

Study Guide 1st Year MBBS



**Vision:**

Our vision is to be a global leader in transformative medical education and healthcare delivery.

**Mission:**

To advance the art and science of medicine through innovative medical education, research, and compassionate healthcare delivery, within available resources, in an environment that advocates critical thinking, creativity, integrity, and professionalism

**We , The Faculty and staff of QAMC are determined:**

To impart core knowledge of basic sciences in interesting, compact and practical way to undergraduate students so that they can differentiate between normal and abnormal structure at gross, microscopic and embryological level. And co relate at the same time. For this we are horizontally integrating our basic subjects and from next year will be adding vertical integration to for this class .

## Objectives :

To impart: Knowledge - On the principles of pedagogy

Skills	Dissection & Prosection Surface Anatomy Models Histological techniques Research skills Communication skills Self directed learning Competency bases learning
Attitude-	Integrated Journal E-Learning Research Professionalism Empathy Inter Personal Skills Team building skills Extra-Curricular activities

## 1. List of Faculty of Anatomy

Dr. Sabahat Gul	Professor & Head of Department
Dr. M. Fahad Atta	Assistant Professor
Dr Zafar Mahmood	APMO
Dr Sajid Munir Qazi	APMO
Dr Irum Alamgir	APWMO
Dr. Sobia Fatima	APWMO
Dr Ali Imram	APMO
Dr Anjum Riaz	APWMO
Dr Lasania Mushtaq	Demonstrator
Dr Sadaf Mushtaq	Demonstrator
Dr Barkat Ali	Demonstrator
Dr Asiya	Demonstrator
Dr Sidra Arshad	Demonstrator
Dr. Anum Saeed	Demonstrator
Dr Hassan Jalil	Demonstrator
Dr Hafiza Urooj	Demonstrator
Dr Zainab Haq	Demonstrator

## 2. List of Faculty of Physiology

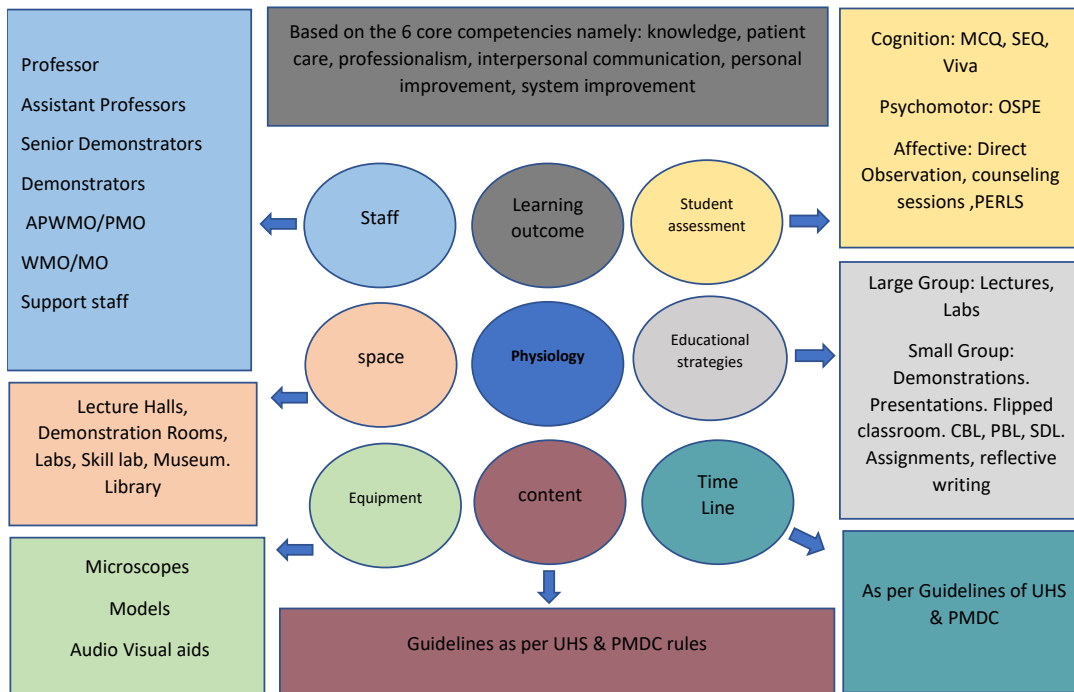
Dr. Sohail Atta ur Rasool	Professor & Head of Department
Dr Tasneem Kausar	APWMO
Dr Javaria Hamid	APWMO
Dr Humaira Sobia	APWMO
Dr. Shaheena Nawab	APWMO
Dr Ayesha Masood Khan	APWMO
Dr Anila Hamayon	Sr. Demonstrator
Dr M Masood Khan	Sr. Demonstrator
Dr Abdul Razaq	Sr Demonstrator
Dr Rukun-ud-din	Demonstrator
Dr Asima Shaeef	Demonstrator
Dr Anum Farheen	Demonstrator
Dr. Anum Baig	Demonstrator
Dr Shagufta Sikandar	Demonstrator

Dr Maham Zaidi	Demonstrator
Dr Hafiz Muhammad Usama	Demonstrator
Dr Asad Ali Bubak	Demonstrator

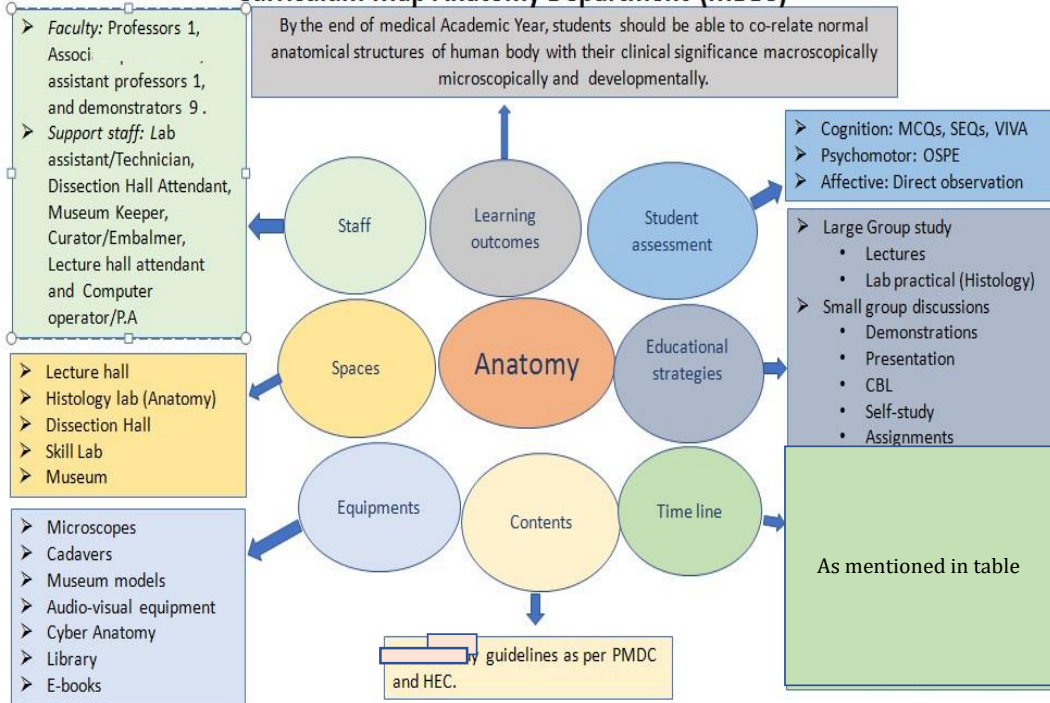
### 3. List of Faculty of Biochemistry

Dr. Naveed Najeeb	Associate Professor & Head of Department
Dr. Tayyaba Batool	Associate Professor
Dr Farhat Batool	APWMO
Dr Javeria Shahbaaz	APWMO
Dr Zafar Iqbal Malik	Sr. Demonstrator
Dr Humaira Ahmed	Sr. Demonstrator
Dr Taiba Tahseen	Sr Demonstrator
Dr Asmat Bashir	Sr. Demonstrator
Dr M Akram Bhutta	Sr Demonstrator
Dr Fatima Fareed	Demonstrator
Dr. Khuzama Khan	Demonstrator
Dr Shagufta Usman	Demonstrator
Dr Sana Fayyaz	Demonstrator
Dr Amara Shabbir	Demonstrator
Dr Tahira Naz	Demonstrator
Dr Madiha Gillani	Demonstrator

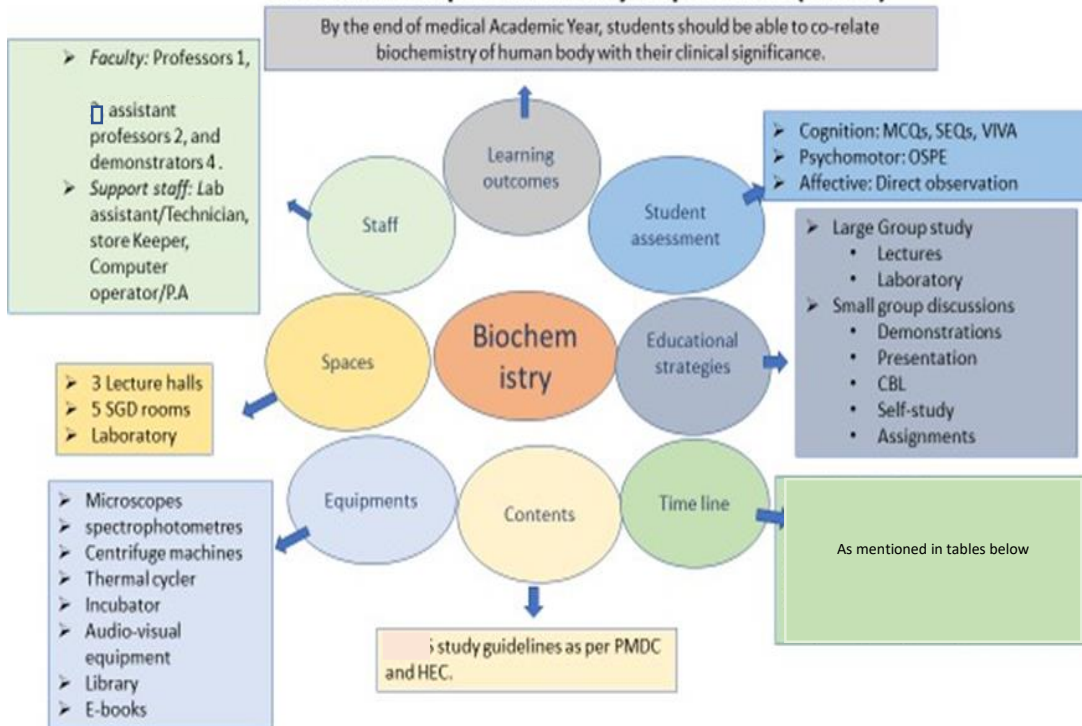
### Curriculum map of Physiology department

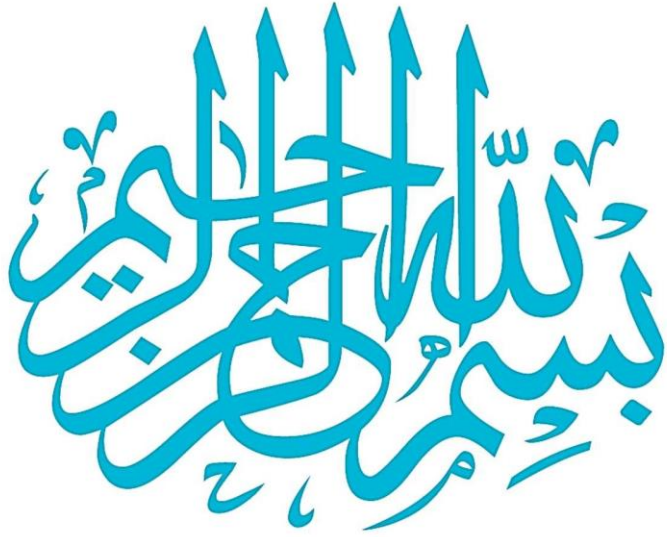


### Curriculum Map Anatomy Department (MBBS)

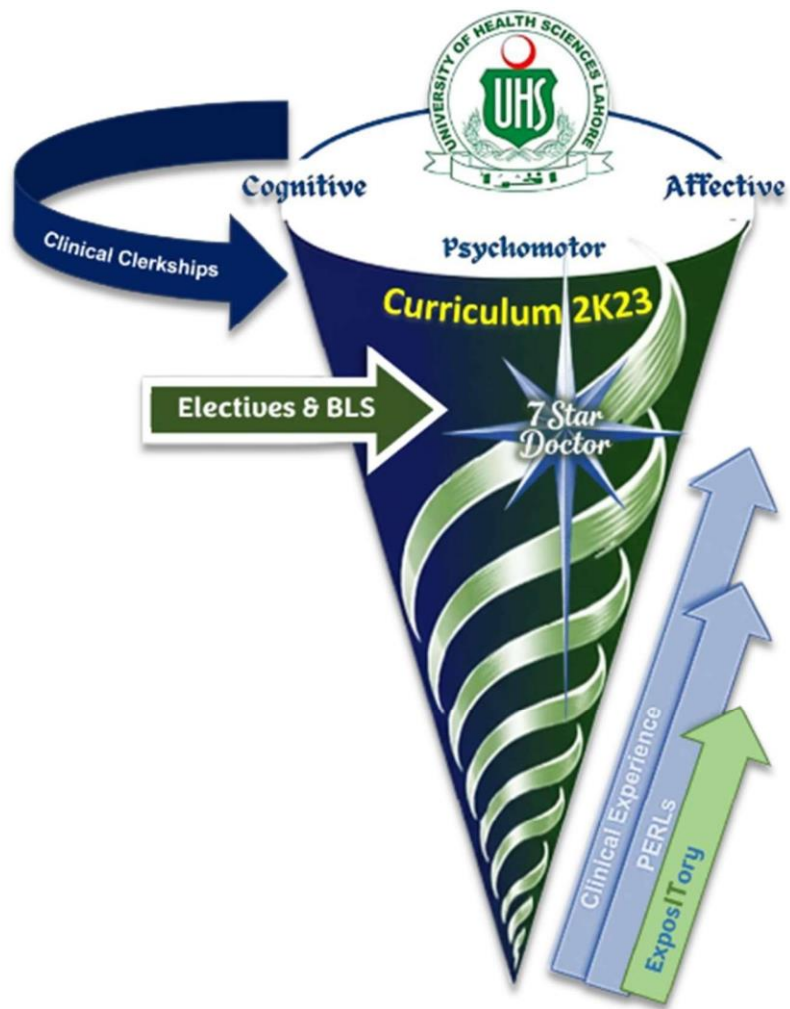


### Curriculum Map Biochemistry Department (MBBS)





Volume-01 / Year-01





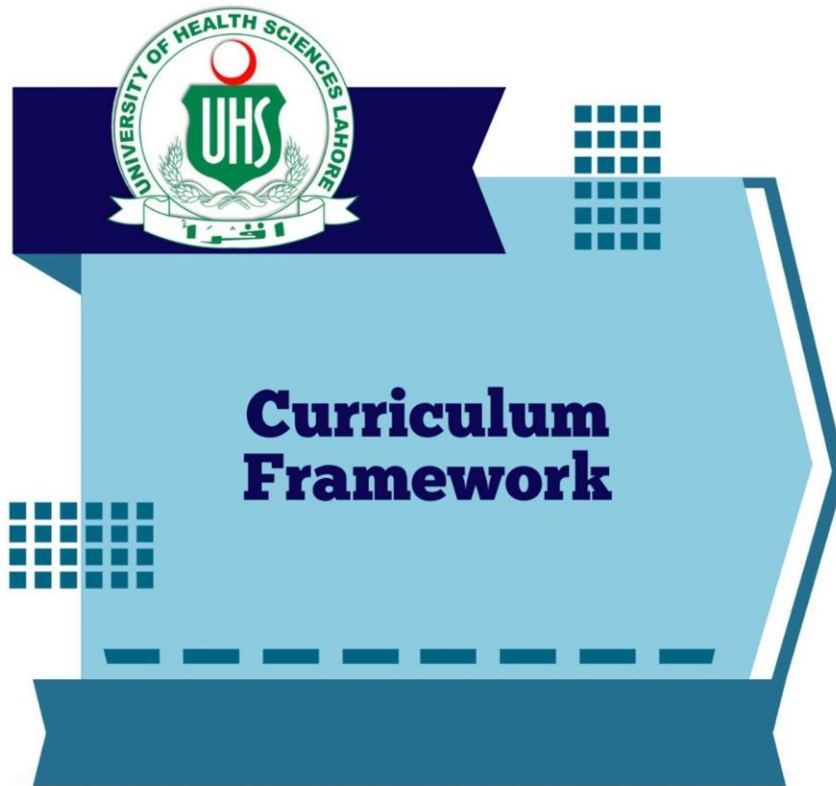
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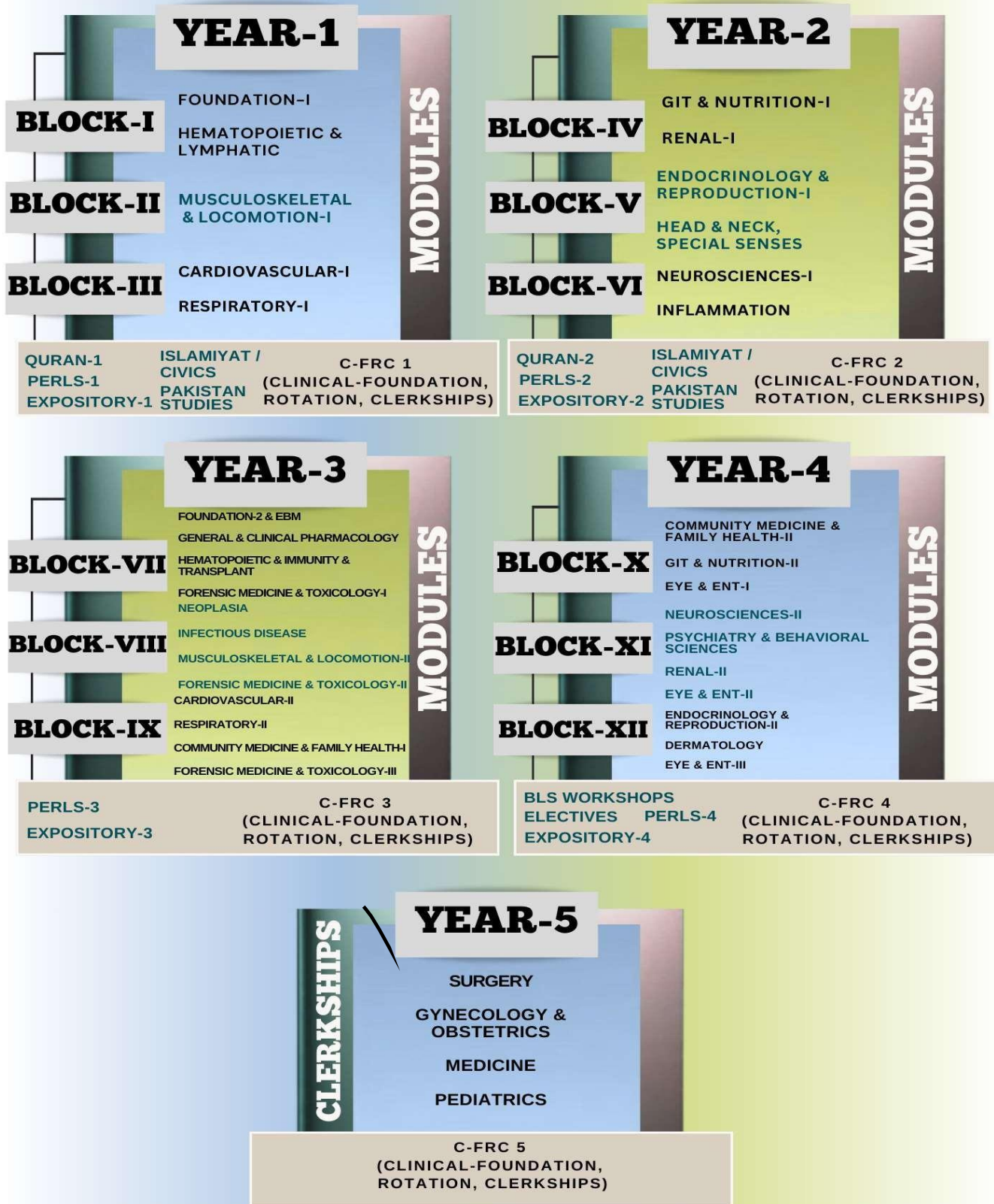
A graphic for 'Section 01'. It features a blue semi-circle with a dark grey border and a drop shadow, containing the number '01' in a white, outlined font. Below the semi-circle is a grey rectangular box with a drop shadow, containing the word 'Section' in a white, cursive font.

01

*Section*



# Modular Integrated Curriculum 2K23 Framework





## MODULE RATIONALE

Tomorrow's doctor is required to acquire competencies, which could align his knowledge base and skill set for his professional practices. The foundation of knowledge needs to commence from 'The Cell'. The cell is a structural and functional unit of life and has a role in normal homeostasis ensuring appropriate cellular functions. Hence, this module has been designed to introduce a blend of molecular, genetic, anatomical, physiological, and psychosocial information essential for developing a perspective on the function of the human body in health and disease. Besides, an initial orientation to pharmacology and pathology subject has been provided so that students are able to use this information in the coming modules.

## MODULE OUTCOMES

- Describe the microscopic features of nerve cells, muscle cells, general features of epithelia of the body.
- Appraise the functional characteristics of various components of cell membrane and organelles of cell.
- Differentiate between the dynamics of various transport mechanisms along the cell membrane.
- Compare the functional differences between RBCs, WBCs and blood groups.
- Explain the significance of homeostatic mechanisms in keeping body's internal environment nearly constant.
- Appraise the formation and functions of autonomic nervous system.
- Correlate the structural design of each organ to its function.
- Acquire information about the different fascial planes in the different regions of the body & their surgical importance.
- Use descriptive anatomical terms of position to describe the different body structures in relation to each other.
- Describe the movements of body using proper anatomical terms of movement.
- Describe and demonstrate the various bony landmarks.
- Describe the types of joints and correlate them to the mechanisms of movement.
- Classify the bone, joints and muscles based on the structure, function, phylogenetic origin.
- Describe the structures associated with muscles and explain their functional correlations.
- Classify and describe the cardiovascular system and correlate it functionally.
- Amplify the anatomical basis for radiological, cross-sectional, anatomy.
- Correlate clinicopathologically the apoptosis in health & diseases.

**THEMES**

- Cell structure
- Cell transport and signaling
- Cell chemistry
- Homeostasis and blood
- Autonomic nervous system
- Body movement
- Muscles
- Growth and development

**IMPLEMENTATION TORs**

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

Overview → Curriculum → Delivery → Competencies → Teaching → Assessment

## Curriculum Dashboard

The Curriculum Dashboard provides a concise overview of the Foundation-I block, highlighting its key educational components, integrated disciplines, teaching-learning strategies, assessment methods, and competency framework. It serves as a quick reference for faculty, students, curriculum planners, and PMDC accreditation reviewers.

Curriculum Indicator	Block 1 (Foundation-I)
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional MBBS
<b>Block</b>	Block 1 – Foundation-I
<b>Curriculum</b>	UHS Integrated Curriculum 2K23
<b>Educational Model</b>	Competency-Based, Integrated Curriculum
<b>Duration</b>	As per UHS Academic Calendar
<b>Major Themes</b>	Foundation Orientation, Cell Structure, Cell Transport & Cell Chemistry, Homeostasis & Blood, Body Movement, Growth & Development
<b>Disciplines Integrated</b>	Foundation Orientation, Anatomy, Histology, Embryology, Physiology, Biochemistry, PERLS, CFRC
<b>Teaching–Learning Methods</b>	Interactive Lectures, Practical Sessions, Demonstrations, Small Group Discussions, Case-Based Learning, Self-Directed Learning, PERLS, CFRC
<b>Assessment Methods</b>	Formative Assessment, MCQs, Practical Examination, OSPE, Viva Voce, Continuous Assessment
<b>Learning Domains Addressed</b>	Cognitive, Psychomotor, Affective
<b>PMDC Competencies Addressed</b>	Medical Expert, Communicator, Collaborator, Leader, Professional, Scholar, Health Advocate
<b>Horizontal Integration</b>	Integration across all contributing basic science disciplines and longitudinal themes
<b>Vertical Integration</b>	Early clinical correlation with Medicine, Surgery, Orthopaedics, Paediatrics, Obstetrics & Gynaecology, Radiology and Community Medicine
<b>Learning Resources</b>	Study Guide, Practical Manuals, LMS, Library Resources, Laboratory Facilities, Recommended Textbooks
<b>Quality Assurance</b>	Continuous curriculum review, student feedback, faculty feedback, Curriculum Committee oversight, DME monitoring

## Theme-wise Curriculum Mapping Matrix

The Theme-wise Curriculum Mapping Matrix demonstrates the integration of disciplines within the Foundation-I block. It aligns each theme with the module learning outcomes, contributing disciplines, teaching and learning strategies, assessment methods, PMDC graduate competencies, and horizontal and vertical integration, thereby ensuring constructive alignment throughout the curriculum.

Week	Major Theme	Integrated Disciplines	Teaching & Learning Methods	Assessment
Week 1	Foundation Orientation	Foundation Orientation, PERLS, CFRC	Interactive lectures, orientation sessions, small-group discussions, self-directed learning	Formative quiz, reflective writing, participation
Week 2	Cell Structure	Anatomy, Histology, Physiology, Biochemistry, Embryology	Interactive lectures, practical sessions, demonstrations, SDL	MCQs, practical assessment
Week 3	Cell Transport & Cell Chemistry	Physiology, Biochemistry	Interactive lectures, tutorials, case-based learning, SDL	MCQs, SEQs
Week 4	Homeostasis & Blood	Anatomy, Histology, Physiology, Biochemistry	Interactive lectures, laboratory practicals, demonstrations	MCQs, practical assessment, OSPE
Week 5	Body Movement	Anatomy, Histology, Physiology	Interactive lectures, demonstrations, dissection, practical sessions	Practical examination, OSPE, viva
Week 6	Growth & Development	Embryology, Physiology, Biochemistry	Interactive lectures, SDL, case-based learning	MCQs
Week 7	Integration and Clinical Correlation	All Basic Science Disciplines, PERLS, CFRC	Integrated sessions, case discussions, SDL	Formative assessment, feedback
Week 8	Revision and Block Assessment	All Disciplines	Revision sessions, tutorials, practical revision	Block examination (Theory & Practical)

## Weekly Curriculum Map

The Weekly Curriculum Map provides an overview of the sequence of learning activities throughout the Foundation-I block. It demonstrates the progressive integration of disciplines, themes, teaching-learning strategies, and assessment methods to ensure the achievement of the intended learning outcomes.

### Week Major Theme Integrated Disciplines Teaching & Learning Methods Assessment

Week	Major Theme	Integrated Disciplines	Teaching & Learning Methods	Assessment
<b>Week 1</b>	Foundation Orientation	Foundation Orientation, PERLS, CFRC	Interactive lectures, orientation sessions, small-group discussions, self-directed learning	Formative quiz, reflective writing, participation
<b>Week 2</b>	Cell Structure	Anatomy, Histology, Physiology, Biochemistry, Embryology	Interactive lectures, practical sessions, demonstrations, SDL	MCQs, practical assessment
<b>Week 3</b>	Cell Transport & Cell Chemistry	Physiology, Biochemistry	Interactive lectures, tutorials, case-based learning, SDL	MCQs
<b>Week 4</b>	Homeostasis & Blood	Anatomy, Histology, Physiology, Biochemistry	Interactive lectures, laboratory practicals, demonstrations	MCQs, practical assessment, OSPE
<b>Week 5</b>	Body Movement	Anatomy, Histology, Physiology	Interactive lectures, demonstrations, dissection, practical sessions	Practical examination, OSPE, viva
<b>Week 6</b>	Growth & Development	Embryology, Physiology, Biochemistry	Interactive lectures, SDL, case-based learning	MCQs, s
<b>Week 7</b>	Integration and Clinical Correlation	All Basic Science Disciplines, PERLS, CFRC	Integrated sessions, case discussions, SDL	Formative assessment, feedback
<b>Week 8</b>	Revision and Block Assessment	All Disciplines	Revision sessions, tutorials, practical revision	Block examination (Theory & Practical)

## PMDC Competency Mapping

The PMDC Competency Mapping Matrix demonstrates how the Foundation-I block contributes to the development of the competencies outlined in the Pakistan Medical and Dental Council (PMDC) Undergraduate Medical Education Standards. The integrated curriculum ensures that each theme contributes to one or more graduate competencies through appropriate teaching-learning activities and assessment strategies

Theme	Medical Expert	Communicator	Collaborator	Leader	Professional	Scholar	Health Advocate
Foundation Orientation		✓	✓	✓	✓	✓	✓
Cell Structure	✓					✓	
Cell Transport & Cell Chemistry	✓					✓	
Homeostasis & Blood	✓					✓	
Body Movement	✓					✓	
Growth & Development	✓				✓	✓	

### Summary

The Foundation-I block primarily develops the Medical Expert competency by establishing a strong foundation in the basic medical sciences. The longitudinal components of Foundation Orientation, PERLS, and CFRC foster the development of professionalism, communication, collaboration, leadership, scholarship, and health advocacy, ensuring a balanced approach to competency-based medical education.

