Rawalpindi Medical University
Department of Medical Education (DME)

Musculoskeletal -I Module

Procedure For Control Of Documented Information

In-Compliance with

ISO 9001:2015

Clause 7.5

Copyright

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)	Director Medical Education, Asst. Director Medical Education,
Reviewer(s)	Curriculum Committee.
Approver(s)	Vice Chancellor
Creation Date	01-03-2024
Effective Date	01-03-2024
Control Status	**Controlled**
Distribution	VC, Principal, ISO Committee
Disclaimer	This document contains confidential information. Do not distribute this document without prior approval from higher management of **Rawalpindi Medical University.**

Document Approval

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

Document Revision History

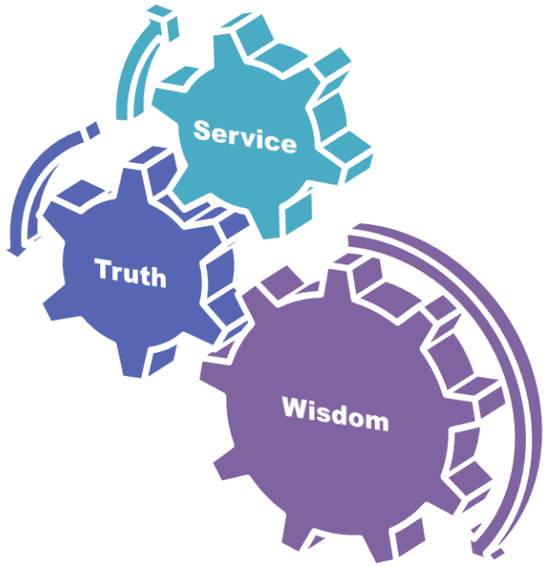
Author(s)	Date	Version	Description
Prof Naeem Akhtar, Dr Ifra Saeed, Dr Sidra Hamid, Dr Tehmina Qamar	2017-2018	1st	Developed for First Year MBBS. Composed of Horizontally and vertically Integrated MSK-I Module.
Dr Tehzeeb, Dr Samia Sarwar, Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid	2019-2020	2nd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated
Dr Tehzeeb, Dr Samia Sarwar, Dr Ayesha Yousaf Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid	2021-2022	3rd	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum incorporated
Dr Tehzeeb, Dr Samia Sarwar, Dr Ayesha Yousaf Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid	2022-2023	4th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research, Bioethics, Family Medicine curriculum incorporated along with Professionalism
Dr Ayesha Yousaf, Dr Samia Sarwar, Dr Ayesha Yousaf Dr Ifra Saeed, Dr Tehmina Qamar, Dr Sidra Hamid	2023-2024	5th	Developed for First Year MBBS. Horizontally and vertically integrated Learning objectives updated, Research curriculum revamped Bioethics, Family Medicine curriculum incorporated along with Professionalism. Entrepreneurship curriculum incorporated

List of Copy Holders

Document Code	Issue # /Rev.#	Copy #	Copy Holders	Distribution Mode	Signature
RMU-MR-SOP-52	01/00	01	V.C	Email	
RMU-MR-SOP-52	01/00	02	HODs	Email	
RMU-MR-SOP-52	01/00	03	IC	Hard Copy	

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.

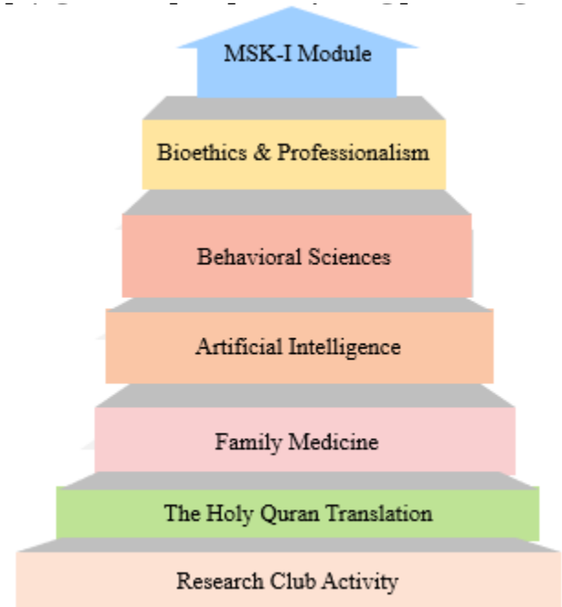
First Year MBBS 2024

Study Guide

MSK-I Module

Integration of Disciplines in MSK-I Module

ses



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 (A, D, E, ascorbic acid, thiamin and niacin), 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			
	Spiral Courses				
	• The Holy Quran Translation	• Imaniat			
	• Seerat Mubarak	• The Significance of Seerah Studies			
	• 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)				
Early Clinical Exposure (ECE)					

	• Clinical Rotations	• How to Read Bone X- ray. • How to find Bone age • Fractures of distal Bones • Placental abnormalities • Uterine abnormalities • Pregnancy and effects of congenital uterine abnormalities • X-ray in pediatric age group • Pathologies like Rickets, congenital dislocation of hip joint and other abnormalities

Table of Contents

MSK-I Module Team

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

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

Module Task Force Team		
1.	Coordinator	Dr. Maria Tasleem (Assistant Professor of Anatomy)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Gaiti Ara (Senior Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. Fahd Anwar (Demonstrator of Physiology)
5.	Co-coordinator	Dr. Romessa Naeem (Demonstrator of Biochemistry)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr. Farzana Fatima
3.	Implementation Incharge 1st & 2nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima
4.	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

Tables & Figures

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.

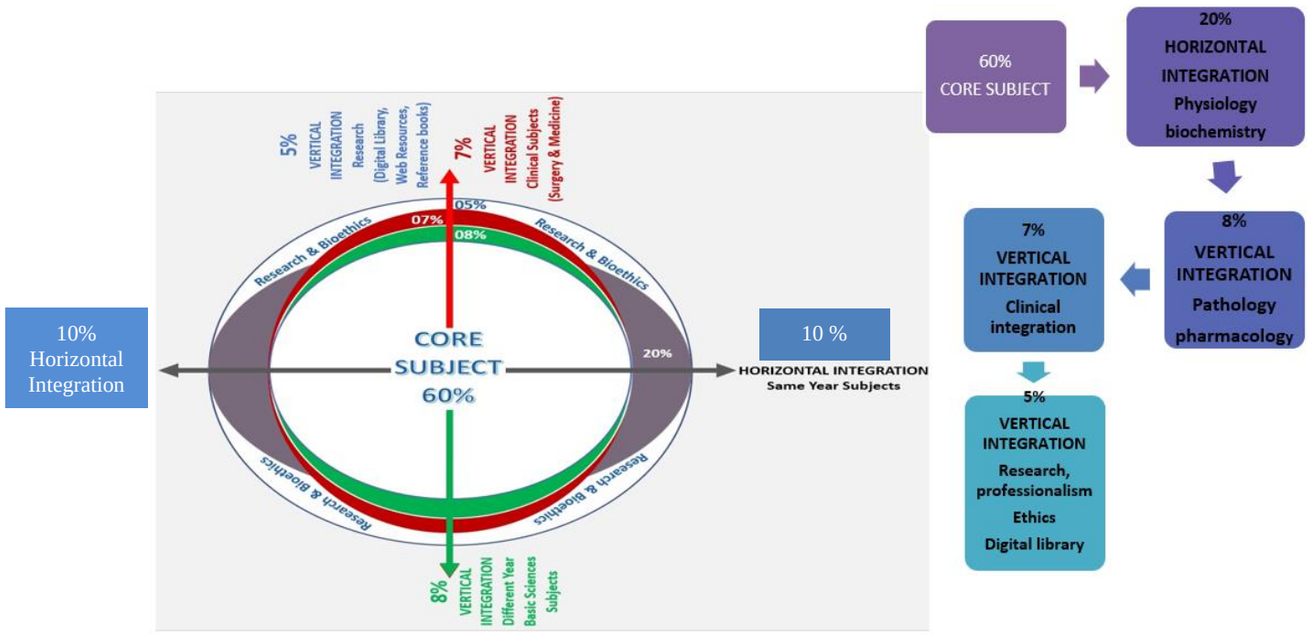


Figure 1. Prof Umar's Model of Integrated Lecture

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 Implementation 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 &Assessments

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			
Formation of Bilaminar Embryonic Disc (2nd week of Human Development)	• Describe formation of Amniotic Cavity, embryonic disc and Umbilical vesicle	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss development of chorionic sac	C2		
	• Outline the process of implantation	C1		
	• Describe changes in Gravid Endometrium	C2		
	• Understand the Bio-physiological aspects of gravid endometrium	C2		
	• Corelate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Gastrulation Establishment of Body Axis and Fate Map (3rd week)	• Discuss process of gastrulation with special reference to primitive streak	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Describe the fate of primitive streak	C2		
	• Discuss establishment of body axis	C2		
	• Draw fate map and discuss its importance in future development	C2		
	• Understand the Biophysiological aspects of gastrulation	C2		
	• Describe congenital abnormalities associated with gastrulation	C3		
	• Corelate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant Research article	C3		
Notochord Formation	• Define notochord	C1	• LGIS	SAQs
	• Delineate different stages of notochord formation	C1		
	• Discuss the importance of notochord in development of central nervous system	C2		

(3rd week)	• Describe role of notochord in development of axial Skeleton	C1		MCQs VIVA VOCE
	• Describe the fate of notochord	C2		
	• Correlate with clinical conditions of notochord formation	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Neurulation (3rd week)	• Define neurulation	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe formation of neural plate and neural tube	C2		
	• 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		
	• Corelate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Development and Differentiation of Somites	• Enumerate three germ layers and their derivatives	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe different divisions of mesoderm	C2		
	• Describe development of somites and their differentiation	C2		
	• Explain different stages of somite development	C2		
	• Understand the Biophysiological aspects of Somite differentiation	C2		
	• Correlate clinical aspects of somite differentiation	C3		
	• Focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	•Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
Early Development of Cardiovascular System &	• Describe early development of cardiovascular system and chorionic villi	C2	• LGIS	SAQs MCQs VIVA
	• Discuss development of intraembryonic coelom	C2		
	• Define angiogenesis and vasculogenesis.	C1		
	• Correlate clinical aspects of angiogenesis	C3		

highlights of 4th-8th week	• Summarize the main developmental events and changes in external form of the embryo during the 4th to 8th weeks	C2		
	• Corelate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Folding of Embryo	• Enlist different phases of embryonic development	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Describe folding of the embryo in median plane	C2		
	• Describe folding of the embryo in horizontal plane	C2		
	• Discuss results of folding	C2		
	• Discuss Omphalocele and Gastroschisis	C3		
	• Corelate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Fetal period	• Describe different criteria for fetal age estimation	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss the trimesters of pregnancy with their importance	C2		
	• Describe highlights of fetal period	C2		
	• Differentiate between embryonic and fetal period	C2		
	• Tabulate growth in length and weight during fetal period	C2		
	• Enumerate and discuss factors influencing fetal growth	C2		
	• Define the term perinatology	C1		
	• Enlist and briefly describe procedures for assessing fetal well-being	C3		
	• Correlate clinical aspects of fetal period	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Placenta	• Discuss Implantation and establishment of the embryo within the uterus	C2	• LGIS	SAQs
	• Describe the differentiation of the uterine lining into decidua	C2		

	• Describe the development of a placenta	C2		MCQs VIVA VOCE
	• Describe fetal – maternal circulation	C2		
	• Discuss the bio-physiological aspects of placenta	C2		
	• Corelate the clinical conditions associated with placenta	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	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	C2		
	• Explain origin, composition, location, function and fate of Amnion	C2		
	• Describe formation of umbilical cord and its structure	C2		
	• Define Allantois along with its importance and function	C1		
	• Discuss different types of twins	C2		
	• Correlate clinical aspects of fetal membranes	C3		
	• Correlate with the clinical conditions of twin pregnancy	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	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	C2		
	• Enlist and explain types of cells in CT	C2		
	• Enumerate sites and describe the function of each type of cell of connective tissue	C2		
	• 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 conditions of CT	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research articles	C3		
Connective tissue II	• Enumerate examples and location of reticular, connective tissue	C1		

