal age estimation	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss the trimesters of pregnancy with their importance	C1		
	• Describe highlights of fetal period	C1		
	• Differentiate between embryonic and fetal period	C1		
	• Tabulate growth in length and weight during fetal period	C1		
	• Enumerate and discuss factors influencing fetal growth	C3		
	• Define the term perinatology	C1		SAQs MCQs
	• Enlist and briefly describe procedures for assessing fetal well-being	C3		

	• Correlate clinical aspects of fetal period	C3	• LGIS	VIVA VOCE
	• Able to read relevant research article	C3		
Placenta	• Discuss Implantation and establishment of the embryo within the uterus	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe the differentiation of the uterine lining into decidua	C1		
	• Describe the development of a placenta	C1		
	• Describe fetal – maternal circulation	C1		
	• Discuss the bio-physiological aspects of placenta	C2		
	• Discuss the clinical conditions associated with placenta	C3		
Fetal Membranes and Multiple Pregnancies	• Enlist membranes developing during pregnancy	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss origin, composition, location, function and fate of yolk sac	C1		
	• Explain origin, composition, location, function and fate of Amnion	C1		
	• Describe formation of umbilical cord and its structure	C1		
	• Define Allantois along with its importance and function	C1		
	• Correlate clinical aspects of fetal membranes	C3		
	• Able to read relevant research article	C3		
	• Discuss different types of twins	C1		
	• Describe the arrangement of fetal membranes in monozygotic and dizygotic twins	C1		
	• Discuss the clinical conditions of twin pregnancy	C3		
Histology				
Connective tissue I Cells of connective tissue Embryonic connective tissue / mucoid Connective Tissue	• Define connective tissue	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Classify connective tissue	C1		
	• Enlist and explain types of cells in CT	C1		
	• Enumerate sites and describe the function of each type of cell of connective tissue	C1		
	• Understand the Biophysiological aspects of connective tissue	C2		
	• Draw and label histological structure of mucoid CT.	C2		
	• Describe fibers in mucoid CT	C2		
	• Correlate clinical aspects of CT	C3		
	• Able to read relevant research articles	C3		
	• Know to use Digital Library	C3		
Connective tissue II Loose aerolar	• Enumerate examples and location of reticular, connective tissue	C1		
	• Illustrate histological structure of loose and reticular connective tissue.	C2		

connective tissue & its types Reticular CT	• Correlate clinical aspects of loose and reticular CT	C3	• LGIS	SAQs MCQs VIVA VOCE
	• Able to read relevant research article	C3		
	• Know to use Digital Library	C3		
Connective tissue III Adipose CT Dense regular and irregular connective	• Enumerate examples and location of adipose and dense CT.	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Draw, describe and label histological structure of all types of connective tissue.	C1		
	• Differentiate between dense regular and irregular connective tissue microscopically	C1		
	• Correlate clinical aspects of loose and reticular CT	C3		
	• Able to read relevant research article	C3		
	• Know to use Digital Library	C3		
Cartilage	• Classify cartilage	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Enlist sites of hyaline, fibro and elastic cartilage	C1		
	• Appreciate microscopic structure of Hyaline, Elastic and Fibrocartilage	C1		
	• Differentiate between three cartilages	C1		
	• Describe the structure of perichondrium	C1		
	• Describe the arrangement of layers in articular cartilage	C1		
	• Understand the Biophysiological aspects of cartilage	C2		
	• Correlate clinical aspects of three types of cartilage	C3		
	• Able to read relevant research article	C3		
	• Know to use Digital Library	C3		
Bone-I	• Describe structure and functions of bone cells	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss periosteum and endosteum	C1		
	• Discuss types of bones	C1		
	• Describe the histological features of spongy and compact bone	C1		
	• Describe structure of osteon.	C2		
	• Understand the Biophysiological aspects of bone	C1		
	• Correlate clinical aspects of bone	C3		
	• Able to read relevant research article	C3		
Bone-II	• Describe osteogenesis	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss bone growth, remodeling and repair	C1		
	• Describe histological changes in bones in osteoporosis, rickets, osteomalacia, osteopetrosis and bone tumors	C3		

General Anatomy				
Bone-I	• Describe the functions of bone and skeleton	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Identify general features of bone	C1		
	• Differentiate between maceration and decalcification of bones	C1		
	• Correlate clinical aspects of bone	C3		
	• Able to read relevant research article	C3		
Bone-II	• Classify bones based on different criteria	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe the growing end hypothesis	C1		
	• Describe blood supply of bones	C1		
	• Appreciate role of bones in estimation of sex, age and stature.	C2		
Joints-I	• Define joints	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Classify fibrous joints with examples	C1		
	• Classify cartilaginous joints with examples	C1		
	• Classify synovial joints with examples	C1		
	• Understand the Bio-physiological aspects of joints	C2		
Joints-II	• Describe structure of synovial joint	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Classify synovial joints	C1		
	• Explain movements around synovial joints	C1		
	• Enlist Degenerative joint diseases	C3		
	• Describe the involvement of anatomical structure of the articular cartilage in Degenerative joint disease	C3		

Physiology Large Group Interactive Session (LGIS)

Topic	Learning Objectives At the end of session students should be able to	C/P/A	Teaching Strategy	Assessment Tool
Structure of Neuron	• Describe different parts of neuron	C1	LGIS SDL	SAQs MCQs VIVA VOCE
Classification of Neurons and nerve fibres, NGF	• Describe the classification of neurons and nerve fibres	C1	LGIS SDL	SAQs MCQs VIVA VOCE
	• Describe NGF; given their roles	C1		
Stimulus and Response & Types of Stimuli	• Define stimulus	C1	LGIS	SAQs MCQs VIVA VOCE
	• Describe various types of stimuli and response	C1		
Concept of degeneration and regeneration	• Explain degeneration and regeneration of nerve fibres	C2	LGIS	SAQs MCQs VIVA VOCE
Properties of nerve fibres	• Discuss the properties of nerve fibres	C2	LGIS	SAQs MCQs VIVA VOCE
Graded Potential, Comparison with action potential	• Define graded Potential with examples	C1	LGIS	SAQs MCQs VIVA VOCE
	• Compare between graded potential and action potential	C2		
Nernst Potential RMP	• Understand the concept of Nernst potential and equilibrium potential for different ions	C2	LGIS SDL	SAQs MCQs VIVA VOCE
	• Define resting membrane potential of nerves.	C1		
	• Explain the factors which determine the level of RMP	C2		
	• Differences between electrical and chemical synapse	C2		
RMP: & Measurement & effect of Electrolytes,	• Describe the terms polarized and hyperpolarized	C1	LGIS	SAQs MCQs VIVA
	• Describe the role of various ions for these states	C1		

				VOCE
Stages of Action Potential I&II	• Define and draw action potential	C1	LGIS	SAQs MCQs VIVA VOCE
	• Describe different phases of action potential	C1		
Recording of Action Potential Propagation of Action Potential & Factors effecting nerve conduction Polarization and hyperpolarization state	• Briefly describe the method of recording resting membrane potential and action potential	C1	LGIS	SAQs MCQs VIVA VOCE
	• Describe the mechanism of propagation of action potential	C1		
	• Describe various factor that effect nerve conduction	C1		
Refractory Period, Different types of Action Potentials	• Define refractory period and discuss its types	C1	LGIS SDL	SAQs MCQs VIVA VOCE
	• Describe various types of action potential	C1		
Synapse and synaptic transmission	• Describe synapse and its types	C1	LGIS	SAQs MCQs VIVA VOCE
EPSP, IPSP, Properties of chemical synapse	• Discuss in detail various properties of chemical synapse	C2	LGIS	SAQs MCQs VIVA VOCE
Properties of Chemical synaptic	• Discuss in detail various properties of chemical synapse	C2	LGIS	SAQs MCQs VIVA VOCE
NMJ , Synthesis and release of Ach Excitation-Contraction coupling	• Describe the physiologic anatomy of neuromuscular junction.	C1	LGIS SDL	SAQs MCQs VIVA VOCE
	• Recall Synthesis and release of Ach	C1		
	• Describe the mechanism of transmission of impulses from nerve endings to skeletal muscle fibers	C1		
	• Describe briefly the biochemistry of acetyl choline	C1		
Drugs acting on	• Enlist drugs that enhance and block transmission at neuromuscular junction	C1	LGIS SDL	SAQs MCQs

NMJ,Excitation-Contraction coupling	• Describe mechanism of excitation contraction coupling	C1		VIVA VOCE
Myasthenia Gravis, Lambert Eaton Syndrome	• Describe the salient features of myasthenia gravis and Lambert Eaton syndrome	C1	LGIS	SAQs MCQs VIVA VOCE

Biochemistry Large Group Interactive Session (LGIS)

Topic	Learning Objectives At The End Of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Minerals & Vitamins				
Minerals & Vitamins Introduction Calcium	• State Daily Requirements of Calcium in different conditions: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 63	C1	LGIS	MCQs, SAQs & Viva
	• Classify Minerals: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2, Chapter#6, Page 56 • Discuss Types & Sources of Calcium: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 63	C2 C2		
Biochemical Role Of Calcium & Phsphate	• Discuss causes of Hypercalcemia & Hypocalcemia: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 69, 70 • Describe effects of Hypercalcemia & Hypocalcemia: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 69, 70 • State Daily Requirements of Phosphate: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 70,78 • Discuss Biochemical functions of Phosphate: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 72	C2 C2 C1 C2	LGIS	MCQs, SAQs & Viva

Fluoride, Magnesium, Sulphur	• Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77 • Enlist Sources of Fluoride, Sulphur & Magnesium: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77 • Describe Deficiency Effects: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77	C2 C1 C2	LGIS	MCQs, SAQs & Viva
Iodine, Copper, Zinc, Selenium, Manganese	• Recall sources & daily requirements: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73, 74,75,78 • Discuss their biochemical functions: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73,74,75,78 • Describe Deficiency Effects: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73,74,75,78	C1 C2 C2	LGIS	MCQs, SAQs & Viva
Vitamins & Their Classification	• Classify Fat & Water Soluble Vitamins: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#1 , Page 1 • Enlist Sources of Vitamin A & E: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 3, 17 • Describe Biochemical functions of Vitamin A & E: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 4, Page 19 • Describe Deficiency Effects of Vitamin A & E: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 6, Page 7, Page 18 • Explain Toxic Effects of Vitamin A: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 6 & 7	C2 C1 C2 C2 C2	LGIS	MCQs, SAQs & Viva

Vitamin D	• Enlist Sources of Vit.D: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 10 • Explain Steps of activation of Vit.D in the body: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page11 • Describe Biochemical functions of Vit.D: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 13 • Explain Deficiency effects of Vit.D: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 14,15,16 • Explain Toxic effects of Vit.D: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 ,Page 17	C1 C2 C2 C2 C2	LGIS	MCQs, SAQs & Viva
Vitamin C	• Enlist Sources of Vit.C: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 24 • Describe Biochemical functions of Vit.C: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2,Chapter#3 , Page 25 • Explain Deficiency effects of Vit.C: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 26 • Explain Toxic effects of Vit.C: Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 ,Page 26, 27	C1 C2 C2 C2	LGIS	MCQs, SAQs & Viva
Niacin & Thiamine	• Enlist Sources : Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 28,29,33,34 • Describe Biochemical functions : Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2,Chapter#3 , Page 28,29,33,34 • Explain Deficiency effects : Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 28,29,33,34	C1 C2 C2	LGIS	MCQs, SAQs & Viva