# Teaching–Learning Matrix

The Teaching–Learning Matrix illustrates the instructional strategies employed throughout the Foundation-I block to facilitate the achievement of the intended learning outcomes. A variety of learner-centred methods are utilized to promote knowledge acquisition, practical skills, critical thinking, communication, professionalism, and self-directed learning in accordance with the principles of competency-based medical education.

Theme	Interactive Lectures	Practical / Laboratory	Demonstration / Dissection	Small Group Discussion (SGD)	Case-Based Learning (CBL)	Self-Directed Learning (SDL)	PERLS / CFRC
Foundation Orientation	✓			✓		✓	✓
Cell Structure	✓	✓	✓	✓		✓	
Cell Transport & Cell Chemistry	✓			✓	✓	✓	
Homeostasis & Blood	✓	✓	✓	✓	✓	✓	✓
Body Movement	✓	✓	✓	✓		✓	
Growth & Development	✓			✓	✓	✓	✓

## Summary

The Foundation-I block employs a diverse range of student-centred teaching and learning strategies to support the achievement of module learning outcomes. Interactive lectures provide core concepts, while practical sessions and demonstrations reinforce psychomotor skills. Small-group discussions and case-based learning encourage critical thinking and collaborative learning. Self-directed learning promotes lifelong learning habits, whereas PERLS and CFRC sessions facilitate the development of professionalism, communication skills, ethical practice, and early clinical reasoning.





The image features a stack of several books, with the top one slightly open, resting on a dark surface. A blue oval with a white border is superimposed over the books, containing the word "Theory" in a bold, dark blue font. The background is a blurred library or study area with bookshelves filled with books.

# **Theory**



## THEORY

### DAY-01

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 01+02+04	
		DISCIPLINE	TOPIC
F-Or-001	<p>Analyze the societal expectations, impact and role of physicians.</p> <p>Meet with doctors in various leadership roles to gain insights into the multifaceted responsibilities in the medical field.</p> <p>Define and explain the concept of a "Seven-Star Doctor."</p>	Foundation orientation	Understanding the Medical Profession and the Physician's Role
F-Or-002	<p>Comprehend the values and mission of the institution.</p> <p>Familiarize themselves with the college campus, its facilities (educational psychologist, career counseling, and research department etc.), faculty, and administrative framework.</p> <p>Comprehend the medical facilities available to the student.</p>	Foundation orientation	Exploring the Academic Environment

F-Or-003	<p>Examine and differentiate various teaching methodologies, assessing their applicability and effectiveness.</p> <p>Develop and maintain professional portfolios and logbooks to reflect on their educational progression.</p> <p>Understand the assessment strategies of the program, considering their types and influence on learning.</p> <p>Practice the PBL (Problem Based Learning) mock to understand its process, including problem identification, teamwork, research, and presentation skills.</p>	Foundation orientation	Acquainting with the MBBS Program
<b>DAY-02</b>			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02+05	
		DISCIPLINE	TOPIC
F-Or-004	<p>Describe and understand the structure of Pakistan's Healthcare System (primary, secondary, and tertiary), recognizing the roles of different sectors and key health policies.</p> <p>Identify and comprehend cultural and ethical aspects unique to the Pakistani Healthcare context.</p> <p>Describe the principles of family practice within the Healthcare System.</p>	Foundation orientation	Delving into the Healthcare System and Delivery

F-Or-005	<p>Use the IT and library facilities such as eBooks', Year planners, access to scientific journals etc.</p> <p>Effectively use the university's learning management system and other online educational tools.</p> <p>Demonstrate proficiency in essential academic software tools such as Microsoft office such as (word, spreadsheets, and presentation software.</p> <p>Recognize and adhere to ethical practices in the use of digital resources, focusing on digital literacy and academic integrity.</p>	Foundation orientation	Integrating Information Technology in Learning
<b>DAY-03</b>			
<b>CODE</b>	<b>SPECIFIC LEARNING OUTCOMES</b>	<b>TOTAL HOURS = 05+04</b>	
		<b>DISCIPLINE</b>	<b>TOPIC</b>
F-Or-006	<p>Articulate the structure and requirements of their MBBS program, including core and elective subjects.</p> <p>Understand the significance of interdisciplinary studies and the interconnection of various courses.</p> <p>Identify opportunities for experiential learning, research, and career advancement within the curriculum.</p>	Foundation orientation	Understanding the Curriculum Structure

F-Or-007	<p>Apply various metacognition strategies for learning.</p> <p>Apply digital tools effectively to organize and synthesize information for their academic projects.</p> <p>Create a personal action plan integrating stress management techniques and personal development strategies to enhance their academic and personal life.</p>	Foundation orientation	Self-Directed Learning
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## NORMAL STRUCTURE

### GROSS ANATOMY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 15	
		DISCIPLINE	TOPIC
F-A-001	<p>Briefly describe the applied branches of anatomy</p> <p>Describe the "Anatomical Position"</p> <p>Describe the anatomical planes of body.</p> <p>Describe the terms of relationship, commonly used in Anatomy.</p> <p>Describe the anatomical terms used specifically for Limbs.</p> <p>Describe the terms related to movements.</p>	General Anatomy	Introduction to General Anatomy

F-A-002	<p>Describe, identify, and exemplify the general morphological features of bones. Describe the developmental classification of bones.</p> <p>Describe the regional classification of bones.</p> <p>Describe the morphological classification of bones.</p> <p>Describe and exemplify Sesamoid, Pneumatic, Wormian and Heterotopic bones.</p> <p>Describe the general features of adult typical long bone.</p> <p>Describe the types of epiphyses</p> <p>Discuss the general concept of ossification (primary and secondary centers and rule of ossification) Describe the relationship of growing end of bones with the direction of nutrient foramen</p> <p>Describe the blood supply of various types of bones</p> <p>Describe the salient features of common types of fractures and basic concept of healing of fracture.</p>	General Anatomy	Bones (Osteology)
F-A-003	<p>Describe the general features of cartilage and its importance in gross anatomy.</p> <p>Describe the subtypes and gross features of Hyaline, elastic and fibro Cartilage. Differentiate the three types of cartilages</p>	General Anatomy	Cartilage (Chondrology)
F-A-004	<p>Describe and exemplify the structural classification of Joints (synovial, cartilaginous &amp; fibrous) along with their sub-classification.</p> <p>Describe the components and characteristic features of a Synovial Joints. Describe the blood supply, innervation of Synovial Joints, cartilaginous joints, and fibrous joints. List the factors stabilizing a synovial joint.</p> <p>Define common joint injuries and diseases</p>	General Anatomy	Joints (Arthrology)

F-A-005	<p>Describe the structure and function of Skin on the basis of its two layers; Epidermis and Dermis</p> <p>Describe the structure of Hair as an appendage of skin.</p> <p>Describe the structure of Nail as an appendage of skin.</p> <p>Describe the structure of Sweat and Sebaceous Glands</p> <p>Describe the structure and function of Superficial Fascia</p> <p>Describe the structure, function, and modifications of Deep Fascia</p> <p>Describe important clinical correlates of skin (skin infections, sebaceous cyst, skin burns and skin grafting)</p>	General Anatomy	Integumentary System
F-A-006	<p>Classify and describe Muscle Tissue based on Structure, Function and Development</p> <p>Describe Somatic and Visceral Muscles</p> <p>Describe and differentiate the Red and White Variety of Skeletal Muscles</p>	General Anatomy	Muscle Tissue (Myology)
	<p>Classify and describe the skeletal muscles based on architecture.</p> <p>Classify skeletal muscle based on action.</p> <p>Describe the parts of a skeletal muscle.</p> <p>Describe and differentiate the basic organization of innervation to skeletal, smooth, and cardiac muscle.</p> <p>Describe the structure of Synovial Bursae</p> <p>Comprehend the meaning of Hypertrophy, Hemiplegia, quadriplegia, paraplegia, hemiparesis</p>	General Anatomy	

F-A-007	<p>Classify the types of blood circulation. Classify and exemplify various types of blood vessels.</p> <p>Describe and exemplify various types of anastomoses.</p> <p>Explain the importance of End Arteries</p> <p>Describe the general organization of Lymphatic Circulation</p> <p>Define the terms: Lymphoid Tissue, Tissue Fluid, Lymphatic, Capillaries, Lymph and Lymphatic Vessels</p> <p>Define the terms; Lymphangitis, Lymphadenitis.</p>	General Anatomy	Vascular System (Angiology)
F-A-008	<p>Define neuron.</p> <p>Describe the anatomical structure of a neuron.</p> <p>Classify neurons based on morphology with examples.</p> <p>Classify neurons based on function. Describe the components of the central nervous system.</p> <p>Describe the components of the peripheral nervous system.</p> <p>Name the supporting cells (neuroglia) of the central nervous system.</p> <p>Describe the structure and functions of the neuroglia of the central nervous system.</p> <p>Enumerate the supporting cells (neuroglia) of the peripheral nervous system.</p> <p>Describe the structure and functions of the neuroglia</p>	General Anatomy	Nervous Tissue (Neurology)

	<p>of the peripheral nervous system.</p> <p>Enlist the cranial nerves I to XII</p> <p>Describe the types of nerve fibers carried by and distribution of the cranial nerves.</p> <p>Describe the formation, types of modalities carried by, and distribution of the spinal nerves.</p> <p>Explain Dermatome (s)</p> <p>Explain Myotome (s)</p> <p>Describe the formation of Plexuses. Differentiate between Somatic and Visceral nervous system.</p> <p>Define Receptors</p> <p>Describe the functions of receptors.</p>	General Anatomy	
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	<p>Classify sensory receptors based on modality (with location)</p> <p>Define Effectors</p> <p>Describe the functions of effectors.</p> <p>Describe ANS (Autonomic Nervous System) and differentiate between sympathetic and parasympathetic nervous system</p>		
F-A-009	<p>Identify displacement of fracture segments of the bone</p> <p>Identify dislocation of joints</p>	Integrate with Radiology	Imaging in Anatomy
CODE	<b>EMBRYOLOGY &amp; POST-NATAL DEVELOPMENT</b>	<b>TOTAL HOURS = 25</b>	
	<b>SPECIFIC LEARNING OUTCOMES</b>	<b>DISCIPLINE</b>	<b>TOPIC</b>

F-A-010	<p>Define Chromosome Theory of inheritance</p> <p>Enlist different stages of Mitosis and Meiosis</p> <p>Compare and contrast Mitosis and Meiosis</p> <p>Enlist the numerical chromosomal anomalies Describe the anatomical basis for numerical chromosomal abnormalities. Describe the clinical presentation of numerical chromosomal abnormalities &amp; justify them embryologically</p> <p>Describe the clinical presentation of structural chromosomal abnormalities and justify them embryologically.</p> <p>Describe the embryological basis for mosaicism</p> <p>Describe the embryological basis for teratoma</p> <p>Describe Concept of Gene Mutation. Enlist common diagnostic techniques for identifying genetic abnormalities.</p>	Embryology	Cell division and Chromosomal abnormalities
F-A-011	<p>Describe the Process of spermatogenesis and spermiogenesis</p> <p>Describe the embryological basis for Abnormal gametes</p>	Embryology	Gametogenesis Spermatogenesis
F-A-012	Describe the Prenatal and postnatal maturation of oocyte	Integrate with Gynecology	Gametogenesis Oogenesis
F-A-013	Describe the significance of arrested development of oocyte	Embryology	Gametogenesis Oogenesis
F-A-014	Compare and contrast oogenesis and spermatogenesis		Gametogenesis

F-A-015	<p>Describe the hormonal control of female reproductive cycles</p> <p>Enumerate and describe the steps of the ovarian cycle</p> <p>Describe the process of ovulation</p> <p>Describe the formation, function and fate of corpus luteum</p> <p>Define Mittelschmerz pain</p> <p>Define menstrual cycle</p> <p>Describe the phases of menstrual cycle</p>	Integrate with Gynecology	Female Reproductive Cycle
F-A-016	Describe the transportation of Oocyte	Embryology	Transportation of gametes
F-A-017	<p>Describe Capacitation &amp; Acrosomal Reaction</p> <p>Define fertilization</p> <p>Describe the phases of fertilization Draw and label a diagram illustrating the phases of fertilization</p> <p>Enumerate and describe the results of fertilization</p>		Fertilization
F-A-018	<p>Define contraception</p> <p>Explain the mechanisms of following contraceptive techniques:</p> <ol style="list-style-type: none"> <li>1. Barrier methods</li> <li>2. Hormonal methods</li> <li>3. Intrauterine device (IUD)</li> <li>4. Emergency contraceptive pills (ECPs)</li> </ol> <ol style="list-style-type: none"> <li>1. Male and female sterilization</li> </ol>	Integrate with physiology	Contraception
F-A-019	<p>Describe the anatomical and physiological basis of male and female infertility</p> <p>Define assisted reproductive techniques Describe the mechanisms of In vitro fertilization (IVF) &amp; embryo transfer</p> <p>Explain the correlation of multiple births with assisted reproductive techniques</p>	Integrate with Gynecology	Infertility & assisted reproductive techniques

F-A-020	Describe the process of cleavage of embryo and blastocyst formation  Describe the origin and uses of embryonic stem cells and the techniques of obtaining these cells from the embryo (reproductive cloning & therapeutic cloning) Explain the embryological basis of spontaneous abortion.	Embryology	Cleavage, blastocyst formation
	Compare and contrast the villi.	Integrate with Gynaecology	
	Describe the process of Compaction.  Describe the Formation of morula (division into inner and outer cell mass)	Embryology	
F-A-021	Describe the Uterus at the time of implantation (decidua reaction)  Illustrate the concept of Implantation.  Describe the Abnormal implantation/ extra uterine implantations.  Define the Molar pregnancy.  Describe the formation of amniotic cavity, embryonic disc, and umbilical vesicle Describe the formation of chorionic sac.	Embryology	Implantation Week 2 of Development
	F-A-022		Describe the Establishment of uteroplacental circulation.
F-A-023	Describe the Formation & fate of primitive streak.  Draw a concept map highlighting the sequence of events responsible for transformation of bilaminar germ disc into trilaminar germ disc.  Describe the embryology behind sacrococcygeal teratoma and justify its clinical picture.	Embryology Integrate with Gynaecology	Gastrulation

F-A-024	<p>Describe the Invagination and movement of prenotochordal cells</p> <p>Describe the Notochordal plate formation Describe the Neuroenteric canal formation</p> <p>Describe the fate of the notochord</p> <p>Describe the Establishment of body axis</p>	Embryology	Formation of notochord
	<p>Draw and label the fate map establishment Describe the Fate map establishment.</p> <p>Describe the role of notochord as an inducer</p> <p>Describe the embryological basis for situs inversus, Sirenomelia, holoprosencephaly</p> <p>Describe the development of trophoblast and chorionic villi during 3rd week of development</p>		
F-A-025	<p>Describe the Formation of neural tube from neural plate.</p> <p>Justify embryologically the clinical picture seen in various neural tube defects</p> <p>Describe the process of Migration of neural crest cells</p> <p>Enlist the Derivatives of neural tube and describe the fate of each</p> <p>Enlist the Derivatives of neural crest cells</p> <p>Enlist the ectodermal derivatives</p> <p>Describe important Neural tube defects</p>	Embryology	Derivatives of ectoderm
F-A-026	<p>Describe the Differentiation of mesoderm into its constituting components</p> <p>Describe the Somite formation and its fate Describe the Estimation of age by somites Describe the formation of intra-embryonic coelom</p>	Integrate with pediatrics	Mesodermal derivatives

F-A-027	Describe the processes of vasculogenesis & angiogenesis Explain the features of primordial cardiovascular system Describe the anatomical justification for Capillary hemangiomas	Integrate with Cardiology	Early development of CVS
F-A-028	Describe the Cephalo-caudal folding Describe the Lateral folding	Integrate with Gynaecology	Folding of embryo
F-A-029	Enlist the derivatives of germ layers Enlist and Describe the Derivatives of intermediate and lateral plate mesoderm Enlist & Describe the Derivatives of endoderm	Embryology	Germ layer derivatives

	Enlist & describe the derivatives of ectoderm	Integrate with Gynaecology/ Pediatrics	
F-A-030	Enlist the characteristic features of the embryo during 2nd month Describe the criteria for estimating the developmental staging in human embryos Explain the estimation of gestational & embryonic age		Folding of Embryo Embryonic period
F-A-031	Explain the measurement and characteristics of fetus/Key events during Embryonic Period. Describe the Overview of External appearance of fetus during fetal period. Enlist developmental horizons during fetal life event. Describe Viability of fetuses and low birth weight babies Explain the factors influencing fetal growth Describe the clinical problems encountered by babies born with IUGR (Intra Uterine Growth Restriction)	Embryology	Fetal Period

F-A-032	<p>Tabulate the criteria for estimating fertilization age during the fetal period</p> <p>Describe the procedures for assessing fetal status Describe the clinical picture of IUGR &amp; factors resulting in IUGR (Intra Uterine Growth Restriction)</p> <p>Define Pre-eclampsia</p>	Integrate with Gynaecology	Fetal Status
F-A-033	<p>List the fetal membranes</p> <p>Describe the macroscopic &amp; microscopic features of Decidua</p> <p>Enlist the various parts of decidua Functionally correlate the parts of the decidua with its structure Describe the Changes in the trophoblast leading to the development of placenta Describe the Structure (macroscopic &amp; microscopic) of placenta</p> <p>Enlist &amp; correlate the Functions of placenta with its structure</p>	Integrate with Gynaecology	Placenta
	<p>Describe the Microscopic anatomy of Placental membrane</p> <p>Describe the Placental circulation (fetal &amp; maternal)</p> <p>Embryologically justify the hemolytic disease of the neonate (Erythroblastosis fetalis)</p> <p>Describe the functions of placenta</p>		

F-A-034	<p>Describe the Formation &amp; fate of Umbilical cord</p> <p>Describe the Cord abnormalities</p> <p>Justify embryologically the clinical features observed in Absence of umbilical artery</p> <p>Describe the formation and circulation of Amniotic fluid</p> <p>Describe the Procedure of diagnostic amniocentesis</p> <p>Explain the significance of amniotic fluid</p> <p>Describe the factors responsible for Polyhydramnios and oligohydramnios</p> <p>Describe the consequences of oligohydramnios and polyhydramnios Define Amniotic Bands</p> <p>Explain the formation and fate of umbilical vesicle (yolk sac) Define Physiological Umbilical Hernia</p>	Integrate with Gynecology	Fetal membranes
F-A-035	<p>Describe the development of Dizygotic twins</p> <p>Describe the development of Monozygotic twins</p> <p>Describe the fetal membranes in twin pregnancy</p> <p>Describe Fetus Papyraceous</p> <p>Explain the zygoty of the twins</p> <p>Describe the characteristics of various types of conjoined monozygotic twins</p>		Multiple pregnancies
F-A-036	<p>Define preterm Birth</p> <p>Describe parturition &amp; three stages of Labor.</p> <p>Describe the Various methods of prenatal diagnosis</p> <p>Describe the Fetal therapy</p> <p>Describe Maternal serum Screening</p> <p>Corelate levels of Alpha fetoprotein levels and fetal anomalies</p> <p>Describe stem cell transplantation and gene therapy</p>	Embryology	Prenatal diagnosis and fetal therapy

F-A-037	<p>Define teratology and causes of birth defects</p> <p>Define genomic imprinting</p> <p>Define human disorders associated with genetic mutations</p> <p>Describe birth defects caused by genetic factors: numerical and structural anomalies</p> <p>Define and enlist the teratogens</p> <p>Describe the role of following in causing teratogenicity in humans:</p> <ol style="list-style-type: none"> <li>1. Drugs</li> <li>2. Environmental agents</li> <li>3. Chemicals &amp; heavy metals</li> <li>4. Infectious agents</li> <li>5. Radiation</li> <li>6. Hormones</li> <li>7. Maternal diseases</li> </ol> <p>Describe the basis for male-mediated teratogens</p> <p>Describe prevention of birth defects</p>		Teratogenicity
CODE	<b>MICROSCOPIC ANATOMY (HISTOLOGY AND PATHOLOGY)</b>	<b>TOTAL HOURS = 08</b>	
	<b>SPECIFIC LEARNING OBJECTIVES</b>	<b>DISCIPLINE</b>	<b>TOPIC</b>
F-A-038	<p>Describe different types of microscopies Describe Staining methods and their significance</p>	Basic technique in Histology	Introduction to microscopy & Basic staining technique
F-A-039	<p>Describe the electron microscopic structure and fluid mosaic model of plasma membrane</p> <p>Draw the fluid mosaic model of plasma membrane</p> <p>Describe the structure of glycocalyx coat and lipid raft and correlate it with function</p> <p>Describe different types of membrane proteins and their functions</p>	Basic Histology	Cell membrane
	<p>Explain different modes of transport across the cell membrane</p>	Integrate with Pathology	

F-A-040	<p>List the membranous and non-membranous cellular organelles</p> <p>Describe the structure of the following cellular organelles and correlate with their function:</p> <ol style="list-style-type: none"> <li>1. Ribosomes</li> <li>2. Endoplasmic reticulum (rough &amp; smooth)</li> <li>3. Golgi apparatus</li> <li>4. Lysosomes</li> <li>5. Proteasomes</li> <li>6. Mitochondria</li> <li>1. Peroxisomes</li> </ol>		Cell organelles
	<p>Describe the structural components of cytoskeleton, and correlate them with their functions</p> <p>Explain the histological basis of immotile cilia syndrome</p>		
	<p>Describe the histological features of cytoplasmic inclusions</p>	Integrate with Pathology	
	<p>Describe the structure of nuclear envelope and nuclear pores</p>	Integrate with Physiology	
F-A-041	<p>Describe the structure of chromatin</p> <p>Describe the structure of chromosome</p> <p>Describe the structure of nucleolus</p> <p>Describe the structure and types of DNA (Deoxy Ribonucleic Acid) and RNA (Ribonucleic Acid)</p> <p>Describe the histological basis for apoptosis and necrosis</p>	Histology	Cell nucleus
	<p>Describe structure of different types of cell junctions</p>		
	<p>Describe the cell cycle &amp; cell division</p> <p>Define important clinicopathological terms: Atresia, Hypertrophy, Atrophy, Hyperplasia, Metaplasia, Anaplasia, Neoplasia, Inflammation, Metastasis</p>	Integrate with Pathology	

F-A-042	Describe the histological structure and function of basement membrane (light and electron)	Histology	Epithelium
	<p>Draw and label a diagram illustrating the electron microscopic structure of basement membrane</p> <p>Describe the basal surface modifications of epithelia</p> <p>Describe the electron microscopic structure and functions of intercellular junctions (lateral surface modifications) and give their locations</p>		
	Describe the Biochemical composition of the basolateral modifications		
	<p>Describe the electron microscopic structure &amp; functions of the following apical cell surface specializations:</p> <ol style="list-style-type: none"> <li>1. Microvilli</li> <li>2. Stereocilia</li> <li>1. Cilia</li> </ol>	Integrate with Biochemistry	
	Classify and exemplify the epithelia with their histological structure, locations and functions	Integrate with Pathology	
	<p>Describe the structure of exocrine glands Explain the mechanism of transport across the epithelia</p> <p>Describe the classification of exocrine glands on the basis of:</p> <ol style="list-style-type: none"> <li>1. Shape of secretory portions and ducts</li> <li>2. Mode of secretion</li> <li>1. Type of secretion</li> </ol>	Histology	

F-A-043	<p>Describe the composition and list the constituents of connective tissue. Classify the connective tissue with examples.</p> <p>Describe the composition of ground substance of connective tissue.</p> <p>Describe the composition, distribution, and function of glycosaminoglycans in connective tissue.</p> <p>Describe connective tissue fibers, cells. Define Fibrosis.</p>	Histology	Connective tissue
	Describe the structure, distribution, and functions of the cells of macrophage mononuclear phagocytic system.	Integrate with Biochemistry/ Physiology	
	<p>Describe the role of macrophages in innate immunity &amp; formation of foreign body Giant cell.</p> <p>Describe the structure &amp; functions of Mast cells. Role of Mast cells in immediate hypersensitivity reactions.</p> <p>Describe structure of Plasma cells and their role in antibody formation.</p>		
	Describe the types of adipose tissue (white & brown), their histogenesis, locations and function.	Histology	
	Describe lipid storage and mobilization in and from adipocytes and compare the brown and white adipose tissue.	Integrate with Pathology	

NORMAL FUNCTION			
MEDICAL PHYSIOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 40	
		DISCIPLINE	TOPIC
F-P-001	Define Homeostasis Explain control system of body by giving examples Differentiate between Extracellular and Intracellular Fluids Explain the positive and negative feedback mechanisms with examples Explain the significance of feed forward/ adaptive control/delayed negative feedback mechanisms	Medical Physiology	Cell Biology
	Define normal body temperature, mechanism of heat production and heat loss. Describe regulation of body temperature (role of hypothalamus) Explain abnormalities of body temperature regulation.		
	Explain the structure of cell membrane Enlist the types of cell membrane proteins Enumerate the functions of membrane proteins Define and enumerate the functions of cell Glycocalyx		

	<p>Enlist membranous and non-membranous organelles</p> <p>Enlist the self-replicative organelles</p> <p>Differentiate between the functions of smooth and rough endoplasmic reticulum</p> <p>Explain the functions of Golgi apparatus</p> <p>Enlist the enzymes of lysosomes</p> <p>Explain the functions of lysosomes</p> <p>Enlist the enzymes of peroxisomes</p> <p>Explain the functions of peroxisomes</p>		
	<p>Enumerate the components and functions of cytoskeleton</p> <p>Define and enlist types of endocytosis</p> <p>Explain the mechanism of pinocytosis</p> <p>Classify different transport mechanisms</p> <p>Compare the composition of Na (Sodium), K (Potassium) and Cl (Chloride) in extracellular and intracellular fluid</p> <p>Define and enlist different types of diffusion Explain the process of facilitated diffusion with the aid of diagram</p> <p>Define and classify different types of active transport</p> <p>Describe primary and secondary active transport with examples</p> <p>Explain voltage and ligand gated channels with examples</p> <p>Name Na, K channel Blockers.</p> <p>Discuss functions and significance of Na/K ATPase pump.</p>		
F-P-002	<p>Enumerate the functions of blood</p> <p>Explain the composition of blood</p> <p>Enumerate the plasma proteins</p> <hr/> <p>Discuss functions of plasma proteins</p> <p>Describe the pathophysiology of edema</p>	Medical Physiology	Blood

F-P-003	<p>Discuss the characteristics of red blood cells</p> <p>Explain different types of Bone marrows Enumerate the different sites of erythropoiesis at different ages</p> <p>Explain the stages of erythropoiesis</p> <p>Enumerate factors that regulate erythropoiesis Discuss the site and role of erythropoietin in red blood cell production</p> <p>Explain the significance of vitamin B12 and folic acid in maturation of red blood cell</p>		Red Blood Cells
F-P-004	Enumerate the types of normal hemoglobin in different ages of life	Medical Physiology	Hemoglobin
	<p>Explain the role of Iron in Hemoglobin formation.</p> <p>Define blood indices, give their normal values &amp; enumerate the conditions in which these values are disturbed (corelate with anemias).</p> <p>Enlist the abnormal types of hemoglobin</p>		
F-P-005	<p>Enumerate the types of white blood cells</p> <p>Describe the characteristics and functions of Neutrophils</p> <p>Explain the process of defense against invading agent by neutrophils</p> <p>Define leukocytosis and leukopenia</p> <p>Explain the effects of leukemia on body</p> <p>Explain the process of defense against invading agent by macrophages</p> <p>Discuss different lines of defense during inflammation</p>	Medical Physiology	White Blood Cells

	<p>Explain the functions of neutrophils and macrophages in spread of inflammation (walling off effect) Define the Reticuloendothelial system</p> <p>Enlist the different components of Reticuloendothelial system</p> <p>Explain the characteristics and functions of basophils</p> <p>Explain the characteristics and functions of eosinophils and enlist conditions in which these cells are raised.</p>		
F-P-006	<p>Enumerate different blood group types.</p> <p>Explain the basis of ABO and Rh blood system</p> <p>Explain the Landsteiner law</p>	Medical Physiology	Blood Types

MEDICAL BIOCHEMISTRY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 36	
		DISCIPLINE	TOPIC
F-B-001	<p>Explain the concept of organization of cells to tissue, tissues to organ, organs to system.</p> <p>Differentiate between the eukaryotic and prokaryotic cells.</p>	Biochemistry Cell Biology	Structure of cell
F-B-002	<p>Describe the composition and structure of cell on biochemical basis and justify it as fluid mosaic model.</p> <p>Describe the structure and function of cell membrane with particular reference to the role of</p> <ol style="list-style-type: none"> <li>1. Lipids</li> <li>2. Carbohydrates</li> <li>3. Proteins</li> </ol> <p>Explain why the cell membrane is called fluid mosaic model</p>		Cell Membrane

F-B-003	Discuss the various ways of cell-to-cell communication and to the environment. Describe cell to cell communications. Cell signaling pathways (only G protein signaling I e. Gs, Gi and Gq) Describe cell to cell adhesion.		Signal transduction
F-B-004	Explain the biochemical markers and importance of subcellular organelles and their inherited disorders especially: 1. I cell disease 2. Refsum disease 3. Parkinsonism 1. Progeria		Subcellular organelles
F-B-005	Describe the chemistry of purines and pyrimidines and their linkage in nucleic acid synthesis.		Chemistry of purine and pyrimidines
F-B-006	Discuss the organization of DNA with special reference to Watson and crick model, composition, structure, role of Pairing		DNA (Deoxy Ribonucleic Acid)

	Describe the structural forms of DNA		
F-B-007	Discuss the structure of different types of RNAs with special reference to composition, linkage, functions of RNA, micro-RNA Illustrate the structure and functions of various types of RNAs Describe the functions of various small RNAs present in cell	Biochemistry Cell Biology	RNA (Ribonucleic Acid)
F-B-008	Explain the structure and nomenclature of nucleotides, biomedical importance of natural and synthetic analogues	Biochemistry Cell Biology	Nucleotides
F-B-009	Explain the higher organization of DNA. Difference between DNA, chromatid and chromosome		Chromosome

F-B-010	Describe enzymes with reference to: <ol style="list-style-type: none"> <li>1. Active sites</li> <li>2. Specificity</li> <li>3. Catalytic efficiency</li> <li>4. Cofactor</li> <li>5. Coenzyme      6. Holoenzyme</li> <li>7. Apoenzyme</li> <li>8. Prosthetic group</li> <li>9. Zymogens</li> </ol>		Enzymes
	Classify enzymes according to the reaction they catalyze and their nomenclature		
	Explain the mechanism of enzyme action from reactants to products (catalysis).		