Loose aerolar connective tissue & its types Reticular CT	• Illustrate histological structure of loose and reticular connective tissue	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Correlate clinical aspects of loose and reticular CT	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	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.	C2		
	• Differentiate between dense regular and irregular connective tissue microscopically	C2		
	• Correlate clinical aspects of loose and reticular CT	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Cartilage	• Classify cartilage	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Enlist sites of hyaline, fibro and elastic cartilage	C1		
	• Appreciate microscopic structure of Hyaline, Elastic and Fibrocartilage	C2		
	• Differentiate between three cartilages	C2		
	• Describe the structure of perichondrium	C2		
	• Describe the arrangement of layers in articular cartilage	C2		
	• Understand the Biophysiological aspects of cartilage	C2		
	• Correlate with clinical conditions	C3		
	• focus on provision of curative and preventive health care measures			
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Bone-I (Cells & Types)	• Describe structure and functions of bone cells	C2	• LGIS	SAQs MCQs
	• Discuss periosteum and endosteum	C2		
	• Discuss types of bones	C2		
	• Describe the histological features of spongy and compact bone	C2		
	• Describe structure of osteon.	C2		
	• Understand the Biophysiological aspects of bone	C2		

	• Correlate clinical aspects of bone	C3		VIVA VOCE
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Bone-II (Ossification)	• Describe osteogenesis	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Discuss bone growth, remodeling and repair	C2		
	• Describe histological changes in bones in osteoporosis, rickets, osteomalacia, osteopetrosis and bone tumors	C3		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		

General Anatomy				
Bone-I (General Features)	• Describe the functions of bone and skeleton	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Identify general features of bone	C2		
	• Differentiate between maceration and decalcification of bones	C2		
	• Correlate with clinical conditions of bone	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Bone-II Classification & Blood supply)	• Classify bones based on different criteria	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Describe the growing end hypothesis	C2		
	• Describe blood supply of bones	C2		
	• Appreciate role of bones in estimation of sex, age and stature.	C2		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		

	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Joints-I (Types)	• Define joints	C1	• LGIS	SAQs MCQs VIVA VOCE
	• Classify fibrous joints with examples	C2		
	• Classify cartilaginous joints with examples	C2		
	• Classify synovial joints with examples	C2		
	• Understand the Bio-physiological aspects of joints	C2		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		
Joints-II (Movements)	• Describe structure of synovial joint	C2	• LGIS	SAQs MCQs VIVA VOCE
	• Classify synovial joints	C2		
	• Explain movements around synovial joints	C2		
	• Enlist Degenerative joint diseases	C3		
	• Describe the involvement of anatomical structure of the articular cartilage in Degenerative joint disease	C3		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• read relevant research article	C3		

Physiology Large Group Interactive Session (LGIS)

Topic	LearningObjectives 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 fibers, NGF	• Describe the classification of neurons and nerve fibers	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 fibers	C2	LGIS	SAQs MCQs VIVA VOCE
Properties of nerve fibers	• Discuss the properties of nerve fibers	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
	• Describe the role of various ions for these states	C1		

				VIVA 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 NMJ, Excitation-Contraction coupling	• Enlist drugs that enhance and block transmission at neuromuscular junction	C1	LGIS SDL	SAQs MCQs VIVA VOCE
	• Describe mechanism of excitation contraction coupling	C1		
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 classification and Introduction. Calcium Phosphate	• Classify Minerals • State Daiy Requirements of Calcium in different conditions	C1 C2	LGIS	MCQs, SAQs & Viva
	• Discuss Types & Sources of Calcium phosphate	C2		
Biochemical Role of Calcium & Phosphate	• Discuss causes of Hypercalcemia & Hypocalcemia • Describe effects of Hypercalcemia & Hypocalcemia • State Daily Requirements of Phosphate • Discuss Biochemical functions of Phosphate	C2 C2	LGIS	MCQs, SAQs & Viva
Fluoride, Magnesium, Sulphur	• Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium • Describe Deficiency Effects	C2 C1	LGIS	MCQs, SAQs & Viva
Iodine, Copper, Zinc, Selenium, Manganese	• Recall sources & daily requirements • Discuss their biochemical functions • Describe Deficiency Effects	C1 C2	LGIS	MCQs, SAQs & Viva

Vitamins & Their Classification Vitamin A and E	• Classify Vitamins & 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	C2 C1	LGIS	MCQs, SAQs & Viva
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 • Explain Toxic effects of Vit.D	C1 C2	LGIS	MCQs, SAQs & Viva
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	C1 C2	LGIS	MCQs, SAQs & Viva
Niacin & Thiamine	• Enlist Sources • Describe Biochemical functions • Explain Deficiency effects	C1 C2	LGIS	MCQs, SAQs & Viva
Classification & Structure of Amino Acids	• Classification & Structure of Amino Acids & Isomerism of Amino Acids	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)	C2	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Discuss the attachments of capsule and ligament	C2		
	• Enlist the intra-articular structure (tendon of biceps brachii)	C1		
	• Describe attachment of glenoidal labrum with its significance in relation to synovial membrane	C2		
	• Discuss the neurovascular supply	C2		
	• Discuss factors indispensable for stability of joint	C2		
	• Discuss the movements at shoulder joint	C2		
	• Enlist related bursae.	C1		
	• Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	C3		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
Flexor compartment & Neurovascular organization of the arm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	C2	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Describe Neurovascular organization of arm.	C2		
	• Map the outline of Brachial artery and Musculo cutaneous nerve in a simulated patient or model	P		
	• Correlate with the clinical conditions (biceps tendinitis, dislocation of tendon of biceps brachii)	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
Extensor compartment of the arm	• Tabulate Muscles of extensor compartment with origin insertion, nerve supply and actions	C2	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Describe the neurovascular organization	C2		
	• Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa)	C3		

	• Map the outline of Radial nerve and ulnar nerve on a simulated patient or model	P		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
Ulna	• Determine the side	C1	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Demonstrate anatomical position	P		
	• Discuss general features, attachments and articulations	C2		
	• Describe ossification	C2		
	• Elaborate interosseous membrane and its importance	C2		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	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	C2		
	• Describe its ossification	C2		
	• Describe the interosseous membrane and its importance	C2		
	• Correlate the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
Flexor compartment of the forearm	• Tabulate muscles of flexor compartment with their origin, insertion, nerve supply and actions	C2	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Correlate with clinical conditions associated with flexor compartment	C3		
	• Map the outline of Median Nerve , Radial Artery and Ulnar Artery of forearm in a simulated patient or Model	P		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		

	• Read a relevant research article	C3		
Extensor compartment of the forearm	• Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions	C2	SGD, Skill Lab	MCQs SEQs VIVA VOCE OSPE
	• Correlate with clinical conditions associated with extensor compartment of forearm (Tennis elbow)	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
Neurovascular organization of forearm	• Describe nerves and vessels of forearm (formation, commencement, course, branches and relations)	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Correlate with associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome)	C3		
	• Map the outline of Radial Nerve and Ulnar Nerve on a simulated patient or model	P		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read relevant research article	C3		
Elbow joint	• Describe the type of joint with its articular surfaces	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss the capsule, synovial membrane and ligaments of the joints	C2		
	• Enumerate the related bursae,	C1		
	• Describe axis and plane of movements	C2		
	• Enumerate muscles producing movements at elbow joint.	C1		
	• Correlate with the associated clinical conditions (Elbow joint dislocation and student's elbow)	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care			
	• Read a relevant research article	C3		
Proximal and distal radioulnar joints	• Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments.	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe movements of supination and pronation with special reference to axes	C2		
	• Enumerate the muscles producing these movements	C1		
	• Correlate clinical aspects of joint	C3		
	• focus on provision of curative and preventive health care measures	C3		

	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
Hand	• Understand the arrangement of carpal bones	C1	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Identify the salient features of carpel bone.	C2		
	• Discuss the special blood supply of scaphoid bone.	C3		
	• Describe the mid carpal joint.	C2		
	• 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	C2		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care			
	• Read relevant research article	C3		
Wrist joint	• Describe the type of joint with its articular surfaces	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss the capsule, synovial membrane and ligaments of the joint	C2		
	• Enumerate the related bursae	C1		
	• Describe axis and plane of movements	C2		
	• Enumerate muscles producing movements at joint	C1		
	• Discuss wrist fractures & Dislocations	C3		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article			
Anastomosis around wrist joint	• Discuss the blood vessels involved in the formation of anastomosis around the wrist joint	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Explain the importance of anastomosis.	C2		
	• Correlate with the clinical conditions	C3		
	• focus on provision of curative and preventive health care measures Able to focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article			
Dorsum of Hand, Flexor	• Describe the muscles of dorsum of hand	C2	SGD, SKILL LAB	MCQs
	• Discuss the Dorsal digital expansion	C2		
	• Describe the attachment of flexor retinaculum with structures related to it.	C2		

retinaculum Extensor retinaculum	• Map the outline of flexor and extensor retinacula on a simulated patient or a model.	P		SEQs VIVA VOCE OSPE
	• Describe the Guyon's canal.	C2		
	• 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.	C2		
	• Discuss the De Quervain's disease.	C3		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care			
	• Read a relevant research article	C3		
Palm of hand-I Muscles & Neurovascular organization	• Tabulate the muscles forming the thenar and hypothenar eminence.	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Discuss Lumbricals, Palmar and dorsal interossei with their attachments and actions.	C2		
	• Discuss the formation of superficial and deep arterial arches	C2		
	• Map the outline of superficial and deep arterial arches on a simulated patient or model.	P		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
Palm of hand-II Fascial spaces of hand Grip	• Discuss the formation and attachments of palmar aponeurosis.	C2	SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Describe the formation of palmar spaces and its divisions	C2		
	• Describe the thenar and mid palmar spaces.	C2		
	• Define pulp spaces	C1		
	• Relate anatomy of pulp space with its common clinical conditions	C3		
	• Describe dorsal subcutaneous spaces	C2		
	• Demonstrate surgical incisions.	C3		
	• Describe different types of grips	C2		
	• Correlate with the clinical conditions.	C3		
	• focus on provision of curative and preventive health care measures	C3		
	• Practice principles of bioethics	C3		
	• Apply strategic use of AI in health care	C3		
	• Read a relevant research article	C3		
	• Identify the structures present at different levels of cross section; mid humeral shaft, end of humeral shaft, elbow joint, superior radioulnar joint, mid forearm, wrist joint,	C2		

Cross sectional Anatomy of upper limb	proximal shafts of metacarpals.		SGD, SKILL LAB	MCQs SEQs VIVA VOCE OSPE
	• Correlate with the clinical conditions	C3		
	• Read a relevant research article	C3		
	• Apply strategic use of AI in health care	C3		

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 & EBSP,IPSP properties of chemical synapse	• Describe synapse and its types	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Differences between electrical and chemical synapse	C2		
Nernst potential	• Concept of Nernst potential	C1	SGD	MCQs SAQs Viva Voce OSPE
	• Equilibrium potential for different ions	C2		
Neuro muscular function (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
Intoduction and Classification of Vitamins & Vitamin E	• Define Vitamins	C1	SGD	MCQ SAQ VIVA
	• Introduction & Classification of Vitamins • Discuss sources, functions and clinical significance of vitamin E.	C1 C2		
Minerals			SGD	MCQ SAQ VIVA
	• Discuss Sources, Functions and Clinical Significance Calcium, Phosphate, Iodine, Fluoride, Copper, Zinc, Selenium, Magnesium, Sulphur And Cobalt.	C2		