Classification & Structure Of Amino Acids	• Classification & Structure Of Amino Acids & Isomerism of Amino Acids Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#1, Page 1-5	C2	LGIS	MCQs, SAQs & Viva

Anatomy Small Group Discussion (SGDs)

Topic	Learning Objectives At the end of Session students should be able to	C/P/A	Teaching Strategy	Assessment Tool
Shoulder Joint	• Classify the joint (according to type, shape and movement)	C1	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Discuss the attachments of capsule and ligament	C1		
	• Enlist the intra-articular structure (tendon of biceps brachii)	C1		
	• Describe attachment of glenoidal labrum with its significance in relation to synovial membrane	C1		
	• Discuss the neurovascular supply	C1		
	• Discuss factors indispensible for stability of joint	C1		
	• Discuss the movements at shoulder joint	C1		
	• Enlist related bursae.	C1		
	• Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	C3		
Flexor compartment & Neurovascular organization of the arm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe Neurovascular organization of arm,	C1		
	• Explain the related clinicals (biceps tendinitis, dislocation of tendon of biceps brachii)	C3		
Extensor compartment of the arm	• Tabulate Muscles of extensor compartment with origin insertion, nerve supply and actions	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe the neurovascular organization	C1		
	• Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa)	C3		
	• Read relevant research article	C3		
	• Use Digital Library	C3		
Ulna	• Determine the side	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Demonstrate anatomical position	P		
	• Discuss general features, attachments and articulations	C1		
	• Describe ossification	C1		
	• Elaborate interosseous membrane and its importance	C1		
	• Correlate the clinical aspects	C3		

Radius	• Determine the side	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Demonstrate its anatomical position	P		
	• Discuss general features, attachments and articulations	C1		
	• Describe its ossification	C1		
	• Describe the interosseous membrane and its importance	C1		
	• Correlate the clinical aspects	C3		
Flexor compartment of the forearm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe clinical conditions associated with flexor compartment	C3		
Extensor compartment of the forearm	• Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe clinical conditions associated with extensor compartment of forearm (Tennis elbow)	C3		
Neurovascular organization of forearm	• Describe nerves and vessels of forearm (formation, commencement, course, branches and relations)	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome)	C3		
	• Read relevant research article	C3		
	• Use Digital Library	C3		
Elbow joint	• Describe the type of joint with its articular surfaces	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss the capsule, synovial membrane and ligaments of the joints	C1		
	• Enumerate the related bursae,	C1		
	• Describe axis and plane of movements	C1		
	• Enumerate muscles producing movements at elbow joint.	C1		
	• Describe the associated clinical conditions (Elbow joint dislocation and student's elbow)	C3		
Proximal and distal radioulnar joints	• Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments.	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe movements of supination and pronation with special reference to axes	C1		
	• Enumerate the muscles producing these movements	C1		
	• Correlate clinical aspects of joint	C3		

Hand	• Understand the arrangement of carpal bones	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Identify the salient features of carpel bone.	C1		
	• Discuss the special blood supply of scaphoid bone.	C3		
	• Describe the mid carpal joint.	C1		
	• Discuss the 1st carpometacarpal joint including the type of the joint capsule synovial membrane and ligaments with axis of the movement and the muscles producing the movements	C1		
	• Read relevant research article	C3		
	• Use Digital Library	C3		
Wrist joint	• Describe the type of joint with its articular surfaces	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss the capsule, synovial membrane and ligaments of the joint	C1		
	• Enumerate the related bursae	C1		
	• Describe axis and plane of movements	C1		
	• Enumerate muscles producing movements at joint	C1		
	• Discuss wrist fractures & Dislocations	C3		
Anastomosis around wrist joint	• Discuss the blood vessels involved in the formation of anastomosis around the wrist joint	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Explain the importance of anastomosis.	C1		
Dorsum of Hand, Flexor retinaculum Extensor retinaculum	• Describe the muscles of dorsum of hand	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss the Dorsal digital expansion	C1		
	• Describe the attachment of flexor retinaculum with structures related to it.	C1		
	• Describe the Guyon's canal.	C1		
	• Describe the formation of the carpel tunnel and its applied anatomy.	C3		
	• Describe the attachment of extensor retinaculum and its various compartments with structures passing through it.	C1		
	• Discuss the De Quervain's disease.	C3		
Palm of hand-I Muscles & Neurovascular organization	• Tabulate the muscles forming the thenar and hypothenar eminence.	C1	SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss Lumbricals, Palmar and dorsal interossei with their attachments and actions.	C1		
	• Discuss the formation of superficial and deep arterial arches	C1		
	• Discuss the clinicals associated with palm	C3		
Palm of hand-II Fascial	• Discuss the formation and attachments of palmar aponeurosis.	C1	SKILL LAB	MCQs
	• Describe the formation of palmar spaces and its divisions	C1		
	• Describe the thenar and mid palmar spaces.	C1		
	• Define pulp spaces	C1		

spaces of hand Grip	• Relate anatomy of pulp space with its common clinical conditions	C3		SEQs VIVA VOCE OSPE
	• Describe dorsal subcutaneous spaces.	C1		
	• Demonstrate surgical incisions.	C3		
	• Describe different types of grips	C1		
	• Read relevant research article	C3		
	• Use Digital Library	C3		
Radiology & Surface Anatomy of upper limb	• Demonstrate the surface anatomy of ○ Subcalvian artery, ○ Subclavian vein, ○ Axillary artery, ○ Brachial artery, ○ Median nerve, ○ Radial artery, ○ Ulnar artery, ○ Radial nerve, ulnar nerve and ○ Superficial and deep palmar arches • Demonstrate major landmarks of upper limb on radiographs	P	SKILL LAB	MCQs SEQs VIVA VOCE OSPE

Physiology Small Group Discussion (SGDs)

Topic	Learning Objectives At the end of Session students should be able to	C/P/A	Teaching Strategy	Assessment Tool
Discussion regarding previous module	• Discuss difficulties regarding questions, MCQs of Foundation Module	C2	SGD	MCQs SAQs Viva Voce OSPE
RMP, measurement & effects, of electrolyte on RMP	• Define resting membrane potential of nerves.	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Explain the factors which determine the level of RMP	C2		
Drugs acting on NMJ excitation contraction coupling	• Drugs acting on NMJ	C1	SGD	MCQs SEQs SAQs Viva Voce OSPE
	• Excitation contraction coupling	C1		
Synapse and synaptic transmission &	• Describe synapse and its types	C1		MCQs SAQs
	• Differences between electrical and chemical synapse			

EBSP,IPSP properties of chemical synapse		C2	SGD	Viva Voce OSPE
Nernst potential	• Concept of Nernst potential	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Equilibrium potential for different ions	C2		
Neuro muscular junction(NMJ)	• Transmission Across NMJ	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Diseases of NMJ	C2		
Nerve growth factor (NGF)	• Describe NGF	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Give their role	C1		
	• Explain De-generation and Re-Generation of nerve fibers	C2		

Biochemistry Small Group Discussion (SGDs)

Topic	Learning Objectives	Learning Domain	Teaching Strategy	Assessment Tools
Minerals & Vitamins Intoduction Vitamin A & Vitamin E	• Define Minerals • Difine Vitamins	C1	SGD	MCQ SAQ VIVA
	• Introduction & Classification of Minrals • Discuss sources, functions and clinical significance of vitamin A, vitamin E.	C1 C2		
Vitamin C & Vitamin D Minerals	• Discuss sources, functions and clinical significance of vitamin C, vitamin D.	C2	SGD	MCQ SAQ VIVA
	• Discuss Sources, Functions And Clinical Significance Calcium, Phosphate, Iodine, Fluoride, Copper, Zinc, Selenium, Magnesium, Sulphur And Cobalt.	C2		

Topic, Learning Objectives & Resources

Anatomy Self Directed Learning (SDL)

Topic	Learning Objectives At the end of Session students should be able to	Learning Resources
Shoulder Joint	• Classify the joint (according to type, shape and movement)	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page 266- 271,284-285).
	• Discuss the attachments of capsule and ligament	
	• Enlist the intra-articular structure (tendon of biceps brachii)	
	• Describe attachment of glenoidal labrum with its significance in relation to synovial membrane	
	• Discuss the neurovascular supply	
	• Discuss factors indispensible for stability of joint	
	• Discuss the movements at shoulder joint	
	• Enlist related bursae.	
	• Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	
Flexor compartment & Neurovascular organization of the arm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page201-211,211-214).
	• Describe Neurovascular organization of arm,	
	• Explain the related clinicals (biceps tendinitis, dislocation of tendon of biceps brachii)	
Extensor compartment of the arm	• Tabulate Muscles of extensor compartment with origin insertion, nerve supply and actions	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page201-211,211-214).
	• Describe the neurovascular organization	
	• Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa)	
	• Read relevant research article	
	• Use Digital Library	
Ulna	• Determine the side	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page147).
	• Demonstrate anatomical position	
	• Discuss general features, attachments and articulations	
	• Describe ossification	
	• Elaborate interosseous membrane and its importance	
	• Correlate the clinical aspects	

Radius	• Determine the side	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page148).
	• Demonstrate its anatomical position	
	• Discuss general features, attachments and articulations	
	• Describe its ossification	
	• Describe the interosseous membrane and its importance	
	• Correlate the clinical aspects	
Flexor compartment of the forearm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240).
	• Describe clinical conditions associated with flexor compartment	
Extensor compartment of the forearm	• Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240).
	• Describe clinical conditions associated with extensor compartment of forearm (Tennis elbow)	
Neurovascular organization of forearm	• Describe nerves and vessels of forearm (formation, commencement, course, branches and relations)	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240).
	• Describe associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome)	
	• Read relevant research article	
	• Use Digital Library	
Elbow joint	• Describe the type of joint with its articular surfaces	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition (Chapter 3, Page271-274).
	• Discuss the capsule, synovial membrane and ligaments of the joints	
	• Enumerate the related bursae,	
	• Describe axis and plane of movements	
	• Enumerate muscles producing movements at elbow joint.	
	• Describe the associated clinical conditions (Elbow joint dislocation and student's elbow)	
Proximal and distal radioulnar joints	• Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments.	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page274-277).
	• Describe movements of supination and pronation with special reference to axes	
	• Enumerate the muscles producing these movements	
	• Correlate clinical aspects of joint	
Hand	• Understand the arrangement of carpal bones	• Clinical Oriented Anatomy by
	• Identify the salient features of carpel bone.	
	• Discuss the special blood supply of scaphoid bone.	