	Discuss the effect of various factors on enzymatic activity: <ol style="list-style-type: none"> <li>1. Substrate concentration</li> <li>2. Temperature</li> <li>3. PH</li> <li>1. Enzyme concentration</li> </ol>		
	Explain the regulation of enzymatic activity (Michaelis Menten and Line weaver Burk's equation). Discuss inhibitors of enzymatic activity (with special reference to $K_m/V_{max}$ ) <ol style="list-style-type: none"> <li>1. Competitive</li> <li>2. Non competitive</li> <li>1. Uncompetitive</li> </ol>		
	Explain the application of enzyme in clinical diagnosis and therapeutic use		

Biochemistry Cell  
Biology

F-B-011	Classify amino acids based on polarity, nutritional importance and glucogenic/Ketogenic properties		Amino acids
	Explain the structure, physical, chemical properties of amino acids and their biomedical importance		
F-B-012	Classify proteins on the basis of functions, solubility and physicochemical properties and their biomedical importance.		Protein
	Explain the structural levels of proteins <ol style="list-style-type: none"> <li>1. Differentiate between alpha helix and beta pleated protein structures</li> <li>1. Identify bonding at different levels of proteins</li> </ol>		
	Describe the role of chaperons in protein folding <ol style="list-style-type: none"> <li>1. Interpret disorders related to protein misfolding on basis of given data</li> <li>1. Describe the biochemical basis of Alzheimer's disease/ prion disease</li> </ol>	Biochemistry Cell Biology	
F-B-013	Classify and explain the bio-chemical role of each class of plasma proteins		Plasma proteins

F-B-014	<p>Explain the structure and biochemical role of immunoglobulins</p> <ol style="list-style-type: none"> <li>1. Describe the production, structure and functions of B cells, plasma cells, and antibodies (IgA, IgD, IgE, IgG, and IgM).</li> <li>2. Discuss the functions of the cytokines (Interleukins (ILs), Tumor Necrosis Factor (TNFs), IFs, Platelet derived growth factor (PDGF), and Platelet activating factor (PAF)).</li> <li>3. Interpret multiple myeloma on basis of given data</li> </ol>		Immunoglobulins
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PATHOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 6+6=12	
		DISCIPLINE	TOPIC
F-Pa-001	<p>Discuss the significance of pathology.            Discuss the causes of cell injury.            Identify the types of cell injury. Describe the mechanism of cell injury.            Identify the types of cell death.            Define necrosis and apoptosis.            Describe different types of necrosis and mechanism of apoptosis.            Compare apoptosis with necrosis.            Define different types and mechanism of cellular adaptations (Hypertrophy, Atrophy, Hyperplasia and Metaplasia)            Define dysplasia and Neoplasia.            Discuss the mechanism and types of intracellular accumulations and pathological calcifications</p>	General Pathology	Cell Injury

F-Pa-002	Describe the basic structure of bacteria and virus. Enlist medically important microbes causing infectious diseases. Differentiate cell walls of gram positive and gramnegative bacteria. Compare the structure of bacterial cell and virus Discuss the growth curve of bacteria and virus. Enlist steps of viral replication Enlist stages of infectious diseases Enlist stages of bacterial pathogenesis Discuss the determinants of bacterial pathogenesis	General Microbiology	Introduction to Microorganisms
F-Pa-003	Define sterilization and disinfection. Describe the principles of sterilization and disinfection.		Sterilization & Disinfection

	Describe clinical uses of common disinfectants and their mode of sterilization. Discuss physical and chemical agents of sterilization		
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### PHARMACOLOGY AND THERAPEUTICS

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 04	
		DISCIPLINE	TOPIC
F-Ph-001	Define Basic terms of General Pharmacology: Drug, Pro-Drug, Placebo, Prototype drug, Orphan Drug, Essential drug, Pharmacology, First Pass effect, Volume of Distribution, Pharmacokinetics, Absorption, Distribution, Metabolism, Elimination, Excretion, Biotransformation.	General Pharmacology	Pharmacokinetics
F-Ph-002	Define the following terms: Pharmacodynamics, Receptor, Potency, Efficacy, Affinity, Agonist, Partial Agonist, Inverse Agonist, Antagonist.	General Pharmacology	Pharmacodynamics
F-Ph-003	Classify types of autonomic receptor (adrenergic and cholinergic) along with their location, actions and postreceptor mechanism		Autonomic System

### COMMUNITY MEDICINE & PUBLIC HEALTH

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 08	
		DISCIPLINE	TOPIC
F-CM-001	Describe the changing concepts and new philosophy of health Explain responsibility for health	Community Medicine and Public Health	Concept of Health
F-CM-002	Explain dimensions and determinants of health and their role in achieving positive health Discuss concept of health and wellbeing Describe the Physical quality of Life Index & Human Development Index		Positive Health Dimensions, Health Determinants
F-CM-003	Describe the importance of health indicators Classify health indicators Define Morbidity and Mortality Describe Disability indicators Compare indicators among countries		Health indicators
F-CM-004	Conceptualize disease causation and natural history of disease	Community Medicine and Public	Disease causation

	Explain Germ theory & multifactorial causation Describe Epidemiological Triad Discuss Web of disease causation Describe Gradient of infection	Health	
F-CM-005	Describe principles of prevention and control on prevalent diseases Explain difference between elimination and eradication Describe disease surveillance, types and cycle Explain Primary, secondary, & tertiary prevention Describe five levels of interventions	Community Medicine and Public Health	Disease Prevention
<b>IMPACT (EPIDEMIOLOGY, SOCIOLOGY/SOCIETY, COMMUNITY MEDICINE, BEHAVIORAL SCIENCE, &amp; PUBLIC HEALTH)</b>			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 08	

		DISCIPLINE	TOPIC
F-BhS-001	Identify the Biological Basis of human behavior and discuss social behavior Describe processes such as neurobiology of memory, emotions, sleep, learning, motivation, sex, arousal, reward and punishment	Behavioral Sciences	Biological Basis of Behavior
F-BhS-002	Identify the burden of mental illness on the person, family and society Describe Intellectual disability, Mental Disorders and Personality Disorders		Psychological Disorders
F-BhS-003	Identify the role of psychosocial factors in various illnesses Describe psychosocial aspects of various system diseases such as Cardio-vascular system (CVS), Central Nervous System (CNS), Gastro Intestinal Tract (GIT), Respiration, renal, endocrine and Cancer		Psychology and Disease
F-BhS-004	Identify the behavioral factors associated with pharmacological treatment of diseases		Behavioral Factors & Pharmacological Treatment
	Discuss Health belief model, treatment compliance and its psychosocial factors, social factors in drugs prescription and drug resistance		
F-BhS-005	Identify the rehabilitation work for patients on dialysis and any kind of physical disability Discuss the care requirements in chronic debilitating conditions like Diabetes, Multi-infarcts Dementia, chronic renal disease, limb amputation	Behavioral Sciences	Palliative Care
F-BhS-006	Identify the various physiological effects of stress Explain ANS response to stress, Describe Behavioural manifestations of stress, Stress related multiple sclerosis and autoimmune diseases		Stress
<b>AGING</b>			

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 01	
		DISCIPLINE	TOPIC
F-Ag-001	Discuss telomeres and telomerase and their clinical significance in aging.	Geriatrics Integrate with Biochemistry	Process of Aging



# Practicals

# PRACTICAL

## ANATOMY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 03	
		DISCIPLINE	TOPIC
F-A-044	Demonstrate the anatomical terms of position and movement, in particular on limbs.	Anatomy	Osteology Imaging and cross-sectional Anatomy Arthrology
	Demonstrate various anatomical movements of body		
	Identify various elevations and anatomical landmarks on bones.		
	Identify and interpret normal radiographs of various body regions		
	Identify and interpret joint dislocations and displaced fracture bone segments radiographically.		
CODE	EMBRYOLOGY	TOTAL HOURS = 05	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
F-A-045	Calculate fertilization age, gestational age, embryonic/fetal age and expected date of delivery.	Anatomy	Embryology
	On models, charts, aborted embryos and fetal specimens, identify the events of embryonic period, i.e., cleavage, morula and blastula formation, yolk sac, amniotic cavity, connecting stalk, Placenta and its positional & Implantational variations, umbilical cord and its contents		
	Describe the USG (Ultrasonography) report for the: Fetal features, fetal age estimation, placental attachment with variations, fetal membranes and multiple pregnancies		

<p>...tive streak, three germ  ...atives), angiogenesis,  ...onic age determination  ...y, secondary &amp; tertiary),  ...cygeal teratoma, neural  ...ese features.</p>		
<b>LOGY</b>	<b>TOTAL HOURS = 14</b>	
<b>OBJECTIVES</b>	<b>DISCIPLINE</b>	<b>TOPIC</b>
<p>...ing techniques and their  ...s on H&amp;E</p>	<p>Microscopic  Anatomy</p>	<p>Staining  techniques</p>
<p>...ent parts of light</p>		<p>Microscope</p>
<p>...ent cell shapes under the</p>		<p>Cell shape</p>
<p>...and Draw &amp; Label the  ...d &amp; non-ciliated) iv.  ...ed &amp; non-  ...n  ...stratified</p>		<p>Epithelium</p>

F-A-050	Identify under light microscope and Draw & Label serous & mucous secreting glands under light microscope	Microscopic Anatomy	Epithelium
F-A-051	Identify under light microscope and Draw & Label the various types of connective tissue		Connective tissue

PHYSIOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 12	
		DISCIPLINE	TOPIC
F-P-007	Explain laboratory/clinical procedure to the subject. Obtain verbal consent from subject before starting a procedure. Reassure the subject after the procedure.	Medical Physiology	Consent
F-P-008	Determine Erythrocyte Sedimentation Rate and packed cell volume		RBCs (Red Blood Cells)
F-P-009	Determination of blood group		Blood Group
F-P-010	Identify various types of WBCs in a prepared DLC (Differential Leukocyte Count)		WBCs (White Blood Cells)
BIOCHEMISTRY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 09	
		DISCIPLINE	TOPIC
F-B-015	Demonstrate the step taken to prevent or rectify the Laboratory Hazards	Biochemistry	Lab hazards
F-B-016	Identify the methods of isolation of cell organelles'		Cell organelles
F-B-017	Identify the different parts of equipment i.e., centrifuge, Microlab, Electrophoresis, Hot Oven, water bath		Equipment
F-B-018	Detect amino acids by paper chromatography		Chromatography Solutions
	Prepare different types of solution Molar, Molal, Normal and %		
PATHOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 02	

		DISCIPLINE	TOPIC
F-Pa-004	Identify the salient morphological features of: Caseous necrosis (Gross & microscopic features), Coagulative necrosis (Gross), Fat necrosis (microscopic)	Pathology	Cell Injury

	Identify the salient morphological features of Dystrophic calcification. Identify the salient microscopic features of the following: Intestinal metaplasia, Squamous metaplasia, Hyperplasia Identify the salient microscopic and gross features of Anthracosis		
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### PHARMACOLOGY AND THERAPEUTICS

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 03	
		DISCIPLINE	TOPIC

F-Ph-004	<p>Identify Sources of drugs through pictures:  Animal, Plant, Microbiological, Minerals, Synthetic and genetically engineered sources.</p> <p>Plant sources: Atropa Belladonna, Pilocarpus microphyllus, Papaver somniferum / Opium poppy, Erythroxyllum coca, Cinchona bark, Digitalis Purpureae / Fox glove plant, Rawulfia serpentine, Ephedra vulgaris, Curare, Catharanthus roseus, Podophyllum, Nux Vomica</p> <p>Animal sources: Heparin (Pig/ Bovine), Insulin (Cow/Pig), Thyroxin (Sheep/Pig), Estrogen, Progesterone, Testosterone, Vitamin A, D (Cod liver), Vaccines</p> <p>Microbiological sources: Penicillins, Cephalosporins, Tetracyclines, Streptomycin, Streptokinase, Cyclosporine</p> <p>Mineral sources: Iron, Magnesium, Zinc, Copper, Silver nitrate, Arsenic, Gold salts, Bismuth salts, Sulfur, Iodine, Calcium salts</p> <p>Recombinant / Genetically engineered drugs:  Human insulin, Erythropoietin, Growth hormone, Alteplase</p>	Pharmacology	Sources of drugs
	<p>Synthetic: Sulfonamides, Anti-histamines, Benzodiazepines, Anti-epileptics</p>		

F-Ph-005	<p>Identify and define the following Active Principles of drugs (alkaloids, glycosides, volatile oils, fixed oils) through pictures.</p> <p>Alkaloids: Atropine, Caffeine, Morphine, Nicotine, Quinine, Reserpine, Codeine, Tubocurarine</p> <p>Glycosides: Digoxin, Senna, Cascara</p> <p>Volatile oils: Clove oil , Peppermint oil, Coriander oil, Dill oil, Ginger oil</p> <p>Fixed oils: Coconut oil, Mustard oil, Olive oil, Castor oil, Cod liver oil</p>	Pharmacology	Active Principles of drugs
F-Ph-006	<p>Identify different dosage forms of drugs along with examples. Tablet, Capsule, Syrup, Suspension, Inhaler, Injection, Infusion, Ointment, Cream, Lotion, Lozenges, Suppository, Enema.</p>	Pharmacology	Dosage
F-Ph-007	<p>Identify the types of transmembrane receptors (diagram) and give example.</p>	Pharmacology	Types of receptors

**Modular Integrated  
Curriculum 2K23**  
*Volume-01*

**MODULE**

**02**

**HEMATOPOIETIC &  
LYMPHATIC-I**



## MODULE RATIONALE

"Blood is Life". Unlike any other organ, components of blood and immunity reflect/reveal disease processes in other organs as well. Therefore, studying blood is like opening a book to all aspects of medicine. Hence, this module has been designed to enable students to have a basic understanding about the normal structure, function and biochemistry of blood, immune and Lymphatic systems. Not only that, but students would also learn, when normal physiology and composition of blood and immune system is disturbed, what disorders result in our community. Emphasis has been given to incorporate deranged laboratory findings into the clinical problem solving.

## MODULE OUTCOMES

- Explain the function of all the organs / structures involved in this system and the mechanisms controlling them. (Spleen, lymph nodes, thymus, bone marrow, RBC's, WBCs and platelets
- Explain the etiology and pathogenesis of common blood & lymphatic diseases, particularly those of importance in Pakistan.
- Explain the rationale for the use of common therapeutic agents for the diseases related to Blood and immunity.
- Describe the role of immunity in the body
- Discuss the working & uses of laboratory instruments in diagnostic lab visit
- Relate red cell indices with health and disease
- Recognize ABO/RH blood grouping system
- Describe the role of Reticuloendothelial system in the body
- Describe the events of hemostasis
- Extrapolate the biochemical aspects of plasma proteins
- Discuss the pharmacological treatment of iron deficiency anemia
- Discuss Blood composition and function
- Discuss the role of liver in hemolytic anemia
- Practice history taking of a patient presented with blood disorders

## THEMES

- Red blood cell
- Platelets
- White blood cell

#### CLINICAL RELEVANCE

- Aplastic anemia
- Hemolytic anemia
- Blood loss anemia
- Nutritional anemia
- Polycythemia
- Hemoglobinopathies
- Jaundice
- Acute and chronic lymphocytic and myelogenous Leukemia
- Allergy (Type I, Type II & Type III)

### IMPLEMENTATION TORs

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.





The image features a stack of several books, with the top one slightly open, resting on a dark surface. The background is a blurred library or bookstore with colorful book spines. A semi-transparent blue oval with a white border is centered over the books, containing the word "Theory" in a bold, dark blue, serif font.

# Theory

NORMAL STRUCTURE			
GROSS ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 02	
		DISCIPLINE	TOPIC
HL-A-001	Identify and describe the components of the Hematopoietic & Lymphoid Tissue and their function	Human Anatomy	Hematopoietic & Lymphoid Tissue
	Describe the location, coverings, relations of Spleen		
	Describe the origin, course branches and distribution of Splenic artery		
	Describe the venous drainage of Spleen, Portal vein formation, tributaries, and area of drainage.		
	Describe the location and relations of Thymus. Age related changes in Thymus		
CODE	EMBRYOLOGY & POST-NATAL DEVELOPMENT	TOTAL HOURS = 01	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
HL-A-002	Describe the Intrauterine Development of spleen	Embryology	Developmental Anatomy of Spleen
NORMAL FUNCTION			
MEDICAL PHYSIOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 20	
		DISCIPLINE	TOPIC
HL-P-001	Define, classify and explain anemia on the basis of morphology and cause	Medical Physiology	Anemia

	Discuss the effects of anemia on the body	
HL-P-002	Define polycythemia	Polycythemia
	Explain types of polycythemias	
	Discuss the effects of polycythemia on the body	

HL-P-003	Define hemostasis		Hemostasis
	Describe the mechanisms by which hemostasis is secured		
HL-P-004	Discuss the characteristics and functions of platelets		Platelets
	Explain the mechanism of formation of platelet plug		
HL-P-005	Enlist the clotting factors in blood		Coagulation factors
	Explain the conversion of Prothrombin to Thrombin & formation of Fibrin Fibers		
	Explain the Intrinsic & extrinsic clotting pathway.		
	Name & explain the mechanism of anticoagulants used in laboratory.		
	Explain the factors that prevent intravascular coagulation		
	Explain the role of Calcium ions in Intrinsic and Extrinsic pathways		
	Enlist the vitamin K dependent clotting factors		
HL-P-006	Explain the prothrombin time, International Normalized Ratio (INR), and its clinical significance.	Integrated with Medicine	Coagulation disorders
	Enlist and explain the conditions that cause excessive bleeding		
	Define thrombocytopenia		
HL-P-007	Enlist the causes and consequences of Thrombocytopenia	Integrated with microbiology	Immunity
	Define immunity		
	Classify immunity		
	Explain humoral immunity		
	Explain Innate immunity.		
Elaborate cell mediated immunity.			

	Describe the structure of antigen and immunoglobulin		
	Describe the role of Helper T-cells in cell mediated immunity		
	Enlist the types of Immunoglobulins along with their functions		
	Explain the role of memory cells in enhancing antibody response (secondary response)		
	Describe the mechanism of action of antibodies		
	Elaborate the complement system.		
HL-P-008	Elaborate Immune tolerance	Integrated with pathology	Tolerance
	Explain the process of clone selection during T cell processing		
	Discuss the failure of tolerance mechanism		
HL-P-009	Discuss immunization.	Integrate with microbiology	Immunization
	Define passive Immunity		Immunization
	Explain features and physiological basis of delayed reaction allergy.		
	Explain features and physiological basis of Atopic Allergy		
	Explain features and physiological basis of Anaphylaxis, urticaria and Hay fever.		
HL-P-010	Discuss the pathophysiology, features and treatment of ABO and RH incompatibility. Enlist the changes that take place in the stored Blood.	Medical Physiology	Blood group Incompatibility
HL-P-011	Discuss the features and complications of mismatched blood transfusion reaction Describe the Hazards of blood transfusion.	Integrate with Pathology	Blood mismatch Transfusion reactions
	Elaborate the Transplantation of Tissues and Organs		
HL-P-012	Explain the process of tissue typing	Integrate with pathology	Transplantation of tissues

	Explain the prevention of Graft Rejection by suppressing immune system		
<b>MEDICAL BIOCHEMISTRY</b>			
<b>CODE</b>	<b>SPECIFIC LEARNING OBJECTIVES</b>	<b>TOTAL HOURS = 19</b>	
		<b>DISCIPLINE</b>	<b>TOPIC</b>
HL-B-001	<p>Explain the steps of synthesis of heme</p> <p>Interpret porphyrias on the basis of sign, symptoms and data.</p> <p>Discuss the biochemical role and types of hemoglobin 1.</p> <p>Differentiate Hemoglobin and myoglobin</p> <p>2. Explain oxygen dissociation curve of hemoglobin and myoglobin</p> <p>3. Enlist the factors regulating oxygen dissociation curve of hemoglobin and myoglobin</p> <p>4. Interpret Carbon monoxide (CO) toxicity on the basis of sign and symptoms</p> <p>5. Explain the role of 2,3 Bisphosphoglycerate (2,3 BPG) in fetal circulation</p>	Medical Biochemistry	Hemoglobin and its types/ RBCs
HL-B-002	<p>Discuss haemoglobinopathies and their biochemical and genetic basis with special emphasis on sickle cell anemia, Thalassemia and methemoglobinemia</p> <p>a) Discuss the following types of anemia on the basis of signs and symptoms and laboratory data:</p> <p>1. Hypochromic microcytic</p> <p>2. Normochromic microcytic</p> <p>3. Normochromic normocytic</p> <p>4. Macrocytic (megaloblastic)</p>	Medical Biochemistry Integrate with Pathology	Hemoglobino pathies/ RBCs/ Homeostasis

HL-B-003	<p>Explain the iron metabolism with mechanism of absorption and factors affecting it.</p> <ol style="list-style-type: none"> <li>1. Interpret iron deficiency anemia on basis of given data and microscopic findings</li> <li>2. Interpret folic acid and cobalamin in relation to anemias on given data and microscopic findings</li> <li>3. Discuss biochemical role of pyridoxine and vitamin C &amp; K in microcytic anemia</li> </ol>	Medical Biochemistry Integrate with medicine	Iron Metabolism/ RBCs
HL-B-004	<p>Discuss the degradation of heme in macrophages of reticuloendothelial system</p> <ol style="list-style-type: none"> <li>1. Describe the formation of bile pigments, their types and transport</li> <li>2. Discuss the fate of bilirubin</li> </ol>	Medical Biochemistry	Heme Degradation/ RBCs

HL-B-005	<p>Discuss hyperbilirubinemias and their biochemical basis</p> <ol style="list-style-type: none"> <li>1. Differentiate types of jaundice on basis of sign/symptoms and data</li> <li>2. Evaluate the genetic basis of jaundice on the basis of lab investigations</li> </ol>		Hyperbilirubinemias / RBCs/ Blood Groups
HL-B-006	<p>Explain and interpret pedigree of single gene defect i.e. sickle cell anemia (Autosomal recessive) and Beta Thalassemia (X linked recessive)</p>		Genetics

### PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 2+5=07	
		DISCIPLINE	TOPIC
HL-Ph-001	<p>Describe the oral and parenteral iron preparations including their pharmacokinetics, uses, adverse effects and Iron Antidotes</p>	Pharmacology & Therapeutics	Anemia
	Describe Vitamin B12 preparations		

HL-Pa-001	Define the terms: Hematopoietic growth factors, their name, mechanism of actions, uses and adverse effects	Pathology	Blood Cells, Platelets and Blood Group
	Define and classify anemias according to underlying mechanism and Mean Corpuscular Volume/ Mean Corpuscular Hemoglobin (MCV/MCH)		
	Discuss the causes and investigations of iron deficiency anemia and megaloblastic anemia		
	Classify the benign and malignant disorders of WBCs		
	Discuss the causes leading to reactive leukocytosis		
	Interpretation of anemias on the basis of peripheral blood smear and bone marrow findings		
	Classify bleeding disorders		
	Discuss first line laboratory investigations for bleeding disorders		
	Describe the basic concept of blood grouping and acute hemolytic transfusion reaction		
<b>DISEASE PREVENTION AND IMPACT</b>			
CODE	COMMUNITY MEDICINE & BEHAVIORAL SCIENCE	TOTAL HOURS = 05	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
HL-CM-01	Describe the nutritional aspects of iron deficiency anemia and psychological aspects of diseases	Community Medicine and Public Health	Anemia
HL-CM-02	Enlist most common blood borne diseases in Pakistan Describe the routes of spread of blood borne diseases		communicable diseases
HL-CM-03	Genetic counseling of parents		Genetic diseases

HL-BhS-01	Psychological Counselling of patients and their families	Behavioral Sciences	Counselling, informational care
HL-BhS-02	Identify and deal with the various psychosocial aspects of Hematopoietic System disorders (such as Sickle Cell Disease, Hemophilia, and Conditions of the Blood) on Individual, Family and Society.		Personal, Psychosocial and vocational issues
<b>AGING</b>			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 01	
		DISCIPLINE	TOPIC
HL-Ag-01	Discuss the role of platelets in Platelet-Rich Plasma (PRP) treatment in old age (for skin, hairs and joints)	Biochemistry /Dermatology	Platelet Rich Plasma Therapy
HL-Ag-02	Explain the role of glutathione in skin whitening		Glutathione



# Practicals

# PRACTICAL

## HISTOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 02	
		DISCIPLINE	TOPIC
HL-A-003	Describe the light microscopic structure of Spleen, thymus, Lymph nodes, tonsils and Mucosa Associated Lymphoid Tissue (MALT) including appendix.	Histology	Histological features of lymph node, spleen & thymus

## PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 6	
		DISCIPLINE	TOPIC
HL-P-013	Interpret the report of Red Blood Cell Count, Hemoglobin concentration, Hematocrit and RBC Indices by Automated Cell Counter	Medical Physiology	Jaundice & Anemias/ RBCs/ Homeostasis
	Interpret the report of Total Leucocyte Count, Differential Leucocyte Count, & Platelet Count by Automated Cell Counter.		
HL-P-014	Determine Bleeding Time. Determine Clotting Time.		Bleeding/ Clotting time

## BIOCHEMISTRY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 6	
		DISCIPLINE	TOPIC
HL-B-007	Estimate serum bilirubin and interpret types of jaundice on the basis of data.	Medical Biochemistry	Jaundice & Anemias
	Estimate serum ALP level		
	Estimate serum AST level		
	Estimate serum ALT level		

## Assessment Matrix

The Assessment Matrix demonstrates the alignment of assessment methods with the intended learning outcomes and teaching-learning strategies employed throughout the Foundation-I block. A combination of formative and summative assessment methods is utilized to evaluate students' knowledge, practical skills, professional attitudes, and competency development in accordance with PMDC standards and UHS assessment regulations.