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) • Discuss the attachments of capsule and ligament • Enlistt heintra-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 indispensable for stability of joint • Discuss the movement sat shoulder joint • Enlist related bursae. • Explain the related clinicals (shoulder dislocation, rotator cuff injuries, Glenoid Labrum tears, Frozen shoulder)	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page 266- 271,284-285). https://teachmeanatomy.info/upper-limb/joints/shoulder
Flexor compartment & Neurovascular organization of the arm	• Tabulate muscles of flexor compartment with the irorigin, insertion, nerve supply and actions • Describe Neurovascular organization of arm, • Explain the related clinicals (biceps tendinitis, dislocation of tendon of biceps brachii)	• Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 3, Page201-211,211-214). https://teachmeanatomy.info/upper-limb/muscles/anterior-forearm/
Extensor compartment of the arm	• Tabulate Muscles of extends or compartment with origin insertion, nerve supply and actions • Describe the neurovascular organization • Discuss consequences of injury to radial nerve (wrist drop), venipuncture in cubital fossa) • Read relevant research article • Use Digital Library	• Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 3, Page201-211,211-214). https://teachmeanatomy.info/upper-limb/muscles/upper-arm/
Ulna	• Determine the side • Demonstrate anatomical position • Discuss general features, attachment sand articulations • Describe ossification • Elaborate interosseous membrane and its importance • Correlate the clinical aspects	• Clinical Oriented Anatomy by Keith L. Moore.8THEdition. (Chapter 3, Page147). https://teachmeanatomy.info/upper-limb/bones/ulna/

Radius	• Determine the side • Demonstrate it anatomical position • Discuss general features, attachments and articulations • Describe its ossification • Describe the interosseous membrane and its importance • Correlate the clinical aspects	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page148). https://teachmeanatomy.info/upper-limb/bones/radius/
Flexor compartment of the forearm	• Tabulate muscles of flexor compartment with their origin, insertion, nerves Supply and actions • Describe clinical conditions associated with flexor compartment	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240) https://teachmeanatomy.info/upper-limb/muscles/anterior-forearm/
Extensor compartment of the forearm	• Tabulate muscles of extensor compartment with origin, insertion, nerve supply and actions • Describe clinical condition associated with extensor compartment of forearm (Tennis elbow)	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240). https://teachmeanatomy.info/upper-limb/muscles/posterior-forearm/
Neurovascular organization of forearm	• Describe nerves and vessels of forearm (formation, commencement, course, branches and relations) • Describe associated clinical conditions (Median nerve injury, pronator syndrome, cubital tunnel syndrome) • Read relevant research article • Use Digital Library	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page215-234,236,240). https://teachmeanatomy.info/upper-limb/muscles/posterior-forearm/
Elbow joint	• Describe the type of joint with its articular surfaces • 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)	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition (Chapter 3, Page271-274). https://www.kenhub.com/en/library/anatomy/elbow-joint

Proximal and distal radioulnar joints	• Describe type of radioulnar joints, articular surfaces, capsular attachments, synovial membrane and ligaments. • Describe movements of supination and pronation with special reference to axes • Enumerate the muscles producing these movements • Correlate clinical aspects of joint	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page274-277). https://www.kenhub.com/en/library/anatomy/proximal-radioulnar-joint https://www.kenhub.com/en/library/anatomy/distal-radioulnar-joint
Hand	• Understand the arrangement of carpal bones • Identify the salient features of carpel bone. • Discuss the special blood supply of scaphoid bone. • Describe the midcarpal joint. • Discuss the1st carpometacarpal joint including the type of the joint capsules ynovial Membrane and ligaments with axis of the movement and the muscles producing the movements • Read relevant research article • Use Digital Library	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. Chapter 3, Page148-151,278-283). https://teachmeanatomy.info/upper-limb/muscles/hand/
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). https://www.kenhub.com/en/library/anatomy/the-wrist-joint
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). https://www.kenhub.com/en/library/anatomy/arterial-anastomoses-of-the-upper-extremity
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.	• Clinical Oriented Anatomy by Keith L. Moore.8TH Edition. (Chapter 3, Page159,224-226).

	• Discuss the De Quervain's disease.	https://teachmeanatomy.info/upper-limb/muscles/hand/
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). https://teachmeanatomy.info/upper-limb/muscles/hand/
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). https://boneandspine.com/spaces-of-hand/

Physiology Self Directed Learning (SDL)

Topics	LearningObjective	References
Structure of neurons Classification of neurons & nerve fibers	• Structure of neurons • Myelinate Dand unmyelinated nerve fibers. • Neuroglia • Difference between neurons and glial cells	• Ganong's Review of Medical Physiology.25TH Edition physiology Excitable Tissue; Nerve (Chapter 04, Page 85-90) • Textbook of Medical Physiology by Guyton & Hall. 14thEdition. Introduction to Physiology. (Unit2, Chapter 05 Membrane Physiology Page74) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 01. Physiology of Body Fluids. (Chapter 03, Page 37)
Nernst potential, RMP	• Basic physics of membrane potential, Nernst equation, • Goldman Equation • Origin of RMP indifferent cell types.	• Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. Chapter no. 05 membrane dynamics Page no.188) • Textbook of Medical Physiology by Guyton & Hall.14th Edition Membrane Potential and action potential. (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. Properties and function of cell membrane. (Chapter 02, Page 31,41-43)
Properties of nerve fibers	• Rhythmicity of Excitable tissues, • Characteristics of signal transmission, • Types of refract toy period • Concept of excitation	• Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Membrane Potential and action potential (Unit2, Chapter 05, Page 73-76) • Ganong's Review of Medical Physiology.25TH Edition, Over view of cell physiology in medical physiology. Excite able Tissue; Nerve (Chapter04, Page 94) • Physiological Basis of Medical Practice by Best &Taylor's.13th Edition.Section01. Property and function of cell membrane. (Chapter03,Page41,55)
Measurement of RMP & effect of electrolytes on RMP	• Measurement of RMP • Effect of electrolyte son RMP • Role of Na/K pump	• Textbook of Medical Physiology by Guyton & Hall. 14th Edition. Membrane Potential and action potential (Unit2, Chapter 05, Page 65,67-70) • Human Physiology by Dee Unglaub Silver thorn. 8THEdition.Chapter no.05 Membrane dynamics Page no.188-194) • Physiology by Linda S. Costanzo 6th Edition. Cellular Physiology (Chapter01.Page18)
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	LearningObjective	References
Minerals & Vitamins		
Minerals Introduction Classification Calcium and phosphate	• State Daily Requirements of Calcium in different conditions • State Daily Requirement of Phosphate in different condition • Classify Minerals Discuss Types • Sources of Calcium • Sources of Phosphate	• Textbook of Lippincott 8th Edition Chapter # 29 page#466-467 • Textbook of Harper 32nd Edition Chapter # 44 page# 540 • https://www.ncbi.nlm.nih.gov/books/NBK218735 • https://youtu.be/34FTvJZCrt4
Biochemical Role of Calcium & Phosphate	• Discuss causes of Hypercalcemia • Discuss causes of Hypocalcemia • Describe effects of Hypercalcemia & Hypocalcemia • State Daily Requirements of Phosphate Discuss Biochemical functions of Phosphate	• Textbook of Lippincott 8th Edition Chapter # 29 page #466-467 • https://www.ncbi.nlm.nih.gov/books/NBK279023/ • https://youtu.be/qAeWKCXDniw
Fluoride, Magnesium, Sulphur	• Elaborate Biochemical functions of Fluoride, Sulphur & Magnesium • Enlist Sources of Fluoride, Sulphur. • Magnesium Describe Deficiency Effects	• Textbook of Lippincott 8th Edition Chapter # 29 page #468 • https://www.ncbi.nlm.nih.gov/ • https://youtu.be/PTOJNdtuXro
Iodine, Copper, Zinc, Selenium, Manganese	• Recall sources & daily requirements • Discuss their biochemical functions Describe Deficiency Effects	• Textbook of Lippincott 8th Edition Chapter # 29 page #449-454 • https://youtu.be/1i9fSQSvYI0 • https://pubmed.ncbi.nlm.nih.gov/
Definition of Vitamins &Classification of Vitamins Vitamin A and E	• 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	• Textbook of Lippincott 8th Edition Chapter # 28 page #423,432-436,441,444 • Textbook of Harper 32nd Edition Chapter # 44 page# 528-529 • https://byjus.com/chemistry • https://youtu.be/7ZFr9xiAt94

Biochemical Role of 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 • Explain Toxic effects of Vit.D	• Textbook of Lippincott 8th Edition Chapter # 28 page # 437-440 • Textbook of Harper 32nd Edition Chapter # 44 page# 530-532 • https://byjus.com/chemistry • https://youtu.be/6xhE5e16X0c
Deficiency Manifestation of Vitamin A and D	• Explain Deficiency effects of vitamin A and D	• Textbook of Lippincott 8th Edition Chapter # 28 Page #435,439 • Textbook of Harper 32nd Edition Chapter # 44 page# 530-532 • https://www.ncbi.nlm.nih.gov/ • shttps://youtu.be/ZCINiQX-mxU
Deficiency manifestation of Thiamine	• Explain Deficiency effects	• Textbook of Lippincott 8th Edition Chapter # 28 Page #429,430 • Textbook of Harper 32nd Edition Chapter # 44 page# 534 • https://www.ncbi.nlm.nih.gov/ • https://youtu.be/WAkXS8lgoA0
Niacin and Thiamine Classification & Structure of Amino Acids	• Classification & Structure of Amino Acids & Isomerism of Amino Acids • Enlist Sources Niacin and Thiamine • Describe Biochemical functions Niacin and Thiamine • Explain deficiency effects of Niacin and Thiamine	• Textbook of Lippincott 8th Edition Chapter # 28and 1 Page #1-5 &429-431 • Textbook of Harper 32nd Edition Chapter # 44 page# 534-535 • https://microbenotes.com/ • https://youtu.be/9pwBUTIcxHk

Histology Practical sSkill 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 wo 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 • Ninhydrin Test	P	Skill Lab	OSPE
Color test for detection of amino acids	• Xanthoprotic Test • Million- Nasse's Test	P	Skill Lab	OSPE
Color test for detection of amino acids	• Arginine by Sakaguchi's Test • Tryptophan by Aldehyde 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**
- **PBL**
- **Vertical Integration LGIS**

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	• Paresthesia	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)

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	LGIS	MCQs
	2. Describe risk factors involved in accidents	C2		
	3. Participate in activities/programs for prevention and control of accidents	C2		
	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
	• Enlist causes Osteoporosis	C2	LGIS	MCQs
	• Discuss changes in bones in Osteoporosis	C2		
	• Describe clinical features	C2		

Osteoporosis	• 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 etiology	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 dislocation	• Discuss the possible sites of shoulder dislocation	C2	LGIS	MCQs
	• Discuss the consequences of dislocation	C2		
	• 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		

List of MSK-I Module Vertical Courses Lectures

Sr. #	Date/Day	Department	Time	Topic of Lectures	Teacher's Name & Contact #
1.	Friday 29-03-24	Surgery	10:00 AM – 11:00 AM	Shoulder Dislocation	Dr. Rana Muhammad Adnan 0334-5410748 Dr. Junaid khan 0300-8359907
2.	Tuesday 02-04-24	Medicine	08:00 AM – 09:00 AM	Osteoporosis	Dr. Saima Meer 0343-5761430 Dr. Javeria Malik 0345-5405248
3.	Monday 29-04-24	Medicine	08:00 AM – 09:00 AM	Osteomalacia, Rickets & Polyarthritis	Dr. Umer Draz 0314-5316163 Dr. Iqra 0342-5430577
4.	Tuesday 30-04-24	Community Medicine	11:20 AM – 12:20 PM	Accidents	
5.	Thursday 02-05-24	Community Medicine	11:20 AM – 12:20 PM	Accidents	
6.	Saturday 11-05-24	Surgery	11:20 AM – 12:20 PM	Tennis elbow, Fracture of olecranon, Radius and Ulna	Dr. Rana Muhammad Adnan 0334-5410748 Dr. Junaid khan 0300-8359907

SECTION – IV

Spiral Courses

Content

- **Longitudinal Themes**
  - **The Holy Quran Translation**
  - **Seerat Mubarak**
  - **Biomedical Ethics & Professionalism**
  - **Family Medicine**
  - **Artificial Intelligence (Innovation)**
  - **Integrated Undergraduate Research Curriculum (IUGRC)**
  - **Early Clinical Exposure (ECE)**

Introduction to Spiral Courses

The Holy Quran Translation

A course of Islamic Studies provides students with a comprehensive overview of the fundamental aspects of Islam, its history, beliefs, practices, and influence on society and familiarize students with a solid foundation in understanding the religion of Islam from an academic and cultural perspective. Ethics, in integrated form will shape the core of the course to foster among students the universal ethical values promoted by Islam.