	• Describe the mid carpal joint. • Discuss the 1st carpometacarpal joint including the type of the joint capsule synovial membrane and ligaments with axis of the movement and the muscles producing the movements • Read relevant research article • Use Digital Library	Keith L. Moore.8TH Edition. Chapter 3, Page148-151,278-283).
Wrist joint	• Describe the type of joint with its articular surfaces • Discuss the capsule, synovial membrane and ligaments of the joint • Enumerate the related bursae • Describe axis and plane of movements • Enumerate muscles producing movements at joint • Discuss wrist fractures & Dislocations	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page278).
Anastomosis around wrist joint	• Discuss the blood vessels involved in the formation of anastomosis around the wrist joint • Explain the importance of anastomosis.	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page278).
Dorsum of Hand, Flexor retinaculum Extensor retinaculum	• Describe the muscles of dorsum of hand • Discuss the Dorsal digital expansion • Describe the attachment of flexor retinaculum with structures related to it. • Describe the Guyon's canal. • Describe the formation of the carpel tunnel and its applied anatomy. • Describe the attachment of extensor retinaculum and its various compartments with structures passing through it. • Discuss the De Quervain's disease.	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page159,224-226).
Palm of hand-I Muscles & Neurovascular organization	• Tabulate the muscles forming the thenar and hypothenar eminence. • Discuss Lumbricals, Palmar and dorsal interossei with their attachments and actions. • Discuss the formation of superficial and deep arterial arches • Discuss the clinicals associated with palm	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Pag243-256).
Palm of hand-II Fascial spaces of hand Grip	• Discuss the formation and attachments of palmar aponeurosis. • Describe the formation of palmar spaces and its divisions • Describe the thenar and mid palmar spaces. • Define pulp spaces • Relate anatomy of pulp space with its common clinical conditions • Describe dorsal subcutaneous spaces. • Demonstrate surgical incisions. • Describe different types of grips • Read relevant research article • Use Digital Library	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page241-243,258-262).

Physiology Self Directed Learning (SDL)

Topics	Learning Objective	References
Structure of neurons Classification of neurons & nerve fibers	• Structure of neurons • Myelinated and unmyelinated nerve fibers. • Neuroglia • Difference between neurons and glial cells	• Ganong's Review of Medical Physiology.25TH Edition physiology Excitable Tissue; Nerve (Chapter04 ,Page 85-90) • Textbook of Medical Physiology by Guyton & Hall.14th Edition.Introduction to Physiology. (Unit 2,Chapter 05 Membrane Physiology Page 74) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Physiology ofBody Fluids. (Chapter 03,Page 37)
Nernst potential, RMP	• Basic physics of membrane potential, Nernst equation, • Goldman Equation • Origin of RMP in different cell types.	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Chapter no. 05 Mmebrane dynamicsPage no. 188) • Textbook of Medical Physiology by Guyton & Hall.14th Edition Membrane Potential and actionpotential. (Unit 2, Chapter 05 Page 63) • Ganong's Review of Medical Physiology.25TH Edition, Excitable Tissue; Nerve (Chapter 04,Page 90) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Propertie andfunction of cell membrane. (Chapter 02,Page 31, 41-43)
Properties of nerve fibers	• Rhythmicity of Excitable tissues, • Characteristics of signal transmission, • Types of refractoy period • Concept of excitation	• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Membrane Potential and actionpotential (Unit 2, Chapter 05,Page 73-76) • Ganong's Review of Medical Physiology.25TH Edition, Overview of cell physiology in medicalphysiology. Excitable Tissue; Nerve (Chapter 04,Page 94) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Propertie andfunction of cell membrane. (Chapter 03,Page 41, 55)
Measurement of RMP & effect of electrolytes on RMP	• Measurement of RMP • Effect of electrolytes on RMP • Role of Na/K pump	• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Membrane Potential and actionpotential (Unit 2, Chapter 05 ,Page 65,67-70) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Chapter no. 05 Membrane dynamicsPage no. 188-194) • Physiology by Linda S. Costanzo 6thEdition. cellular Physiology (Chapter 01. Page 18)
Concept of degeneration & regeneration	• Introduction • Axonal Degeneration • Wallerian Degeneration	• Ganong's Review of Medical Physiology.25TH Edition, overview of cell physiology in medical physiology (chapter 6, page 133) • A & P Anatomy and physiology Tortora, Chapter 12 Nervous tissue And Homeostasis Page 447 • Ganong's Review of Medical Physiology.25TH Edition, overview of cell physiology in medical physiology (Chapter 4, page 97)

Stimulus & response & types of stimuli, Stages of action potential	• Neuron action potential, • Stages of Propagation of AP • Conduction Rates • ALL-OR-NONE Principle	• Textbook of Medical Physiology by Guyton & Hall.14th Edition.Introduction to Physiology. (Unit 2, Chapter 05 Membrane Potential and action potential Page 71) • Ganong's Review of Medical Physiology.25TH Edition, Excitable Tissue; Nerve (Chapter 04,Page 93) • Physiology by Linda S. Costanzo 6thEdition. cellular Physiology (Chapter 01. Page 25) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Properties and function of cell membrane. (Chapter 03,Page 45,47-51)
A, Refractory period, types of action potential. Graded potential comparison with action potential B. Recording & propagation of action potential & factors effecting nerve conduction & hyperpolarized state	• Threshold Potential • Action potential • Types of Action Potential • Propagation of Action Potential • Hyperpolarization • Factors effecting Action potential	• A. • Ganong's Review of Medical Physiology.25TH Edition, General principles and Energy production in Medical Physiology (chapter 04, Page 90, 93) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology. (Chapter 5, page 67). • Ganong's Review of Medical Physiology.25TH Edition, General principles and Energy production in Medical Physiology (chapter 8, page 273) • B. • Ganong's Review of Medical Physiology.25TH Editions, Overview of Cellular Physiology in Medical Physiology (chapter 08, Page 276, 278, 281) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Introduction to Physiology. (Section 1, chapter 04. , page 71,72.73,74) • Ganong's Review of Medical Physiology.25TH Editions, Overview of Cellular Physiology in Medical Physiology (chapter 04, page 93)

Biochemistry Self Directed Learning (SDL)

Topics	Learning Objective	References
Minerals & Vitamins		
Minerals Introduction & Calcium	• State Daily Requirements of Calcium in different conditions • Classify Minerals Discuss Types • Sources of Calcium	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 63 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2, Chapter#6, Page 56 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 63

Biochemical Role Of Calcium & Phsphate	• Discuss causes of Hypercalcemia • Discuss causes of Hypocalcemia • Describe effects of Hypercalcemia & Hypocalcemia • State Daily Requirements of Phosphate Discuss Biochemical functions of Phosphate	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 69, 70 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 69, 70 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 70,78 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 72
Fluoride, Magnesium, Sulphur	• Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium • Enlist Sources of Fluoride, Sulphur. • Magnesium Describe Deficiency Effects	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 76, 77
Iodine, Copper, Zinc, Selenium, Manganese	• Recall sources & daily requirements • Discuss their biochemical functions Describe Deficiency Effects	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73, 74,75,78 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73,74,75,78 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#6 , Page 73,74,75,78
Vitamins & Their Classification	• Classify Fat- & Water-Soluble Vitamins • Enlist Sources of Vitamin A & E • Describe Biochemical functions of Vitamin A & E • Describe Deficiency Effects of Vitamin A & E • Explain Toxic Effects of Vitamin A	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#1 , Page 1 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 3, 17 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 4, Page 19 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 6, Page 7, Page 18 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 6 & 7
Vitamin D	• Enlist Sources of Vit.D • Explain Steps of activation of Vit.D in the body • Describe Biochemical functions of Vit.D • Explain Deficiency effects of Vit.D	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 10 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page11 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 ,

	• Explain Toxic effects of Vit.D	Page 13 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 , Page 14,15,16 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#2 ,Page 17
Vitamin C	• Enlist Sources of Vit.C • Describe Biochemical functions of Vit.C • Explain Deficiency effects of Vit.C • Explain Toxic effects of Vit.C	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 24 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2,Chapter#3 , Page 25 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 26 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 ,Page 26, 27
Niacin & Thiamine	• Enlist Sources • Describe Biochemical functions • Explain Deficiency effects	• Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 28,29,33,34 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2,Chapter#3 , Page 28,29,33,34 • Essentials of Medical Biochemistry Book By Mushtaq Ahmed Edition 9th Volume#2 ,Chapter#3 , Page 28,29,33,34
Classification & Structure Of Amino Acids	• Classification & Structure Of Amino Acids & Isomerism of Amino Acids	• Reference Book: Lippincott's Illustrated reviews of Biochemistry 8th Edition Chapter#1, Page 1-5

Histology Practicals Skill Laboratory (SKL)

Topic	At The End Of The Practical The Students Should Be Able To	C/P/A	Teaching Strategy	Assessment Tools
Connective Tissue-I • Embryonic connective tissue / mucoid Connective Tissue • Loose areolar connective tissue • Reticular Connective Tissue • Adipose Connective Tissue	• Identify mucoid connective tissue under microscope	P	Skill Lab	OSPE MCQs
	• Illustrate histological structure of mucoid connective tissue	C2		
	• Write two points of identification	C1		
	• Identify reticular and adipose connective tissue under microscope	C2		
	• Illustrate histological structure of reticular and adipose connective tissue	C2		
	• Write two points of identification	C1		
	• Focus the slide	P		
Connective Tissue-II • Dense regular connective tissue • Dense irregular connective tissue	• Identify dense regular and irregular connective tissue under microscope	P	Skill Lab	OSPE MCQs
	• Illustrate histological structure of dense regular and irregular connective tissue	C2		
	• Write two points of identification	C1		
	• Differentiate between dense regular and irregular connective tissue microscopically	C2		
	• Focus the slide	P		
CARTILAGE • Hyaline cartilage • Elastic cartilage • Fibrocartilage	• Identify all three types of cartilages under microscope	P	Skill Lab	OSPE MCQs
	• Illustrate microscopic structure of all three cartilages	C2		
	• Discuss the structure of perichondrium	C1		
	• Write two points of identification	C1		
	• Enlist sites of hyaline, fibro and elastic cartilage	C1		
	• Focus the slide	P		
BONE • Compact Bone • Spongy Bone	• Identify compact and spongy bone under microscope	P	Skill Lab	OSPE MCQs
	• Illustrate microscopic structure of compact bone and spongy bone	C2		
	• Write two points of identification	C1		
	• Focus the slide	P		

Physiology Practicals Skill Laboratory (SKL)

Topic	At the end of practical students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Estimation of hemoglobin Practical I	• Apparatus identification • Detail procedure • Precautions • Aseptic measures taken during blood sampling	P, A	Skill lab	OSPE
Estimation of hematocrit Practical I	• Hct definition • How to measure • Precautions	P, A	Skill lab	OSPE
ESR Practical I	• Procedure • Precautions • Clinical importance of ESR, normal values	P, A	Skill lab	OSPE
Preparation of DLC	• Preparation of slide – practice • How to make blood film • How to stain it after preparation • Help of teaching aid identification of cells	P, A	Skill lab	OSPE

Biochemistry Practicals Skill Laboratory (SKL)

Topic	At The End Of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Color test for detection of amino acids	• Biuret test • Ninhydein Test	P	Skill Lab	OSPE
Color test for detection of amino acids	• Xanthoprotic Test • Million- Nasse's Test • Tryptophan by Aldehyde Test	P	Skill Lab	OSPE
Color test for detection of amino acids	• Arginine by Sakaguchi's Test • Cystein by lead sulphide Test	P	Skill Lab	OSPE
Quantitative Analysis	• Serum calcium • Serum Ascorbic Acid	P	Skill Lab	OSPE

SECTION - III

Basic and Clinical Sciences (Vertical Integration)

Content

- **CBLs**
- **Vertical Integration LGIS**
- **Longitudinal Themes**
    - **Biomedical Ethics & Professionlism**
    - **Family Medicine**
    - **Artificial Intelligence (Innovation)**
    - **Integrated Undergraduate Research Curriculum (IUGRC)**