Theme	Formative Assessment	Summative Assessment	Assessment Domain
Foundation Orientation	Reflective Writing, Participation	Continuous Assessment	Cognitive, Affective
Cell Structure	MCQs, Practical Exercises	Theory Paper, OSPE	Cognitive, Psychomotor
Cell Transport & Cell Chemistry	MCQs	Theory Paper	Cognitive
Homeostasis & Blood	MCQs, Practical Assessment	Theory Paper, OSPE	Cognitive, Psychomotor
Body Movement	Practical Assessment, Viva	Theory Paper, Practical Examination (OSPE)	Cognitive, Psychomotor
Growth & Development	MCQs, Tutorials	Theory Paper	Cognitive

### Block Assessment Summary

Assessment Component	Method
Formative Assessment	Tutorials, Practical Exercises, Reflective Writing, Participation
Summative Assessment	Integrated Theory Examination (MCQs as per UHS regulations), Practical Examination (OSPE/Practical), Viva Voce
Feedback Mechanism	Immediate verbal feedback, written feedback, post-assessment review sessions
Remediation	Conducted in accordance with institutional and UHS assessment policies

### Assessment Alignment

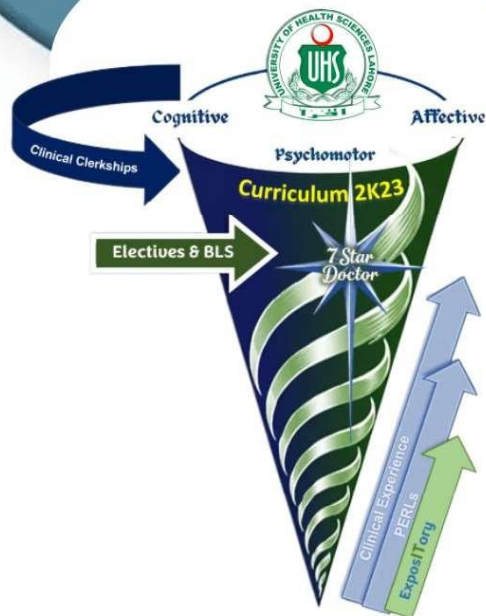
The assessment strategy of the Foundation-I block is designed to ensure constructive alignment between learning outcomes, teaching-learning activities, and assessment methods. Multiple assessment tools are employed to evaluate cognitive, psychomotor, and affective domains, thereby supporting competency-based medical education and continuous student development.



# Modular Integrated Curriculum 2K23

## MBBS Year-01

# BLOCK-2



**Modular Integrated  
Curriculum 2K23**  
*Volume-01*

**MODULE**

**03**

**MUSCULOSKELETAL  
& LOCOMOTION-I**



## BLOCK AT A GLANCE

Item	Details
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional MBBS
<b>Block</b>	Block 2
<b>Module</b>	Musculoskeletal & Locomotion-I
<b>Curriculum</b>	UHS Integrated MBBS Curriculum 2K23
<b>Educational Model</b>	Integrated Competency-Based Curriculum
<b>Duration</b>	As per UHS Academic Calendar
<b>Major Themes</b>	Pectoral Region & Axilla, Upper Limb, Pelvic Girdle, Lower Limb
<b>Integrated Disciplines</b>	Anatomy, Histology, Embryology, Physiology, Biochemistry, Pharmacology, Orthopaedics, Surgery, Medicine, Radiology, Paediatrics
<b>Learning Domains</b>	Cognitive, Psychomotor, Affective
<b>Teaching-Learning Methods</b>	Interactive Lectures, Practical Sessions, Dissection, Histology Practicals, Demonstrations, Case-Based Learning, Self-Directed Learning
<b>Assessment</b>	Formative Assessment, MCQs, Practical Examination, OSPE, Viva Voce
<b>Clinical Correlation</b>	Congenital anomalies, fractures, joint dislocations, muscular dystrophy, myopathies, multiple sclerosis, musculoskeletal disorders

## MODULE RATIONALE

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

## MODULE OUTCOMES

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

## THEMES

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

**CLINICAL RELEVANCE**

- Congenital anomalies of limb
- Joint Dislocation
- Fracture
- Multiple Sclerosis, Astrocytoma, Alzheimer's Disease
- Myopathy, Muscular Dystrophy

**IMPLEMENTATION TORs**

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
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## CURRICULUM DASHBOARD

<b>Curriculum Indicator</b>	<b>Block 2 (Musculoskeletal &amp; Locomotion-I)</b>
Programme	MBBS
Academic Year	First Professional
Module	Musculoskeletal & Locomotion-I
Curriculum	UHS Integrated Curriculum 2K23
Major Themes	4
Module Outcomes	10
Integrated Disciplines	Anatomy, Histology, Embryology, Physiology, Biochemistry, Pharmacology, Orthopaedics, Surgery, Medicine, Radiology, Paediatrics
Teaching Methods	Interactive Lectures, Dissection, Demonstrations, Practical Sessions, Histology Practical, Case-Based Learning, Self-Directed Learning
Assessment	MCQs, Practical, OSPE, Viva, Continuous Assessment
Learning Domains	Cognitive, Psychomotor, Affective
PMDC Competencies	Medical Expert, Communicator, Collaborator, Professional, Scholar, Leader, Health Advocate
Horizontal Integration	Basic Sciences integrated around the musculoskeletal system
Vertical Integration	Orthopaedics, Surgery, Medicine, Radiology, Paediatrics
Clinical Correlation	Fractures, Joint Dislocations, Congenital Limb Anomalies, Muscular Disorders, Neurovascular Injuries
Quality Assurance	Continuous assessment, feedback, curriculum review, DME monitoring

## Theme-wise Curriculum Mapping Matrix

The Theme-wise Curriculum Mapping Matrix demonstrates the integration of disciplines within the Musculoskeletal & Locomotion-I block. It aligns each theme with the module learning outcomes, integrated disciplines, teaching-learning strategies, assessment methods, PMDC competencies, and horizontal and vertical integration to ensure constructive alignment throughout the module.

Theme	Module Learning Outcomes	Integrated Disciplines	Teaching & Learning Methods	Assessment Methods	PMDC Competencies	Horizontal Integration	Vertical Integration
<b>Pectoral Region &amp; Axilla</b>	Describe the anatomy, embryological development, histology and neurovascular organization of the pectoral region and axilla with relevant clinical correlations.	Anatomy, Embryology, Histology, Physiology	Interactive lectures, dissection, demonstrations, histology practicals, SDL	MCQs, Practical, OSPE, Viva	Medical Expert, Scholar	Anatomy + Histology + Embryology + Physiology	Surgery, Radiology, Orthopaedics
<b>Upper Limb</b>	Explain the osteology, muscles, joints, blood supply, nerve supply and functional anatomy of the upper limb with clinical application.	Anatomy, Physiology, Histology, Embryology, Biochemistry	Interactive lectures, dissection, demonstrations, practical sessions, CBL, SDL	MCQs, Practical, OSPE	Medical Expert, Scholar	Anatomy + Physiology + Histology + Biochemistry	Orthopaedics, Surgery, Medicine, Radiology
<b>Pelvic Girdle</b>	Describe the anatomy, development, joints, muscles and neurovascular structures of the pelvic girdle with functional and clinical significance.	Anatomy, Embryology, Histology, Physiology	Interactive lectures, practical sessions, demonstrations, SDL	MCQs, Practical, OSPE	Medical Expert	Anatomy + Embryology + Physiology	Orthopaedics, Surgery, Obstetrics & Gynaecology
<b>Lower Limb</b>	Explain the osteology, joints, muscles, blood supply, nerve supply and biomechanics of the lower limb and correlate them with common musculoskeletal disorders and locomotion.	Anatomy, Physiology, Histology, Embryology, Biochemistry	Interactive lectures, dissection, demonstrations, practical sessions, CBL, SDL	MCQs, Practical Examination, OSPE, Viva	Medical Expert, Scholar	Anatomy + Histology + Physiology + Biochemistry	Orthopaedics, Surgery, Medicine, Radiology, Rehabilitation

### Theme Summary

Theme	Educational Focus
Pectoral Region & Axilla	Regional anatomy, neurovascular structures and clinical anatomy
Upper Limb	Structure, function, movements and clinical application of the upper limb
Pelvic Girdle	Pelvic anatomy, stability, support and locomotion
Lower Limb	Functional anatomy, gait, posture, weight bearing and clinical disorders

## Weekly Curriculum Map

The Weekly Curriculum Map outlines the chronological progression of learning throughout the **Musculoskeletal & Locomotion-I** block. It demonstrates the integration of basic medical sciences with clinical relevance and highlights the sequence of themes, teaching-learning activities, and assessment methods.

Week	Major Theme	Integrated Disciplines	Teaching–Learning Methods	Assessment
Week 1	Pectoral Region & Axilla	Anatomy, Histology, Embryology, Physiology	Interactive lectures, dissection, histology practicals, demonstrations	Formative MCQs, Practical
Week 2	Upper Limb – Part I	Anatomy, Physiology, Histology	Interactive lectures, dissection, practical sessions, SDL	MCQs, Practical Assessment
Week 3	Upper Limb – Part II	Anatomy, Physiology, Biochemistry	Interactive lectures, demonstrations, CBL, SDL	MCQs
Week 4	Pelvic Girdle	Anatomy, Embryology, Histology, Physiology	Interactive lectures, demonstrations, practical sessions	MCQs, OSPE
Week 5	Lower Limb – Part I	Anatomy, Histology, Physiology	Interactive lectures, dissection, practical sessions	Practical Assessment, Viva
Week 6	Lower Limb – Part II	Anatomy, Biochemistry, Physiology	Interactive lectures, CBL, SDL, demonstrations	MCQs, Practical
Week 7	Integrated Musculoskeletal System	All Integrated Disciplines	Integrated case discussions, tutorials, revision sessions	Formative Assessment
Week 8	Revision & Block Assessment	All Disciplines	Revision sessions, practical revision, feedback	Block Examination (Theory & Practical)

### Weekly Progression

The module follows a regional approach to learning, beginning with the pectoral region and axilla, progressing through the upper limb, pelvic girdle, and lower limb. Each week's learning integrates anatomy with embryology, histology, physiology, and biochemistry while reinforcing clinical relevance through demonstrations, case-based discussions, and practical sessions. The block concludes with integrated revision and summative assessment.

## PMDC Competency Mapping

The PMDC Competency Mapping Matrix demonstrates the alignment of the Musculoskeletal & Locomotion-I module with the PMDC Undergraduate Medical Education Competency Framework. The integrated curriculum enables students to develop foundational biomedical knowledge, practical skills, professionalism, communication, and lifelong learning attributes required for future clinical practice.

Theme	Medical Expert	Communicator	Collaborator	Leader	Professional	Scholar	Health Advocate
Pectoral Region & Axilla	✓					✓	
Upper Limb	✓				✓	✓	
Pelvic Girdle	✓				✓	✓	
Lower Limb	✓				✓	✓	✓

## Competency Integration Summary

PMDC Competency	Contribution within the Module
<b>Medical Expert</b>	Develops knowledge of gross anatomy, embryology, histology, physiology and functional anatomy of the musculoskeletal system.
<b>Communicator</b>	Enhances communication through group discussions, practical sessions and presentations.
<b>Collaborator</b>	Promotes teamwork during laboratory work, dissection and small-group learning.
<b>Leader</b>	Encourages responsibility, organization and active participation during practical and group activities.
<b>Professional</b>	Develops ethical behaviour, punctuality, respect for cadaveric material and professional conduct.
<b>Scholar</b>	Promotes self-directed learning, evidence-based inquiry and critical thinking.
<b>Health Advocate</b>	Builds awareness of musculoskeletal health, injury prevention, disability and rehabilitation.

## Competency Alignment

The Musculoskeletal & Locomotion-I module primarily contributes to the development of the Medical Expert competency by establishing a comprehensive understanding of the normal structure and function of the musculoskeletal system. Integrated learning activities, laboratory sessions, and self-directed learning further strengthen scholarship, professionalism, collaboration, communication, leadership, and advocacy for musculoskeletal health, supporting competency-based medical education.

## Teaching–Learning Matrix

The Teaching–Learning Matrix outlines the educational strategies employed throughout the Musculoskeletal & Locomotion-I module to facilitate the achievement of the intended learning outcomes. A combination of learner-centred instructional methods is used to promote the acquisition of knowledge, practical skills, clinical reasoning, professionalism, teamwork, and self-directed learning in accordance with the principles of competency-based medical education.

Theme	Interactive Lectures	Practical / Laboratory	Dissection / Demonstration	Small Group Discussion (SGD)	Case-Based Learning (CBL)	Self-Directed Learning (SDL)	Early Clinical Exposure / Clinical Correlation
Pectoral Region & Axilla	✓	✓	✓	✓	✓	✓	✓
Upper Limb	✓	✓	✓	✓	✓	✓	✓
Pelvic Girdle	✓	✓	✓	✓	✓	✓	✓
Lower Limb	✓	✓	✓	✓	✓	✓	✓

### Teaching–Learning Strategy Summary

The Musculoskeletal & Locomotion-I module utilizes an integrated, student-centred approach to learning. Interactive lectures establish foundational concepts, while dissection, practical sessions, and demonstrations enhance understanding of regional anatomy and functional relationships. Small-group discussions and case-based learning promote clinical reasoning and problem-solving, whereas self-directed learning encourages independent inquiry and lifelong learning. Continuous clinical correlation throughout the module enables students to relate normal musculoskeletal structure and function to common clinical conditions encountered in medical practice.





The image features a stack of several books, with the top one slightly open, resting on a dark surface. The background is a blurred library or study area with bookshelves. Overlaid on the books is a light blue oval with a white border and a subtle gradient. Inside this oval, the word "Theory" is written in a bold, dark blue, serif font.

# Theory

NORMAL STRUCTURE			
GROSS ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 105	
		DISCIPLINE	TOPIC
UPPER LIMB			
MS-A-001	Describe the topographical anatomy of Pectoral Region	Human Anatomy	Pectoral Region
	Perform dissection of the Pectoral Region or use models to identify the key structures		
	Describe muscles of the Pectoral Region with their origin, insertion, nerve supply and actions.		
MS-A-002	Describe the cutaneous nerves. and Superficial veins of the Upper Limb.	Human Anatomy	Dermatomes and cutaneous innervation of Upper Limb
	Describe the extent, attachments, and structures passing through Clavipectoral Fascia	Human Anatomy	
MS-A-003	Define the boundaries of auscultation and state its clinical significance	Integrate with Medicine	Pectoral region & Back

	<p>Describe the osteology of the bones in pectoral region.</p> <p>Enumerate the superficial muscles of back, connecting shoulder girdle with vertebral column.</p> <p>Describe the</p> <ol style="list-style-type: none"> <li>1. Attachments</li> <li>2. Nerve supply</li> </ol> <p>Actions of Trapezius, Latissimus Dorsi, Rhomboid major and minor.</p> <p>Mention the neurovascular supply of pectoral region and Correlate with important clinical conditions. Describe superficial muscles of the back with their origin, insertion, nerve supply and actions.</p>	Human Anatomy	
MS-A-004	Describe the Osteology of Clavicle	Human	

	<p>(Morphological features, side determination, attachments, ossification)</p> <p>Describe the correlates functions of Clavicle (clavicle fracture, its role in terms of weight transmission of upper limb, compression of neurovascular structures)</p> <p>Describe the Osteology of Scapula (morphological features, attachments, ossification)</p> <p>Determine the side and identify the landmarks of scapula</p> <p>Describe the movements of Scapula associated with movements of Shoulder Girdle</p> <p>Tabulate the muscles of scapular region and give their attachments, nerve supply and action</p> <p>Tabulate the attachments, origin, insertion, innervation, and actions of Anterior Axio-appendicular Muscles</p>	Anatomy	<p>Bones of Upper Limb: Clavicle &amp; Scapula</p>
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MS-A-005	Describe the Sternoclavicular Joint in terms of articulating surfaces, ligaments, articular disc, nerve supply.	Human Anatomy	Bones of thorax, Joints of Upper Limb: Sternoclavicular Joint
MS-A-006	Develop clear concepts of the topographical anatomy of Axilla and its contents	Human Anatomy	Axila
	Describe the boundaries of Axilla. (Identification of muscles forming the boundaries of axilla)		
	List the contents of Axilla		
	Perform dissection/ Identify the Axilla and its contents		
	Describe Axillary Artery with reference to its 3 parts their relations, branches, and anastomoses	Human Anatomy	
	Describe the formation, tributaries, and drainage of Axillary Vein		
	Identify and demonstrate the course/ relation and branches/tributaries of axillary vessels		
Describe the Axillary Lymph Nodes in terms of location, grouping, areas of drainage and clinical significance			

	Describe the course, relations, root value and distribution of Axillary nerve. Describe the boundaries and contents of quadrangular space.		
MS-A-007	Describe the Osteology of Humerus (Side Determination, morphological features, attachments, ossification)	Human Anatomy	Bones of upper limb: Humerus
MS-A-008	Describe the Shoulder Joint under the following headings: Articulation, Type/ Variety, Capsule, Ligaments, Innervation, Blood supply, Movements.		Joints of Upper Limb: Shoulder Joint

	<p>Describe the 3 parts of Deltoid Muscle and correlate them with its unique functions.</p> <p>Explain its role in abduction of shoulder joint.</p> <p>Explain mechanism of Abduction of arm</p>		
	Identify and demonstrate the movements of scapula and shoulder joint.		
	Draw and label the arterial anastomosis around shoulder joint		
	Describe, in detail, the Scapula-Humeral Mechanism in relation to movement of abduction. Discuss important clinical conditions		
MS-A-009	Describe Rotator Cuff Muscles, state their Anatomical significance and explain Rotator Cuff Tendinitis	Human Anatomy	Rotator Cuff
	Clinical correlates of shoulder joint. (shoulder joint stability, dislocation and shoulder pain)	Integrate with Surgery	
MS-A-010	Describe the formation of Brachial Plexus; Infra and Supraclavicular parts. Discuss Brachial plexus injuries	Human Anatomy	Nerves of Upper Limb
	Demonstrate and identify the formation of brachial plexus and its branches		
	List the branches of brachial plexus and give their areas of distribution and muscles they innervate		

	<p>Enlist and tabulate the muscles of anterior compartment of arm with their attachments, nerve supply and action.</p> <p>Identify &amp; Describe Musculocutaneous Nerve in terms of its Origin, Course, Termination, Relations, Branches, and distribution.</p> <p>Describe and illustrate the cutaneous innervation of the arm.</p>		
MS-A-011	Describe the Brachial Artery in terms of its course, relations, branches, and distribution	Human Anatomy	Blood supply of arm
	Tabulate the attachments, innervation, and actions of Triceps brachii as a muscle of Posterior Fascial Compartment of Arm		
	Identify & Describe the Profunda Brachii Artery giving its course, relations, branches, and distribution		
MS-A-012	Describe Cubital Fossa with emphasis on its boundaries, contents, and clinical significance	Human Anatomy	Muscles of Arm
	Demonstrate surface marking of superficial veins of arm and forearm for IV (Intra venous) injections		
	Demonstrate biceps brachii reflex, triceps reflex and brachioradialis reflex		
MS-A-013	<p>Determine the side and identify the landmarks of radius and ulna.</p> <p>Describe the Osteology of Radius (Side Determination, morphological features, attachments).</p>	Human Anatomy	Bones of Forearm
	Describe the Osteology of Ulna (Side Determination, morphological features, attachments).		
MS-A-014	<p>Describe osseofascial compartment of forearm. Tabulate flexor and pronators muscles of forearm, their attachments, actions and nerve supply.</p> <p>Describe the action of paradox with examples</p>	Human Anatomy	Muscle of Anterior/Flexor Compartment of Forearm

MS-A-015	Tabulate the attachments, innervation, and actions of Extensor Muscles of the Forearm		Muscle of Lateral and Posterior/Extensor
	Tabulate the attachments, innervation, and actions of Lateral Muscles of the Forearm		
			Compartment of Forearm
MS-A-016	Identify the muscles and nerves of flexor and extensor compartments of forearm		Nerves of Forearm
	Describe and illustrate the cutaneous innervation of the Forearm		
	Describe ulnar, median and radial nerves in fore arm.		
MS-A-017	Describe the Origin, Course, Relations, and branches of Ulnar and radial Artery in Forearm Describe the Origin, Course, Relations and list the tributaries of veins of Forearm.		Blood supply of forearm
	Surface marking of Brachial artery, Cephalic, Median cubital, Basilic Vein, Radial & Ulnar arteries, anterior & posterior interosseous artery		
MS-A-018	Identify the Extensor & Flexor Retinacula and describe their attachments and relations	Human Anatomy	Retinacula of Forearm
MS-A-019	Demonstrate the formation of carpal tunnel and identify the contents Describe Carpel Tunnel Syndrome	Human Anatomy- Integrate with surgery	Carpal tunnel syndrome
	Describe the features, attachments, relations and structures passing under Flexor Retinaculum	Human Anatomy	
MS-A-020	Describe the Origin, Course, Relations, and branches of Ulnar Artery in Forearm		Forearm: Blood supply and Venous drainage
	Describe the Origin, Course, Relations and list the tributaries of veins of Forearm		

	Surface marking of Brachial artery, Cephalic, Median cubital, Basilic Vein, Radial & Ulnar arteries, anterior & posterior interosseous artery		
	Describe the Elbow Joint in terms of articular surfaces, type, variety, ligaments, muscles producing movements, blood supply {Anastomosis around elbow joint}, nerve supply and radiological imaging.	Human Anatomy	Joints of Upper Limbs: Elbow Joint

MS-A-021	Describe Carrying Angle and justify its importance in limb movement	Integrate with Surgery	
MS-A-022	Describe the Radioulnar Joints in terms of articular surfaces, type, variety, ligaments, muscles producing movements, nerve supply and radiological imaging.	Human Anatomy	Joints of Upper Limbs: Radioulnar Joint
	Describe the wrist joint in terms of articular surfaces, type, variety, ligaments, muscles producing movements, nerve supply and radiological imaging.		
	Demonstrate mechanisms of movements of Pronation & Supination		
MS-A-023	Describe the features of Interosseous Membrane with structures that pierce through it	Human Anatomy	Interosseous membrane
MS-A-024	Describe the features and explain the importance of Fibrous Flexor Sheaths, synovial flexor sheaths and extensor expansion	Human Anatomy	Fascia & Muscles of Hand
MS-A-025	Demonstrate the attachments and actions of the muscles of hand Identify the muscles and neurovasculature of palm. Explain the morphology and tabulate the attachments, innervation and actions of intrinsic muscles of hand. Explain the fascial spaces of palm and pulp space of fingers Describe Dupuytren contracture, mallet finger and boutonniere deformity.	Human Anatomy	Hand & Actions of Muscles of Upper Limb as a Functional Unit

	Describe hand as a functional unit. (position of hand, movement of thumb and fingers while performing different functions) Discuss cupping of hand and fist formation.		
MS-A-026	Draw the Radial Artery course, relation and termination in hand with its clinical significance in the region	Human Anatomy	Blood vessels of forearm and hand

	Describe the Ulnar Artery's Course, relation and termination in hand with its clinical significance in the region		
	Describe the formation, branches, and areas of distribution of Superficial and Deep Palmar Arch		
MS-A-027	Describe the course, relations and branches of Ulnar, Median and Radial Nerves in the Hand	Human Anatomy	Nerves of forearm and hand
MS-A-028	Describe the First Carpometacarpal Joint in terms of; Type, Variety, Articular Surfaces, Ligaments, Relations, Blood Supply, Innervation, movements.	Human Anatomy	Joints of Hands
	Demonstrate the movements of the 1st carpometacarpal joint		
	Describe the Metacarpophalangeal & interpharyngeal Joints in terms of; Type, Variety, Articular Surfaces, Ligaments, Relations, Blood Supply, Innervation & Movements		
MS-A-029	Palpate the arteries of the upper limb on a subject	Integrate with Medicine	Skills
	Identify the topographical features of upper limb in a cross-sectional model/ specimen.		
	Demonstrate and identify the anatomical landmarks of upper limb on radiographs/ CT (Computed tomography)/ MRI (Magnetic resonance imaging)	Integrate with Radiology	
	Mark the anatomical landmarks and surface marking on a subject/ simulated model	Human Anatomy	

LOWER LIMB			
CODE	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
MS-A-030	Draw and label the Parts of the hip bone, with its attachments.	Human Anatomy	Hip Bone
	Describe the parts, attachments of hip bone		
	Identify the parts and bony features of the hip bone, with its attachments, important relations		
	Demonstrate the side determination of hip bone, its bony features, attachments		
MS-A-031	Describe the parts, attachments, side determination of femur	Human Anatomy	Femur
	Identify the parts and bony features of the femur, with its attachments.		
	Demonstrate the side determination of femur, its bony features, attachments, and important relations (correlate these with fractures)		
	Describe coxa Vara and coxa valga and their clinical significance		
MS-A-032	Describe the extent, attachments, and modifications of Fascia Lata	Human Anatomy	Fascia Lata
	Demonstrate the attachment of fascia Lata, iliotibial tract		
MS-A-033	Describe the cutaneous nerves and vessels of thigh	Human Anatomy	Neurovascular Supply of thigh
	Draw and label the cutaneous nerve supply of thigh and lumbar plexus.		
	Describe the formation, course, relations, tributaries, and termination of the superficial veins		
	Explain the anatomical justification of venesection, varicose veins, and saphenous venous grafts		

	Describe the lymphatic drainage of the region with special emphasis on afferent and efferent of inguinal lymph nodes		
	Identify the superficial and deep lymph nodes		
	Explain the anatomical justification for enlargement of inguinal lymph nodes		
MS-A-034	Describe and identify the Boundaries and contents of femoral triangle	Human Anatomy	Femoral Triangle & Canal
	Draw and label the Boundaries and contents of femoral triangle		
	Identify the femoral sheath with its compartments		
	Describe the formation of femoral sheath and its significance		

	Describe the formation of femoral canal and its contents and significance		
	Describe the formation and significance of femoral ring		
	Compare and contrast the anatomical features of femoral and inguinal hernias	Integrate with Surgery	
MS-A-035	Tabulate the muscles of anterior compartment of thigh with their attachments, nerve supply and actions	Human Anatomy	Muscles of Anterior Compartment of Thigh
	Demonstrate and identify the muscles of anterior compartment of thigh with their proximal and distal attachments		
	Demonstrate the actions of muscles of anterior compartment of thigh		
	Explain the anatomical basis of psoas abscess	Integrate with Surgery	

MS-A-036	Identify and demonstrate the nerves and vessels of anterior compartment of thigh along with their branches	Human Anatomy	Neurovascular supply of Anterior Compartment of Thigh
	Describe the origin, course, relations, branches, distribution, and termination of femoral artery		
	Describe the origin, course, relations, tributaries, area of drainage and termination of femoral vein		
	Describe the origin, course, relations, branches, distribution, and termination of femoral nerve		
	Tabulate the muscles of anterior compartment of thigh with their attachments, nerve supply and actions.		
MS-A-037	Describe the formation, boundaries, contents of adductor canal	Human Anatomy	Adductor Canal
	Identify and demonstrate the boundaries and contents of adductor canal		
MS-A-038	Describe Muscles of medial compartment of thigh with their proximal and distal attachments, innervation and actions		

	Identify the muscles of medial compartment of thigh with their proximal and distal attachments		
	Demonstrate the actions of the muscles of the compartment on self/ subject		
MS-A-039	Describe the origin, course, relations, branches/ tributaries, distribution, and termination of neurovascular structures of medial compartment of thigh	Human Anatomy	Neurovascular supply of Medial Compartment of Thigh
	Identify the nerves and vessels of medial compartment of thigh along with their branches		
	Describe and identify the lumbar and sacral plexus and its branches supplying the lower limb		

	Describe the cutaneous nerve supply and lymphatics of the region		
MS-A-040	List the structures passing through the greater and lesser sciatic foramen.		Gluteal Region
	Describe the muscles of gluteal region with their proximal and distal attachments, innervation, and actions		
	Identify the muscles of gluteal region with their proximal and distal attachments		
	Describe the origin, course, relations, branches/ tributaries, distribution, and termination of neurovascular structures of gluteal region		
	Demonstrate the actions of the muscles of gluteal region		
	Explain the anatomical basis of the consequences of wrongly placed gluteal intramuscular injections Damage to Gluteus medius & minimus due to poliomyelitis	Integrate with Medicine	
	Demonstrate and identify the origin, course, relations, branches/tributaries and termination of nerves and vessels of gluteal region	Human Anatomy	
MS-A-041	Describe the Attachments of muscles of posterior compartment of thigh with the innervation and action	Human Anatomy	Muscles of Posterior