Bioethics

Biomedical ethics, also known as bioethics, is a field of study that addresses the ethical, social, and legal issues arising from medicine and the life sciences. It applies moral principles and decision-making frameworks to the practice of clinical medicine, biomedical research, and health policy. Biomedical ethics seeks to navigate the complex ethical dilemmas posed by advances in medical technology, research methodologies, and healthcare practices. Key areas of focus include patient rights and autonomy, confidentiality, informed consent, end-of-life care, resource allocation, and the ethics of genetic engineering, among others.

Biomedical ethics within medical universities plays a pivotal role in shaping the moral framework through which future healthcare professionals navigate the complex and often challenging decisions they will face in their careers. This critical discipline integrates ethical theories and principles with clinical practice, research, and healthcare policy, fostering a deep understanding of the ethical dimensions of medicine. By embedding biomedical ethics into the curriculum, Rawalpindi medical university equips students with the tools to critically analyze and address ethical dilemmas, ranging from patient confidentiality and informed consent to end-of-life care and the equitable distribution of healthcare resources.

This education goes beyond theoretical knowledge, encouraging students to apply ethical reasoning in practical scenarios, thus preparing them for the moral complexities of the medical field. Biomedical ethics also promotes a culture of empathy, respect, and integrity, ensuring that future medical practitioners not only excel in their technical skills but also uphold the highest ethical standards in patient care and research. Through seminars, case studies, and interdisciplinary collaborations, students are encouraged to engage in ethical discourse, reflecting on the societal impact of medical advancements and the responsibility of medical professionals to society. This foundational aspect of medical education cultivates a generation of healthcare professionals committed to ethical excellence, patient advocacy, and the pursuit of equitable healthcare for all.

Professionalism

Professionalism in medicine refers to the set of values, behaviors, and relationships that underpin the trust the public has in doctors and other healthcare professionals. It encompasses a commitment to competence, integrity, ethical conduct, accountability, and putting the interests of patients above one's own. Professionalism involves adhering to high standards of practice, including maintaining patient confidentiality, communicating effectively and respectfully with patients and colleagues, and continually engaging in self-improvement and professional development. It also includes a responsibility to improve access to high-quality healthcare and to contribute to the welfare of the community and the betterment of public health. In essence, professionalism in medicine is foundational to the quality of care provided to patients and is critical for maintaining the trust that is essential for the doctor-patient relationship.

Rawalpindi Medical University emphasizes the importance of professionalism in medicine, integrating it throughout its curriculum to ensure that students embody the core values of respect, accountability, and compassion in their interactions with patients, colleagues, and the community. This focus on professionalism is designed to prepare students for the complexities of the healthcare environment, instilling in them a deep sense of responsibility to their patients, adherence to ethical principles, and a commitment to continuous learning and improvement. Through a combination of theoretical learning, practical training, and mentorship, RMU encourages its students to exemplify professionalism in every aspect of their medical practice. Workshops, seminars, and clinical rotations further reinforce these values, providing students with real-world experiences that highlight the importance of maintaining professional conduct in challenging situations. RMU's approach to professionalism not only shapes competent and ethical medical professionals but also contributes to the broader mission of improving healthcare standards and patient outcomes. By prioritizing professionalism, Rawalpindi Medical University plays a crucial role in advancing the medical profession and ensuring that its graduates are well-equipped to meet the demands of a rapidly evolving healthcare landscape with honor and integrity.

Communication Skills

Communication skill for health professionals involves the ability to effectively convey and receive information, thoughts, and feelings with patients, their families, and other healthcare professionals. It encompasses a range of competencies including active listening, clear and compassionate verbal and non-verbal expression, empathy, the ability to explain medical conditions and treatments in an understandable way, and the skill to negotiate and resolve conflicts. Effective communication is essential for establishing trust, ensuring patient understanding and compliance with treatment plans, making informed decisions, and providing holistic care. It directly impacts patient satisfaction, health outcomes, and the overall efficiency of healthcare delivery.

At Rawalpindi Medical University (RMU), the development of communication skills is regarded as a fundamental aspect of medical education, recognizing its critical importance in enhancing patient care, teamwork, and interdisciplinary collaboration. RMU is dedicated to equipping its students with exceptional communication abilities, enabling them to effectively interact with patients, their families, and healthcare colleagues. The curriculum is thoughtfully designed to incorporate various interactive and experiential learning opportunities, such as role-playing, patient interviews, and group discussions, which allow students to practice and refine their communication skills in a supportive environment.

By integrating communication skills training throughout its programs, RMU not only enhances the interpersonal competencies of its future healthcare professionals but also contributes to improving the overall quality of healthcare delivery. Graduates from RMU are distinguished not just by their clinical expertise but also by their ability to connect with patients and colleagues, making them highly effective and compassionate practitioners.

Behavioral Sceinces

Behavioral sciences in medicine focus on understanding and addressing the psychological and social aspects of health and illness. This interdisciplinary field combines insights from psychology, sociology, anthropology, and other disciplines to enhance medical care and patient outcomes. It explores how behavior, emotions, and social factors influence health, disease, and medical treatment. By incorporating behavioral science principles into medical practice, healthcare professionals can better understand patients' perspectives, improve communication, and promote positive health behaviors, ultimately contributing to more comprehensive and effective patient care.

Family Medicine

Family medicine is a medical specialty dedicated to providing comprehensive health care for people of all ages and genders. It is characterized by a long-term, patient-centered approach, building sustained relationships with patients and offering continuous care across all stages of life. It focuses on treating the whole person within the context of the family and the community, emphasizing preventive care, disease management, and health promotion.

The Family Medicine Curriculum at Rawalpindi Medical University (RMU) marks a significant stride towards holistic healthcare education, aiming to prepare medical graduates for the comprehensive and evolving needs of family practice. This curriculum is designed to offer a broad perspective on healthcare, focusing on preventive care, chronic disease management, community health, and the treatment of acute conditions across all ages, genders, and diseases. Emphasizing a patient-centered approach, the curriculum ensures that students develop a deep understanding of the importance of continuity of care, patient advocacy, and the ability to work within diverse community settings.

RMU's Family Medicine Curriculum integrates theoretical knowledge with practical experience. Students are exposed to a variety of learning environments, including community health centers, outpatient clinics, and inpatient settings, providing them with a well-rounded understanding of the different facets of family medicine. This hands-on approach is complemented by interactive sessions, workshops, and seminars that cover a wide range of topics from behavioral health to geriatric care, ensuring students are well-equipped to address the comprehensive health needs of individuals and families.

Artificial Intelligence

To realize the dreams and impact of AI requires autonomous systems that learn to make good decisions. Reinforcement learning is one powerful paradigm for doing so, and it is relevant to an enormous range of tasks, including robotics, game playing, consumer modeling and healthcare. This class will provide a solid introduction to the field of reinforcement learning and students will learn about the core challenges and approaches, including generalization and exploration. Through a combination of lectures, and written and coding assignments, students will become well versed in key ideas and techniques for RL. Assignments will include the basics of reinforcement learning as well as deep reinforcement learning — an extremely promising new area that combines deep learning techniques with reinforcement learning. In addition, students will advance their understanding and the field of RL through a final project.

Integrated Undergraduate Research Curriculum

The integrated undergraduate research curriculum (IUGRC) of RMU occupies a definite space in schedule of each of the five years in rational and incremental way. It has horizontal harmonization as well as multidisciplinary research work potentials. In the first-year teachings are more introductory & inspirational rather than instructional. The teachings explain what & why of research and what capacities are minimally required to comprehend research & undertake research. Some research dignitaries' lecture are specifically arranged for sharing their experiences and inspiring the students. Students are specifically assessed through their individual compulsory written feedback (reflection) after the scheduled teachings end.

Entrepreneurship

Entrepreneurship is the process of designing, launching, and running a new business, which typically starts as a small enterprise offering a product, process, or service for sale or hire. It involves identifying a market opportunity, gathering resources, developing a business plan, and managing the business's operations, growth, and development.

Entrepreneurship in medical universities represents a burgeoning field where the innovative spirit intersects with healthcare to forge advancements that can transform patient care, medical education, and healthcare delivery. This unique amalgamation of medical expertise and entrepreneurial acumen empowers students, faculty, and alumni to develop groundbreaking medical technologies, healthcare solutions, and startups that address critical challenges in the health sector. By integrating entrepreneurship into the curriculum, Rawalpindi Medical university is not only expanding the traditional scope of medical education but also fostering a culture of innovation and problem-solving. This enables future healthcare professionals to not only excel in clinical skills but also in business strategies, leadership, and innovation management.

Such initiatives often lead to the creation of medical devices, digital health platforms, and therapeutic solutions that can significantly improve patient outcomes and make healthcare more accessible and efficient. Through incubators, accelerators, and partnerships with the industry, medical universities are becoming hotbeds for healthcare innovation, driving economic growth, and contributing to the broader ecosystem of medical research and entrepreneurial success.

Digital Literacy Module

Digital literacy means having the skills one needs to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices.

Early Clinical Exposure (ECE)

Early clinical exposure helps students understand the relevance of their preclinical studies by providing real-world contexts. This can enhance motivation and engagement by showing students the practical application of their theoretical knowledge. Early exposure allows students to begin developing essential clinical skills from the start of their education. This includes not only technical skills but also crucial soft skills such as communication, empathy, and professionalism. Direct interaction with patients early in their education helps students appreciate the complexities of patient care, including the psychological and social aspects of illness. Early exposure to various specialties can aid students in making informed decisions about their future career paths within medicine.

Early clinical experiences contribute to the development of a professional identity, helping students see themselves as future physicians and understand the responsibilities and ethics associated with the profession. This can help reduce the anxiety associated with clinical work by familiarizing students with the clinical environment. It can build confidence in their abilities to interact with patients and healthcare professionals. Engaging with real-life clinical situations early on encourages the development of critical thinking and problem-solving skills, which are essential for medical practice. It helps bridge the gap between theoretical knowledge and practical application, leading to a more integrated and holistic approach to medical education. It allows students to observe and understand how healthcare systems operate, including the challenges and limitations faced in different settings.: Early patient interaction emphasizes the importance of patient-centered care from the outset, underscoring the importance of treating patients as individuals with unique needs and backgrounds. Practical experiences can enhance long-term retention of knowledge as students are able to connect theoretical learning with clinical experiences.: Early clinical experiences often involve working in multidisciplinary teams, which fosters a sense of collaboration and understanding of different roles within healthcare.

In summary, early clinical exposure in medical education is pivotal for the holistic development of medical students, providing them with a strong foundation of practical skills, professional attitudes, and a deep understanding of patient-centered care.