Basic And Clinical Sciences (Vertical Integration)

Case Based Learning (CBL)

Subject	Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain
Anatomy	• Shoulder Dislocation	Apply basic knowledge of subject to study clinical case.	C1
	• Wrist Drop	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Parasthesia	Apply basic knowledge of subject to study clinical case.	C3
	• Insecticide poisoning	Apply basic knowledge of subject to study clinical case.	C3
Biochemistry	• Night Blindness	Apply basic knowledge of subject to study clinical case.	C3
	• Rickets	Apply basic knowledge of subject to study clinical case.	C3

Large Group Interactive Sessions (LGIS)

Family Medicine

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Approach to a Patient with body aches	• Describe presenting complains of patients with body aches	C3	LGIS-1	MCQs
	• Disscus complications of body aches			
	• Descirbe intial treatment of patients with body aches			
	• Know when to refer patient to consultant/ Hospital			

Community Medicine

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Accidents	At the end of session students will be able to 1. Categorize different types of accidents	C2		
	2. Describe risk factors involved in accidents	C2		

	3. Participate in activities/programs for prevention and control of accidents	C2	LGIS	MCQs
	4. Describe steps involved in prevention of different types of accidents.	C2		

Medicine

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Osteoporosis	• Enlist causes Osteoporosis	C2	LGIS	MCQs
	• Discuss changes in bones in Osteoporosis	C2		
	• Describe clinical features	C2		
	• Enlist investigation	C3		
	• Discuss management	C2		
Polyarthritis	• Differentiate different causes of polyarthritis • on basis of clinical features	C2	LGIS	MCQs
	• Discuss the diagnostic criteria of rheumatoid arthritis	C2		
	• Discuss the diagnostic criteria of SLE	C2		
	• Plan investigations of a patient with polyarthritis to find out aetiology	C3		
	• Discuss general and specific management of a patient with polyarthritis	C2		
Osteomalacia /rickets	• Enlist causes of rickets	C1	LGIS	MCQs
	• Discuss changes in bones in osteomalacia	C2		
	• Describe clinical features of osteomalacia & rickets	C2		
	• Enlist investigations for of osteomalacia & rickets	C1		
	• Discuss management of osteomalacia & rickets	C2		

Surgery

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Shoulder	• Discuss the possible sites of shoulder dislocation	C2	LGIS	MCQs
	• Discuss the consequences of dislocation	C2		

dislocation	• Management concepts	C2		
Tennis elbow, fracture of olecranon, radius and ulna	• Describe: • Tennis elbow	C2	LGIS	MCQs
	• Discuss fractures of radius and ulna	C2		
	• Describe the common sites of fracture	C2		
	• Management concepts	C2		

Biomedical Ethics & Professionalism

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Islamic concepts of Bioethics	• Conceptualize the Islamic teachings of medical ethics • Outline the main points in oath of Muslim doctor • Correlate the 4 principles of medical ethics with principles of Islamic medical ethics	C2 C2	LGIS	MCQs

Radiology/Artificial Intelligence (Innovation)

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Fractures of upper limb	• Discuss fractures of upper limb with their clinical significance. • Discuss role of artificial intelligence in interpretation of radiographs	C2	LGIS	MCQS

Integrated Undergraduate Research Curriculum (IUGRC)

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Practical based teachings				
Practical Session -I (Club Activity)	• Comprehend their role in under “theme and scheme” of IUGRC-1st Year Practical component		LGIS	MCQS
	• Understand the techniques used to access, retrieve, and review and source of Scientific literature on the given topics (on selected topics for “updated evidence in Health” (UEIH) for poster development.			
	• Make search string and perform literature search using Boolean operators			
	• Access scientific databases and carry out an effective literature review using a number of sources or databases (PubMed)			

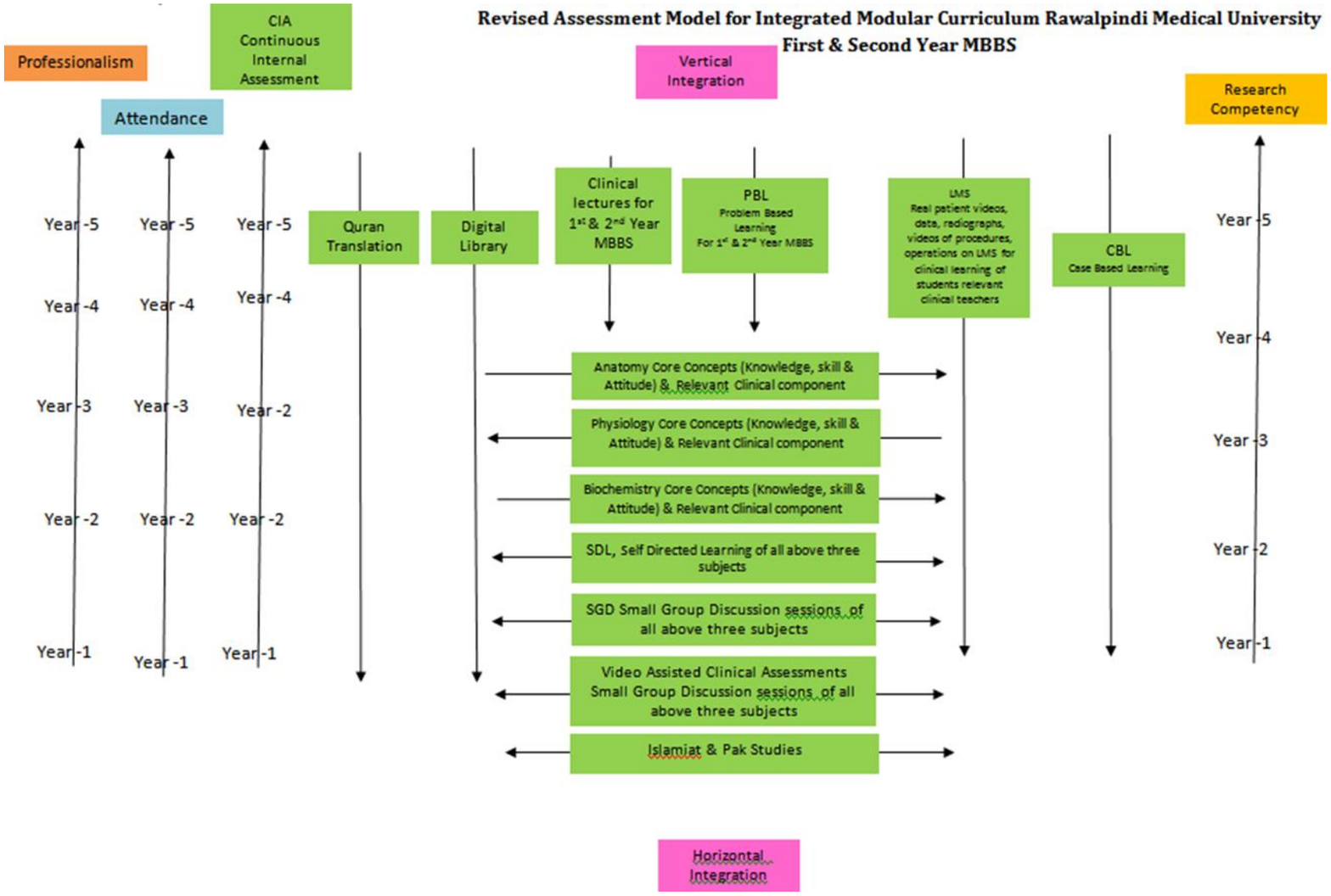
	• Access HEC Digital library / PERN network use			
	• Understand EBM Cycle & its 5 steps			
	• How to configure & present a scientific poster / element of a scientific poster			
	• How to write References of the information cited			
	• Learn overall posters' work reporting guidelines			

SECTION - IV

Assessment Policies

Contents

- **Assessment plan**
- **Types of Assessment:**
- **Modular Examinations**
- **Block Examination**
- **Table 4: Assessment Frequency & Time in MSK-I Module**



Gauge for Continuous Internal Assessment (CIA)

Red Zone	High Alert	Yellow Zone	Green Zone	Excellent	Extra Ordinary
0 - 25%	26 - *50%	51 - 60%	61 – 70%	71 – 80%	81 - 100%

*50% and above is Passing Marks.

Gauge for attendance percentage

Red Zone	High Alert	Yellow Zone-1	Yellow Zone-2	Green Zone	Excellent
0 - 25%	26 - 50%	51 - 60%	61 – 74%	*75 – 80%	81 - 100%

90% is eligibitlly criteria for appearing in professional examination.

Assessment plan

University has followed the guidelines of Pakistan Medical and Dental Council for assessment. Assessment is conducted at the mid modular,modular and block levels.

Types of Assessment:

The assessment is formative and summative.

Formative Assessment	Summative Assessment
Formative assessment is taken at modular (2/3rd of the module is complete) level through MS Teams. Tool for this assessment is best choice questions and all subjects are given theshare according to their hour percentage.	Summative assessment is taken at the mid modular (LMS Based),modular and block levels.

Modular Assessement

Theory Paper	Viva Voce
There is a module examination at the end of first module of each block. The content of the whole teaching of the module are tested in this examination. It consists of paper with objective type questions and structured essay questions. The distribution of the questions is based on the Table of Specifications of the module. (Annexure I attached)	Structured table viva voce is conducted including the practical content of the module.

Block Assessement

On completion of a block which consists of two modules, there is a block examination which consists of one theory paper and a structured viva with OSPE.

Theory Paper	Block OSPE
There is one written paper for each subject. The paper consists of objective type questions and structured essay questions. The distribution of the questions is based on the Table of Specifications of the module.	This covers the practical content of the whole block.

Table 4-Assessment Frequency & Time In MSK-I Module II

Block	Sr #	Module – 1 MSK-I Module Components	Type of Assessments	Total Assessments Time			No. of Assessments	
				Assessment Time	Summative Assessment Time	Formative Assessment Time		
Block-I	1	Mid Module Examinations LMS based (Anatomy, Physiology & Biochemistry)	Summative	30 Minutes	3 Hour 15 Minutes	45 Minutes	2 Formative	6 Summative
	2	Topics of SDL Examination on MS Team	Formative	30 Minutes				
	3	End Module Examinations (SEQ & MCQs Based)	Summative	2 Hours				
	4	Anatomy Structured and Clinically Oriented Viva	Summative	10 Minutes				
	5	Physiology Structured & Clinically oriented Viva voce	Summative	10 Minutes				
	6	Assessment of Clinical Lectures	Formative	15 Minutes				
	7	Assessment of Bioethics Lectures	Summative	2 Minutes				
	8	Assessment of IUGRC Lectures	Summative	10 Minutes				

Learning Resources

Subject	Resources
Anatomy	**A. Gross Anatomy** 1. Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier. 2. Clinical Anatomy for Medical Students by Richard S.Snell 10th edition. 3. Clinically Oriented Anatomy by Keith Moore 9th edition. 4. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 16th edition, Vol-I, II and III **B. Histology** 1. B. Young J. W. Health Wheather's Functional Histology 6th edition. 2. Medical Histology by Prof. Laiq Hussain 7th edition. **C. Embryology** 1. Keith L. Moore. The Developing Human 11th edition. 2. Langman's Medical Embryology 14th edition.
Physiology	**A. Textbooks** 1. Textbook Of Medical Physiology by Guyton And Hall 14th edition. 2. Ganong ' S Review of Medical Physiology 26th edition. **B. Reference Books** 1. Human Physiology by Lauralee Sherwood 10th edition. 2. Berne & Levy Physiology 7th edition. 3. Best & Taylor Physiological Basis of Medical Practice 13th edition. 4. Guyton & Hall Physiological Review 3rd edition.
Biochemistry	**Textbooks** 1. Harper's Illustrated Biochemistry 32th edition. 2. Lehninger Principle of Biochemistry 8th edition. 3. Biochemistry by Devlin 7th edition.
Community Medicine	**Textbooks** 1. Community Medicine by Parikh 25th edition. 2. Community Medicine by M Illyas 8th edition. 3. Basic Statistics for the Health Sciences by Jan W Kuzma 5th edition.
Pathology/Microbiology	**Textbooks** 1. Robbins & Cotran, Pathologic Basis of Disease, 10th edition. 2. Rapid Review Pathology, 5th edition by Edward F. Goljan MD. 3. http://library.med.utah.edu/WebPath/webpath.html
Pharmacology	**Textbooks** 1. Lippincot Illustrated Pharmacology 9th edition.