	Identify the muscles of posterior compartment of thigh with their proximal and distal attachments		Compartment of Thigh
	Demonstrate the actions of muscles of posterior compartment of thigh		
	Describe the anatomical basis of signs and symptoms of sciatica.	Integrate with Surgery	
MS-A-042	Describe the origin, course, relations, branches, distribution, and termination of Profunda femoris artery	Human Anatomy	Blood supply of Posterior compartment thigh

	Describe blood supply on back of thigh		
MS-A-043	Describe the origin, course, relations, branches, distribution, and termination of sciatic nerve	Human Anatomy	Sciatic Nerve
	Describe the anatomical basis, signs and symptoms of compression of or injury to sciatic nerve		
MS-A-044	Describe the hip joint with its type, articulations, ligaments, stabilizing factors	Integrate with Surgery	Hip Joint
	Movements, and neuro-vascular supply with clinical significance.		
	Perform the movements of hip joint at various angles and be able to describe the muscles producing the movement.  Discuss important associated clinical conditions (Hip dislocation, Arthritis, Hip joint stability and Trendelenburg sign) movements, and neurovascular supply with clinical significance.	Human Anatomy	
MS-A-045	Describe the Boundaries and contents of popliteal fossa. Discuss clinical correlates (Popliteal aneurysm, Palpation of Popliteal artery, semi membranous bursa swelling and Baker's cyst	Human Anatomy	Popliteal Fossa
	Draw and label boundaries and contents of popliteal fossa		
	Identify the boundaries and contents of popliteal fossa		

	Describe the origin, course, relations, branches/tributaries, distribution and termination of popliteal artery and vein		
MS-A-046	Describe parts of tibia and fibula, with their attachments, important relations and side determination	Human Anatomy	Knee Joint

	<p>Identify the parts and bony features of the tibia &amp; fibula, their bony features, attachments, important relations.</p>		
	<p>Draw and label Parts of patella with its attachments</p>		
	<p>Describe features of patella, and name the factor responsible for stabilizing Patella</p>		
	<p>Describe the knee joint with its type, articulations, ligaments, movements, and neuro-vascular supply</p>		
	<p>Explain the mechanism of locking and unlocking of knee joint with the foot on ground and off the ground</p>		
	<p>Describe the attachments and role of popliteus in locking and unlocking of the knee joint</p>		
	<p>Describe the factors responsible for stability of knee joint. Discuss important associated clinical conditions.</p>		
MS-A-047	<p>Describe the Muscles of anterior, lateral, and posterior compartments of leg with their proximal &amp; distal attachments, innervation, and actions</p>	Human Anatomy	Muscles of leg
	<p>Identify the muscles of anterior, lateral, and posterior compartments of leg with their proximal and distal attachments</p>		Neurovascular supply of Leg
MS-A-048	<p>Describe the origin, course, relations, branches/tributaries and termination of nerves and vessels of anterior, lateral, and posterior compartments of leg- Compartment Syndrome, Foot Drop</p>		Neurovascular supply of Leg
	<p>Describe the cutaneous nerves and veins of leg.</p>		
	<p>Draw and label the cutaneous nerve supply and dermatomes of leg</p>		
MS-A-049	<p>Identify the extensor, flexor, and peroneal retinacula and demonstrate the structures related to them</p>		Flexor,

	Describe the attachments, relations, and structures passing under cover of, extensor, peroneal, and flexor retinacula		Extensor, and peroneal Reticula
	Identify and demonstrate the nerves and vessels of anterior, lateral, and posterior compartments of leg along with their branches		
	Describe the formation of noncalcaneous (Achilles tendon)		
MS-A-050	Describe the articulations, muscles and nerve supply and movements at Tibiofibular joints	Human Anatomy	Tibio-fibular Joint
MS-A-051	Describe the ankle joint with its type, articulations, ligaments, movements, and nerve supply	Human Anatomy	Ankle Joint
	Describe the factors stabilizing the ankle joint. Discuss important associated clinical conditions.		
	Identify and demonstrate the articulating surfaces and ligaments of ankle joint		
MS-A-052	Describe the formation, attachments, and clinical significance of plantar aponeurosis	Human Anatomy	Plantar Fascia
	Explain the anatomical basis of the signs and symptoms of plantar fasciitis.	Integrate with Orthopedics	
MS-A-053	Identify the parts and bony features, attachments, and important relations of the articulated foot	Human Anatomy	Muscles of foot
	Describe the muscles of the dorsum and sole of foot with their proximal & distal attachments, innervation and actions emphasizing the role of interossei and lumbricals.		
	Draw and label the muscles of the layers of sole of foot		
	Demonstrate and identify the muscles and tendons with their proximal and distal attachments in the sole of foot		

MS-A-054	Describe the interphalangeal, subtalar and midtarsal joints with their types, articulation, movements, ligaments.	Human Anatomy	Small joints of foot
MS-A-055	Describe the formation, components, stabilizing and maintaining factors of the arches of foot	Integrate with Orthopedics	Arches of foot
	Describe the clinical significance of arches of foot with respect to flat foot, claw foot.		
MS-A-056	Describe the fibrous flexor sheaths, extensor expansions and synovial flexor sheaths	Human Anatomy	Retinacula of foot
MS-A-057	Describe the origin, course, relations, branches/tributaries, distribution, and termination of plantar vessels	Human Anatomy	Neurovascular supply of foot
	Identify the nerves and vessels on the foot along with their branches		
	Describe the cutaneous nerves of foot		
	Draw and label the cutaneous nerve supply and dermatomes of foot		
	Identify the nerves and vessels in the sole of foot along with their branches		
	Describe the palpation of dorsalis pedis artery & explain the clinical significance of dorsalis pedis artery		
MS-A-058	Describe the surface anatomy, course, relations, tributaries, and communications of the superficial veins of the lower limb	Human Anatomy	Arterial and Venous drainage of lower limb
	Draw a concept map of the superficial veins of lower limb		
	List the factors favoring venous return of the lower limb		
MS-A-059	Explain the anatomical basis of the formation,	Integrate with Surgery	Human Gait
	and signs and symptoms of deep venous thrombosis		

	Discuss Clinical correlations of Lower Limb Arteries (palpation of femoral, popliteal, posterior tibial &	Integrate with Medicine	
	dorsalis pedis arteries, collateral circulation, intermittent claudication, occlusive arterial disease)		
MS-A-060	Draw a concept map of the lymphatic drainage of lower limb	Human Anatomy	Lymphatic drainage of lower limb
MS-A-061	Draw and label the cutaneous nerves & dermatomes of the lower limb  Discuss clinical correlates of Lower limb nerves (Femoral nerve injury, Sciatic Nerve injury, Common fibular, tibial & obturator nerve injury)  Describe the anatomical basis of knee jerk, ankle jerk, and plantar reflex	Human Anatomy	Cutaneous dermatomes & nerve supply of lower limb
MS-A-062	Demonstrate the surface marking of nerves and vessels of lower limb	Human Anatomy	Topographical and radiological anatomy of lower limb
	Demonstrate the surface marking of bony landmarks of lower limb		
	Identify the topographical features of lower limb in a cross-sectional model		
	Demonstrate and identify the features of bones and joints of lower limb on radiograph/ CT scan/ MRI	Integrate with Radiology	

MS-A-063	<p>Describe the common fractures of the following bone with the risk factors, clinical presentations, and management:</p> <ol style="list-style-type: none"> <li>1. Clavicle</li> <li>2. Humerus</li> <li>3. Radius</li> <li>4. Ulna</li> <li>5. Small bones of hand</li> <li>6. Hip bone</li> <li>7. Femur</li> <li>8. Tibia</li> <li>9. Fibula</li> <li>1. Small bones of foot</li> </ol>	Orthopedics and trauma	Bone Fracture
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MS-A-064	<p>Describe the dislocations of the following joints with the risk factors and clinical presentations, and brief management:</p> <p>Shoulder joint</p> <ol style="list-style-type: none"> <li>1. Elbow joint</li> <li>2. Interphalangeal joint of hand</li> <li>3. Hip joint</li> <li>4. Knee joint</li> <li>1. Ankle joint</li> </ol>	Orthopedics and trauma	Joint Dislocation
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### EMBRYOLOGY & POST-NATAL DEVELOPMENT

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 06	
		DISCIPLINE	TOPIC
MS-A-065	Describe the development of skeletal muscle and innervation of axial skeletal Muscles-developmental basis of myotome	Human Embryology	Development of Muscles
	Briefly discuss the development of cardiac and smooth muscle (Detail to be covered in respective modules later).		

MS-A-066	Describe the process of limb development and limb growth	Human Embryology	Development of Limb
MS-A-067	Describe the embryological basis of cutaneous innervation of limb	Human Embryology	Development of Nerve supply of limbs
	Describe the embryological basis of blood supply of limbs and concept of axial artery		
MS-A-068	Describe the embryological basis of congenital anomalies related to muscular system.	Human Embryology	Congenital anomalies of limbs
	Describe the clinical presentations and embryological basis of; i. Amelia ii. Meromelia iii. Phocomelia	Integrate with Paediatrics	

	iv. Cleft Hand and Foot v. Polydactyly, Brachydactyly, Syndactyly i. Congenital club foot		
MS-A-069	Describe the developmental process of cartilage and bone	Human Embryology	Development of Cartilage
	Describe the process of histogenesis of cartilage and bone		

### MICROSCOPIC ANATOMY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 06	
		DISCIPLINE	TOPIC
MS-A-070	Describe the microscopic structure and ultramicroscopic structure of skeletal muscle	Histology	Histology of Muscles
	Explain the basis of myasthenia gravis.	Integrate with Medicine	

	Describe the microscopic and ultramicroscopic structure of cardiac muscle	Histology	
	Describe the microscopic and ultramicroscopic structure of smooth muscle		
	Compare and contrast the histological features of three types of muscle tissue		
MS-A-071	Describe Myosatellite Cells & their role in regeneration of muscle, hyperplasia, and hypertrophy of muscle fiber	Histology/ Integrate with Pathology	Functional Histology
	Explain the histopathological basis of leiomyoma	Histopathology	
MS-A-072	Describe the light and electron microscopic structure of bone cells Describe the light and electron microscopic structure of compact and spongy bone	Histology	Histology of Osseous tissue
	Describe the histological justification for osteoporosis, Osteopetrosis	Integrate with Pathology	
	Describe the histological basis for bone repair after fractures.		
MS-A-073	Compare and contrast the microscopic features of compact and spongy bone	Histology	Histology of Bone
	Explain the characteristic features of ossification (Intramembranous & Endochondral ossification)		
	Describe the zones seen in an epiphyseal growth plate		
MS-A-074	Describe the metabolic role of bone -	Integrate with Medicine	Functional Histology of Bone
	Describe the clinical presentation of osteoporosis, osteopenia	Integrate with Orthopedics	
MS-A-075	Describe the microscopic and ultramicroscopic structure of all types of cartilage	Histology	Histology of Cartilage

	Compare and contrast the structure of cartilage and bone matrix		
	Tabulate the differences between three types of cartilage		
MS-A-076	Describe the histological basis for bone & Cartilage growth and repair	Histology	Mechanism of Bone growth

### NORMAL FUNCTION

### MEDICAL PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 32	
		DISCIPLINE	TOPIC
MS-P-001	Explain the Physiological basis of membrane potential	Medical Physiology	Diffusion / Equilibrium Potentials
	Explain diffusion potentials of Na & K		
MS-P-002	Define Nernst potential		Nernst potential
	Explain Physiological Basis of Nernst potential		
	Write the Nernst equation.		
	Calculate Nernst potential for Na & K		
	Explain the effects of altering the concentration of Na <sup>+</sup> , K <sup>+</sup> , Ca on the equilibrium potential for that ion		
MS-P-003	Describe the normal distribution of Na <sup>+</sup> , K <sup>+</sup> , Ca and Cl <sup>-</sup> across the cell membrane	Goldman Equation	

	Explain physiological basis of Goldman equation		
	Clarify the role of Goldman equation in generation of Resting Membrane Potential (RMP).		
MS-P-004	Describe the Physiological basis of generation of RMP.		Resting Membrane Potential in Neurons
	Explain the effects of hyperkalemia and Hypokalemia on the Resting Membrane Potential (RMP)		

	Name the membrane stabilizers		
	Explain the physiological basis of action of Local Anesthetics.	Medical Physiology Integrate with Anesthesiology	
MS-P-005	Describe the Physiological anatomy of Neurons	Medical Physiology	Neurons
	Discuss the axonal transport		
	Enlist & give functions of Neuroglial cells		
	Explain process of myelination in Central Nervous System (CNS) & Peripheral Nervous System (PNS)		
MS-P-006	Classify neurons functionally.		Classification of Neurons & Fibers
	Classify nerve fibers according to Erlanger & Gasser Classification		
	Enlist properties of nerve fibers.		
MS-P-007	Discuss Components of ANS (Autonomic nervous system)	Autonomic nervous system	
	Explain the physiological anatomy of sympathetic and parasympathetic nervous system		
	Describe the types of adrenergic and cholinergic receptors and their functions		
	Explain the effects of sympathetic and parasympathetic on various organs/ system of body		
MS-P-008	Define Action Potential	Action Potential of Neurons	
	Enlist the properties of action potential		
	Describe the ionic basis of an action potential.		
	Explain the phases of action potential.		
	Explain the effects of hyperkalemia and Hypokalemia on the action potential.		
	Draw monophasic action potential.		
	Explain absolute and relative refractory period		
MS-P-009	Explain the role of other ions in action potential.		

	Elaborate the effect of hypocalcemia on neuron excitability.		Role of other ions in action potential
MS-P-010	Explain Physiological basis & properties of Graded potential		Local / Graded potentials
	Draw & explain Physiological basis & properties of compound action potential.		
	Contrast between action potential and graded potential		
	Describe the ionic basis of excitatory Post Synaptic Potential (EPSP), Inhibitory Post Synaptic Potential (IPSP), End Plate Potential (EPP).		
MS-P-011	Classify and explain Physiological basis of different types of synapses	Medical Physiology	Synapse
	Elaborate how signal transmission takes place across chemical synapse		
MS-P-012	Explain the mechanism of conduction of Nerve impulse in myelinated and unmyelinated nerve fibers.		Conduction of Nerve Impulse
	Elaborate significance of saltatory conduction		
MS-P-013	Enlist the types of nerve injury	Medical Physiology Integrate with Medicine	Nerve Degeneration
	Explain Wallerian degeneration.		
	Describe the process of regeneration of nerve fiber.		
	Describe the causes, features & pathophysiology of Multiple sclerosis, GB syndrome.		
MS-P-014	Discuss the physiological anatomy of skeletal muscles.	Medical Physiology	Skeletal muscle
	Discuss the physiological anatomy of skeletal, smooth, and cardiac muscles.		
	Describe the structure of Sarcomere		
MS-P-015	Differentiate between isometric and isotonic contraction by giving examples.		

	Compare the fast and slow muscle fibers.		Characteristics of whole muscle contraction
MS-P-016	Explain the mechanism of summation and Tetanization.	Medical Physiology	Mechanics of muscle contraction
	Describe staircase effect/Treppe phenomena		
	Discuss the mechanism of skeletal muscle fatigue.		
	Explain the remodeling of skeletal muscle to match the function. Describe the development of macro motor units in poliomyelitis.		
	Explain the physiological basis of rigor mortis	Medical Physiology Integrate with Forensic Medicine	
MS-P-017	Describe the physiological anatomy of Neuro Muscular Junction (NMJ)	Medical Physiology	Neuromuscular junction
	Mechanism of Neuromuscular transmission & generation of End Plate Potential		
	Explain features, pathophysiology & treatment of myasthenia Gravis	Medical Physiology Integrate with Medicine	
	Describe the enhancers or blockers of neuromuscular transmission at the neuromuscular junction.	Medical Physiology	
	Discuss the steps/ events of excitation contraction coupling in skeletal muscle.	Medical Physiology	
MS-P-018	Differentiate between types of smooth muscles.	Medical Physiology	Smooth Muscle
	Describe mechanism of smooth muscle contraction in comparison to skeletal muscle.		
	Explain the physiological anatomy of neuromuscular junction of smooth muscle		
	Explain the excitatory and inhibitory transmitters secreted at Neuro Muscular Junction (NMJ) of smooth muscles.		

	Explain the depolarization of multiunit smooth muscles without action potentials.		
	Explain the local tissue factors and hormones that can cause smooth muscle contraction without action potential.		
	Explain the regulation of smooth muscle contraction by calcium ions.		
	Explain membrane potential and action potentials in smooth muscles.		
	Explain the phenomena of stress relaxation and reverse stress relaxation in smooth muscles.		
	Explain the LATCH mechanism		
	Describe the significance of LATCH mechanism.		
	Explain the nervous and hormonal control of Smooth Muscle Contraction.		
<b>MEDICAL BIOCHEMISTRY</b>			
<b>CODE</b>	<b>SPECIFIC LEARNING OBJECTIVES</b>	<b>TOTAL HOURS = 30</b>	
		<b>DISCIPLINE</b>	<b>TOPIC</b>
MS-B-001	Classify carbohydrates along with the structure and biomedical importance of each class	Biochemistry	Classification carbohydrates
MS-B-002	Explain the isomerization of carbohydrates	Biochemistry	Carbohydrates
MS-B-003	Describe the physical and chemical properties of carbohydrates	Biochemistry	Extracellular matrix
	Differentiate between proteoglycan and glycoproteins		

	<p>Describe the components of extracellular matrix:</p> <ol style="list-style-type: none"> <li>1. Describe structure, functions and clinical significance of glycosaminoglycans</li> <li>2. Discuss structure and functions of Fibrous proteins (collagen and Elastin)</li> <li>3. Interpret diseases associated with them on basis of sign/symptoms and data</li> <li>4. Interpret the importance of vitamin C in collagen synthesis</li> <li>5. Describe sources, active form, functions and deficiency diseases of vitamin C</li> </ol>	Biochemistry	
	<ol style="list-style-type: none"> <li>1. Identify the defects in collagen synthesis based on given data (Osteogenesis Imperfecta)</li> </ol>		
	Interpret genetic basis of Duchene muscular dystrophy		
	Explain the transport and uptake of glucose in cells, steps of glycolysis and citric acid cycle along with enzymes, co enzymes and cofactors involved	Biochemistry	
MS-B-004	Discuss the provision of energy to the muscles and cells through glycolytic pathway and TCA cycle	Biochemistry	Glycolysis and Tricarboxylic acid cycle (TCA)
MS-B-005	<p>Describe the digestion and absorption of proteins</p> <p>Discuss the uptake of amino acids by cells</p> <p>Define amino acid pool and nitrogen balance.</p> <p>Explain ATP -dependent &amp; ATP independent systems of protein degradation.</p>	Biochemistry	Protein Digestion & Transport across cell

MS-B-006	<p>Explain following reactions with enzymes involved in it:</p> <ol style="list-style-type: none"> <li>1. Transamination</li> <li>2. Deamination decarboxylation</li> <li>3. Deamidation</li> <li>4. Trans deamination.</li> </ol> <ol style="list-style-type: none"> <li>1. Oxidative deamination.</li> </ol>	Biochemistry	Reactions involve in catabolism
MS-B-007	Explain the role of pyridoxal phosphate, glutamate, glutamine, alanine and discuss the mechanism of transport of ammonia to liver	Biochemistry	Transportation of ammonia to liver
MS-B-008	<p>Illustrate steps of urea cycle with enzymes and its importance</p> <p>Discuss ammonia intoxication</p>	Biochemistry	Urea cycle
MS-B-009	Interpret different types of hyperammonemia on basis of sign symptoms and data		
MS-B-010	Discuss the metabolism of aliphatic, aromatic, branched chain, sulfur containing, hydroxyl group containing amino acids with the products formed and enzymes and vitamins involved in them	Biochemistry	Protein metabolism

MS-B-011	<p>Interpret the following on basis of given data:</p> <ol style="list-style-type: none"> <li>1. Phenylketonuria</li> <li>2. Tyrosinemia</li> <li>3. Albinism</li> <li>4. Homocystinuria</li> <li>5. Maple syrup urine disease</li> </ol> <ol style="list-style-type: none"> <li>1. Alkaptonuria</li> </ol>	Biochemistry	Inborn errors of amino acid metabolism
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### PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

#### THEORY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 4+7=11	
		DISCIPLINE	TOPIC

MS-Ph-001	Explain the mechanism by which drugs can stimulate NMJ.	Pharmacology & Therapeutics	Drugs acting on Neuromuscular Junction (NMJ)
	Explain the mechanism by which drugs can block NMJ.		
MS-Ph-002	Discuss briefly the therapeutic effect of drugs used in myasthenia gravis.		
MS-Ph-003	Discuss briefly the therapeutic effect of drugs used as local anesthetics.	Local Anesthetics	
MS-Pa-001	Describe the hyperplasia, hypertrophy, and atrophy of muscle fiber	Pathology	Muscle remodeling
	Explain the histopathological basis of leiomyoma		
MS-Pa-002	Describe the histological basis of Duchenne Muscular Dystrophy.		Diseases of Muscle
MS-Pa-003	Describe the clinical presentation and histological justification for osteoporosis, osteopetrosis		Diseases of Bone
	Briefly enlist the steps of repair.		
MS-Pa-004	Describe the histological basis for bone repair after fracture and cartilage growth and repair	Disease of Cartilage	
<b>AGING</b>			
<b>THEORY</b>			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	

		DISCIPLINE	TOPIC
MS-Ag-01	Discuss the effect of age on bone fragility and its implications with management.	Geriatrics/ Medicine/ Biochemistry	Bone
MS-Ag-02	Discuss the effect of age on loss of cartilage resilience and its implications and management		Cartilage
MS-Ag-03	Discuss the effect of age on Muscular strength and its implications and management		Muscle

MS-Ag-04	Explain the protective effect of estrogen (female sex hormone) on bone mineral density and relate it to increased prevalence of postmenopausal fractures in women.		Effect of estrogen on BMD
<b>DISEASE PREVENTION AND IMPACT</b>			
CODE	COMMUNITY MEDICINE & BEHAVIORAL SCIENCE	TOTAL HOURS = 14+3=17	
	SPECIFIC LEARNING OUTCOMES	DISCIPLINE	TOPIC
MS-CM-001	Explain causes of low back pain		Back Pain
	Describe prevention of low back pain		
MS-CM-002	Describe work related musculoskeletal disorders addition with its burden/epidemiology	Community Medicine and Public Health	Work related Musculoskeletal disorders
	Identify risk factors of Musculoskeletal disorders MSD at workplace		
	Describe prevention of exposure to risk factors related to workplace		
MS-CM-003	Describe MSD related to mobile addition with its burden/epidemiology	Community Medicine and Public Health	MSD related to mobile usage
	Describe MSD related to mobile usage (Text neck, Trigger thumb, DeQuervain Syndrome, Carpel Tunnel Syndrome)		
	Identify risk factors related to MSD due to excessive mobile usage.		
	Describe the preventive strategies for mobile addiction-related MSD.		
MS-CM-004	Describe the application of ergonomics in MSD related to the above disorders.	Community Medicine and Public Health	Ergonomics
MS-CM-005	Describe the concept of non-communicable Musculoskeletal diseases	Community Medicine and Public Health	Noncommunicable disease

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



# Practicals

# PRACTICAL

## HISTOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 08	
		DISCIPLINE	TOPIC
MS-A-077	Draw and label the histology of skeletal muscle	Histology	Histology of Muscles
	Draw and label the histology of smooth muscle		
	Draw and label the histology of cardiac muscle		
MS-A-078	Draw and label the histological picture of compact bone	Histology	Histology of Bones
	Draw and label the histological picture of spongy bone		
MS-A-079	Draw and label the microscopic structure of hyaline cartilage	Histology	Histology of Cartilage
	Draw and label the microscopic structure of elastic cartilage		
	Draw and label the microscopic structure of fibro cartilage		

## PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=02	
		DISCIPLINE	TOPIC
MS-P-019	Demonstrate and categorize the following movements: Pushing against the wall, Biceps curls, squats, yoga chair pose, standing on toes, running on an inclined treadmill, yoga tree pose, deadlift as isotonic and isometric skeletal muscle contraction.	Physiology	Locomotion

MS-P-020	Interpret the graph of local/action potential/compound action potential from the recording of nerve fibers, & nerve trunk.	Physiology	Nerve Fibers
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MS-P-021	Interpret the graph of local/action potential from the recording of skeletal, & smooth muscles.	Physiology	Muscles
MS-P-022	Interpret the graph of frequency summation and tetanization	Physiology	

### BIOCHEMISTRY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=04	
		DISCIPLINE	TOPIC
MS-B-012	Estimate total proteins by kit method.	Biochemistry	Total proteins
MS-B-013	Estimate serum albumin level. Calculate serum globulin level.		Albumin/ globulin

### PHARMACOLOGY

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

PATHOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS=02	
		DISCIPLINE	TOPIC
MS-Pa-005	Identify the salient gross and microscopic features of Leiomyoma.	Pathology	Leiomyoma
MS-Pa-006	Identify the salient gross and microscopic features of steps of bone healing (Pictorial) with factors and complications affecting bone healing.		Bone healing

## Assessment Matrix

The Assessment Matrix demonstrates the alignment of assessment methods with the intended learning outcomes and teaching–learning strategies employed throughout the Musculoskeletal & Locomotion-I module. A combination of formative and summative assessment methods is utilized to evaluate students' knowledge, practical skills, professional attitudes, and competency development in accordance with PMDC standards and UHS assessment regulations.

Theme	Formative Assessment	Summative Assessment	Assessment Domain
<b>Pectoral Region &amp; Axilla</b>	MCQs, Practical Demonstration, Viva, Classroom Participation	Theory Paper, Practical Examination (OSPE)	Cognitive, Psychomotor
<b>Upper Limb</b>	MCQs, Practical Exercises, Tutorials, Viva	Theory Paper, OSPE, Practical Examination	Cognitive, Psychomotor
<b>Pelvic Girdle</b>	MCQs, Practical Assessment, Case Discussion	Theory Paper, Practical Examination	Cognitive, Psychomotor
<b>Lower Limb</b>	MCQs, Practical Assessment, Viva, Case-Based Discussion	Theory Paper, Practical Examination (OSPE)	Cognitive, Psychomotor, Affective

## Block Assessment Summary

Assessment Component	Method
<b>Formative Assessment</b>	MCQs, Tutorials, Practical Exercises, Viva Voce, Classroom Participation, Case-Based Discussions
<b>Summative Assessment</b>	Integrated Theory Examination (MCQs as per UHS regulations), Practical Examination (OSPE), Viva Voce (where applicable)
<b>Feedback Mechanism</b>	Immediate verbal feedback, written feedback, post-assessment review sessions, individual academic guidance
<b>Remediation</b>	Conducted in accordance with institutional assessment and UHS promotion policies

## Assessment Alignment

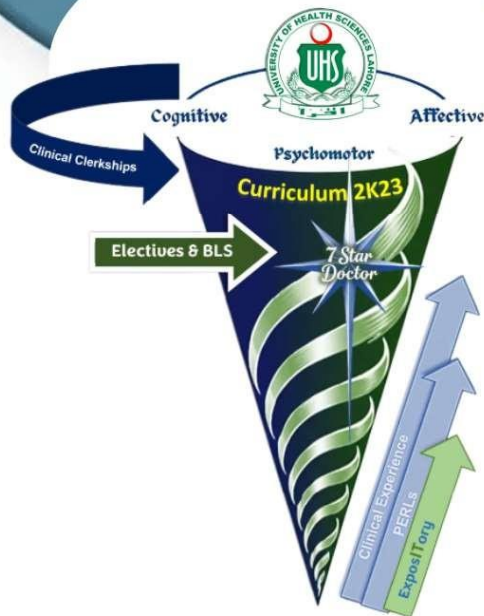
Assessment within the Musculoskeletal & Locomotion-I module is constructively aligned with the intended learning outcomes and instructional strategies. Both formative and summative assessments are designed to evaluate knowledge acquisition, practical competence, clinical application, communication skills, and professional behaviour. Practical examinations, OSPE, viva voce, and theory assessments collectively ensure comprehensive evaluation of cognitive, psychomotor, and affective learning domains while supporting competency-based medical education.



# Modular Integrated Curriculum 2K23

## MBBS Year-01

# BLOCK-3



**Modular Integrated  
Curriculum 2K23**  
*Volume-01*

**MODULE**

**04**

**CARDIOVASCULAR-I**



## MODULE RATIONALE

The Cardiovascular system comprises the study of the heart & circulatory system. The initial learning activities will help in understanding the normal structure & development of the organs of the system. Understanding of anatomical details of each component of Cardiovascular System (CVS) will be accompanied by study of normal physiological mechanisms. This will help in better understanding the possible pathological conditions of the system, including some of the most prevalent conditions in society like ischemic heart disease, hypertension, shock, heart block, heart failure. This will be followed by discussion on some important group of drugs used for treatment and/or prevention of these conditions (administration route, mechanism of action and side effects). The impact of cardiovascular diseases on society and the effect of ageing on cardiovascular system will be discussed.