The Holy Quran Translation Lecture

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Imaniat	• Describe the Concept of Tauheed • Explain the attributes of pious • Discuss the attributes of Allah Almighty • Explain Hazarat Uzair's and Hazarat Ibrahim's experience about resurrection	C2	LGIS	SAQ

Seerat Mubarak

Topic	Learning Objectives At the end of the lecture the student should be able to	Learning Domain	Teaching Strategy	Assessment Tool
The Significance of Seerah Studies	• Discuss the meaning of Seerat un Nabi • Explain the importance of knowing the Seerah of Prophet	C2	LGIS	SAQ

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	MCQs
	• Discus complications of body aches			
	• Describe initial treatment of patients with body aches			
	• Know when to refer patient to consultant/ Hospital			

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 • 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		LGIS	MCQS

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

List of MSK-I Module Spiral Courses Lectures

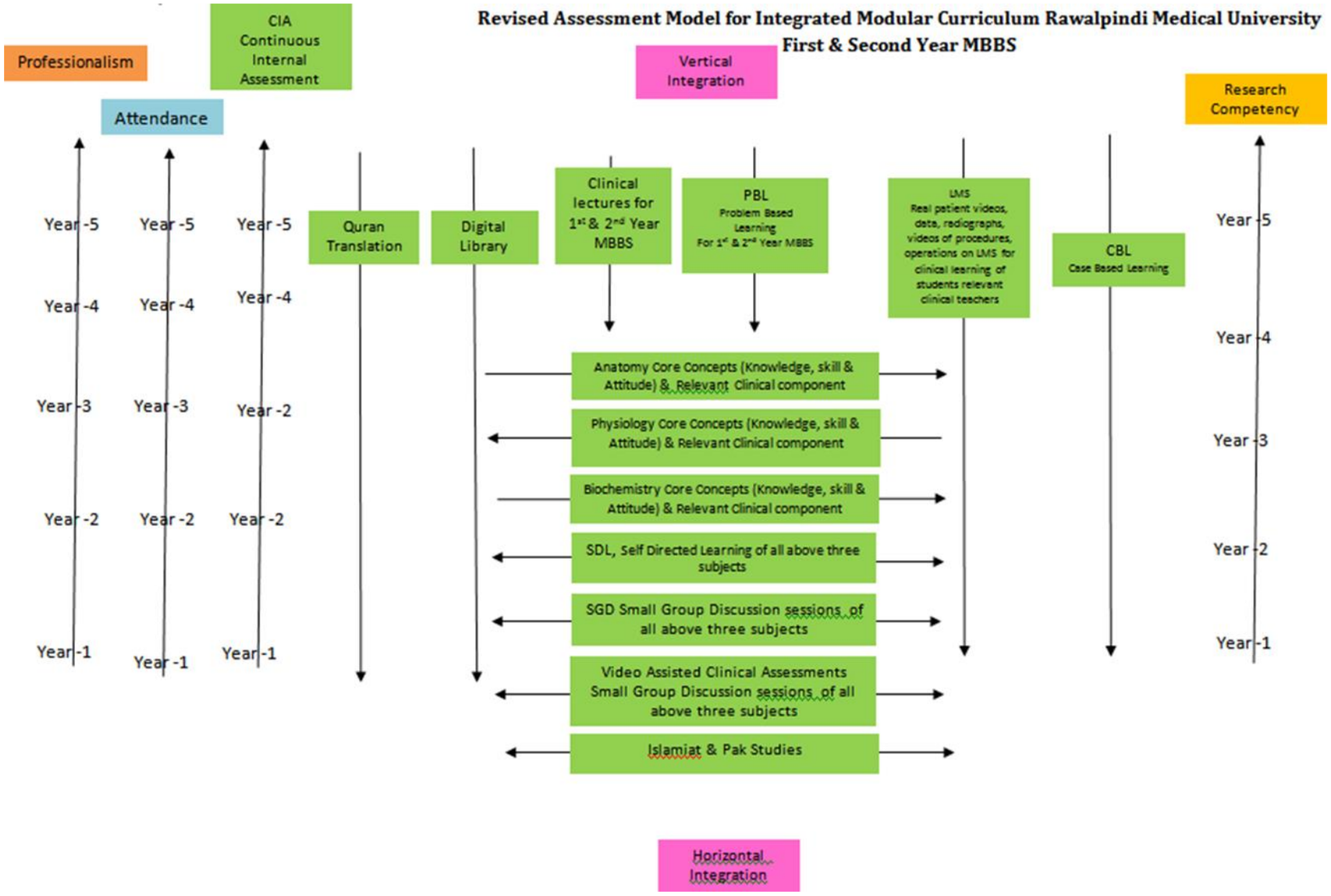
Sr. #	Date/Day	Department	Time	Topic of Lectures	Teacher's Name& Contact #
1.	Monday 01-04-24	Bio Ethics	11:00 AM – 11:50 AM	Islamic concept of Bioethics	`Dr. Kashif Rauf 0300-6097484 Dr. Fahd Anwar 0300-5156800
2.	Wednesday 03-04-24	Family Medicine	11:00 AM – 11:50 AM	Approach to a patient with Body Pains	Dr. Sadia 0336-5091229 Dr. Sidra Hamid 0331-5025147
3.	Friday 26-04-24	Quran Translation	09:00 AM – 10:00 AM	Imaniat	Moulana Abdul Wahid Mufti Naeem Sherazi
4.	Friday 26-04-24	Seerat Mubarak	10:00 AM – 11:00 AM	The Significance of Seerah Studies	Mufti Naeem Sherazi Moulana Abdul Wahid
5.	Saturday 04-05-24	Artificial Intelligence Radiology	10:00 AM – 11:00 AM	Interpretation of upper limb Radiograph & use of AI	

SECTION - V

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%

60% 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 eligibility 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 the share according to their hour percentage.	Summative assessment is taken at the mid modular (LMS Based) modular and block levels.

Modular Assessment

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 Assessment

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 theTable 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	Biochemistry Structured & Clinically Oriented Viva	Summative	10 Minutes				
	7	Assessment of Clinical Lectures	Formative	15 Minutes				
	8	Assessment of Bioethics Lectures	Summative	2 Minutes				
	9	Assessment of IUGRC Lectures	Summative	10 Minutes				

LearningResources

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. YoungJ. W. HealthWheather'sFunctionalHistology 6th edition. 2. Medical Histology by Prof. Laiq Hussain 7th edition. **C. Embryology** 1. KeithL. Moore.TheDeveloping Human 11th edition. 2. Langman'sMedical 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.LippincottTextbook of Biochemistry 8th edition. 2. Harper's Illustrated Biochemistry 32th edition. 3.Lehninger Principle of Biochemistry 8th edition **Websites:** • https://www.ncbi.nlm.nih.gov/books/NBK218735 • https://www.ncbi.nlm.nih.gov/books/NBK279023/ • https://www.ncbi.nlm.nih.gov/ • https://pubmed.ncbi.nlm.nih.gov/ • https://byjus.com/chemistry • https://www.ncbi.nlm.nih.gov/ • https://www.ncbi.nlm.nih.gov/ • https://microbenotes.com/

	Youtube: • https://youtu.be/34FTvJZCrt4 • https://youtu.be/qAeWKCXDniw • https://youtu.be/PTOJNdtuXro • https://youtu.be/1i9fSQSvYI0 • https://youtu.be/7ZFr9xiAt94 • https://youtu.be/6xhE5e16X0c • https://youtu.be/ZCINiQX-mxU • https://youtu.be/WAkXS8lgoA0 • https://youtu.be/9pwBUTIcxHk **HEC Digital Library** **Journals:** • https://pubs.acs.org/journal/bichaw • https://academic.oup.com/jb • https://www.hindawi.com/journals/bri/
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 – VI

Time Table

Integrated Clinically Oriented Modular Curriculum for First Year MBBS

MSK- I Module Time Table

First Year MBBS

Session 2023 - 2024

Batch- 51

MSK-I Module Team

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

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

Module Task Force Team		
1.	Coordinator	Dr. Maria Tasleem (Assistant Professor of Anatomy)
2.	DME Focal Person	Dr. Farzana Fatima
3.	Co-coordinator	Dr. Gaiti Ara (Senior Demonstrator of Anatomy)
4.	Co-Coordinator	Dr. Fahd Anwar (Demonstrator of Physiology)
5.	Co-coordinator	Dr. Romessa Naeem (Demonstrator of Biochemistry)

DME Implementation Team		
1.	Director DME	Prof. Dr. Ifra Saeed
2.	Assistant Director DME	Dr. Farzana Fatima
3.	Implementation Incharge 1st & 2nd Year MBBS	Prof. Dr. Ifra Saeed Dr. Farzana Fatima
4.	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 (A, D, E, ascorbic acid, thiamin and niacin), 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 • NernstPotential, RMP • Recording & Propagation of Action Potential & Factors Effecting NerveConduction & Hyperpolarized State • Stimulus & Response & Types of Stimuli, Stages of Action Potential			
	Spiral Courses				
	• The Holy Quran Translation	• Imaniat			
	• Seerat Mubarak	• The Significance of Seerah Studies • The Status of Hadith and Sunnah in Islam			
	• 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, Radiusand Ulna (Surgery) • Osteoporosis (Medicine) • Osteomalacia, Rickets & Polyarthritis (Medicine)				

	• Accidents (Community Medicine)	
Early Clinical Exposure (ECE)		
	• Clinical Rotations	• How to Read Bone X- ray. • How to find Bone age • Fractures of distal Bones • Placental abanormalities • Uterine abnormalities • Pregnancy and effects of congenital uterine abnormalities • X-ray in paediatric age group • Pathologies like Rickets, congenital dislocation of hip joint and other abnormalities

Categorization of Modular Content of Anatomy:

Category A*	Category B**	Category C				
General Embryology	**General Histology**	**Demonstrations / SGD**	**CBL**	**Practical's**	**SDL**	**SSDL**
• 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	• Proximal & distal radioulnar joint • Bones 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 * 23= 46 hours
2.	Small Group Discussions (SGD)	1.5 * 18 + 2*1=29 hours
3.	Case Based Learning (CBL)	2* 2 = 4 hours
5.	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 * 20 = 20 hours
2.	Small Group Discussions (SGD)	1.5 * 18 + 2*1=29 hours
3.	Case Based Learning (CBL)	2* 2 = 4 hours
4.	SSDL	3*2 = 6 hours
5.	Practical / Skill Lab	1.5 * 4 = 6 hours
6.	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 & fateo facety lcholine (**Prof. Dr. Samia Sarwar /Dr Aneela)**	Structureofneurons. 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 RMP 5. Concept of degeneration & regeneration 6. Stimulus & response & types of stimuli, Stages of action potential 7.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 **SDL:(On Campus)** 1.Nernst potential, RMP Action Potential
Drugsactingon NMJ, Myasthenia Gravis, Lambart Eaton	Nernst potential, RMP **(By Dr Shazia)**					

Syndrome (**Prof. Dr. Samia Sarwar / Dr Aneela)**						
	Properties of nerve fibers **(By Dr Sheena)**					
	Measurement of RMP& effect of electrolytes on RMP **(By Dr. Shazia)**					
	Concept of degeneration & re generation **(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 effect ingnerve Conduction & hyper polarized 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 of teaching 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-DirectedLearning (SDL)	7x 1hour= 7 hours (Off Campus) 4x 1hour= 4hours (On Campus) (Third week)

Categorization of Modular Content of Department of Biochemistry:

<table>
<tr><th>Category A*</th><th>Category B**</th><th colspan="4">Category C***</th></tr>
<tr><th>LGIS</th><th>LGIS</th><th>PBL</th><th>CBL</th><th>Practical’s</th><th>SGD</th></tr>
<tr><td rowspan="2">Minerals: Introduction & Classification.
Calcium & Phosphate</td><td rowspan="2">Vitamins: Introduction & Classification.
Vitamin A &Vitamin E</td><td rowspan="4"></td><td rowspan="4">• Night Blindness
• Rickets</td><td>• 7 Colour Tests for Proteins</td><td rowspan="2">Introduction & Classification of Vitamins.
Vitamin E</td></tr>
<tr><td rowspan="3">• Serum Calcium & Ascorbic Acid</td></tr>
<tr><td>Vitamin C</td><td rowspan="3">•Minerals</td></tr>
<tr><td>Vitamin D</td><td>Niacin & Thiamine
Magnesium, Sulphur, Fluoride
Minerals: Copper, Zinc, Selenium, Iodine, Magnesia
Classification & Structure of Amino Acids& Isomerism</td></tr>
<tr><td colspan="6">Category A*: Assistant Professor& Senior Demonstrator with post graduate Qualification</td></tr>
<tr><td colspan="6">Category B**: Senior Demonstrators</td></tr>
<tr><td colspan="6">Category C***: By All Demonstrators</td></tr>
</table>

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)	01
2	Demonstrators of biochemistry department	06

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)	12	6
2.	Small Group Discussions (SGD)	6 * 5 = 30 hours	1.5*4=6
3.	Problem Based Learning (PBL)	2 * 1 = 2 hours	02
4.	Practical / Skill Lab	30 hours	6
5.	Self-Directed Learning (SDL)	1 * 7= 7hours	07