SECTION – V

Time Table

Integrated Clinically Oriented Modular Curriculum for First Year MBBS

Msk- I Module Time Table

First Year MBBS

Session 2022-2023

Batch- 50

MSK-I Module Team

Module Name : MSK-I Module
Duration of module : 05 Weeks
Coordinator : Dr. Maria Tasleem
Co-coordinator : Dr. Urooj Shah
Reviewed by : Module Committee

Module Committee		
1.	Vice Chancellor RMU	Prof. Dr. Muhammad Umar
2.	Director DME	Prof. Dr. Rai Muhammad Asghar
3.	Convener Curriculum	Prof. Dr. Naeem Akhter
4.	Chairperson Anatomy & Dean Basic Sciences	Prof. Dr. Ayesha Yousaf
5.	Additional Director DME	Prof. Dr. Ifra Saeed
6.	Chairperson Physiology	Prof. Dr. Samia Sarwar
7.	Chairperson Biochemistry	Dr. Aneela Jamil
8.	Focal Person Anatomy First Year MBBS	Prof Dr. Ayesha Yousaf
9.	Focal Person Physiology	Dr. Sidra Hamid
10.	Focal Person Biochemistry	Dr. Aneela Jamil
11.	Focal Person Pharmacology	Dr. Zunera Hakim
12.	Focal Person Pathology	Dr. Asiya Niazi
13.	Focal Person Behavioral Sciences	Dr. Saadia Yasir
14.	Focal Person Community Medicine	Dr. Afifa Kulsoom
15.	Focal Person Quran Translation Lectures	Dr. Fahad Anwar

Module Task Force Team		
1.	Coordinator	Dr. Maria Tasleem (Assisstant Professor of Anatomy)
2.	DME Focal Person	Dr. Sidra Hamid
3.	Co-coordinator	Dr. Urooj Shah (Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. Fahd Anwar (Senior Demonstrator of Physiology)
5.	Co-coordinator	Dr. Faiza Zafar (Senior Demonstrator of Biochemistry)

DME Implementation Team		
1.	Director DME	Prof. Dr. Rai Muhammad Asghar
2.	Implementation Incharge 1st & 2nd Year MBBS & Add. Director DME	Prof. Dr. Ifra Saeed
3.	Deputy Director DME	Dr Shazia Zaib
4.	Module planner & Implementation coordinator	Dr. Sidra Hamid
5.	Editor	Muhammad Arslan Aslam

Discipline Wise Details of Modular Content

Block	Module	General Anatomy	Embryology	Histology	Gross Anatomy
I	• Anatomy	Skeletal System • Bones • Joints	General Embryology Second Week of Human Development till Placenta & Fetal Membranes	General Histology • Connective Tissue • Cartilage • Bone	Shoulder joint till Hand
	• Biochemistry	• Minerals, Vitamins, Introduction & Classification of Amino Acids			
	• Physiology	• NMJ, Introduction Concept of Motor Unit. Neuromuscular Transmission, Synthesis & Fate of Acetylcholine • Drugs Acting On NMJ, Myasthenia Gravis, Lambart Eaton Syndrome • Structure Of Neurons. Classification Of Neurons & Nerve Fibers • Nernst Potential, RMP • Recording & Propagation of Action Potential & Factors Effecting Nerve Conduction & Hyperpolarized State • Stimulus & Response & Types of Stimuli, Stages of Action Potential			
	• Bioethics & Professionalism	• Islamic concept of Bioethics			
	• Research Club Activity	• Comprehend their role in under “theme and scheme”			
	• Family Medicine	• Approach to a patient with Body Pains			
	• Artificial Intelligence/Radiology	• Interpretation of upper limb Radiograph & use of AI			
	• Vertical components	• The Holy Quran Translation Component			
	• Vertical Integration	Clinically content relevant to musculoskeletal-I module • Shoulder Dislocation (Surgery) • Tennis elbow, Fracture of olecranon, Radius and Ulna (Surgery) • Osteoporosis (Medicine) • Osteomalacia, Rickets& Polyarthritis (Medicine) • Accidents (Community Medicine)			

Categorization of Modular Content of Anatomy:

Category A*	Category B**	Category C			
General Embryology	**General Histology**	**Demonstrations / SGD**	**CBL**	**Practical's**	**(SDL)**
• Second week of Human Development • Gastrulation (3rd week) • Notochord Formation (3rd week) • Neurulation & differentiation of Somites (3rd week) • Early development of CVS & highlights of 4th-8th week • Folding of Embryo • Fetal period • Placenta • Fetal Membranes & Multiple pregnancy	• Connective Tissue I • Connective Tissue II • Connective Tissue III • Cartilage • Bone	• **Gross Anatomy:** • Shoulder joint • -Flexor Compartment & Neurovascular organization of Arm • Extensor compartment & Neurovascular organization of Arm • Bones of Forearm • Flexor compartment of forearm • Extensor compartment of forearm • Neurovascular organization of Forearm • Elbow joint • Proximal & Distal radioulnar joints • Bones of Hand • Wrist joint • Dorsum of Hand, Flexor & Extensor retinaculum • Palm of Hand & Facial spaces • Neurovascular organization of Hand • Surface Marking	• Shoulder Dislocation • Wrist Drop	• Histology of connective Tissue I • Connective tissue II • Cartilage • Bone	• Shoulder joint • Flexor and Extensor compartment of arm • Flexor & Extensor compartment of forearm • Elbow joint • Bones of Hand • Wrist joint • Neurovascular organization of Hand

Category A*: By Professors

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resource of Department of Anatomy

Sr. #	Designation Of Teaching Staff / Human Resource	Total number of teaching staff
1.	Professor of Anatomy department	01
2.	Associate professor of Anatomy department	01
3.	Assistant professor of Anatomy department (AP)	01
4.	Demonstrators of Anatomy department	03

Contact Hours (Faculty)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	2 * 17 = 34 hours
2.	Small Group Discussions (SGD)	1.5*15=22.5 hours
3.	Case Based Learning (CBL)	1.5* 2 = 3 hours
4.	Practical / Skill Lab	1.5 * 20 = 30 hours

Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	1 * 17 = 17 hours
2.	Small Group Discussions (SGD)	1.5*15=22.5 hours
3.	Case Based Learning (CBL)	1.5* 2 = 3 hours
4.	Practical / Skill Lab	1.5 * 4 = 6 hours
5.	Self-Directed Learning (SDL)	1 * 7= 7 hours

Categorization of Modular Content of Physiology:

Category A*	Category B**	Category C***				
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**	**SDL**
NMJ, Introduction concept of motor unit. Neuromuscular transmission, synthesis &fate of acetylcholine (**Prof. Dr. Samia Sarwar/Dr Aneela)**	Structure of neurons. Classification of neurons & nerve fibers **(By Dr Sheena Tariq)**		**1.** Paresthesia, Paresis **2.** Insecticide poisoning	**1.** Determination of Hemoglobin concentration **2.** Determination of Hematocrit (HCT) **3.** Determination of Erythrocyte Sedimentation Rate (ESR) **4.** Determination of Differential leukocyte Count (DLC)	**1.** Nernst potential **2.** NMJ, Transmission across NMJ, Diseases of NMJ	1. Structure of neurons. Classification of neurons & nerve fibers 2. Nernst potential, RMP 3. Properties of nerve fibers 4. Measuret of RMP & effect of electrolytes on RMP5.Concept of degeneration & regeneration 6. Stimulus & response & types of stimuli, Stages of action potential 7.A Refractory period, types of action potential. Graded potentialcomparison with action potential B. Recording & propagation of action potential & factors effectingnerve conduction & hyperpolarized state **SDL: (On Campus)** 1.Nernst potential, RMP Action Potential
Drugs acting on NMJ, Myasthenia Gravis, Lambart Eaton Syndrome (**Prof. Dr. Samia**	Nernst potential, RMP **(By Dr Shazia)**					

Sarwar/ Dr Aneela)						
	Properties of nerve fibers **(By Dr Kamil)**					
	Measurement of RMP & effect of electrolytes on RMP **(By Dr. Shazia)**					
	Concept of degeneration & regeneration **(By Dr Kamil)**					
	Stimulus & response & types of stimuli, Stages of action potential **(By Dr Fareed)**					
	Refractory period, types of action potential. Graded potential comparison with action potential **(By Dr Shazia)**					
	Recording & propagation of action potential & factors effecting nerve conduction & hyperpolarized state **(By Dr Fareed)**					

Category A*: By Professors

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resource of Department of Physiology

Sr. #	Designation Of Teaching Staff / Human Resource	Total number ofteaching staff
1.	Professor of physiology department	01
2.	Associate professor of physiology department	01
3.	Assistant professor of physiology department (AP)	01 (DME)
4.	Demonstrators of physiology department	07
5.	Residents of physiology department (PGTs)	06

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LECTURES)	10X 2 = 20 Hours
2.	Small Group Discussions (SGD)/ Case based learning (CBL)	18x 2 hours = 36hours + 2hours (4th week) +1 hour (1ST week) =39 hours
3.	Problem Based Learning (PBL)	---
4.	Practical / Skill Lab	18x 2 hours= 36hours + 2 hours (4th week) = 38 hours
5.	Self-Directed Learning (SDL)	7 x 1 hour = 7 hours (Off Campus) 4 x 1 hour = 4 hours (On Campus) (Third week)

Categorization of Modular Content of Department Of Biochemistry:

Category A*	Category B**	Category C***			
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**
Minerals: Introduction & Classification. Calcium & Phosphate Minerals: Fluoride, Magnesium,Sulphur Minerals: Copper, Zinc, Selenium, Iodine, Manganese	Vitamins: Introduction & Classification. Vitamin A & Vitamin E Vitamin D		• Night Blindness • Rickets	• 7 Colour Tests for Proteins	Introduction & Classification of Minerals & Vitamins. •Vitamin A, Vitamin E
	Vitamin C			• Serum Calcium & Ascorbic Acid	Vitamin C & Vitamin D •Minerals: Calcium, Phosphate, Magnesium, Sulphur, Zinc, Iodine
Classification & Structure of Amino Acids & Isomerism	Niacin & Thiamine				

Category A*: By HOD and Assistant Professor

Category B:** By All (HOD, Assistant Professors, Senior Demonstrators)