## MODULE OUTCOMES

- Describe the normal structure of heart including development, topographical anatomy, neurovascular supply, and histology.
- Review the arrangement of circulatory system (arteries, veins, lymphatics).
- Define the congenital anomalies of cardiovascular system with reference to normal development and early circulation.
- Define functions of cardiac muscle along with its properties
- Interpret pressure changes during cardiac cycle along with regulation of cardiac pumping.
- Interpret normal & abnormal Electrocardiogram (ECG), ST-T changes, and its abnormalities.
- Identify the risk factors and role of lipids in coronary blockage and atherosclerosis (hyperlipidemia/ dyslipidemia).
- Define cardiac output and its modulating/controlling factors.
- Differentiate left and right sided heart failure and correlate it with the importance of pressure differences.
- Enumerate different types of arrhythmias and describe the electrical events that produce them.
- Discuss the psychosocial impact of cardiovascular diseases in society.

## THEMES

- Heart
- Circulation

## CLINICAL RELEVANCE

- Cardiac Failure
- Arrhythmias
- Atherosclerosis and Ischemic heart diseases
- Hypertension

- Shock
- Congenital Heart diseases
- Peripheral arterial diseases

#### IMPLEMENTATION TORs

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.
- The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

**BLOCK AT A GLANCE**

Item	Details
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional MBBS
<b>Block</b>	Block 3
<b>Module</b>	Cardiovascular–I (Module 04)
<b>Curriculum</b>	UHS Integrated MBBS Curriculum 2K23
<b>Educational Model</b>	Integrated Competency-Based Curriculum
<b>Duration</b>	As per UHS Academic Calendar
<b>Major Themes</b>	Heart, Circulation
<b>Integrated Disciplines</b>	Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Geriatrics
<b>Learning Domains</b>	Cognitive, Psychomotor, Affective
<b>Teaching–Learning Methods</b>	Interactive Lectures, Practical Sessions, Histology Practicals, Demonstrations, Small Group Discussions, Case-Based Learning (CBL), Self-Directed Learning (SDL), Clinical Correlation
<b>Assessment</b>	Formative Assessment, MCQs, Practical Examination, OSPE, Viva Voce, Continuous Assessment
<b>Clinical Correlation</b>	Cardiac Failure, Arrhythmias, Atherosclerosis, Ischemic Heart Disease, Hypertension, Shock, Congenital Heart Diseases, Peripheral Arterial Disease
<b>PMDC Competencies Addressed</b>	Medical Expert, Communicator, Collaborator, Leader, Professional, Scholar, Health Advocate

**CURRICULUM DASHBOARD**

Curriculum Indicator	Block 3 (Cardiovascular–I)
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional
<b>Module</b>	Cardiovascular–I
<b>Curriculum</b>	UHS Integrated Curriculum 2K23
<b>Major Themes</b>	2 (Heart, Circulation)
<b>Module Outcomes</b>	Understanding the normal structure, development and function of the cardiovascular system with clinical application
<b>Integrated Disciplines</b>	Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Geriatrics
<b>Teaching–Learning Methods</b>	Interactive Lectures, Practical Sessions, Histology Practicals, Demonstrations, CBL, SDL, Small Group Discussions
<b>Assessment Methods</b>	MCQs, Practical Examination, OSPE, Viva Voce, Continuous Assessment
<b>Learning Domains</b>	Cognitive, Psychomotor, Affective
<b>PMDC Competencies</b>	Medical Expert, Communicator, Collaborator, Leader, Professional, Scholar, Health Advocate
<b>Horizontal Integration</b>	Integration across Anatomy, Physiology, Histology, Embryology, Biochemistry, Pathology, Pharmacology, Community Medicine and Behavioral Sciences
<b>Vertical Integration</b>	Cardiology, Internal Medicine, Cardiothoracic Surgery, Pediatrics, Radiology, Emergency Medicine
<b>Clinical Correlation</b>	Hypertension, Heart Failure, Arrhythmias, Shock, Ischemic Heart Disease, Atherosclerosis, Congenital Heart Diseases
<b>Quality Assurance</b>	Continuous assessment, structured feedback, curriculum review, DME monitoring, PMDC and UHS guidelines

## Theme-wise Curriculum Mapping Matrix

The Theme-wise Curriculum Mapping Matrix demonstrates the integration of basic and clinical sciences within the Cardiovascular-I module. It aligns each theme with the module learning outcomes, integrated disciplines, teaching–learning strategies, assessment methods, PMDC competencies, and horizontal and vertical integration, ensuring constructive alignment throughout the module.

Theme	Module Learning Outcomes	Integrated Disciplines	Teaching & Learning Methods	Assessment Methods	PMDC Competencies	Horizontal Integration	Vertical Integration
<b>Heart</b>	Describe the normal anatomy, embryological development, histology and physiology of the heart, cardiac cycle, conduction system and ECG. Correlate normal structure and function with common cardiovascular diseases.	Anatomy, Embryology, Histology, Physiology, Pathology, Pharmacology	Interactive lectures, practical sessions, demonstrations, histology practicals, CBL, SDL	MCQs, Practical Examination, OSPE, Viva	Medical Expert, Scholar	Anatomy + Embryology + Histology + Physiology + Pathology	Cardiology, Internal Medicine, Cardiothoracic Surgery, Pediatrics
<b>Circulation</b>	Explain systemic and pulmonary circulation, regulation of blood pressure, cardiac output, coronary circulation, shock, lipid metabolism and prevention of cardiovascular diseases with relevant clinical applications.	Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Geriatrics	Interactive lectures, practical sessions, tutorials, CBL, SDL, demonstrations	MCQs, Practical Assessment, OSPE	Medical Expert, Scholar, Health Advocate	Physiology + Biochemistry + Pathology + Pharmacology + Community Medicine	Cardiology, Internal Medicine, Emergency Medicine, Public Health

### Theme Summary

Theme	Educational Focus
<b>Heart</b>	Gross anatomy, embryology, histology, physiology, cardiac cycle, ECG, conduction system and congenital heart diseases
<b>Circulation</b>	Blood flow, blood pressure regulation, cardiac output, coronary circulation, shock, hypertension, lipid metabolism and cardiovascular disease prevention

### Theme Integration:

The Cardiovascular-I module adopts a system-based integrated approach in which the Heart and Circulation themes are taught through coordinated contributions from Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences and Geriatrics. This integration enables students to develop a comprehensive understanding of normal cardiovascular structure and function while relating these concepts to common cardiovascular disorders, their prevention, diagnosis and management.

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## Weekly Curriculum Map

The Weekly Curriculum Map outlines the logical sequence of learning activities throughout the Cardiovascular-I module. It demonstrates the progressive integration of basic medical sciences with clinical relevance, ensuring the achievement of the intended module learning outcomes through a competency-based educational approach.

Week	Major Theme	Integrated Disciplines	Teaching–Learning Methods	Assessment
<b>Week 1</b>	Heart – Gross Anatomy & Embryology	Anatomy, Embryology	Interactive lectures, demonstrations, practical sessions, SDL	Formative MCQs, Practical
<b>Week 2</b>	Heart – Histology & Physiology	Histology, Physiology	Interactive lectures, histology practicals, CBL, SDL	MCQs, Practical Assessment
<b>Week 3</b>	Cardiac Cycle, Conducting System & ECG	Physiology, Anatomy	Interactive lectures, ECG practicals, demonstrations	MCQs
<b>Week 4</b>	Circulation & Blood Pressure Regulation	Physiology, Biochemistry	Interactive lectures, practical sessions, CBL	MCQs, OSPE
<b>Week 5</b>	Coronary Circulation, Lipid Metabolism & Atherosclerosis	Physiology, Biochemistry, Pathology	Interactive lectures, tutorials, case discussions	Practical Assessment, Viva
<b>Week 6</b>	Heart Failure, Arrhythmias, Shock & Pharmacotherapy	Pathology, Pharmacology, Medicine	Interactive lectures, CBL, demonstrations, SDL	MCQs, Practical
<b>Week 7</b>	Prevention of Cardiovascular Diseases & Community Integration	Community Medicine, Behavioral Sciences, Geriatrics	Small-group discussions, seminars, SDL	Formative Assessment
<b>Week 8</b>	Integrated Revision & Block Assessment	All Integrated Disciplines	Integrated revision sessions, practical revision, feedback	Block Examination (Theory & Practical)

## Weekly Progression

The Cardiovascular-I module follows a system-based integrated approach, beginning with the normal structure and development of the heart, progressing to cardiac physiology and circulation, and culminating in the study of common cardiovascular disorders, their prevention, and pharmacological management. Learning is reinforced through practical sessions, case-based discussions, clinical correlations, and integrated assessments, enabling students to connect foundational sciences with early clinical practice.

## PMDC Competency Mapping

The PMDC Competency Mapping Matrix demonstrates the alignment of the Cardiovascular-I module with the PMDC Undergraduate Medical Education Competency Framework. Through an integrated systems-based approach, the module develops students' knowledge of cardiovascular structure and function, clinical reasoning, professionalism, communication, leadership, and preventive healthcare, preparing them for subsequent clinical training.

Theme	Medical Expert	Communicator	Collaborator	Leader	Professional	Scholar	Health Advocate
Heart	✓	✓	✓		✓	✓	
Circulation	✓	✓	✓	✓	✓	✓	✓

## Competency Integration summary

PMDC Competency	Contribution within the Module
Medical Expert	Develops comprehensive knowledge of cardiovascular anatomy, embryology, histology, physiology, pathology and pharmacology, with emphasis on clinical application.
Communicator	Promotes effective communication through case discussions, practical demonstrations, ECG interpretation and small-group learning.
Collaborator	Develops teamwork and collaborative learning during laboratory work, practical sessions and integrated learning activities.
Leader	Encourages responsibility, ethical decision-making and leadership during collaborative learning and community-based activities.
Professional	Reinforces professionalism, ethical conduct, patient safety, respect and accountability throughout teaching and assessment activities.
Scholar	Promotes self-directed learning, critical thinking, evidence-based medicine and lifelong learning through integrated educational strategies.
Health Advocate	Develops awareness of cardiovascular disease prevention, risk factor modification, health promotion and community-based interventions.

## Competency Alignment

The Cardiovascular-I module primarily develops the Medical Expert competency by providing a comprehensive understanding of the normal structure and function of the cardiovascular system and correlating these with common cardiovascular disorders. Through integration with Community Medicine, Behavioural Sciences and Pharmacology, students also develop competencies in communication, teamwork, professionalism, leadership, scholarship and health advocacy, particularly in the prevention and control of cardiovascular diseases.

## Teaching–Learning Matrix

The Teaching–Learning Matrix outlines the instructional strategies employed throughout the Cardiovascular-I module to facilitate the achievement of the intended learning outcomes. The module adopts an integrated, learner-centred approach that combines foundational biomedical sciences with clinical application through a variety of active learning strategies, consistent with competency-based medical education.

Theme	Interactive Lectures	Practical / Laboratory	Demonstration	Small Group Discussion (SGD)	Case-Based Learning (CBL)	Self-Directed Learning (SDL)	Early Clinical Exposure / Clinical Correlation
Heart	✓	✓	✓	✓	✓	✓	✓
Circulation	✓	✓	✓	✓	✓	✓	✓

### Teaching–Learning Strategy Summary

The Cardiovascular-I module utilizes a variety of student-centred instructional methods to facilitate deep learning and competency development. Interactive lectures provide the conceptual framework, while practical sessions, demonstrations, and histology laboratories reinforce anatomical and physiological understanding. Small-group discussions and case-based learning promote critical thinking and clinical reasoning, whereas self-directed learning encourages independent study and lifelong learning. Continuous clinical correlation enables students to relate normal cardiovascular structure and function to common cardiovascular disorders encountered in clinical practice.

### Educational Highlights

- **Integrated teaching** across Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine and Behavioral Sciences.
- **Practical sessions** in anatomy, histology, physiology and biochemistry to reinforce theoretical concepts.
- **ECG recording and interpretation**, blood pressure measurement, pulse examination and cardiac auscultation to develop essential clinical skills.
- **Case-based learning** to integrate basic sciences with common cardiovascular diseases such as hypertension, heart failure, arrhythmias and ischemic heart disease.
- **Self-directed learning** to strengthen critical appraisal, independent learning and lifelong learning habits.
- **Early clinical correlation** through discussion of congenital heart diseases, shock, atherosclerosis, myocardial infarction and preventive cardiology.



The image features a stack of several books, with the top one being an open book showing its pages. A blue oval with a white border is superimposed over the books, containing the word "Theory" in a bold, dark blue font. The background is a blurred image of a library or bookstore with bookshelves filled with books.

# Theory

NORMAL STRUCTURE			
GROSS ANATOMY			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CV-A-001	Define mediastinum giving its boundaries and compartments. List the contents of its various compartments.	Human Anatomy	Mediastinum
	Describe the formation, tributaries, and termination of superior vena cava		
	Describe the formation, branches, and relations of ascending aorta, aortic arch and descending thoracic aorta.		
	Discuss the distribution of ascending aorta, aortic arch and descending thoracic aorta in reference to their branches		
	Describe formation, course and tributaries of azygous, hemizygous and accessory hemizygous veins.		
	Describe the course, relations, and distribution of vagus and thoracic splanchnic nerves in relation to nerve supply of heart.		
CV-A-002	Describe Pericardium and its parts with emphasis on their nerve supply.	Human Anatomy	Pericardium
	Describe the pericardial cavity mentioning transverse and oblique sinuses. Discuss their clinical significance		
	Describe the anatomical correlates of various pericardial conditions like pericardial rub, pericardial pain, pericarditis, pericardial effusion, and cardiac tamponade.	Integrate with Medicine	
	Describe the anatomical basis for Paracentesis /pericardiocentesis.		

CV-A-003	Describe the external features of heart.	Human Anatomy	Heart
	List various chambers of heart mentioning their salient features and openings.		

Describe the arterial supply of heart: coronary arteries and their distribution with special emphasis on collaterals established during ischemia.		
Describe the sites of anastomosis between right and left coronary arteries with the participating vessels.		
Discuss the anatomical correlates of cardiac arterial supply	Integrate with cardiology/ Medicine	
Describe the anatomical correlates of electrocardiography, cardiac referred pain.	Integrate with Cardiology/ Medicine	
Describe the anatomical basis for angioplasty, and coronary grafts.		
Describe the features of angina pectoris and myocardial infarction and correlate them anatomically	Human Anatomy	
Describe the venous drainage of heart.		
Describe the alternative venous routes to the heart		
Identify the vessels supplying the heart with their origins/terminations.		
Describe the formation, relations, and distribution of cardiac plexus.		
Describe components and significance of fibrous skeleton of heart		
Describe the cardiac valves		
Explain the anatomical basis for valvular heart diseases	Integrate with Cardiology/ Medicine	
Perform surface marking of various anatomical landmarks of heart and great vessels	Human Anatomy	
Perform percussion and auscultation of heart	Integrate with Medicine	
Identify the salient features of heart and great vessels on Computed tomography/ Magnetic Resonance Imaging CT/ MRI	Integrate with Radiology	

EMBRYOLOGY & POST-NATAL DEVELOPMENT			
CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 14	
		DISCIPLINE	TOPIC
CV-A-004	Describe the early development of heart and blood vessels	Human Embryology	Introduction
	Describe the development of pericardial cavity	Human Embryology	
CV-A-005	Define parts of primitive heart tube and give its folding	Human Embryology	Development of Heart
	Describe the development of various chambers of heart with emphasis on their partitioning		
	Identify various parts of developing heart tube and structures derived from them during embryonic and fetal life (Models and specimens)		
CV-A-006	Describe the embryological basis of dextrocardia and ectopia cordis	Human Embryology	Development of Heart and Development of Lymphatic System
	Describe the partitioning of primordial heart: atrioventricular canal and atrium		
	Describe the development of sinus venosus		
	List clinically significant types of atrial septal defects along with their embryological basis and features.	Integrate with Pediatrics	
	Describe probe patent foramen ovale		
	Describe the partitioning of truncus arteriosus and bulbus cordis	Human Embryology	
	Describe the formation of ventricles and interventricular septum		
	Describe the clinical features and embryological basis of ventricular septal defects	Integrate with Pediatrics	
Describe the development of cardiac valves and conducting system.	Human Embryology		

	Describe the development of lymphatic system	Human Embryology	
CV-A-007	Describe the embryological correlates and clinical presentation of developmental defects of heart:	Integrate with Pediatrics	
	Tetralogy of Fallot, Patent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis, Coarctation of aorta		Development of Arteries
	Describe the formation and fate of pharyngeal arch arteries	Human Embryology	
	Describe the anomalies of great arteries emerging from heart: Coarctation of aorta, anomalous arteries	Integrate with Cardiology/ Medicine	
CV-A-008	Describe the development of embryonic veins associated with developing heart: Vitelline veins, Umbilical Veins and Common cardinal vein and their fate	Human Embryology	Development of Veins
	Describe the formation of superior & inferior vena cava and portal vein with their congenital anomalies		
	With the help of diagrams illustrate the development of superior vena cava, inferior vena cava and portal vein		
CV-A-009	List the derivatives of fetal vessels and structures: Umbilical vein, ductus venosus, umbilical artery, foramen ovale, ductus arteriosus	Human Embryology	Fetal Vessels & Circulation
	Describe Fetal and neonatal circulation mentioning transitional neonatal circulation with its clinical implication	Integrate with Pediatrics/ Obgyn	
CV-A-010	List clinically significant types of atrial septal defects along with their embryological basis and features. Describe patent foramen ovale.	Pediatrics	Congenital Heart defects

Describe the embryological correlates and clinical presentation of developmental defects of heart: Tetralogy of Fallot, Persistent ductus arteriosus, Unequal division of arterial trunks, Transposition of great vessels and Valvular stenosis		
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MICROSCOPIC ANATOMY (HISTOLOGY & PATHOLOGY)			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 04	
		DISCIPLINE	TOPIC
CV-A-011	Describe microscopic structure of Heart wall (Endocardium, Myocardium, Epicardium) Describe histology of Cardiac skeleton, SA (sinoatrial) node, AV (atrioventricular) node, Purkinje fibers.	Histology	Heart & Cardiac Muscle
	Describe the microscopic and ultramicroscopic structure of cardiac muscle emphasizing on Tubules, sarcoplasmic reticulum and intercalated discs. Identify, draw and label histological structure of cardiac muscle		
CV-A-012	Describe general histological organization of blood vessels: Tunica intima, media and adventitia.	Histology	Blood Vessels Organization
	Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids		
CV-A-013	Describe histological features of arteries: Muscular arteries, elastic arteries, Arterioles	Histology	Arteries
CV-A-014	Describe histological features of veins and exchange vessels: large veins, medium sized veins, venules, Capillaries, and sinusoids	Histology	Veins
	Compare and contrast the light microscopic structure of arteries and veins		

CV-A-015	Describe the histopathological basis of thrombus and embolus formation.	Integrate with Pathology	Thrombus/ Embolus formation
CV-A-016	Explain the histological basis of arteriosclerosis and atherosclerosis. Describe role of arterioles in hypertension	Histology	Arteriosclerosis atherosclerosis Hypertension
CV-A-017	Describe histological features of Lymph vascular system (Lymph capillaries, Lymph vessels & Lymphatic duct)		Lymph vascular System

## NORMAL FUNCTION

## MEDICAL PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 68	
		DISCIPLINE	TOPIC
CV-P-001	Explain the physiological anatomy of cardiac muscle.	Physiology	Cardiac Muscle
	Explain the functional importance of intercalated discs.		
	Discuss the properties of cardiac muscles.		
	Describe and draw the phases of action potential of ventricle.		
	Describe and draw the phases of action potential of SA node along with explanation of the mechanism of selfexcitation/ Auto rhythmicity of SA node.		
	Define and give the duration of the Absolute and relative refractory period in cardiac muscle.		
	Describe the mechanism of excitation-contraction coupling and relaxation in cardiac muscle.		
	Draw & explain pressure & volume changes of left ventricle during cardiac cycle.		
Explain & draw relationship of ECG (Electrocardiography) with cardiac cycle.			

	Explain & draw the relationship of heart sounds with cardiac cycle.		
	Enlist, draw, and explain the physiological basis of atrial pressure waves in relation to cardiac cycle.		
	Define & give the normal values of the cardiac output, stroke volume, end diastolic volume & end systolic volume	Integrate with Medicine	
CV-P-002	Describe the Frank Starling mechanism.	Physiology	Regulation of heart pumping
	Describe the autonomic regulation of heart pumping.		
	Describe the effect of potassium, calcium ions & temperature on heart function.		
	Define chronotropic effect- positive and negative.		
	Define the inotropic effect: positive and negative.		
	Define dromotropic effect: positive and negative		
	Describe the location of adrenergic & cholinergic receptors in heart.		
	Name the receptors present in coronary arterioles.		
	Explain sympathetic & parasympathetic effects on heart rate & conduction velocity		
CV-P-003	Draw and explain the conducting system of heart	Physiology	Conducting system of heart
	Describe the physiological basis and significance of AV nodal delay.		
CV-P-004	Explain the ectopic pacemaker	Integrate with Cardiology/Medicine	Fundamentals of ECG
	Enlist, draw, and explain the physiological basis & give durations of waves, intervals, and segments of normal ECG.	Physiology	
	Describe the standard limb leads, Augmented limb leads & precordial leads.		
	Define Einthoven's Triangle & Einthoven's law.		

	Explain the physiological basis of upright T wave in normal ECG.		
	Describe the location and significance of J point in ECG.		
	Explain the physiological basis of current of injury.		
	Enlist the ECG changes in angina pectoris.	Integrate with Medicine	
	Enlist the ECG changes in myocardial infarction.		
	Plot the mean cardiac axis.	Physiology	
	Enlist the physiological & pathological causes of right axis deviation of heart.		
	Enlist the physiological & pathological causes of left axis deviation of heart		
	Describe the abnormalities of T wave and their causes	Integrate with Medicine	
CV-P- 005	Describe the effect of hypokalemia and hyperkalemia on ECG		

	Describe the effect of hypocalcemia and hypercalcemia on ECG.	Integrate with Biochemistry	Effect of electrolyte on ECG
CV-P- 006	Define tachycardia and enlist its causes.	Integrate with Medicine	Cardiac arrhythmia
	Define bradycardia and enlist its causes.		
	Classify arrhythmias	Physiology	
	Explain the physiological basis of sinus arrhythmia.		
	Explain the physiological basis of reflex bradycardia in Athletes.		
	Explain the carotid sinus syndrome.		
	Enlist the causes of atrioventricular block.	Integrate with Cardiology/ Medicine	
	Explain the types of atrioventricular blocks.		
	Explain the ECG changes in 1 <sup>st</sup> , 2 <sup>nd</sup> & 3 <sup>rd</sup> degree heart block.		
Explain the cause, physiological basis & ECG changes in Stokes Adam syndrome/ventricular escape.	Physiology		

	Enlist the causes of premature contractions.	Integrate with Cardiology/ Medicine	
	Explain the causes and ECG changes of premature atrial contractions.		
	Explain the physiological basis of pulses deficit.	Physiology	
	Explain the causes and ECG changes in Premature Ventricular Contraction (PVC)	Integrate with Cardiology/ Medicine	
	Enlist the causes and ECG findings in Long QT syndrome.		
	Explain the causes, physiological basis, features, ECG changes & management of premature heartbeat.		
	Explain the causes, physiological basis, features, ECG changes & management of atrial fibrillation.		
	Explain the causes, physiological basis, features & ECG changes of ventricular fibrillation.		
	Explain the physiological basis, features & ECG changes of atrial flutter.	Physiology	
	Compare Flutter and Fibrillations	Physiology	

CV-P-007	Explain the functional parts of circulation (arteries, arterioles, capillaries, veins, venules).	Physiology	Organization of Circulation
CV-P-008	Explain the pressures in systemic & pulmonary circulation.	Physiology	Blood flow
	Explain the types of Blood flow and significance of Reynolds number.		
CV-P-009	Describe local control of blood flow according to tissue needs.	Physiology	Local & Humoral Control of Blood flow
	Discuss humoral control of local blood flow.		
	Explain long term control of local blood flow.		
	Describe vascular control by ions and other chemical factors.		

	Name the organs in which auto regulation of blood flow occurs during changes in arterial pressure (metabolic & myogenic mechanisms).		
CV-P-010	Explain the role of autonomic nervous system for regulating the circulation.	Physiology	Nervous Regulation of circulation
	Explain the vasomotor center.		
	Explain the control of vasomotor center by higher nervous centers.		
	Explain emotional fainting/vasovagal syncope.		
	Identify vessels constituting micro-capillaries. Enumerate hydrostatic and osmotic factors that underlie Starling's hypothesis for capillary function.		
CV-P-011	Explain the role of nervous system in rapid control of arterial blood pressure.	Physiology	Rapid control of arterial blood pressure
	Explain the regulation of arterial blood pressure during exercise.		
	Enlist different mechanisms for short term regulation of arterial blood pressure.		
	Explain the role of baroreceptors in regulation of arterial blood pressure.		
	Explain the role of chemoreceptors in regulation of arterial blood pressure.		
	Make a flow chart to discuss the role of Atrial volume reflexes/ Bainbridge reflex in control of blood pressure.		
	Make a flow chart to show the reflex responses to increased blood volume which increase blood pressure and atrial stretch.		
	Describe the role of CNS ischemic response in regulation of the blood pressure.		
	Explain the Cushing reflex		

	Explain the role of abdominal compression reflex to increase the arterial blood pressure.		
CV-P-012	Make a flow chart to discuss the role of renin angiotensin system for long term control of blood pressure.	Physiology	Role of kidneys in long term Regulation of Arterial Blood Pressure
	Make a flow chart to show the regulation of blood pressure in response to increase in ECF (Extra Cellular Fluid) volume.		
	Make a flow chart to show the regulation of blood pressure in response to increase in salt intake.		
CV-P-013	Define cardiac output, cardiac index & venous return with their normal values.	Integrate with Cardiology/ Medicine	Cardiac output
	Discuss the factors regulating cardiac output		
	Discuss factors regulating venous return	Physiology	
CV-P-014	Explain the regulation of skeletal muscle blood flow at rest & during exercise.	Physiology	Skeletal muscle Circulation
CV-P-015	Explain the physiological anatomy of coronary circulation.	Physiology	Coronary circulation
	Explain the regulation of coronary blood flow.		
	Explain the physiological basis of angina, myocardial & subendocardial infarction		
CV-P-016	Define & enlist different types of shock.	Physiology	Circulatory shock
	Explain the causes, features, and pathophysiology of hypovolemic/hemorrhagic shock.		
	Explain the causes, features, and pathophysiology of septic shock.	Integrate with Pathology	
	Explain the causes, features, and pathophysiology of neurogenic shock.		