Time Table for Musculoskeletal-I Module (First Week)
(01-04-2024 To 03-04-2024)

Day & Date	08:00AM – 09:00AM		09:00AM – 09:50AM	09:50AM – 10:40AM		10:40AM– 11:00 AM	11:00AM – 11:50AM		11:50AM – 01:00PM	Home Assignment
Monday 01- 04-2024	**BIOCHEMISTRY (LGIS)**		**DME**	**ANATOMY (LGIS)**		**Break**	**PHYSIOLOGY(LGIS)**		Practical & Tutorial Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Physiology Structure of Neurons & Classification of Neurons
	Mineral introduction/ classification/ calcium & Phosphate	Defination and classification of vitamins vitamin A & E	Students Feedbacks of Foundation Module 1st year Students MBBS	**Embryology** 2nd Week of Development	**Histology** Connective tissue (CT) – I (Cells of CT)		Structure of neurons Classification of neurons and nerve fibers	Nernst Potential & RMP		
	Dr. Aneela / Dr. Uzma (Even)	Dr. Almas (Odd)	Foundation Module Team	Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Mohtasham (Odd)		Dr. Sheena (Even)	Dr. Shazia (Odd)		
Tuesday 02 -04-2024	**CBL**			**PHYSIOLOGY (LGIS)**			**RESEARCH CLUB ACTIVITY**			SDL Physiology Nernst Potential & RMP
	Shoulder Joint (Shoulder Dislocation) Batches, Teachers & Venue Mentioned in Table No. 1			Nernst Potential & RMP	Structure of neurons Classification of neurons andnerve fibers		Hands on Session on Data Analysis			
				Dr. Shazia (Even)	Dr. Sheena (Odd)		Dr. Rizwana Shahid (Even)	Dr. Asif (Odd)		
Wednesday 03-04-2024	**SGD/ DISSECTION**			**ANATOMY (LGIS)**			**BIOETHICS**		Practical & Tutorial Venue & topic mentioned at the end **(Tuesday Batch)** Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Definition & classification of vitamins, Vitamin A, Vitamin E
	Flexor compartment & Neurovascular organization of arm Batches, Teachers & Venue Mentioned in Table No. 2			**Histology** Connective tissue-I (Cells of CT)	**Embryology** 2nd Week of Human Development		Islamic concept of Bioethics			
				Ass. Prof. Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)		Dr. Kashif Rauf (Even)	Dr. Fahd Anwar (Odd)		

Spring Holidays & Eid Ul Fitr Holidays 2024
04th April 2024 to 13th April, 2024

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)		
Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Connective Tissue I (Anatomy Histology Practical) Venue- Histology Laboratory-Dr Ali Raza
- Biuret, Ninhydrin Test (Biochemistry Practical) Venue- Biochemistry Laboratory
- Determination of Hemoglobin concentration (Physiology-Practical)

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Supervised by HOD	Biochemistry Practical		Supervised by HOD	Physiology Practical		Physiology SGD		Biochemistry SGD		Supervised by HOD
	Batch	Teacher Name		Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name	Batch	Teacher Name	
Monday	C			B	Dr. Rahat		E	Dr. Farid/Dr. Ali Zain	A	Dr. Sheena/ Dr. Ali Zain	D	Dr. Uzma	
Tuesday	D			C	Dr. Nayab		A	Dr. Sheena/Dr.Nazia	B	Dr. Uzma/ Dr. Nazia	E	Dr. Almas	
Wednesday	E			D	Dr. Uzma		B	Dr. Uzma/ Dr. Farhat	C	Dr. Fahd	A	Dr. Romessa	
Thursday	B			A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen	E	Dr. Farid/ Dr. Ali Zain	C	Dr. Nayab	
Saturday	A			E	Dr. Romessa		C	Dr. Fahd	D	Dr. Maryam/ Dr. Afsheen	B	Dr. Rahat	

Topics for SGDs / CBL with Venue

- Physiology SGD: Nernst potential (Physiology Lecture Hall 05)
- Biochemistry SGD: Introduction and Classification of Vitamins &Vitamin E (Venue: Lecture Hall No 2)
- Anatomy CBL: Shoulder Dislocation, Wrist drop

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	**Roll No**	**Anatomy Teacher**	**Venue**
A	01-90	Dr. Ali Raza	Anatomy Lecture Hall No.4
B	91-180	Dr Zeneara Saqib	New Lecture Hall Complex No. 02
C	181-270	Dr. Kashif Ashraf	New Lecture Hall Complex No. 03
D	271- onwards	Dr. Sajjad	Anatomy Lecture Hall No.3
Supervised by Prof. Dr. Ayesha Yousaf			

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Farhat Jabeen (PGT Physiology)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Prof. Dr. Ifra Saeed (Professor of Anatomy)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Afsheen Batool (PGT Physiology)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Muhammad Usman (PGT Physiology)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Prof. Dr. Ayesha Yousaf (Professor of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Nayab (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)
No PBL Session during this week									

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Time Table for Musculoskeletal-I Module (First Week)
(15-04-2024 To 17-04-2024)

Day & Date	08:00AM – 09:00AM	09:00AM – 09:50AM	09:50AM – 10:10AM	10:10AM – 11:00AM	11:00AM– 11:20 AM	11:20AM – 12:20PM	12:20PM – 02:00PM	Home Assignment
Monday 15-04-2024	**CBL** Extensor compartment & Neurovascular organization of arm (Wrist Drop) Batches, Teachers & Venue Mentioned in Table No. 1		**B r e a k**	**ANATOMY (LGIS)** **General Anatomy**: Bone-I (General Features) — Dr. Arslan (Even) **Histology**: Connective tissue-II (Extracellular Matrix & Types of CT) — Prof. Dr. Saima Naz / Ass. Prof. Dr. Mohtasham (Odd)	**B r e a k**	**PHYSIOLOGY(LGIS)** Properties of nerve Fibers — Dr. Sheena (Even) Measurement & effect of electrolytes on RMP — Dr. Shazia (Odd)	Practical & Tutorial Venue & topic mentioned at the end **(Wednesday Batch)**	SDL Biochemistry Mineral introduction/ classification/ calcium & Phosphate
Tuesday 16-04-2024	**MEDICINE** Osteoporosis Dr Saima Mir (Even) — Dr Javaria Malik (odd)	**BIOCHEMISTRY (LGIS)** Definition & classification of vitamins, Vitamin A, Vitamin E — Dr. Almas (Even) Mineral introduction/ classification/ calcium & Phosphate — Dr. Aneela / Dr. Uzma (Odd)		**ANATOMY (LGIS)** **Histology**: Connective Tissue – II (Extracellular Matrix & Types of CT) — Prof. Dr. Saima Naz / Ass. Prof. Dr. Mohtasham (Even) **Embryology**: 3rd week of development (Gastrulation) — Prof. Dr. Ayesha (Odd)		**FAMILY MEDICINE** Approach to a patient with Body Pains Dr Sadia (Even) — Dr. Sidra Hamid (Odd)	Practical & Tutorial Venue & topic mentioned at the end **(Thursday Batch)** Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Shoulder joint
Wednesday 17-04-2024	**SGD/ DISSECTION** Dissection & Spotting Batches, Teachers & Venue Mentioned in Table No. 2			**ANATOMY (LGIS)** **Embryology**: 3rd week of development (Gastrulation) — Prof. Dr. Ayesha (Even) **General Anatomy**: Bone-I (General Features) — Ass. Prof. Dr. Arslan (Odd)		**PHYSIOLOGY(LGIS)** Measurement & effect of electrolytes on RMP — Dr. Shazia (Even) Properties of nerve Fibers — Dr. Sheena (Odd)	Practical & Tutorial Venue & topic mentioned at the end **(Saturday Batch)** Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Flexor and Extensor compartments of arm

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)

Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Connective Tissue I (Anatomy Histology Practical) Venue- Histology Laboratory-Dr Ali Raza
- Biuret, Ninhydrin Test (Biochemistry Practical) Venue- Biochemistry Laboratory
- Determination of Hemoglobin concentration (Physiology-Practical)

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical		Supervised by HOD	Physiology Practical		Physiology SGD		Biochemistry SGD		Supervised by HOD
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name	Batch	Teacher Name	
Monday	C	Supervised by HOD	B	Dr. Rahat		E	Dr. Farid/Dr. Ali Zain	A	Dr. Sheena/ Dr. Ali Zain	D	Dr. Uzma	
Tuesday	D		C	Dr. Nayab		A	Dr. Sheena/Dr.Nazia	B	Dr. Uzma/ Dr. Nazia	E	Dr. Almas	
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farhat	C	Dr. Fahd	A	Dr. Romessa	
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen	E	Dr. Farid/ Dr. Ali Zain	C	Dr. Nayab	
Saturday	A		E	Dr. Romessa		C	Dr. Fahd	D	Dr. Maryam/ Dr. Afsheen	B	Dr. Rahat	

Topics for SGDs / CBL with Venue

- Physiology SGD: Nernst potential (Physiology Lecture Hall 05)
- Biochemistry SGD: Introduction and Classification of Vitamins &Vitamin E (Venue: Lecture Hall No 2)
- Anatomy CBL: Shoulder Dislocation, Wrist drop

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	**Roll No**	**Anatomy Teacher**	**Venue**
A	01-90	Dr. Ali Raza	Anatomy Lecture Hall No.4
B	91-180	Dr Zeneara Saqib	New Lecture Hall Complex No. 02
C	181-270	Dr. Kashif Ashraf	New Lecture Hall Complex No. 03
D	271- onwards	Dr. Sajjad	Anatomy Lecture Hall No.3
Supervised by Prof. Dr. Ayesha Yousaf			

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Farhat Jabeen (PGT Physiology)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Prof. Dr. Ifra Saeed (Professor of Anatomy)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Afsheen Batool (PGT Physiology)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Muhammad Usman (PGT Physiology)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Prof. Dr. Ayesha Yousaf (Professor of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Nayab (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)
No PBL Session during this week									

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Time Table for Musculoskeletal-I Module Second Week
(18-04-2023 to 24-04-2024)