Category C*:** By All Demonstrators

Teaching Staff / Human Resource of Department of Biochemistry

Sr. #	Designation Of Teaching Staff / Human Resource	Total number of teaching staff
1	Assistant professor of biochemistry department (AP)	02
2	Demonstrators of biochemistry department	08

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours (Faculty)	Total Hours (student)
1.	Large Group Interactive Session (LECTURES)	5 * 1 = 5 hours	5
2.	Small Group Discussions (SGD)	1.5 * 5 = 7.5 hours	7.5
3.	Problem Based Learning (PBL)	2 * 1 = 2 hours	02
4.	Practical / Skill Lab	1.5 * 05	7.5
5.	Self-Directed Learning (SDL)	1 * 8 = 8 hours	08

Musculoskeletal Module –I First Week
(27-03-2023 To 01-04-2023)

Day & Date	08:00AM – 08:45AM		08:45AM – 09:30AM		09:30AM – 10:30AM		10:30AM – 11:30AM		11:30PM – 01:00PM	Home Assignment
Monday 27-03-2023	**BIOCHEMISTRY (LGIS)**		**QURAN TRANSLATION**		**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		Practical & Tutorial Venue & topic mentioned at the end	SDL Physiology Structure of Neurons &Classification of Neurons
	Mineral introduction/ classification/ calcium & Phosphate	Definition & classification of vitamins, Vitamin A, Vitamin E	Ibadaat		Embryology Second Week of Human Development	Histology Connective tissue - I	Structure of neurons Classification of neurons and nerve fibers	Nernst Potential& RMP		
	Dr. Uzma (Even)	Dr. Almas (Odd)	Dr. Fahd Anwar		Prof. Dr. Ayesha (**Even**)	Ass. Prof. Dr.Mohtasham (**Odd**)	Dr. Sheena (Even)	Dr. Shazia (Odd)		
Tuesday 28-03-2023	**CBL(DISSECTION)**				**SURGERY**		**PHYSIOLOGY(LGIS)**		Practical & Tutorial Venue & topic mentioned at the end	SDL Physiology Structure of Neurons &Classification of Neurons
	Shoulder joint				Shoulder Dislocation		Nerve Potential RMP	Structure of neurons Classification of neurons andnerve fibers		
					Dr Rana Adnan (Even)	Dr . Muhammad Hassan (odd)	Dr. Shazia (Even)	Dr. Sheena (Odd)		
Wednesday 29-03-2023	**SGD / DISSECTION**				**ANATOMY (LGIS)**		**BIOETHICS**		Practical & Tutorial Venue & topic mentioned at the end	SDL Biochemistry Definition & classification of vitamins, Vitamin A, Vitamin E
	Flexor compartment & Neurovascular organization of arm				Histology Connective tissue-I	Embryology Second Week of Human Development	Islamic concept of Bioethics			
					Ass. Prof. Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)	Dr. Kashif Rauf			
Thursday 30-03-2023	**CBL / DISSECTION**				**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		Practical & Tutorial Venue & topic mentioned at the end	SDL Biochemistry Mineral introduction/ classification/ calcium & Phosphate
	Extensor compartment & Neurovascular organization of arm (Wrist Drop)				General Anatomy Bone-I	Histology Connective tissue-II	Properties of nerve Fibers	Measurement & effect of electrolytes on RMP		
					Dr. Arslan (Even)	Dr. Maria (Odd)	Dr. Kamil (Even)	Dr. Shazia (Odd)		
Friday 31-03-2023	**MEDICINE**		**FAMILY MEDICINE**		**ANATOMY (LGIS)**		**BIOCHEMISTRY (LGIS)**		SDL Anatomy Shoulder joint	
	Osteoporosis		Approach to a patient with Body Pains		Histology Connective Tissue - II	Embryology Gastrulation (3rd week)	Definition & classification of vitamins, Vitamin A, Vitamin E	Mineral introduction/ classification/ calcium & Phosphate		
	Dr Saima Mir (Even)	Dr Javaria Malik (odd)	Dr Sadia (Even)	Dr. Sidra Hamid (Odd)	Ass. Prof. Dr Mohtasham (Even)	Prof. Dr. Ayesha (Odd)	Dr. Almas (Even)	Dr. Uzma (Odd)		
Saturday 01-04-2023	**DISSECTION**				**ANATOMY (LGIS)**		**PHYSIOLOGY**		Practical & Tutorial Venue & topic mentioned at the end	SDL Anatomy Flexor and Extensor compartments of arm
	DISSECTION & SPOTTING				Embryology Gastrulation (3rd week)	General anatomy Bone-I	Measurement & effect of electrolytes on RMP	Properties of nerve Fibers		
					Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Arslan (Odd)	Dr. Shazia (Even)	Dr. Sheena (Odd)		

Topics For Practical with Venue	Topics For Small Group Discussion& CBLs With Venue
● Connective Tissue I(Anatomy/Histology-practical) ● Biuret Test, Ninhydrin Test (Biochemistry practical) ● Determination of Hemoglobin concentration (Physiology-Practical)	● Physiology SGD: Nernst potential (Physiology Lecture Hall 05) ● Biochemistry SGD: Mineral introduction/ classification/ calcium & Inroduction & classification of vitamins, Vitamin A & Vitamin E (Anatomy Lecture Hall 03)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-120	Dr. Zeneara	Lecture Hall No.03 Anatomy Lecture Hall
B	121-240	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
C	241- onwards	Dr. Ali Raza	Dissection Hall

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. UzmaKiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. IqraAyub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (PBL) Dr. Shazia Noreen (SGD)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Izzah (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	A	01-70	Dr. Faiza Zafar	Dr. Sheena Tariq
2.	B	71-140	Dr. Almas Ijaz	Dr. Uzma Kiani
3.	C	141-210	Dr. Rahat Afzal	Dr. Fahd Anwar
4.	D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	E	281-onwards	Dr. Romessa	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Musculoskeletal Module –I Second Week
03-04-2023 to 08-04-2023

Day & Date	08:00AM – 09:30AM	09:30AM – 10:30AM		10:30AM – 11:30PM		11:30PM – 01:00PM	Home Assignment
Monday 03-04-2023	**SGD / DISSECTION**	**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		**Practical & CBL** Venue & topic mentioned at the end	SDL Physiology Resting Membrane Potential
	Bones of forearm Ulna & Radius	General Anatomy	Embryology	Concept of Degeneration andregeneration	Stimulus & Response & Typeof stimuli. Stages of action potential		
		Bone-II	Notochord formation & Differentiation of Somites (3rdweek)				
		Ass. Prof. Dr. Arslan (Even)	Prof. Dr. Ayesha (Odd)	Dr. Kamil (Even)	Dr. Fareed (Odd)		
Tuesday 04-04-2023	**SGD / DISSECTION**	ANATOMY (LGIS)		**PHYSIOLOGY(LGIS)**		**Practical & CBL** Venue & topic mentioned at the end	SDL Physiology Action Potential
	Flexor compartment of forearm	Embryology	General Anatomy	Stimulus & Response & Typeof stimuli. Stages of action potential	Concept of Degeneration andregeneration		
		Notochord formation & Differentiation of Somites (3rd Week)	Bone-II				
		Prof. Dr.Ayesha (Even)	Ass. Prof. Dr. Arslan (Odd)	Dr. Fareed (Even)	Dr. Kamil (Odd)		
Wednesday 05-04-2023	**SGD / DISSECTION**	**ANATOMY (LGIS)**		PBL SESSION -I		**Practical & CBL** Venue & topic mentioned at the end	SDL Biochemistry Biochemical role of vitamin D
	Extensor compartment of forearm	Histology	Embryology	Muscle Weakness PBL Team			
		Connective Tissue-III	Neurulation (3rd week)				
		Ass. Prof. Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)				
Thursday 06-04-2023	**SGD / DISSECTION**	**ANATOMY (LGIS)**		**BIOCHEMISTRY LGIS**		**Practical & CBL** Venue & topic mentioned at the end	SDL Biochemistry Fluoride, Magnesium & Sulphur Copper, Zinc, Selenium, Iodine, Manganese
	Neurovascular organization of forearm	Embryology	Histology	Fluoride, Magnesium & Sulphur Copper, Zinc, Selenium, Iodine, Manganese	Vitamine D		
		Neurulation (3rd week)	Connective Tissue-III				
		Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Mohtasham(Odd)	Dr. Uzma (Even)	Dr. Almas (Odd)		
Friday 07-04-2023	**SGD/ DISSECTION**	**ANATOMY (LGIS)**		PBL SESSION -II		SDL Anatomy Flexor & Extensor compartments of forearm	
	Elbow joint & Anastomosis around elbow joint	Embryology	Histology	Muscle Weakness PBL Team			
		Early development of CVS & Highlights of 4th-8th week	Cartilage				
		Prof. Dr. Ayesha (Even)	Ass. Prof.Dr. Mohtasham (Odd)				
Saturday 08-04-2023	**SGD / DISSECTION**	**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		**Practical & CBL** Venue & topic mentioned at the end	SDL Anatomy Elbow joint **Online LMS Assessment will be conducted in evening**
	Proximal & Distal Radioulnar joints	Histology	Embryology	Refractory period,types of action potential. Graded potential comparison with action potential	Recording & propagation of actionpotential & factors effecting nerve conduction & hyperpolarized state		
		Cartilage	Early development of CVS & Highlights of 4th-8th week				
		Ass. Prof.Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)	Dr Shazia (Even)	Dr. Fareed (Odd)		

Topics For Practical with Venue	Topics For Small Group Discussion& CBLs With Venue
• Connective Tissue I1 (Anatomy/Histology-practical) • Xanthoproteic Test, Millon-Nasse's Test (Biochemistry practical) • Determination of Hematocrit (HCT)(Physiology-Practical)	• Physiology CBL: Parasthesias, paraesis (Physiology Lecture Hall 05) • BiochemistryCBL: Night Blindness(Anatomy Lecture Hall 03)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-120	Dr. Zeneara	Lecture Hall No.03 Anatomy Lecture Hall
B	121-240	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
C	241- onwards	Dr. Ali Raza	Dissection Hall

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. UzmaKiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room (Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. IqraAyub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (PBL) Dr. Shazia Noreen (SGD)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Izzah (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	A	01-70	Dr. Faiza Zafar	Dr. Sheena Tariq
2.	B	71-140	Dr. Almas Ijaz	Dr. Uzma Kiani
3.	C	141-210	Dr. Rahat Afzal	Dr. Fahd Anwar
4.	D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. Nayab Zonish
5.	E	281-onwards	Dr. Romessa	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL	
Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Musculoskeletal Module –I Third Week
10-04-2023 to 13-04-2023