	Explain the causes, features, and pathophysiology of anaphylactic shock.		
	Discuss the treatment of different types of shock.	Integrate with Medicine	
	Explain the different stages of shock.	Physiology	
	Explain the mechanisms that maintain the cardiac output & arterial blood pressure in non-progressive shock.		
	Enlist different types of positive feedback mechanisms that can lead to the progression of shock.		
CV-P-017	Enlist the different types of heart sounds and explain the physiological basis of each.	Physiology	Heart sounds
	Enlist the causes of 3 <sup>rd</sup> and 4 <sup>th</sup> heart sounds.		
	Explain the causes & physiological basis of murmurs caused by valvular lesions.		
	Enumerate abnormal heart sounds and describe the physiological basis of each.	Integrate with Medicine	

### MEDICAL BIOCHEMISTRY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 21	
		DISCIPLINE	TOPIC
CV-B-001	Classify lipids	Biochemistry	Classification of lipids
CV-B-002	Discuss the biomedical functions & properties of lipids	Biochemistry	Functions of lipids & Properties of lipids
CV-B-003	Classify fatty acids. Discuss the role of trans saturated, saturated, poly- and mono-unsaturated fatty acids in diet on lipid profile.	Biochemistry	Classification of fatty acids &
CV-B-004	Discuss lipid peroxidation and its significance	Biochemistry	Lipid peroxidation

CV-B-005	Explain the biochemical and therapeutic roles of eicosanoids (prostaglandins, leukotrienes, thromboxane, and prostacyclin)	Biochemistry	Eicosanoids
CV-B-006	Discuss Lipoprotein metabolism	Biochemistry	Lipoprotein metabolism
	Discuss role of oxidized LDL in atherosclerosis	Biochemistry	
CV-B-007	Discuss the signs and symptoms of hyperlipidemia	Biochemistry	Type I to V hyperlipidemias
	Interpret data related to hyperlipidemia		
CV-B-008	Discuss the sources, biomedical importance, active states, deficiency and excess of fat-soluble vitamins (excluding Vitamin K).	Biochemistry	Fat soluble vitamins
CV-B-009	Discuss the sources, biomedical importance, active states, deficiency and excess of water-soluble vitamins (excluding B6, B9 & B12 and Vitamin C).	Biochemistry	Water soluble vitamins
CV-B-010	Discuss the sources, biomedical importance, active states, deficiency and excess of minerals and trace elements especially zinc, Mg, Na, K, I, Ca, P, Se, S, Cu and Cl.	Biochemistry	Minerals and trace elements

AGING			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 05	
		DISCIPLINE	TOPIC
CV-Ag-001	Discuss the effect of age on blood vessels with reference to hypertension	Physiology/ Geriatrics/ Medicine	Hypertension
CV-Ag-002	Discuss the risk of cardiac attack in old age and weather conditions		Cardiac Attack
CV-Ag-003	Discuss the effect of age on valvular system of the heart.		Valvular diseases

CV-Ag-004	Discuss the effect of age on neural conduction of the heart in relation to arrhythmia.		Arrhythmia
CV-Ag-005	Discuss the protective role of female hormone against CVS diseases in women of reproductive age group	Physiology/ Obstetrics and Gynecology	Role of female hormone on CVS disease

### PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 14	
		DISCIPLINE	TOPIC
CV-Pa-001	Define Inflammation Enumerate cardinal signs of acute inflammation Enlist types of Inflammation	Pathology	Inflammation
	Enumerate causes & outcomes of inflammation Differentiate acute & chronic inflammation		
	Describe general concept of vascular & cellular events of acute inflammation Enumerate chemical mediators of inflammation along with their principal functions		
CV-Pa-002	Classify types of thrombosis, embolism, and infarction Discuss the pathophysiology of thrombosis, embolism, and infarction	Pathology/ Pathology/	Atherosclerosis
	Identify the types and causes of hypertension		
CV-Pa-003	Discuss the clinical consequences of hypertension and atherosclerosis	Integrate with medicine	Hypertension
CV-Pa-004	Discuss the pathophysiology of shock		Shock
CV-Pa-005	Classify the types of heart failure		Cardiac Failure
	Identify the causes leading to heart failure		

CV-Pa-006	Identify the types of ischemic heart disease		Ischemic Heart Disease
	Discuss the pathophysiology of different types of ischemic heart disease		
CV-Pa-007	Explain the pathological causes of high & low cardiac output.		Cardiac Output
CV-Ph-001	Classify antihypertensive drugs.	Pharmacology	Anti-hypertensive drugs
CV-Ph-002	Classify antianginal drugs.		Antianginal drugs
CV-Ph-003	Classify antiarrhythmic drugs.		Antiarrhythmic drugs
CV-Ph-004	Classify drugs used in cardiac failure.		Drugs for cardiac failure
<b>DISEASE PREVENTION AND IMPACT</b>			
CODE	COMMUNITY MEDICINE & BEHAVIORAL SCIENCE	TOTAL HOURS = 11+2=13	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
CV-CM-001	Describe the various strategies and models to prevent diseases.	Community Medicine and Public Health	Disease Prevention Models
CV-CM-002	Describe primordial prevention and its application to preventing CVS diseases.		Primordial Prevention
	Depict the concept of primary prevention in context to CVS and able to apply on CVS diseases.		
CV-CM-003	Discuss the basic concept of health promotion and its application to CVS.		Health Promotion
CV-CM-004	Discuss various methods of behavioural change interventions at community level.		Behavioural Change Intervention
CV-CM-005	To apply secondary and tertiary preventions on CVS diseases (coronary heart disease, ischemic heart disease, hypertension)		Secondary & Tertiary Prevention
CV-CM-006	Describe the concept of cardiovascular diseases as non-communicable diseases	Noncommunicable disease	

CV-CM-007	Identify the risk factors in the community for CVS diseases.  Learn and apply interventions to prevent the risk factors in community.		Risk factor assessment of CVS diseases
CV-BhS-001	Identify and deal with the various psychosocial aspects of Cardiovascular conditions (such as Hypertension, Coronary artery disease, Heart failure, Arrhythmias, and other cardiovascular conditions) on Individual, Family and Society.	Behavioral Sciences	Personal, Psychosocial and vocational issues
CV-BhS-002	Psychological basis of emotional fainting & its impact		Emotional fainting



# Practicals

# PRACTICAL

## HISTOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 03	
		DISCIPLINE	TOPIC
CV-A-018	Identify, draw and label histological structure of cardiac muscle	Histology	Histological features of Cardiac Muscle
CV-A-019	Identify, draw and label histological sections of elastic artery, muscular artery, arterioles, vein, capillaries and sinusoids	Histology	Histological features of Blood Vessels

## PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CV-P-018	Record an electrocardiogram (ECG) by correct lead placement and connections. Perform auscultation of the chest to recognize normal heart sounds.	Physiology	ECG & Heart Sounds
CV-P-019	Determine the effect of posture and exercise on blood pressure by auscultatory method.		Blood Pressure
CV-P-020	Measure the blood pressure of the subject by palpatory and auscultatory methods.		Blood Pressure
CV-P-021	Examine arterial pulse to recognize normal characteristics of pulse.		Arterial Pulse
CV-P-022	Examine neck veins to determine Jugular Venous Pulse (JVP)		JVP

BIOCHEMISTRY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 10	
		DISCIPLINE	TOPIC
CV-B-011	Perform cardiac markers Creatine Kinase and Lactate Dehydrogenase (CK and LDH) Interpret lab reports based on enzymes for diseases like cardiac disorders and hyperlipidemias	Biochemistry	Performance Interpretation of Lab report
PATHOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 01	
		DISCIPLINE	TOPIC
CV-Pa-008	Identify the pathological changes of infarction (microscopic)	Pathology	Hemodynamics
	Identify the pathological changes of thrombosis (microscopic)		
PHARMACOLOGY			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 01	
		DISCIPLINE	TOPIC
CV-Ph-004	Illustrate mechanism of action of antihypertensive drugs.	Pharmacology	Anti-hypertensive drugs
CV-Ph-005	Illustrate mechanism of action of antianginal drugs.		Antianginal drugs
CV-Ph-006	Illustrate mechanism of action of drugs used in cardiac failure.		Drugs for cardiac failure

## Assessment Matrix

The Assessment Matrix demonstrates the alignment of assessment methods with the intended learning outcomes and teaching–learning strategies employed throughout the **Cardiovascular-I** module. Both formative and summative assessment methods are utilized to evaluate students' knowledge, practical skills, clinical reasoning, professionalism, and competency development in accordance with PMDC standards and UHS assessment regulations.

Theme	Formative Assessment	Summative Assessment	Assessment Domain
Heart	MCQs, Tutorials, ECG Interpretation, Histology Practical, Viva, Classroom Participation	Theory Paper, Practical Examination (OSPE), Viva Voce	Cognitive, Psychomotor
Circulation	MCQs, Practical Assessment, Case-Based Discussion, Blood Pressure & Pulse Examination	Theory Paper, Practical Examination (OSPE), Viva Voce	Cognitive, Psychomotor, Affective

## Block Assessment Summary

Assessment Component	Method
Formative Assessment	MCQs, Tutorials, Practical Exercises, ECG Interpretation, Case-Based Discussions, Viva Voce, Classroom Participation
Summative Assessment	Integrated Theory Examination (MCQs as per UHS regulations), Practical Examination (OSPE), Viva Voce
Feedback Mechanism	Immediate verbal feedback, written feedback, post-assessment review sessions and individual academic guidance
Remediation	Conducted in accordance with institutional assessment policy and UHS promotion regulations

## Assessment Alignment

Assessment within the Cardiovascular-I module is constructively aligned with the intended learning outcomes and instructional strategies. The assessment program evaluates students' understanding of cardiovascular anatomy, embryology, physiology, pathology, pharmacology, and preventive medicine while assessing practical competencies such as ECG recording and interpretation, blood pressure measurement, pulse examination, and cardiac auscultation. The integration of formative and summative assessments ensures evaluation across the cognitive, psychomotor, and affective domains, supporting competency-based medical education.

**Modular Integrated  
Curriculum 2K23**  
*Volume-01*

**MODULE**

**05**

**RESPIRATORY-I**



## MODULE RATIONALE

The diseases related to the respiratory system are on the rise not only in developing countries but also in developed countries. The infant mortality rate in Pakistan is highest in Southeast Asia and one of the important reasons is common respiratory infections in children. With the world suffering from COVID-19 not only physically but also mentally, it is very important for medical students to study in detail the structures, functions, prevention, epidemiology, genetic basis of diseases and their management.

The respiratory system is responsible for bringing oxygen into the body and removing carbon dioxide. It is made up of several organs and structures, including the nose, pharynx, larynx, trachea, bronchi, lungs, and diaphragm.

## MODULE OUTCOMES

- Apply basic sciences` knowledge to understand the causes of common respiratory problems.
- Explain the pathogenesis of respiratory diseases.
- Enlist the main investigations relevant to respiratory disorders.
- Recognize risk factors and preventive measures of main respiratory diseases.

## THEMES

- Rib cage
- Thoracic vertebrae
- Upper respiratory system
- Lower Respiratory system

## CLINICAL RELEVANCE

- Acute Respiratory Distress Syndrome
- Bronchial Asthma
- Tuberculosis
- Pneumonia

### IMPLEMENTATION TORs

- The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1200.
- The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council.
- The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these.
- However, the level of cognition can be kept at a higher level by the institution.

The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the respective three block exams for internal assessment.

## BLOCK AT A GLANCE

Item	Details
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional MBBS
<b>Block</b>	Block 3
<b>Module</b>	Respiratory-I (Module 05)
<b>Curriculum</b>	UHS Integrated MBBS Curriculum 2K23
<b>Educational Model</b>	Integrated Competency-Based Curriculum
<b>Duration</b>	As per UHS Academic Calendar
<b>Major Themes</b>	Rib Cage, Thoracic Vertebrae, Upper Respiratory System, Lower Respiratory System
<b>Integrated Disciplines</b>	Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine & Public Health, Behavioral Sciences, Microbiology, Geriatrics
<b>Learning Domains</b>	Cognitive, Psychomotor, Affective
<b>Teaching-Learning Methods</b>	Interactive Lectures, Practical Sessions, Histology Practicals, Demonstrations, Small Group Discussions, Case-Based Learning (CBL), Self-Directed Learning (SDL), Clinical Correlation
<b>Assessment</b>	Formative Assessment, MCQs, Practical Examination, OSPE, Viva Voce, Continuous Assessment
<b>Clinical Correlation</b>	Acute Respiratory Distress Syndrome (ARDS), Bronchial Asthma, Tuberculosis, Pneumonia, COPD, Respiratory Failure, Pleural Effusion, Pulmonary Edema
<b>PMDC Competencies Addressed</b>	Medical Expert, Communicator, Collaborator, Leader, Professional, Scholar, Health Advocate

## CURRICULUM DASHBOARD

Curriculum Indicator	Respiratory-I (Module 05)
<b>Programme</b>	MBBS
<b>Academic Year</b>	First Professional
<b>Module</b>	Respiratory-I
<b>Curriculum</b>	UHS Integrated Curriculum 2K23
<b>Major Themes</b>	4 (Rib Cage, Thoracic Vertebrae, Upper Respiratory System, Lower Respiratory System)
<b>Module Outcomes</b>	Understand the normal structure, development and function of the respiratory system and correlate them with common respiratory disorders, their prevention and management.

<b>Curriculum Indicator</b>	<b>Respiratory-I (Module 05)</b>
<b>Integrated Disciplines</b>	Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Microbiology, Geriatrics
<b>Teaching-Learning Methods</b>	Interactive Lectures, Practical Sessions, Histology Practicals, Demonstrations, Small Group Discussions, Case-Based Learning, Self-Directed Learning
<b>Assessment Methods</b>	MCQs, SEQs, Practical Examination, OSPE, Viva Voce, Continuous Assessment
<b>Learning Domains</b>	Cognitive, Psychomotor, Affective
<b>PMDC Competencies</b>	Medical Expert, Communicator, Collaborator, Leader, Professional, Scholar, Health Advocate
<b>Horizontal Integration</b>	Integration across Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences and Microbiology
<b>Vertical Integration</b>	Pulmonology, Internal Medicine, Pediatrics, Radiology, Thoracic Surgery, Emergency Medicine
<b>Clinical Correlation</b>	Asthma, Tuberculosis, Pneumonia, ARDS, COPD, Respiratory Failure, Pulmonary Edema, Pleural Effusion
<b>Quality Assurance</b>	Continuous assessment, structured feedback, curriculum review, DME monitoring, PMDC and UHS guidelines

## Theme-wise Curriculum Mapping Matrix

The Theme-wise Curriculum Mapping Matrix demonstrates the integration of basic and clinical sciences within the Respiratory-I module. It aligns each theme with the module learning outcomes, integrated disciplines, teaching–learning strategies, assessment methods, PMDC competencies, and horizontal and vertical integration, ensuring constructive alignment throughout the module.

Theme	Module Learning Outcomes	Integrated Disciplines	Teaching & Learning Methods	Assessment Methods	PMDC Competencies	Horizontal Integration	Vertical Integration
<b>Rib Cage</b>	Describe the anatomy, development and functional significance of the ribs, sternum and thoracic cage, and correlate them with common clinical conditions.	Anatomy, Embryology, Physiology	Interactive lectures, practical sessions, demonstrations, SDL	MCQs, Practical, OSPE	Medical Expert, Scholar	Anatomy + Embryology + Physiology	Surgery, Radiology, Pulmonology
<b>Thoracic Vertebrae</b>	Explain the anatomy and embryological development of the thoracic vertebrae and their role in respiration with relevant clinical correlations.	Anatomy, Embryology, Physiology	Interactive lectures, demonstrations, practical sessions	MCQs, Practical Examination	Medical Expert	Anatomy + Embryology + Physiology	Orthopaedics, Radiology, Surgery
<b>Upper Respiratory System</b>	Describe the anatomy, embryology, histology and physiology of the nose, pharynx, larynx and trachea, and correlate normal structure with common upper respiratory disorders.	Anatomy, Embryology, Histology, Physiology, Pathology	Interactive lectures, histology practicals, demonstrations, CBL, SDL	MCQs, Practical, OSPE	Medical Expert, Scholar	Anatomy + Histology + Physiology + Pathology	ENT, Pediatrics, Pulmonology
<b>Lower Respiratory System</b>	Explain the anatomy, histology and physiology of the bronchi, lungs, pulmonary ventilation, gas exchange and acid–base balance, and relate these concepts to common respiratory diseases and their prevention.	Anatomy, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Microbiology	Interactive lectures, practical sessions, CBL, SDL, demonstrations	MCQs, Practical Examination, OSPE, Viva	Medical Expert, Scholar, Health Advocate	Physiology + Biochemistry + Pathology + Pharmacology + Community Medicine	Pulmonology, Internal Medicine, Thoracic Surgery, Emergency Medicine

### Theme Integration

The **Respiratory-I** module follows a systems-based integrated approach by combining Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences and Microbiology to develop a comprehensive understanding of the respiratory system. Students integrate normal structure and function with the pathogenesis, prevention, diagnosis and management of common respiratory disorders such as asthma, tuberculosis, pneumonia, COPD and acute respiratory distress syndrome.

## Weekly Curriculum Map

The Weekly Curriculum Map outlines the logical sequence of learning activities throughout the **Respiratory-I** module. It demonstrates the progressive integration of basic medical sciences with clinical relevance, ensuring the achievement of the intended module learning outcomes through competency-based medical education.

Week	Major Theme	Integrated Disciplines	Teaching–Learning Methods	Assessment
Week 1	Rib Cage & Thoracic Vertebrae	Anatomy, Embryology, Physiology	Interactive lectures, demonstrations, practical sessions, SDL	Formative MCQs, Practical
Week 2	Upper Respiratory System – Anatomy & Embryology	Anatomy, Embryology, Histology	Interactive lectures, histology practicals, demonstrations	MCQs, Practical Assessment
Week 3	Upper Respiratory System – Physiology & Clinical Correlation	Physiology, Histology, Pathology	Interactive lectures, CBL, tutorials, SDL	MCQs, SEQs
Week 4	Lower Respiratory System – Anatomy & Histology	Anatomy, Histology, Embryology	Interactive lectures, practical sessions, demonstrations	MCQs, OSPE
Week 5	Pulmonary Physiology & Gas Exchange	Physiology, Biochemistry	Interactive lectures, laboratory practicals, CBL	Practical Assessment, Viva
Week 6	Respiratory Diseases & Pharmacotherapy	Pathology, Pharmacology, Medicine	Interactive lectures, case discussions, SDL	MCQs, Practical
Week 7	Prevention of Respiratory Diseases & Community Integration	Community Medicine, Behavioral Sciences, Microbiology, Geriatrics	Small-group discussions, seminars, integrated sessions	Formative Assessment
Week 8	Integrated Revision & Block Assessment	All Integrated Disciplines	Revision sessions, practical revision, feedback	Block Examination (Theory & Practical)

## Weekly Progression

The Respiratory-I module follows a system-based integrated approach, beginning with the anatomy of the thoracic cage and upper respiratory tract, progressing to the structure and function of the lower respiratory system, pulmonary physiology and gas exchange, and concluding with the pathogenesis, prevention and management of common respiratory diseases. Clinical correlation, practical sessions and case-based learning are integrated throughout the module to strengthen the application of basic sciences in clinical practice

## PMDC Competency Mapping

The PMDC Competency Mapping Matrix demonstrates the alignment of the Respiratory-I module with the PMDC Undergraduate Medical Education Competency Framework. Through an integrated systems-based approach, the module develops students' understanding of respiratory structure and function while promoting clinical reasoning, communication, professionalism, teamwork, scholarship, and disease prevention in accordance with competency-based medical education.

Theme	Medical Expert	Communicator	Collaborator	Leader	Professional	Scholar	Health Advocate
Rib Cage	✓				✓	✓	
Thoracic Vertebrae	✓				✓	✓	
Upper Respiratory System	✓	✓	✓		✓	✓	
Lower Respiratory System	✓	✓	✓	✓	✓	✓	✓

## Competency Integration Summary

PMDC Competency	Contribution within the Module
<b>Medical Expert</b>	Develops comprehensive knowledge of respiratory anatomy, embryology, histology, physiology, biochemistry, pathology and pharmacology with application to common respiratory disorders.
<b>Communicator</b>	Enhances communication skills through case discussions, practical demonstrations, clinical presentations and small-group learning.
<b>Collaborator</b>	Promotes teamwork and collaborative learning during practical sessions, laboratory work and integrated learning activities.
<b>Leader</b>	Encourages responsibility, decision-making and leadership during team-based learning and community health activities.
<b>Professional</b>	Reinforces ethical practice, professionalism, patient safety and accountability throughout teaching and assessment activities.
<b>Scholar</b>	Promotes self-directed learning, evidence-based practice, critical thinking and lifelong learning.
<b>Health Advocate</b>	Develops awareness of prevention and control of respiratory diseases through smoking cessation, immunization, environmental health and health promotion strategies.

## Competency Alignment

The Respiratory-I module primarily develops the Medical Expert competency by providing students with an integrated understanding of the normal structure, development and function of the respiratory system and its relationship to common respiratory diseases. Integration with Community Medicine, Behavioural Sciences, Pharmacology and Microbiology further strengthens competencies in communication, collaboration, professionalism, scholarship, leadership and health advocacy, particularly in the prevention and management of respiratory illnesses such as asthma, tuberculosis, COPD and pneumonia.

## Teaching–Learning Matrix

The Teaching–Learning Matrix outlines the instructional strategies employed throughout the Respiratory-I module to facilitate achievement of the intended learning outcomes. The module utilizes an integrated, learner-centred approach that combines basic medical sciences with clinical application through a variety of active learning strategies, consistent with the principles of competency-based medical education.

Theme	Interactive Lectures	Practical / Laboratory	Demonstration	Small Group Discussion (SGD)	Case-Based Learning (CBL)	Self-Directed Learning (SDL)	Early Clinical Exposure / Clinical Correlation
Rib Cage	✓	✓	✓	✓	✓	✓	✓
Thoracic Vertebrae	✓	✓	✓	✓	✓	✓	✓
Upper Respiratory System	✓	✓	✓	✓	✓	✓	✓
Lower Respiratory System	✓	✓	✓	✓	✓	✓	✓

### Teaching–Learning Strategy Summary

The **Respiratory-I** module adopts an integrated, student-centred teaching approach to facilitate the development of knowledge, clinical reasoning, practical skills, and professional attitudes. Interactive lectures establish the conceptual foundation, while anatomy demonstrations, histology practicals, physiology laboratory sessions, and small-group discussions reinforce understanding of respiratory structure and function. Case-based learning and self-directed learning promote critical thinking and lifelong learning, whereas continuous clinical correlation enables students to relate normal respiratory physiology to common respiratory diseases encountered in clinical practice.

### Educational Highlights

- **Integrated teaching** across Anatomy, Embryology, Histology, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Behavioral Sciences, Microbiology and Geriatrics.
- **Anatomy demonstrations and practical sessions** to strengthen understanding of the thoracic cage, airways and lungs.
- **Histology practicals** to correlate microscopic and gross anatomy of the respiratory tract.
- **Physiology practicals** including **spirometry, pulse oximetry, respiratory examination and cardiopulmonary resuscitation (CPR)** to develop essential clinical skills.
- **Case-based learning** integrating asthma, COPD, pneumonia, tuberculosis, ARDS and respiratory failure.
- **Self-directed learning** to promote evidence-based practice and lifelong learning.
- **Early clinical correlation** through interpretation of chest X-rays, respiratory examination, inhaler technique, pulmonary function tests and respiratory emergency



The image features a stack of several books, with the top one slightly open, resting on a dark surface. The background is a blurred library or bookstore with rows of books on shelves. Overlaid on the center of the image is a blue oval with a white border, containing the word "Theory" in a bold, dark blue, serif font.

# Theory

## NORMAL STRUCTURE

### GROSS ANATOMY

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 24	
		DISCIPLINE	TOPIC
Re-A-001	Give the boundaries of thoracic cavity, superior and inferior thoracic apertures and list the structures contained/ traversing them.	Human Anatomy	Thoracic Cavity
	Describe the anatomical correlates of Thoracic outlet syndrome	Integrate with Surgery	
Re-A-002	Identify and differentiate the typical from atypical ribs.	Human Anatomy	Rib Cage
	Describe the anatomical features of ribs		
	Describe the anatomical correlates of supernumerary cervical rib.	Integrate with Surgery	
	Classify the articulations of the ribs.	Human Anatomy	
	Describe the anatomical features of these articulations.		
	Describe the movements with the muscles producing articulations.	Human Anatomy	
	Describe the effects of fracture to the neck of rib and give its anatomical justification	Integrate with Orthopedics	
	Describe the anatomical correlates of Flail Chest.		
Re-A-003	Describe the anatomical correlates of Thoracotomy	Integrate with Surgery	Intercostal space
	Define the attachments, relations, nerve supply and actions of intercostal muscles	Human Anatomy	
	Define an intercostal space and give details of its contents		
Re-A-004	Describe the anatomical features of typical & atypical thoracic vertebrae.	Human Anatomy	Thoracic Vertebrae
	Differentiate between typical and atypical vertebrae		

	Explain the thoracic part of the vertebral column (normal curvature, intervertebral joints & fascia of the back, blood supply, lymphatic drainage, nerve supply of back) Associated Clinical conditions -Kyphosis, Scoliosis		
Re-A-005	Describe the bony features of the sternum	Human Anatomy	Sternum

	Describe the anatomical correlates of sternal biopsy. and sternotomy
	Describe the presentation of sternal fractures and correlate anatomically
Re-A-006	Define endo thoracic fascia
	Describe the supra-pleural membrane and its attachments.
Re-A-007	Classify the joints of the thorax mentioning their articulations and movements with the muscle producing them.
	Describe the mechanics of inspiration and expiration
Re-A-008	Describe the origin, course, relations and distribution of intercostal nerves and vessels
	Describe the alternate routes of venous drainage in block superior/ inferior vena cava
Re-A-009	Describe the cutaneous nerve supply and dermatomes of thorax.
	Give anatomical justification of the manifestations of zoster infection on thoracic wall.
	Discuss anatomical correlates of intercostal nerve block
Re-A-010	Describe the anatomical features of the Trachea with its relations, neurovascular supply and lymphatics.
Re-A-011	Name the parts of diaphragm mentioning their attachments and neurovascular supply
	Explain the role of diaphragm in respiration
	Enumerate the diaphragmatic apertures with their vertebral levels, mentioning the structures traversing them.
Re-A-012	Describe the pleura giving its parts, layers, neurovascular supply, and lymphatic drainage

	Describe the pleural cavity giving its recesses and the lines of pleural reflection		
	Describe the anatomical correlates of pleural pain pleurisy, pneumothorax, pleural effusion	Human Anatomy	
	Describe the anatomical features, relations of lungs	Integrate with Medicine	
Re-A-013	Describe the neurovascular supply and lymphatic drainage of lungs.	Human Anatomy	Lungs
	Compare and contrast the anatomical features and relations of right and left lung		
	Describe the root of the lung and pulmonary ligament with arrangement of structures at the hilum		
	Define Bronchopulmonary segments. Give their vascular supply, lymphatic drainage and clinical significance		
	Describe the anatomical correlates of chest tube intubation	Integrate with Surgery	
	Describe the anatomical correlates of thoracentesis		
	Describe the anatomical correlates of bronchoscopy	Integrate with Pulmonology	
	Describe the anatomical basis for medicolegal significance of lungs in determining the viability of newborn	Integrate with Forensic Medicine	
Identify various anatomical landmarks on chest X-Rays, CT and MRI	Integrate with Radiology		

## EMBRYOLOGY & POST-NATAL DEVELOPMENT

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 05	
		DISCIPLINE	TOPIC
Re-A-014	Describe the development of ribs, sternum, and thoracic vertebrae. Give the associated congenital malformations	Human Embryology	Bony components of Thoracic cavity
Re-A-015	Describe the developmental process of Vertebral Column		Development of Vertebral Column
Re-A-016	List the embryological sources of the diaphragm. Describe the events taking place in the development and descent of the diaphragm	Human Embryology	Diaphragm & Thoracic cavity
	Describe the development of Thoracic cavities (Pleural and Pericardial cavities)	Integrate with Pediatrics	
Re-A-017	Describe the development of trachea.	Human Embryology	Upper Respiratory Tract
	Describe congenital anomalies of Trachea- Tracheoesophageal fistulas of different types	Integrate with Pediatrics	
Re-A-018	List the phases of lung development with their time periods. Describe the events taking place in each phase	Human Embryology	Lungs
	Describe the embryological basis of respiratory distress syndrome/Hyaline membrane disease, Ectopic Lung lobes, Congenital cysts of Lung	Integrate with Pediatrics	

### MICROSCOPIC STRUCTURE

CODE	SPECIFIC LEARNING OUTCOMES	TOTAL HOURS = 04	
		DISCIPLINE	TOPIC
Re-A-019	Give the general histological organization of respiratory system.	Histology	Organization of respiratory system
Re-A-020	Describe the microscopic features of respiratory epithelium & Olfactory epithelium	Histology	Respiratory epithelium

Re-A-021	Describe histology of Nasopharynx	Histology	Nasopharynx
Re-A-022	Describe the histological features of epiglottis and larynx	Histology	Epiglottis & larynx
Re-A-023	Describe the histological features of trachea and lungs Describe histology of blood-air barrier	Histology	Trachea & lungs blood-air barrier
Re-A-024	Explain the histological basis of: 1. Laryngitis 2. Singer's nodules 3. Emphysema 4. Pneumonia 5. Atelectasis 1. Infant respiratory distress syndrome	Integrate with Pathology	Clinical correlates

CODE	SPECIFIC LEARNING OBJECTIVES
Re-P-001	Enlist the muscles of inspiration and expiration in quiet breathing
	Enlist the muscles of inspiration and expiration in labored breathing
	Explain the components of the work of breathing
	Discuss the mechanics of pulmonary ventilation
	Explain periodic breathing
	Explain the causes and pathophysiology of sleep apnea
Re-P-002	Define and explain lung compliance
	Enlist the factors that affect lung compliance
	Draw the compliance diagram of air filled and saline lungs
	Enlist the components of surfactant
	Describe the role of surfactant in lung compliance
	Explain the role of surfactant in premature babies
Re-P-003	Define the different lung volumes and capacities and their clinical significance
	Discuss Forced Expiratory Volume 1/ Forced Vital Capacity (FEV1/FVC) ratio and its clinical significance
	Enlist the lung volumes and capacities that cannot be measured by spirometer.
	Define dead space & explain its types
	Discuss FEV1/FVC ratio in relation to Bronchial Asthma

	Discuss FEV1/FVC ratio in relation to Chronic Obstructive Pulmonary disease/restrictive lung diseases	Pulmonology	
	Discuss Forced Expiratory Volume 1/ Forced Vital Capacity (FEV1/FVC) ratio in relation to pulmonary embolism	Integrate with medicine	
Re-P-004	Define alveolar ventilation.	Medical Physiology	Pulmonary ventilation
	Define minute respiratory volume		
	Describe the pressures in the pulmonary system.		
Re-P-005	Describe the blood volume of the Lungs	Medical Physiology	Pulmonary Circulation
	Describe the distribution and regulation of blood flow through the lungs.		
	Describe the mechanics of blood flow in the three blood flow zones of the lung		
	Describe the effect of heavy exercise on pulmonary arterial pressure.		
	Describe the function of pulmonary circulation when left atrial pressure rises as a result of left-sided heart failure.		
	Explain pulmonary capillary dynamics.		
Re-P-006	Discuss pathophysiology and common causes of pulmonary edema		Pulmonary Edema, and Pleural Fluid
	Explain the safety factors that prevent pulmonary edema.		
	Explain the physiological basis of the presence of fluid normally in the pleural cavity.		
	Define pleural effusion and give its causes.		
Re-P-007	Explain the ultrastructure of respiratory membrane	Medical Physiology	Principles of Gaseous Exchange
	Discuss the factors affecting diffusion of gases across the respiratory membrane		
	Explain the diffusion capacity of respiratory membrane for oxygen and carbon dioxide		
	Define alveolar, pleural and transpulmonary pressure.		