DATE/ DAY	8:00 AM – 09:50 AM	09:50 AM – 10: 10 AM	10:10 AM – 11:00 AM		11:00 AM – 11:20 AM	11:20 AM - 12:20 PM		12:20 PM -02:00PM	Home Assignment
Thursday 18-04-2024	**SGD / DISSECTION**	**Break**	**ANATOMY (LGIS)**		**Break**	Physical Activity		**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Physiology Resting Membrane Potential
	Bones of forearm (Ulna & Radius) Batches, Teachers & Venue Mentioned in Table No. 2		**General Anatomy**	**Embryology**					
			Bone-II (Classification & Blood Supply)	3rd week (Notochord formation & Differentiation of Somites)					
			Ass. Prof. Dr. Arslan(Even)	Prof. Dr. Ayesha (Odd)					
DATE/ DAY	**8:00 AM – 10:00 AM**		**10:00 AM – 11:00 AM**			**11:00 AM – 12:00 PM**			
Friday 19-04-2024	**SGD / DISSECTION**		**ANATOMY (LGIS)**			**PHYSIOLOGY(LGIS)**		SDL Physiology Action Potential	
	Flexor compartment of forearm Batches, Teachers & Venue Mentioned in Table No. 2		**Embryology**	**General Anatomy**		Concept of Degeneration and regeneration	Stimulus & Response &Type of stimuli. Stages of action potential		
			3rd week (Notochord formation & Differentiation of Somites)	Bone-II (Classification & Blood Supply)					
			Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Arslan (Odd)		Dr. Kamil (Even)	Dr. Fareed (Odd)		
Saturday 20-04-2024	**SGD / DISSECTION**	**Break**	**ANATOMY (LGIS)**		**Break**	**PHYSIOLOGY(LGIS)**		**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Biochemical role of vitamin D
	Extensor compartment of forearm Batches, Teachers & Venue Mentioned in Table No. 2		**Histology**	**Embryology**		Stimulus & Response &Type of stimuli. Stages of action potential	Concept of Degeneration and regeneration		
			Connective Tissue-III (Types of CT)	3rd week (Neurulation)		Dr. Fareed (Even)	Dr. Kamil (Odd)		
			Ass. Prof. Dr. Mohtasham (Even)	Prof. Dr. Ayesha (Odd)					
Monday 22-04-2024	**SGD / DISSECTION**	**Break**	**ANATOMY (LGIS)**		**Break**	**BIOCHEMISTRY LGIS**		**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Fluoride, Magnesium & Sulphur Copper, Zinc, Selenium, Iodine, Manganese
	Neurovascular organization of forearm Batches, Teachers & Venue Mentioned in Table No. 2		**Embryology**	**Histology**		Fluoride, Magnesium & Sulphur Copper, Zinc, Selenium, Iodine, Manganese	Vitamin D		
			3rd week (Neurulation)	Connective Tissue-III (Types of CT)		Dr. Uzma (Even)	Dr. Aneela (Odd)		
			Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Mohtasham (Odd)					
Tuesday 23-04-2024	**SGD/ DISSECTION**		**ANATOMY (LGIS)**			**PBL SESSION –I**		**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Flexor & Extensor compartments of forearm
	Elbow joint & Anastomosis around elbow joint Batches, Teachers & Venue Mentioned in Table No. 2		**Embryology**	**Histology**		Muscle Weakness			
			4th-8th week of development & Early development of CVS	Cartilage		PBL Team			
			Prof. Dr. Ayesha Yousaf / Prof. Dr. Saima (Even)	Prof. Dr. Ifra Saeed/Ass. Prof. Dr. Mohtasham (Odd)					
Wednesday 24-04-2024	**SGD/ DISSECTION**		**ANATOMY (LGIS)**			**PHYSIOLOGY (LGIS)**		**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Physiology NMJ **Online SDL Evaluation)**
	Proximal & Distal Radioulnar joints Batches, Teachers & Venue Mentioned in Table No. 2		**Histology**	**Embryology**		Recording & propagation of action potential & factors effecting nerve conduction & hyperpolarized state	Refractory period, types of action potential. Graded potential comparison with action potential		
			Cartilage	4th-8th week of development & Early development of CVS		Dr. Fareed (Even)	Dr Shazia (Odd)		
			Prof. Dr. Ifra Saeed/Ass. Prof .Dr. Mohtasham (Even)	Prof. Dr. Ayesha Yousaf / Prof. Dr. Saima (Odd)					

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects)
CBL / Small Group Disscusion (Biochemistry and Physiology)

Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Connective Tissue II (Anatomy Histology Practical) Venue-Histology Laboratory-Dr Zeneara Saqib
- Xanthoproteic Test, Millon's Test (Biochemistry Practical) Venue-Biochemistry Laboratory
- Determination of Hematocrit (HCT)(Physiology-Practical)

Topics for SGDs / CBL with Venue

- Physiology CBL: Parasthesias paraesis (Physiology Lecture Hall 05)
- Biochemistry CBL: Night Blindness (Venue: Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical			Physiology Practical		Physiology SGD			Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/Dr. Ali Zain	A	Dr. Sheena/Dr. Ali Zain	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Nayab		A	Dr. Sheena/Dr. Nazia	B	Dr. Uzma/ Dr. Nazia		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farhat	C	Dr. Fahd		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen	E	Dr. Farid/ Dr. Ali Zain		C	Dr. Nayab
Saturday	A		E	Dr. Romessa		C	Dr. Fahd	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Ali Raza	Anatomy Lecture Hall No.4
B	91-180	Dr Zeneara Saqib	New Lecture Hall Complex No. 02
C	181-270	Dr. Kashif Ashraf	New Lecture Hall Complex No. 03
D	271- onwards	Dr. Sajjad	Anatomy Lecture Hall No.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Farhat Jabeen (PGT Physiology)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Prof. Dr. Ifra Saeed (Professor of Anatomy)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Afsheen Batool (PGT Physiology)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Muhammad Usman (PGT Physiology)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Prof. Dr. Ayesha Yousaf (Professor of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Nayab (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Time Table for Musculoskeletal-I Module Third Week
(25-04-2024 to 08-05-2024)

DATE/ DAY	8:00 AM – 09:00 AM	09:00 AM – 09: 50 AM	09:50 AM – 10:10 AM	10:10 AM – 11:00 AM	11:00 AM - 11:20 PM	11:20 PM -12:20PM	12:20 PM - 02:00PM	Home Assignment
Thursday 25-04-2024	**RESEARCH CLUB ACTIVITY** Manuscript Writing Workshop		**Break**	**ANATOMY (LGIS)** **Histology**: Bone I (Cells & types) — Prof. Dr. Ifra Saeed /Ass. Prof. Dr. Mohtasham (Even) **Embryology**: Folding of Embryo — Prof. Dr. Ayesha (Odd)	**Break**	**PHYSIOLOGY (LGIS)** Refractory period, types of action potential. Graded potential comparison with action potential — Dr Shazia (Even) NMJ, Introduction concept of motor unit. Neuro muscular transmission, synthesis & fate of acetylcholine — Prof. Dr. Samia Sarwar/ Dr Aneela (Odd)	**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Wrist Joint

DATE/ DAY	8:00 AM – 9:00 AM		9:00 AM – 10:00 AM		10:00 AM – 11:00 AM		11:00 AM – 12:00 PM			
Friday 26-04-2024	**QURAN TRANSLATION** Imaniat Moulana Abdul Wahid (Even) / Mufti Naeem Sherazi (Odd)		**SEERAT MUBARIK** The Significance of Seerah Studies Mufti Naeem Sherazi (Odd) / Moulana Abdul Wahid (Even)		**ANATOMY (LGIS)** **Embryology**: Folding of Embryo — Prof. Dr. Ayesha (Even) **Histology**: Bone I (Cells & types) — Prof. Dr. Ifra Saeed / Ass. Prof. Dr. Mohtasham (Odd)		**PHYSIOLOGY(LGIS)** NMJ, Introduction concept of motor unit. Neuro muscular transmission, synthesis & fate of acetylcholine — Prof. Dr. Samia Sarwar/ Dr Aneela (Even) Recording & propagation of action potential & factors effecting nerve conduction & Hyperpolarized state — Dr. Fareed (Odd)		SDL Physiology Concept of Degeneration and regeneration	
Saturday 27-04-2024	**SGD/ DISSECTION** Dissection & Spotting Batches, Teachers & Venue Mentioned in Table No. 2		**Break**	**ANATOMY (LGIS)** **Histology**: Fetal period — Prof. Dr. Ayesha (Even) **Embryology**: Bone II (Ossification) — Ass. Prof. Dr. Mohtasham (Even)	**Break**	**SYNCH RMU** Topic: Guidance session for Integrated Modular System			**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Fluoride, Magnesium & SulphurCopper, Zinc, Selenium, Iodine, Manganese

Sports Week 29th April – 04th May, 2024

Monday 06-05-2024	**SGD/ DISSECTION** Bones of Hand Batches, Teachers & Venue Mentioned in Table No. 2		**Break**	**ANATOMY (LGIS)** **Histology**: Bone II (Ossification) — Ass. Prof. Dr. Mohtasham (Even) **Embryology**: Fetal period — Prof. Dr. Ayesha (Odd)	**Break**	**PBL SESSION –II** Muscle Weakness PBL Team	**Practical & CBL** Venue & topic mentioned at the end. Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Deficiency manifestation of thiamine
Tuesday 07-05-2024	**SGD / DISSECTION** Wrist joint	**BIOCHEMISTRY (LGIS)** Vitamin D / Fluoride, Magnesium & SulphurCopper, Zinc, Selenium,		**ANATOMY LGIS** **Embryology**: Placenta **General Anatomy**: Joints 1(types)		**PHYSIOLOGY (LGIS)** SDL: Nernst Potential & RMP & Action Potential Drugs acting on NMJ, Myasthenia Gravis, Lambart Eaton Syndrome	**Practical & CBL** Venue & topic mentioned at the end.	SDL Anatomy Elbow joint

			Iodine, Manganese		Prof. Dr. Ayesha (Odd)	Ass. Prof. Dr. Arslan (Even)				Batches, Teachers & Venue Mentioned in Table No. 1	
		Dr. Aneela (Even)	Dr. Uzma (Odd)					Dr Shazia (Even)	Prof. Dr. Samia Sarwar/Dr Aneela (Odd)		
Wednesday 08-05-2024	**SGD/ DISSECTION**				**ANATOMY LGIS**			**PHYSIOLOGY LGIS**		**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Physiology Nernst Potential & RMP & Action Potential
	Dorsum of Hand, Flexor & Extensor Retinacula Batches, Teachers & Venue Mentioned in Table No. 2				**General Anatomy**	**Embryology**		Drugs acting on NMJ, Myasthenia Gravis, Lambart Eaton Syndrome	SDL: Nernst Potential & RMP & Action Potential		
					Joints I (Types)	Placenta		Prof. Dr. Samia Sarwar /Dr Aneela (Even)	Dr Shazia (Odd)		
					Ass. Prof. Dr. Arslan (Even)	Prof. Dr. Ayesha (Odd)					

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects) CBL / Small Group Disscusion (Biochemistry and Physiology)

Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Cartilage (Anatomy Histology Practical) Venue-Histology Laboratory-Dr Kashif Ashraf
- Tryptophan Test, Sakaguchi's Test (Biochemistry Practical) Venue-Biochemistry Laboratory
- Determination of Erythrocyte Sedimentation Rate (ESR)(Physiology-Practical)

Topics for SGDs / CBL with Venue

- Physiology CBL: Insecticide poisoning (Physiology Lecture Hall 05)
- Biochemistry SGD: Minerals (Venue: Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical		Supervised by HOD	Physiology Practical		Physiology SGD		Supervised by HOD	Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat		E	Dr. Farid/ Dr. Ali Zain	A	Dr. Sheena/Dr. Ali Zain		D	Dr. Uzma
Tuesday	D		C	Dr. Nayab		A	Dr. Sheena/ Dr..Nazia	B	Dr. Uzma/Dr. Nazia		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farhat	C	Dr. Fahd		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/ Dr. Afsheen	E	Dr. Farid/ Dr. Ali Zain		C	Dr. Nayab
Saturday	A		E	Dr. Romessa		C	Dr. Fahd	D	Dr. Maryam/ Dr. Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Ali Raza	Anatomy Lecture Hall No.4
B	91-180	Dr Zeneara Saqib	New Lecture Hall Complex No. 02
C	181-270	Dr. Kashif Ashraf	New Lecture Hall Complex No. 03
D	271- onwards	Dr. Sajjad	Anatomy Lecture Hall No.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Farhat Jabeen (PGT Physiology)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Prof. Dr. Ifra Saeed (Professor of Anatomy)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Afsheen Batool (PGT Physiology)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Muhammad Usman (PGT Physiology)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Prof. Dr. Ayesha Yousaf (Professor of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Nayab (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Time Table for Musculoskeletal-I Module Fourth Week
(09-05-2024 to 15-05-2024)