Day & Date	08:00AM TO 08:45AM		08:45AM TO 09:30AM		09:30AM TO 10:30AM		10:30AM TO 11:30PM		11:30 to 01:00pm	Home Assignment
Monday 10-04-2023	**MEDICINE (LGIS)**		**BIOCHEMISTRY (LGIS)**		**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		**Practical & CBL** Venue & topic mentioned at the end	SDL Physiology NMJ **Online SDL Evaluation)**
	Osteomalacia, rickets&Polyarthritis		Vitamin D	Fluoride, Magnesium & Sulphur Copper, Zinc, Selenium, Iodine, Manganese	Embryology	Histology	Recording & propagation of action potential & factors effecting nerve conduction & Hyperpolarizedstate	Refractory period,types of action potential. Graded potential comparison with action potential		
					Folding Of Embryo	Bone				
	Dr. Umer Daraz (Even)	Dr Iqra Ashraf (Odd)	Dr. Almas (Even)	Dr. Uzma (Odd)	Prof. Dr. Ayesha (Even)	Ass. Prof.Dr. Mohtasham (Odd)	Dr. Fareed (Even)	Dr Shazia (Odd)		
Tuesday 11-04-2023	**SGD / DISSECTION**				**ANATOMY (LGIS)**		**COMMUNITY MEDICINE**	**PHYSIOLOGY(LGIS)**	**Practical & CBL** Venue & topic mentioned at the end	SDL Physiology Concept of Degeneration and regeneration
	Bones of Hand				Histology	Embryology	Accidents	NMJ, Introduction concept of motor unit. Neuromuscular transmission, synthesis & fate of acetylcholine		
					Bone	Folding Of Embryo				
					Ass. Prof.Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)	Dr. Maimoona (Even)	Prof. Dr. Samia Sarwar/ Dr Aneela (Odd)		
Wednesday 12-04-2023	**SGD / DISSECTION**				**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**	**COMMUNITY MEDICINE**	**Practical & CBL** Venue & topic mentioned at the end	SDL Biochemistry Deficiency manifestation of thiamine **(Online Clinical content Evaluation)**
	Wrist joint				General Anatomy	Embryology	NMJ, Introduction concept of motor unit. Neuromuscular transmission, synthesis & fate of acetylcholine	Accidents		
					Joints I	Fetal period				
					Ass. Prof. Dr. Arsalan (Even)	Prof. Dr. Ayesha (Odd)	Prof. Dr. Samia Sarwar/ Dr Aneela (Even)	Dr Abdul Quddos (Odd)		
Thursday 13-04-2023	**SGD / DISSECTION**				**ANATOMY (LGIS)**		**PHYSIOLOGY(LGIS)**		Practical & CBL Venue & topic mentioned at the end	SDL Biochemistry Deficiency manifestation of Vitamin A&D
	Dorsum of Hand, Flexor & Extensor Retinacula				Embryology	General Anatomy	SDL: Nernst Potential & RMP & Action Potential	Drugs acting on NMJ, MyastheniaGravis, Lambart Eaton Syndrome		
					Fetal period	Joints I				
					Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Arsalan (Odd)	Dr Shazia (Even)	Prof. Dr. Samia Sarwar /Dr Aneela (Odd)		
Friday 14-04-2023	**Eid & Spring Holidays**									
Saturday 15-04-2023	**Eid & Spring Holidays**									

Topics For Practical With Venue	Topics For Small Group Discussion& CBLs With Venue
• Cartilage (Anatomy/Histology-practical) • Tryptophan by Aldehyde Test, Arginine by Sakaguchi's Test (Biochemistry practical) • Determination of Erythrocyte Sedimentation Rate (ESR)(Physiology-Practical)	• Physiology CBL: Insecticide poisoning (Physiology Lecture Hall 05) • Biochemistry SGD: Minerals: Zinc, Selenium, Copper, Iodine, Phosphate, magnesium, sulphur (Anatomy Lecture Hall 03)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches For Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-120	Dr. Zeneara	Lecture Hall No.03 Anatomy Lecture Hall
B	121-240	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
C	241-onwards	Dr. Ali Raza	Dissection Hall

Venue For First Year Batches For PBL & SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. UzmaKiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room(Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. IqraAyub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Roamessa (PBL) Dr. Shazia Noreen (SGD)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Izzah (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	A	01-70	Dr. Faiza Zafar	Dr. Sheena Tariq
2.	B	71-140	Dr. Almas Ijaz	Dr. UzmaKiani
3.	C	141-210	Dr. Rahat Afzal	Dr. Fahd Anwar
4.	D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. NayabZonish
5.	E	281-onwards	Dr. Romessa	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Musculoskeletal Module –I Fourth Week
24-04-2023 to 29-04-2023

Day & Date	08:00AM TO 09:00AM	09:00am to 10:00am	10:00am to 11:00am	11:00am to 12:00pm		12:20-02:00 pm	Home Assignment
Monday 24-04-2023	**Eid Holiday**						
Tuesday 25-04-2023	**Eid Holiday**						
Wednesday 26-04-2023	**BIOCHEMISTRY (LGIS)**	**SGD/ DISSECTION**	**ANATOMY LGIS**	**Practical & CBL** Venue & topic mentioned at the end **Saturday Batch (15-4-23)**	**BREAK 12:00 –12:20PM**	**Practical & CBL** Venue & topic mentioned at the end	SDL Anatomy Wrist joint
	Vitamin C, Niacin & Thiamine / Classification & Structure of Amino Acids Isomerism	Palm of Hand & Facial spaces	Embryology / General Anatomy; Placenta / Joints II				
	Dr. Almas (even) / Dr. Rahat (Odd)		Prof. Dr. Ayesha (Even) / Ass. Prof. Dr. Arsalan (Odd)				
Thursday 27-04-2023	**SGD / DISSECTION**		**ANATOMY LGIS**	**PHYSIOLOGY LGIS**		**Practical & CBL** Venue & topic mentioned at the end	SDL Biochemistry Niacin and Thiamin & Classification and structure of Amino acid
	Neurovascular Organization of Hand		General Anatomy / Embryology; Joints II / Placenta	Drugs acting on NMJ, Myasthenia Gravis, Lambart Eaton Syndrome / SDL: Nernst Potential & RMP & ActionPotential			
			Ass. Prof. Dr. Arsalan (Even) / Prof. Dr. Ayesha (Odd)	Prof. Dr.Samia Sarwar / Dr Aneela (Even) / Dr Shazia (Odd)			
Friday 28-04-2023	**BIOCHEMISTRY (LGIS)**	**ARTIFICIAL INTELLIGENCE/RADIOLOGY(LGIS)**	**ANATOMY LGIS**	**Practical & CBL** Venue & topic mentioned at the end **Monday Batch (24-4-23)**		SDL Anatomy Neurovascular organization of Hand	
	Classification & Structure of Amino Acids Isomerism / Vitamin C, Niacin & Thiamine	Interpretation of upper limb Radiograph & use of AI	Embryology / Embryology; Fetalmembranes & multiple pregnancy / Fetal membranes & multiple pregnancy				
	Dr. Rahat (Even) / Dr. Almas (Odd)	Dr. Sana Yaqoob / Dr. Riffat Raja	Ass. Prof. Dr. Arsalan (Even) / Prof. Dr. Ayesha (Odd)				
Saturday 29-04-2023	**SGD / DISSECTION**		**Practical & CBL** Venue & topic mentioned at the end **Tuesday Batch (25-4-23)**	**SURGERY LGIS**		**Practical & CBL** Venue & topic mentioned at the end	SDL physiology
	Cutaneous innervation & Dermatomes of upper limb , Force & weight transmission & Surface Marking			Tennis elbow, Fracture of Olecranon, radius, ulna			
				Dr. Junaid Khan / Dr. Rana Adnan			

Topics For Practical With Venue	Topics For Small Group Discussion& CBLs With Venue
• Bone (Anatomy/Histology-practical) • Serum Calcium & Ascorbic Acid Estimation (Biochemistry practical) • Determination of Differential leukocyte Count (DLC)(Physiology-Practical)	• Physiology: NMJ, Transmission across NMJ, Diseases of NMJ (Physiology Lecture Hall 05) • Biochemistry CBL: Rickets (Anatomy Lecture Hall 03)

Schedule For Practical / Small Group Discussion

Day	Histology Practical	Biochemistry Practical	Physiology Practical	Physiology SGD	Biochemistry SGD
Monday	**C**	**B**	**E**	**A**	**D**
Tuesday	**D**	**C**	**A**	**B**	**E**
Wednesday	**E**	**D**	**B**	**C**	**A**
Thursday	**B**	**A**	**D**	**E**	**C**
Saturday	**A**	**E**	**C**	**D**	**B**

Venue For First Year Batches For Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-120	Dr. Zeneara	Lecture Hall No.03 Anatomy Lecture Hall
B	121-240	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
C	241-onwards	Dr. Ali Raza	Dissection Hall

Venue For First Year Batches For PBL &SGD Team-I

Batches	Roll No	Venue	
Batch-A1	(01-35)	New Lecture Hall Complex Lecture no.02	Dr. Sheena Tariq
Batch-A2	(36-70)	New Lecture Hall Complex Lecture no.03	Dr. UzmaKiani
Batch-B1	(71-105)	Lecture Hall no.02(Basement)	Dr. Fahd Anwar
Batch-B2	(106-140)	Conference room(Basement)	Dr. Fareedullah
Batch-C1	(141-175)	Lecture Hall no.04(Basement)	Dr. Maryam Abbas (PGT Physiology)
Batch-C2	(176-210)	Lecture Hall no.05(Basement)	Dr. Nayab (PGT Physiology)
Batch-D1	(210-245)	Lecture Hall no.03 (First Floor)	Dr. IqraAyub (PGT Physiology)
Batch-D2	(246-280)	Anatomy Museum (First Floor Anatomy)	Dr. Romessa (PBL) Dr. Shazia Noreen (SGD)
Batch-E1	(281-315)	Lecture Hall no.04 (First Floor Anatomy)	Dr. Izzah (PGT Physiology)
Batch-E2	(315 onwards)	Lecture Hall no.05Physiology	Dr. Uzma Zafar (PBL) Dr. Kamil Tahir (SGD)

Sr. No	Batch	Roll no	Names of Teachers	
			Biochemistry	Physiology
1.	A	01-70	Dr. Faiza Zafar	Dr. Sheena Tariq
2.	B	71-140	Dr. Almas Ijaz	Dr. UzmaKiani
3.	C	141-210	Dr. Rahat Afzal	Dr. Fahd Anwar
4.	D	211-280	Dr. Uzma Zafar	Dr. Maryam Abbas & Dr. NayabZonish
5.	E	281-onwards	Dr. Romessa	Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

Odd Roll Numbers	New Lecture Hall Complex Lecture Theater # 03
Even Roll Number	New Lecture Hall Complex Lecture Theater # 02

Spring Vacation	**01 May 2023 To 06 May, 2023**

Musculoskeletal Module –I Fifth Week
08-05-2023 to 13-05-2023

Date & Day	8:00 AM – 9:00 AM	11:00AM – 12:00 PM
Monday 08-05-2023	Anatomy /Physiology Viva Voce	
Tuesday 09-05-2023	Anatomy /Physiology Viva Voce	
Wednesday 10-05-2023	Anatomy Theory Paper & Gross OSPE	
Thursday 11-05-2023	Physiology Theory Paper & Video Assisted Quiz	
Friday 12-05-2023	Biochemistry Theory Paper & Allieds	
Saturday 13-05-2023	Integrated OSPE	

(Logistics Details of assessments will be notified separately)

SECTION VI

Table of Specification (TOS) For MSK-I Module Examination for First Year MBBS

Sr. #	Discipline	No. of MCQs (%)	No. of MCQs according to cognitive domain			No. of SEQs (%)		No. of SEQs according to cognitive domain			Viva voce	Integrated OSPE	Total Marks
			C1	C2	C3	No. of items	Marks	C1	C2	C3			
1.	Anatomy	20	10	5	5	4	20	1	2	1	60	45 (15 Stations)	145
2.	Physiology	30	18	9	3	4	20	1	2	1	50		118
3.	Biochemistry	10	5	4	1	3	15	-	1	-	10	10	37
Total Marks													300
Table of Specification for Clinical Subjects													
1.	Bioethics & Professionalism	2											2
2.	Research	2											2
3.	Family Medicine	2											2
5.	Medicine	5											5
6.	Surgery	5											5
7.	Community Medicine	2											2
8.	Radiology & Artificial Intelligence (Innovation)	2											2
Total													20