DATE/ DAY	8:00 AM – 09:00 AM	09:00 AM – 09: 50 AM	09:50 AM – 10:10 AM	10:10 AM – 11:00 AM		11:00 AM - 11:20 PM	11:20 PM -12:20PM	12:20 PM -02:00PM	Home Assignment
Thursday 09-05-2024	**DISSECTION**		Break	**BIOCHEMISTRY LGIS**		Break	Physical Activity	**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Wrist joint **(Online Clinical content Evaluation)**
	Dissection & Spotting Batches, Teachers & Venue Mentioned in Table No. 2			Classification & Structure of Amino Acids Isomerism	Vitamin C, Niacin & Thiamine				
				Dr. Rahat (Even)	Dr. Almas/ Dr Aneela (Odd)				
Friday 10-05-2024	Early Clinical Exposure (ECE)								
Saturday 11-05-2024	**MEDICINE**	**SGD/ DISSECTION**	Break	**ANATOMY LGIS**		Break	**COMMUNITY MEDICINE**	**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Niacin and Thiamin
	Osteomalacia, rickets Polyarthritis	Cross Sectional Anatomy Batches, Teachers & Venue Mentioned in Table No. 2		**Embryology**	**General Anatomy**		Accidents		
	Dr. Umer Daraz (Even) / Dr Iqra Ashraf (Odd)			Fetal membranes & multiple pregnancy	Joints II		Dr Abdul Quddos (Odd) / Dr. Maimoona (Even)		
				Prof. Dr. Ayesha (Even)	Ass. Prof. Dr. Arsalan (Odd)				
Monday 13-05-2024	**SGD / DISSECTION**		Break	**ANATOMY LGIS**		Break	**BIOCHEMISTRY (LGIS)**	**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Biochemistry Classification and structure of Amino acid
	Palm of Hand & Facial spaces Batches, Teachers & Venue Mentioned in Table No. 2			**General Anatomy**	**Embryology**		Vitamin C, Niacin & Thiamine / Classification & Structure of Amino Acids Isomerism		
				Joints II	Fetal membranes & Multiple Pregnancy		Dr. Almas/Dr Aneela (Even) / Dr. Rahat (Odd)		
				Ass. Prof. Dr. Arsalan (Even)	Prof. Dr. Ayesha (Odd)				
Tuesday 14-05-2024	**SGD/ DISSECTION**		Break	**SURGERY LGIS**		Break	**ANATOMY LGIS**	**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL Anatomy Neurovascular organization of Hand
	Neurovascular Organization of Hand Batches, Teachers & Venue Mentioned in Table No. 2			Tennis elbow, Fracture of Olecranon, radius, ulna			**Embryology** / **Embryology**		
				Dr. Junaid Khan	Dr. Rana Adnan		Teratogenesis / Teratogenesis		
							Ass. Prof. Dr. Arsalan (Even) / Prof. Dr. Saima (Odd)		
Wednesday 15-05-2024	**SGD / DISSECTION**		Break	**ARTIFICIAL INTELLIGENCE/RADIOLOGY(LGIS)**		Break	**DISSECTION**	**Practical & CBL** Venue & topic mentioned at the end Batches, Teachers & Venue Mentioned in Table No. 1	SDL physiology Drugs acting on NMJ
	Cutaneous Innervation & Dermatomes of upper limb, Force & weight transmission Batches, Teachers & Venue Mentioned in Table No. 2			Interpretation of upper limb Radiograph & use of AI			Dissection & Spotting		
				Dr. Sana Yaqoob	Dr. Riffat Raja				

Table No. 1 (Time: 12:20pm – 02:00pm)

Batch Distribution for Practical Skills (all subjects)
CBL / Small Group Discussion (Biochemistry and Physiology)

Sr. No	Batch	Roll No.
1.	A	01-70
2.	B	71-140
3.	C	141-210
4.	D	211-280
5.	E	281-onwards

Topics for Skill Lab with Venue

- Bone (Anatomy Histology Practical) Venue-Histology Laboratory-Dr Sajjad
- Calcium &Ascorbic Acid Estimation (Biochemistry Practical) Venue-Biochemistry Laboratory
- Determination of Differential leukocyte Count (DLC)(Physiology-Practical)

Topics for SGDs / CBL with Venue

- Physiology: NMJ, Transmission across NMJ, Diseases of NMJ (Physiology Lecture Hall 05)
- Biochemistry CBL: Rickets (Venue: Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

Day	Histology Practical		Biochemistry Practical			Physiology Practical		Physiology SGD			Biochemistry SGD	
	Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name	Batch	Teacher Name		Batch	Teacher Name
Monday	C	Supervised by HOD	B	Dr. Rahat	Supervised by HOD	E	Dr. Farid/Dr. Ali Zain	A	Dr. Sheena/Dr. Ali Zain	Supervised by HOD	D	Dr. Uzma
Tuesday	D		C	Dr. Nayab		A	Dr. Sheena/ Dr. Nazia	B	Dr. Uzma/ Dr. Nazia		E	Dr. Almas
Wednesday	E		D	Dr. Uzma		B	Dr. Uzma/ Dr. Farhat	C	Dr. Fahd		A	Dr. Romessa
Thursday	B		A	Dr. Almas		D	Dr. Maryam/Dr. Afsheen	E	Dr. Farid/Dr. Ali Zain		C	Dr. Nayab
Saturday	A		E	Dr. Romessa		C	Dr. Fahd	D	Dr. Maryam/ Dr .Afsheen		B	Dr. Rahat

Table No. 2 Batch Distribution and Venues for Anatomy Small Group Discussion SGDs / Dissections

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Ali Raza	Anatomy Lecture Hall No.4
B	91-180	Dr Zeneara Saqib	New Lecture Hall Complex No. 02
C	181-270	Dr. Kashif Ashraf	New Lecture Hall Complex No. 03
D	271- onwards	Dr. Sajjad	Anatomy Lecture Hall No.3

Supervised by Prof. Dr. Ayesha Yousaf

Table No. 3 Batch Distribution with Venues and Teachers Name for Problem Based Learning (PBL) Sessions

Sr No.	Batches	Roll No	Venue	Teachers	Sr No.	Batches	Roll No	Venue	Teachers
1.	A1	(01-35)	Lecture Hall no.05 Physiology	Dr. Farhat Jabeen (PGT Physiology)	6.	C2	(176-210)	Lecture Hall no.04 (Basement)	Dr. Nayab Zonish (PGT Physiology)
2.	A2	(36-70)	Lecture Hall #.04 (1st Floor Anatomy)	Prof. Dr. Ifra Saeed (Professor of Anatomy)	7.	D1	(210-245)	Lecture Hall no.02 (Basement)	Dr. Iqra Ayub (PGT Physiology)
3.	B1	(71-105)	Anatomy Museum (First Floor Anatomy)	Dr. Afsheen Batool (PGT Physiology)	8.	D2	(246-280)	Conference Room (Basement)	Dr. Muhammad Usman (PGT Physiology)
4.	B2	(106-140)	Lecture Hall no.03 (First Floor)	Prof. Dr. Ayesha Yousaf (Professor of Anatomy)	9.	E1	(281-315)	New Lecture Hall no.01	Dr. Ramsha (PGT Physiology)
5.	C1	(141-175)	Lecture Hall no.05 (Basement)	Dr. Nayab (PGT Physiology)	10	E2	(315 onwards)	Lecture Hall no.04	Dr. Jawad Hassan (Demonstrator Physiology)

No PBL Session during this week

Table No. 6 Venues for Large Group Interactive Session (LGIS)

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

Time Table for Musculoskeletal-I Module Fifth Week
(16-05-2024 to 25-05-2024)

Date & Day	
Thursday 16-05-2024	Assessment Week
Friday 17-05-2024	
Saturday 18-05-2024	
Monday 20-05-2024	
Tuesday 21-05-2024	
Wednesday 22-05-2024	
Thursday 23-05-2024	
Friday 24-05-2024	
Saturday 25-05-2024	

(Logistics Details of assessments will be notified separately)

SECTION VII

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

Domains: C-Core Subject (70%) Levels C1-C2, HV- Horizontal & Vertical Integration (20%) Levels C2-C3, S- Spiral Integration (10%) Levels C2-C3

End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment												
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks	Grand Total	Total Time of Module Assessment
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy	Total			
First Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessment of 30 MCQs (10 MCQs per Subject)																																	

End of Module Assessment	Subject	Theory (Cognitive) Assessment																			Practical (Skill & Attitude) Assessment												
		MCQs					EMQs			SAQs					SEQs				Marks	Total Marks Theory	Total Time	AV OSPE					Time	AED Reflective Writing	OSVE			Total Practical Marks	Grand Total	Total Time of Module Assessment
		C	HV	S	Total	Marks	C	Total	Marks	C	HV	S	Total	Marks	C	HV	S	Total				C	HV	S	Total	Marks			Viva	Copy	Total			
Second Module	Anatomy	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Physiology	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
	Biochemistry	19	4	2	25	25	1	1	5	3	1	1	5	25	3	1	1	5	45	100	2 HRS	7	2	1	10	50	50 min	15 min	45	5	50	100	200	6 HRS
Formative- Weekly LMS Based Assessmen tof 30 MCQs (10 MCQs per Subject)																																	

Block	Subjects	LMS Based Assessment					OSPE						Grand Total	Total Block Time
		MCQs					LabOSPE	IOSPE	COSPE	Total	Marks	Time		
		C	HV	S	Total	Time	C	HV	S					
BLOCK	Anatomy	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
	Physiology	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS
	Biochemistry	21	6	3	30	30 min	14	4	2	20	60	6 HRS	90	10 HRS

50% Questions/OSPE Stations/Viva Stations will be from Foundation Module and 50% Questions will be from MSK-1 Module

For Each assessment student will have to individually pass Theory and Practical components

Weekly LMS Assessment			
Subjects	Anatomy	Physiology	Biochemist
No of MCQs*	30	30	30
Marks/MCQ	30	30	30
*MCQ=1 Mark each, 1 min each			

Marks per Item

MCQ=1	EMQ= 5	SAQ= 5	SEQ= 9	AVOSPE= 5		OSPE= 3

OSPE Time=1 Round of 40 Students =80 min

3 Round of 40 Students =240 min

OSVE=Time per student=5mins

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 Neuro vasculature 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 Assisted Quiz Papers)

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

1. 30-year-old Female secretary presents with wrist pain and a sensation of numbness and burning in her palm and the first, second, and third fingers of her right hand. The pain worsens at night and is relieved by loose shaking of the hand. There is sensory loss in the same fingers. Exam reveals a positive Tinel's sign. What could be the likely diagnosis?

a. Carpel Tunnel syndrome
b. Cubital Tunnel Syndrome
c. Saturday night palsy
d. Pronator syndrome
e. Klumpke's paralysis

3. 50-year-old Male presents with right shoulder pain after falling onto his outstretched hand while skiing. He noticed deformity of his shoulder and had to hold his right arm. Which work up will be the most relevant in this scenario?

a. XR-Hand
b. XR-Shoulder
c. XR-Chest
d. XR-Arm
e. XR-Elbow

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

a. Axillary nerve
b. Radial nerve
c. Median nerve
d. Ulnar nerve
e. Musculocutaneous nerve

2. 55-year-old Male presents with pain in the elbow when he plays tennis. His grip is impaired as a result of the pain. There is tenderness over the lateral epicondyle as well as pain on resisted wrist dorsiflexion (Cozen's test) with the elbow in extension. What could be the likely diagnosis?

a. Medical epicondylitis
b. Lateral epicondylitis
c. Colle's fracture
d. Pott's fracture
e. Smith's fracture

4. 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

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. 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. Cl
    c. HCO
    d. K
    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

Sample Paper of EMQ

A 60-year-old man presents to the clinic with complaints of progressive weakness in his legs over the past six months. He reports difficulty climbing stairs and standing from a seated position. On examination, there is noticeable wasting (atrophy) of the muscles in his thighs and calves bilaterally. Neurological examination reveals normal reflexes and sensation. He denies any recent trauma or prolonged immobilization.

Match the following types and causes of muscle atrophy with their corresponding descriptions:

Types and Causes of Muscle Atrophy:

A. Disuse atrophy

B. Neurogenic atrophy

C. Cachexia

D. Sarcopenia

E. Endocrine-related atrophy

F. Denervation atrophy

G. Malnutrition-related atrophy

Descriptions:

Atrophy due to reduced physical activity or immobilization, leading to loss of muscle mass and strength.

Muscle wasting secondary to damage or disease affecting the nerves that supply the muscles.

Severe muscle wasting associated with chronic illness such as cancer, characterized by involuntary weight loss and systemic inflammation.

Age-related loss of muscle mass and strength, often seen in elderly individuals.

Muscle wasting due to hormonal imbalances or deficiencies affecting muscle protein synthesis.

Atrophy resulting from inadequate intake of essential nutrients, leading to muscle weakness and wasting.

Matching:

Type A:

Type B:

Type C:

Type D:

Type E:

Type F:

Type G:

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. Complete index (1)

b. Complete and signed diagrams (1)

c. 2 Identification 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

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)