Table of Specification For Integrated OSPE

Anatomy

Sr. # / Station No	Topics	Knowledge	Skill	Attitude	Marks
Block 1- Upper Limb					
1	Bones and Joints	30%	50%	20%	3
2	Pectoral Region & Breast				3
3	Axillary Region				3
4	Bones and Joints of Arm, Forearm				3
5	Muscles and Neurovascular of Anterior Compartment of Arm				3
6	Muscles and Neurovascular of Posterior Compartment of Arm				3
7	Muscles and Neurovascular of Anterior Compartment of Forearm				3
8	Muscles and Neurovascular of Posterior Compartment of Forearm				3
9	Muscles and Neurovascuature of Hand				3
10	Radiology of Upper Limb				3
				Total	**30**

Sr. # / Station No	Topics	Knowledge	Skill	Attitude	Marks
Block 1- Foundation and MSK-I					
1	Development of Fertilisation to Eighth Week	30%	50%	20%	3
2	Development of Placenta, foetal membranes, Multiple pregnancy and estimation of fetal age.				3
3	Microscopic anatomy of Epithelia				3
4	Microscopic anatomy of Connective Tissue				3
5	Practical Copy				3
				Total	**15**

Physiology

Block – I (Foundation & MSK-I)						
1.	Introduction to compound microscope	30%	50%	20%	1 A	1.5
2.	Apparatus identification (Introduction to Neubauer's chamber, Red Blood Cell (RBC) pipettes& White Blood Cell (WBC) pipette				1 B	1.5
3.	Introduction to Wintrobe&Westergen tube				2 A	1.5
4.	Determination of Hematocrit (HCT)				2 B	1.5
5.	Apparatus identification (Introduction to centrifuge machine)				3	3
6.	Determination of Hemoglobin concentration				4	3
7.	Determination of Erythrocyte Sedimentation Rate (ESR)				5	3
8.	Practical note book / sketch copy				6	3

Biochemistry

Sr. No	Block	Topic	Knowledge	Skill	Attitude	Station No.	Marks
1.	Block – I (Foundation & MSK-I)	Adsorption	100%			1A	1
2.		Surface tension				1B	1
3.		Tonicity	100%			2A	1
4.		Introduction to glassware				2B	1
5.		Calcium estimation	100%			3	2
6.		Ascorbic estimation					
7.		Casein detection by isoelectric pH					
8.		Color test for amino acids(observed)		90%	10%	4	2
9.		Practical note book		80%	20%	5	2
						Total	**10**

Annexure I

(Sample MCQ, SEQ, OSPE & Video Asissted Quiz Papers)

RAWALPINDI MEDICAL UNIVERSITY, RWP
ANATOMY DEPARTMENT
1ST YEAR MBBS MCQs MSK-I MODULE EXAM

1. A patient complaints of pain in shoulder joint especially during overhead abduction due to rotator cuff injury. The subscapularis is a muscle of the rotator cuff that inserts on,

a. Greater tubercle of the humerus

b. Lesser tubercle of the humerus

c. Coracoid process of the scapula

d. Acromion process of the scapula

e. Head of humerus

2. A patient presents to the emergency department with a dislocated shoulder. The nerve that could be damaged is,

a. Axillary nerve

b. Radial nerve

c. Median nerve

d. Ulnar nerve

3. A patient presents to the emergency department with a humeral shaft fracture. The structures that could be damaged are,

a. Axillary nerve and posterior circumflex humeral artery

b. Radial nerve and profunda brachii artery

c. Median nerve and brachial artery

d. Ulnar nerve and ulnar collateral artery

e. Musculocutaneous nerve and brachial artery

4. A patient presents to the clinic with a complaint of numbness and tingling on the medial side of the left hand. The nerve involved is,

a. Median nerve

b. Ulnar nerve

c. Radial nerve

d. Axillary nerve

5. A phlebotomist performs venepuncture on the vein traveling on the medial side of forearm. This vein is,

a. Cephalic vein

b. Brachial vein

c. Axillary vein

d. Basilic vein

e. Median antebrachial vein

RAWALPINDI MEDICAL UNIVERSITY, RWP
ANATOMY DEPARTMENT
1ST YEAR MBBS SEQs MSK-I MODULE EXAM

Note: Attempt all questions. All questions carry equal marks. Draw diagram where necessary

Q1- A 12-year-old male football player presented to the emergency department with a painful right elbow after a tackle during a game. He reported that he landed on his right arm and felt a sudden, sharp pain in his elbow. He was diagnosed with a fracture of the medial epicondyle of the humerus.

i. Which nerve and artery is affected in this case? (1)

ii. Enlist the muscles supplied by this nerve. (1)

iii. What would be the position of hand in this case? (1)

b. A 45-year-old female office worker presented to the clinic with complaints of numbness and tingling in her right hand, particularly in the thumb, index, and middle finger. On physical examination, there is mild swelling and tenderness over the volar aspect of the right wrist. Tinel's sign was positive, with tingling and numbness elicited upon percussion over the median nerve at the wrist.

i. What is the name of this condition? (1)

ii. Enlist the muscles affected in this case? (1)

Q2- A 55-year-old female presented with pain in her wrist and forearm. Examination revealed tenderness over the anatomical snuffbox.

a) What are its boundaries and contents? (2.5)

b) Trace the course, relations, and branches of the radial artery. (2.5)

RAWALPINDI MEDICAL UNIVERSITY, RWP
PHYSIOLOGY DEPARTMENT
1ST YEAR MBBS MCQs MSK-I MODULE EXAM

1. Plateau in action potential is caused by olonged opening of:
    a. Voltage gated K channels
    b. Chloride channels
    c. Slow Ca' sodium channels
    d. K leak Channels
    e. Voltage gated Ca' Channels

2. Propagation of action potential is ensured because of the following property of action potential:
    a. Adaptation b.
    b. Summation
    c. All and none law
    d. Saltatory conduction
    e. Absolute refractory period

3. The resting potential of a myelinated fiber is primarily dependent on the concentration gradient of:
    a. Ca
    b. b. Cl
    c. HCO
    d. d. K
    e. e. Na

4. Drug that stimulate the muscle fibre by Acetylcholine like action is:
    a. Neostigmine
    b. Nicotine
    c. Physostigmine
    d. D-tubocurarine
    e. Diisopropylflourophosphate

5. A 35-year-old lady presented with sudden onset of extreme muscle weakness. She could not talk or see. After administration of a drug called neostigmine, her symptoms improved because the drug a. Activates acetylcholine:
    a. Activates acetylcholine esterase permanently
    b. Activates acetylcholine temporarily
    c. Inhibits acetylcholine permanently:
    d. Inhibits acetylcholine esterase temporarily
    e. Releases acetylcholine at the nerve termina

RAWALPINDI MEDICAL UNIVERSITY, RWP
PHYSIOLOGY DEPARTMENT
1ST YEAR MBBS SEQs MSK-I MODULE EXAM

Q2. A 35-year-old lady presented in emergency department with sudden onset of shortness of breath, dropping of eyelids and slurring of speech. Her serum auto-antibody titer was much raised. These antibodies were directed against ligand- gated-channels at the neuromuscular junction. The symptoms reversed after the administration of a drug prescribed by the duty doctor.

a. Name the drug. Give its mechanism of action. (1)

b. Name the disorder she is suffering from. (1)

c. What is the pathophysiological basis of this disorder? (3)

RAWALPINDI MEDICAL UNIVERSITY, RWP
BIOCHEMISTRY DEPARTMENT
1ST YEAR MBBS MCQs MSK-I MODULE EXAM

1. Pick up element that prevents the development of dental caries?
   a. Calcium
   b. Phosphorus
   c. Sodium
   d. Fluorine
   e. Lithium

2. Which of these vitamins can be used in high doses to treat hypercholesterolemia?
   a. Riboflavin
   b. Niacin
   c. Pyridoxine
   d. Folic acid
   e. Thiamine

3. Calcium has the following role in the body:
   a. Formation of organic bone matrix
   b. Antioxidant
   c. Second messenger
   d. Synthesis of rhodopsin
   e. Role in red cell formation

4. Following vitamin has role in blood clotting:
   a. Riboflavin
   b. Vitamin C
   c. Pyridoxine
   d. Folic acid
   e. Vitamin K

SEQ

Q. a. Write down the biological functions of vitamin D. 03

b. What is the role of vitamin A in visual cycle? 02

RAWALPINDI MEDICAL UNIVERSITY, RAWALPINDI
DEPARTMENT OF ANATOMY
1st Year MBBS Integrated OSPE Block-I

Station No. 1 Time Allowed: 1 Min 30secs

Histology sketch copy will be assessed for

a. omplete index (1)

b. CComplete and signed diagrams (1)

c. 2 ID points mentioned with each diagram (1)

Station No. 2 Time Allowed: 1 Min 30secs

a. Identify slide A (1)

b. Identify slide B (1)

c. What are common locations of slide B in human body (1)

RAWALPINDI MEDICAL UNIVERSITY, RAWALPINDI
DEPARTMENT OF BIOCHEMISTRY
1st Year MBBS Integrated OSPE Block-I

Station No. 1 Time Allowed: 2 Mins

Observed station

Perform Hay's sulfur test 03

Station No. 2 Time Allowed: 2 Mins

Observed station

Perform Biuret test 03

RAWALPINDI MEDICAL UNIVERSITY
BIOETHICS DEPARTMENT
1ST YEAR MBBS MCQs MSK-I MODULE EXAM

1. ----Includes rules of conduct that may be used to regulate our activities concerning the biological world.
   a. Bio-piracy
   b. Biosafety
   c. Bioethics
   d. Bio-patents
   e. Bio-logistic

2. The right of patients having self-decision is called.
   a. Justice
   b. Autonomy
   c. Beneficence
   d. Veracity
   e. Fidelity

3. Following is not code of ethics.
   a. Integrity
   b. Objectivity
   c. Confidentiality
   d. Behaviour
   e. Autonomy

4. -------in the context of medical ethics, if it's fair and balanced
   a. Justice
   b. Autonomy
   c. Beneficence
   d. Veracity
   e. Fidelity

5. ------Principle requiring that physicians provide, positive benefits
   a. Justice
   b. Autonomy
   c. Beneficence
   d. Veracity
   e. Fidelity

RAWALPINDI MEDICAL UNIVERSITY
ANATOMY DEPARTMENT
1ST YEAR MBBS VIDEO ASISSTED QUIZ MSK-I MODULE EXAM

I. What is this clinical condition? (1)

II. Describe its features with the muscle affected (4)

RAWALPINDI MEDICAL UNIVERSITY
BIOCHEMISTRY DEPARTMENT
1ST YEAR MBBS VIDEO ASISSTED QUIZ MSK-I MODULE EXAM

1. Name this signaling pathway and ligands that bind to GPCR. (2)
2. What is the mechanism of action of G proteins? (2)
3. Name the drugs/compounds that inhibit phosphodiesterase (1)