	Explain differences in the partial pressures of atmospheric, humidified, alveolar air and explain physiological change in each pressure
Re-P-008	Explain the different forms of transport of oxygen in the blood
Re-P-009	Draw and explain oxyhemoglobin dissociation curve
	Enlist the factors that cause the rightward shift of oxyhemoglobin dissociation curve

	Enlist the factors that cause the leftward shift of oxyhemoglobin dissociation curve
	Discuss the P50 in relation to oxygen hemoglobin dissociation curve
	Explain the Bohr's effect
	Define, enlist the types and causes of cyanosis
Re-P-010	Enlist different forms in which Carbon dioxide is transported in the blood
	Explain carboxyhemoglobin dissociation curve
	Explain the Haldane effect
	Explain the chloride shift/Hamburger phenomenon
	Define the respiratory exchange ratio (RER)
Re-P-011	Explain the alveolar oxygen and carbon dioxide pressures. Pulmonary ventilation (V) and Perfusion (Q), VA/Q= 0, zero, and normal
	Explain the concept of physiological shunt when VA/Q is below normal
	Explain the concept of physiological dead space when VA/Q ratio is above normal
Re-P-012	Enlist the respiratory and non-respiratory functions of the respiratory system

	Explain the nervous control of bronchiolar musculature		
	Trace the reflex arc of cough reflex and sneeze reflex		
Re-P-013	Explain the principle means by which acclimatization occurs	Medical Physiology	Aviation and space
	Explain the events that occur during acute mountain sickness		
	Enlist the features of chronic mountain sickness		
Re-P-014	Explain the pathophysiology, features, prevention and treatment of decompression sickness.	Medical Physiology	Deep sea diving
Re-P-015	Draw and explain the effect of CO poisoning on oxyhemoglobin dissociation curve	Medical Physiology	Carbon monoxide poisoning
	Explain the pathophysiology, features, and treatment of CO poisoning.	Integrate with Medicine	
Re-P-016	Enumerate the components of respiratory centers and explain their functions.	Medical Physiology	Nervous regulation of respiration
	Explain the inspiratory RAMP signal		
	Explain the Herring Breuer reflex/lung inflation reflex and its clinical significance		
Re-P-017	Explain the location of chemo sensitive area (central chemoreceptors) and peripheral chemoreceptors	Medical Physiology	Chemical control of respiration
	Explain the effect of hydrogen ions & carbon dioxide on the chemo- sensitive area		
	Explain the role of oxygen in the control of respiration/peripheral chemoreceptors		
Re-P-018	Explain the regulation of Respiration during Exercise	Medical Physiology	Exercise and Respiration
Re-P-019	Enlist the effects of acute hypoxia		Hypoxia

	Explain the hypoxia inducible factor a master switch response to hypoxia
	Define and explain different types of hypoxias
Re-P-021	Discuss the bacteria and viruses that cause Pneumonia
Re-P-022	Define Dyspnea
	Enlist different causes of dyspnea
	Differentiate between cardiac and respiratory dyspnea
	Outline management strategies for dyspnea
Re-P-023	Explain the pathophysiology of emphysema
Re-P-024	Explain the pathophysiology of Atelectasis.
Re-P-025	Enlist the causes of Pneumothorax
	Describe the signs and symptoms of Pneumothorax
Re-P-026	Enlist the causes of Pleuritis
	Describe the signs and symptoms of Pleuritis
	Discuss the management of Pleuritis
Re-P-027	Enlist the causes of Bronchitis
	Discuss the signs and symptoms of Bronchitis
	Discuss the management of Bronchitis

Re-P-028	Classify different types of pneumonia
	Discuss the sign symptoms of pneumonia
	Discuss the management of pneumonia
Re-P-029	Classify different types of asthma
	Discuss the signs and symptoms of asthma
	Discuss the management of asthma
Re-P-030	Classify different types of Tuberculosis
	Discuss the signs and symptoms of tuberculosis
	Discuss the management of Tuberculosis

Re-P-031	Classify different types of acute respiratory distress syndrome	Integration with General Medicine	Acute respiratory distress syndrome
	Discuss the signs and symptoms of acute respiratory distress syndrome		
	Discuss the management of acute respiratory distress syndrome		
Re-P-032	Define respiratory failure	Integration with General Medicine	Respiratory Failure
	Describe various types of respiratory failure		
	Enlist various causes of respiratory failure		
	Outline management strategies of respiratory failure		
Re-P-033	Describe ABC in a trauma patient	Integration with Surgery	First Aid in Surgical Patients
<b>MEDICAL BIOCHEMISTRY</b>			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 14	
		DISCIPLINE	TOPIC
Re-B-001	Describe the biochemical basis of emphysema, Chronic obstructive pulmonary disease (COPD) and cystic fibrosis	Medical Biochemistry	Genetic defects
	Explain and interpret the pedigree of single gene defect i.e., Emphysema and cystic fibrosis (autosomal recessive)		
	Discuss the biochemical basis of Respiratory Distress syndrome		
Re-B-002	Describe ionization of water and elaborate its significance. Discuss water and electrolyte balance in health and disease.	Integrate with Physiology	Water, pH, Buffers/ Ionization of water
Re-B-003	Define pH and describe the concept of pH scale.		Water, pH, Buffers/ pH and pH scale

Re-B-004	Define weak acids and conjugate base.
Re-B-005	Define $K_a$ and $pK_a$ and give their significance.
Re-B-006	Describe Henderson-Hasselbach (HH) equation. (no derivation required) along with its application/use. Interpret the titration curve for amino acids (alanine, histidine, acetic acid)
Re-B-007	Define buffers. Enumerate the component of a buffers system and their mechanism of action. Enlist important buffers present in blood, plasma, ECF (Extracellular Fluid), ICF (Intra Cellular Fluid) and renal fluid. Elaborate the working of bicarbonate buffer and phosphate buffer.
Re-B-008	Elaborate the role of lungs in the regulation of acid base balance.
Re-B-009	Elaborate the concept of 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> line of defense against changes in $H^+$ ion concentration.

Re-B-010	Discuss the concept of acid base balance	Medical Biochemistry	Acid base balance
<b>PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS</b>			
<b>THEORY</b>			
CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 5+3=08	
		DISCIPLINE	TOPIC
Re-Ph-001	Classify the drugs for cough suppression & expectoration	Pharmacology & Therapeutics	Cough Suppressants
	Explain the mechanism of action and adverse effects of cough suppressants		
Re-Ph-002	Explain the mechanism of action and adverse effects of anti-asthmatics		antiasthmatics
Re-Ph-003	Classify anti-histamines	Anti asthmatics	
Re-Pa-001	Describe the pathophysiology of acute respiratory distress syndrome	Pathology	Acute Respiratory Distress Syndrome
Re-Pa-002	Give the salient features of Obstructive and Restrictive Lung diseases.		Obstructive lung Disease
Re-Pa-003	Tabulate the differences between Obstructive and Restrictive lung diseases		Restrictive Lung Disease
<b>DISEASE PREVENTION &amp; IMPACT</b>			
CODE	COMMUNITY MEDICINE & BEHAVIORAL SCIENCES	TOTAL HOURS = 10	
	SPECIFIC LEARNING OBJECTIVES	DISCIPLINE	TOPIC
Re-CM-001	Identify the common risk factors of acute respiratory infections with emphasis on smoking	Community	Prevention of acute

	Discuss preventive strategies of different problems in the respiratory system
	Enlist the common vaccines used for the prevention of respiratory infections
	Explain the role of vitamins in the respiratory tract infections
Re-CM-002	Explain the effect of air pollutants on the respiratory system
Re-CM-003	Describe the burden of respiratory diseases
Re-CM-004	Enlist the common respiratory diseases related to occupational and environmental factors
Re-BhS-001	Identify the psychosocial factors leading to dyspnea.
Re-BhS-002	Identify the psychosocial factors leading to psychogenic asthma.
Re-BhS-003	Identify and deal with the various psychosocial aspects of respiratory conditions (such as Asthma, Tuberculosis, Cystic Fibrosis, Sleep Apnea) on the Individual, Family and Society.
<b>AGING</b>	
<b>THEORY</b>	
<b>CODE</b>	<b>SPECIFIC LEARNING OBJECTIVES</b>
Re-Ag-001	Discuss the microbiological basis of respiratory infections and how to prevent them in cold weather
Re-Ag-002	Discuss how aging impairs respiratory clearance, immunity, and inflammation and infection risk.

	Describe the biochemical basis of emphysema, COPD and cystic fibrosis	Chemical Pathology	Respiratory diseases
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# Practicals

# PRACTICAL

## HISTOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 05	
		DISCIPLINE	TOPIC
Re-A-025	Identify, draw and label the histologic sections of epiglottis and larynx.	Histology	Epiglottis & Larynx
Re-A-026	Describe the histological features of bronchial tree: trachea, bronchi, bronchioles, alveoli		Trachea & Organization of Respiratory System
Re-A-027	Identify, draw and label the histological sections of bronchial tree: trachea, bronchi, bronchioles, alveoli, Lung		Bronchial tree & Lung
	Describe the mucosal changes encountered in the trachea-bronchial tree		
Compare and contrast the histological features of various components of bronchial tree: trachea, bronchi, bronchioles, alveoli.			
Re-A-028	Describe, compare and contrast the light and electron microscopic features of type I and type II pneumocytes	Pneumocytes	

## PHYSIOLOGY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 06	
		DISCIPLINE	TOPIC
Re-P-034	Perform the clinical examination of chest for the respiratory system (inspection, palpation, percussion, Auscultation)	Medical Physiology	Clinical Examination of Chest

Re-P-035	Determine lung volumes and capacities with a spirometer.	Lung volume & capacities
Re-P-036	Determine Blood Oxygen Saturation with finger Pulse Oximeter	Oxygen Saturation

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Re-P-037	Determine Peak Expiratory Flow rate.	Peak Expiratory Flow rate
Re-P-038	Perform Cardio pulmonary Resuscitation (CPR) on adult and infant.	CPR

### BIOCHEMISTRY

CODE	SPECIFIC LEARNING OBJECTIVES	TOTAL HOURS = 04	
		DISCIPLINE	TOPIC
Re-B-011	Determine the pH of the solution by pH meter	Medical Biochemistry	Determination of pH
Re-B-012	Interpret metabolic and respiratory disorders of acid base balance on the basis of sign, symptoms and ABG findings	Biochemistry	Acid base balance Interpretations

# Assessment Matrix

The Assessment Matrix demonstrates the alignment of assessment methods with the intended learning outcomes and teaching–learning strategies employed throughout the **Respiratory-I** module. A balanced combination of formative and summative assessment methods is utilized to evaluate students' knowledge, practical skills, clinical reasoning, communication, and professional attitudes in accordance with PMDC standards and UHS assessment regulations.

Theme	Formative Assessment	Summative Assessment	Assessment Domain
<b>Rib Cage</b>	MCQs, Tutorials, Practical Demonstration, Viva	Theory Paper, Practical Examination (OSPE)	Cognitive, Psychomotor
<b>Thoracic Vertebrae</b>	MCQs, Practical Exercises, Classroom Participation	Theory Paper, Practical Examination	Cognitive, Psychomotor
<b>Upper Respiratory System</b>	MCQs, Histology Practical, Case-Based Discussion, Viva	Theory Paper, OSPE, Practical Examination	Cognitive, Psychomotor
<b>Lower Respiratory System</b>	MCQs, Spirometry, Pulse Oximetry, Respiratory Examination, Case Discussion	Theory Paper, Practical Examination (OSPE), Viva Voce	Cognitive, Psychomotor, Affective

## Block Assessment Summary

Assessment Component	Method
<b>Formative Assessment</b>	MCQs, Tutorials, Practical Exercises, Histology Practicals, Case-Based Discussions, Viva Voce, Classroom Participation
<b>Summative Assessment</b>	Integrated Theory Examination (MCQs/SEQs as per UHS regulations), Practical Examination (OSPE), Viva Voce (where applicable)
<b>Feedback Mechanism</b>	Immediate verbal feedback, written feedback, post-assessment review sessions and individualized academic guidance
<b>Remediation</b>	Conducted in accordance with institutional assessment policy and UHS promotion regulations

## Assessment Alignment

Assessment within the **Respiratory-I** module is constructively aligned with the intended learning outcomes and instructional strategies. Students are assessed on their understanding of respiratory anatomy, embryology, histology, physiology, biochemistry, pathology, pharmacology and community health. Practical assessments evaluate essential clinical competencies including respiratory system examination, spirometry, pulse oximetry, chest X-ray interpretation and cardiopulmonary resuscitation (CPR). The integration of formative and summative assessments ensures evaluation across the cognitive, psychomotor and affective domains while supporting competency-based medical education.

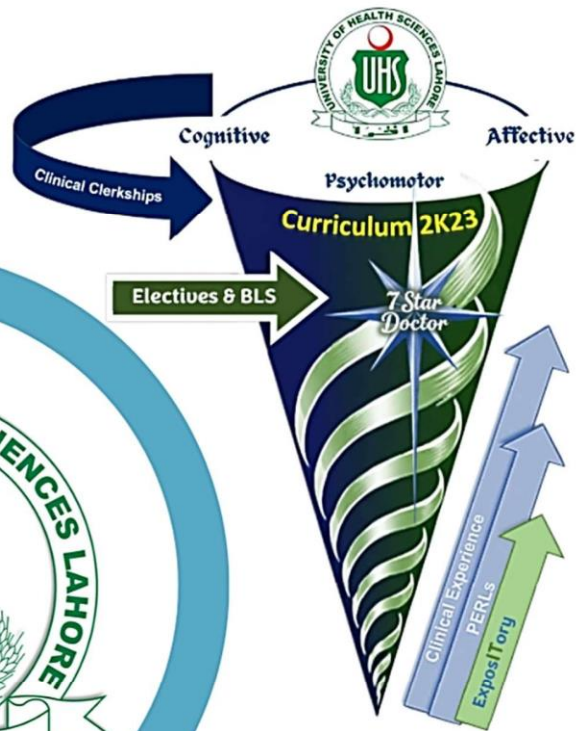
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03

*Section*

# Modular Integrated Curriculum 2K23

## Year 1 & 2

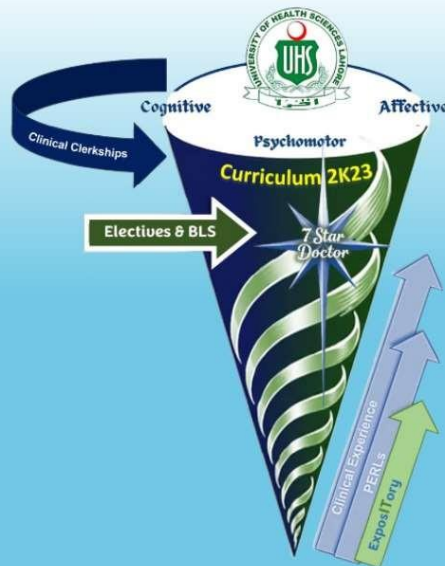


**The Holy Quran**  
**Pakistan Studies**



# Modular Integrated Curriculum 2K23

## Year 1 & 2



# The Holy Quran

## 1. MODULE RATIONALE

The Holy Quran provides wisdom and knowledge to be followed in every applied component of modern civilization covering Ethical, Social, Legal, Financial and Healthcare Domains. The complete Quran encompasses the guidelines, all full of ‘Hikmah’ (wisdom) to deal with all practical scenarios encountering patients and health professionals. As the Holy Quran is the guiding light for humanity and a way of life for all the believers of one true Allah, therefore, understanding the message of this Holy Book is mandatory for realizing the duties which one has towards other human beings in general and the profession in particular. Holy Quran is a guide for the modern society and scientific development therefore, orbiting around Quranic doctrines and axioms of Hadith, all challenges faced by modern healthcare can be solved. Therefore, this longitudinal curriculum is developed so that all health professionals can get, as enunciated by the Holy Quran itself, “the best of this world as well as the best of the Hereafter”.

## 2. VISION & MISSION

2.1: Vision: Building the personality and character of health professionals in light of teachings of the Holy Quran and Sunnah, to alleviate human sufferings.

2.2: Mission: Teaching Holy Quran and Sunnah to undergraduate students of Health Sciences, building their personality and character, enabling them to apply these principles in patient care and innovative research.

## 3. CURRICULUM DESIGN AND ORGANIZATION

3.1: Course Aim: The Holy Quran course aims to imbibe Health profession students with professionalism, general and medical, based on Divine teachings. The professionals thus groomed shall be able to correlate religion with healthcare delivery and modern science with an understanding that evidence-based practice itself originated from the system by which the “Hadith” was preserved after centuries.

3.2: Mode of Delivery: The module will be taught in the form of interactive lectures.

3.3: Learning Experience: Classroom environment will be used.

3.4: Attendance: Eighty five percent (85%) attendance is mandatory to be eligible to sit in the professional examination.

3.5: Course Modules for Year 1 and Year 2

The curriculum will be taught under three Major Sections

- Faith
- Worship
- Specific Quranic Commandments

3.6: Module Credit hours & Contact hours: This will be a three (03) credit hour course where each credit hour will be equivalent to eighteen (18) contact hours distributed over two years.

3.7: Assessment Portfolio

The assessment will be done through student portfolios based on four written assignments and two quizzes per year. The portfolio submission to the Quran teacher will be mandatory for sending admission to the university and sitting in the professional examination. The assignments will be based on the topics discussed during the year. One will be given after first half of the course will be completed for the year and second will be given at the completion of the Quran course.

3.8: Reference Material

- Translations of the Holy Quran approved by the Quran Board
- Six Authentic Books of Hadith

3.9. Module Faculty

At least one full time faculty member (Lecturer or above) will be hired for running the Holy Quran course throughout four years. The qualifications of the faculty member will be certified by the academic council of the college/institution to be declared as the teacher of Holy Quran course.



# Quran: Year-1

## SECTION ONE: FAITH (AQAIID)

### LEARNING OUTCOMES

- a. Oneness of Allah (SWT) (Tawheed)
  - i. Describe Unity of Allah in being
  - ii. Describe Unity of Allah in attributes
  - iii. Describe concept of Shirk
  - iv. Impact of Tawheed in human life
- b. Prophethood (Risalat)
  - i. Explain Significance of Risalat
  - ii. Identify Prophets as role models
  - iii. Recognize finality of Prophethood - Prophet Muhammad (PBUH)
- c. Belief in Hereafter (Aakhirat)
  - i. Appraise continuity of life beyond material world
  - ii. Concept of Doomsday and its various stages
  - iii. Concept of Day of Judgment and accountability in the Hereafter
  - iv. Concept of “Meezan”
- d. Divine Revelations (Holy Books)
  - i. Explain the divine decree in sending the Holy Books
  - ii. Identify the Holy Quran as the only preserved & authenticated divine revelation to date
  - iii. Interpret Quran as Furqan
- e. Angels
  - i. Discuss belief in angels and its significance
  - ii. Describe the universal role of angels (their specific duties)
- f. Qadr
  - i. Identify Taqdeer as Knowledge of Allah
  - ii. Explain the concept of Faith in Good and Evil

### CONTENTS

1. Oneness of Allah subhan wa taala (Tawheed)
2. Prophethood (Risalat)
3. Belief in Hereafter (Akhirat)
4. Devine revelations (Holy Books)

## SECTION TWO: WORSHIP (IBADAAT)

### LEARNING OUTCOMES

a. Prayer (Namaz)

- i. Recognize the importance of physical purity (Taharah)
- ii. Discuss the philosophy of prayer and its role in purification of soul
- iii. Recognize the importance of prayer in building personal character - sense of duty, patience, perseverance, punctuality and self/social discipline
- iv. Spiritual, moral and social impact of prayer in building of righteous community
- v. Role in creating brotherhood, equality and unity in ummah
- vi. Identify the conditions in which relaxation in prayer is allowed e.g. during operation, travelling etc.

b. Obligatory Charity (Zakat)

- i. Identify obligatory importance of Zakat and other items as outlined under 'fee-sabilillah'
- ii. Categorize the people who can be the beneficiaries of Zakat
- iii. Role of zakat in eradication of greed and love of material world
- iv. Effect of Zakat and sadaqat in circulation of wealth and alleviation of poverty
- v. Explain the essence of zakat and sadaqat in building just communities
- vi. Describe the role of state in collection and disbursement of zakat

c. Fasting (Roza)

- i. Discuss the importance and significance of fasting
- ii. Relate the Holy Quran and the month of Ramadan
- iii. Role of fasting in building personal qualities like self-control, piety and soft corner for the poor and needy persons
- iv. Identify the applications of "Taqwa" through fasting

d. Pilgrimage (Hajj)

- i. Discuss the importance and significance of Hajj
- ii. Identify the conditions in which Hajj becomes an obligation
- iii. Role of manasik-e-Hajj in producing discipline and complete submission
- iv. Recognize the importance of Hajj in uniting the ummah
- v. Sacrifice for Allah subhan wa taala (essence of qurbani)

**TOPIC AREAS**

1. Prayer (Salah/Namaz)

2. Obligatory charity (Zakat)
3. Fasting (Saum/Roza)
4. Pilgrimage (Hajj)

## Quran: Year-2

### SECTION THREE: SPECIFIC QURANIC COMMANDMENTS

#### LEARNING OUTCOMES

a. Importance of the protection of Human life

- i. Concept of the sanctity of human life in Quran and Sunnah
- ii. Importance and significance of a single human being even during war
- iii. Concept of punishment in regard to the killing of a human being, voluntarily or involuntarily

b. Jihad

- i. Concept of Jihad and its significance (hikmat)
- ii. Different forms of Jihad and their importance
- iii. Principles and preparation of Jihad

c. Heirship/Inheritance (Virasat)

- i. Heirship and division of wealth in accordance with divine teachings
- ii. Heirs and their shares
- iii. Legal aspect of virasat (Hud-e-Illahi)

d. Amar-bil-marroof-wa-Nahi-anil-munkar

- i. Differentiation between Marroof and Munkar

iv. Devine reward of Jihad ii. Importance and significance (effects of avoiding this principle)

iii. Necessary conditions of both amar-bil-marroof and nahi-anil-munkar

iv. The different stages and the necessary prerequisites

e. Hadood-e Illahee and taazeerat

- i. Meaning and various types of hadood-e-Illahee
- ii. Authority for fixation of limit (hudd)

- iii. Criteria and permissible relaxation in fixing the limits
- iv. Difference between 'Haddoo', 'Qisas' and 'Tazeerat'. Punishments which are left to the court of law
- v. Benefits for the good of community

f. Justice (Adal-o-insaf)

- i. Justice of Allah subhan wa taala
- ii. Importance of justice for the survival of community
- iii. Need of justice to be prevailed irrespective of religion
- iv. Devine reward for fair justice

g. Business (Bay-o-tijarat)

- i. Importance of fair business and its necessary constituents
- ii. Permissible and impermissible conditions of businesses
- iii. Concept of loan in businesses

h. Interest (Riba or Sudi karobar)

- i. Meaning of Riba or interest and its different forms
- ii. Impact of Riba on a society in general
- iii. Devine declaration and its punishment both in this world and Hereafter

i. Nikah-o-talaq

- i. Basic rulings regarding marriage and divorce
- ii. Importance of Nikah and its constituents
- iii. Conditions of Nikah and various forms of prohibited/impermissible nikah

Conception of dowry

- v. Talaq and its various forms
- vi. Meaning of Khula and its conditions

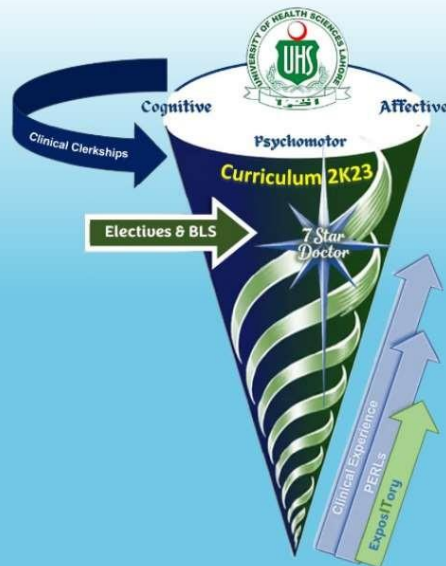
CONTENTS

1. Importance of the protection of Human life
2. Jihad
3. Heirship/Inheritance (Virasat)
4. Amar-bil-marooif-wa-Nahi-anil-munkar
5. Hadd-e Allahee and taazeerat
6. Justice (Adal-o-insaf)
7. Business (Bay-o-tijarat)
8. Interest (Riba or Sudi karobar)
9. Nikah-o-talaq



# Modular Integrated Curriculum 2K23

## Year 1 & 2



# Islamiyat & Pakistan Studies

## MODULE RATIONALE

This module comprises of Islamiyat & Pakistan Studies. All the medical or other curricula relate to our core context and internal fiber. The study of religion and country endorses all relevancy and competency acquisition for the purpose of service to humanity and community orientation.

### ISLAMIYAT

A short course on Islamic Studies will be completed in First and Second year with an exam at the end of second year.

#### Course Content:

1. Understand the basic principles of Islam.
2. Explain the concept of the Islamic state.
3. Explain the Quran as a guide for modern society and scientific development.
4. Describe the life of the Holy Prophet Peace be upon him as an example to follow.
5. Explain ethics in the Islamic prospective.
6. Describe the rights of the individual in Islam.
7. Describe the rights of women and children in Islam.
8. Explain the contribution of Islamic scholars to science and medicine.
9. Understand Islam in terms of modern scientific development.
10. Explain the concept of Rizk-e-Hilal.
11. Explain the concept of Hukook-ul-Ibad.

### PAKISTAN STUDIES

A short course on Pakistan Studies will be completed in First and Second year with an exam at the end of second year.

#### Course Content:

1. Describe brief the salient features of the Pakistan movement.
2. Explain the basis for the creation of Pakistan.
3. Give a brief account of the history of Pakistan.
4. Explain the ethnic and cultural distribution of the population of Pakistan.
5. Describe the Provinces and resources available in Pakistan.
6. Explain current problems faced by Pakistan.
7. Describe the social, economic and health problems of the rural population of Pakistan.

**ISLAMİYAT AND PAKISTAN STUDIES BOOKS**

- Standard Islamiyat (Compulsory) for B.A, B.Sc., M.A, M.Sc., MBBS by Prof. M.Sharif Islahi  
Ilmi Islamiyat (Compulsory) for B.A. B.Sc., & equivalent.
- Pakistan studies (Compulsory) for B.A. B.Sc., B.Com., Medical/Engineering by Prof. Shah Jahan Kahlun
- Pakistan studies (Compulsory) for B.A, B.Sc., B.Com., B.Ed., Medical/Engineering by Prof. Shah Jahan Kahlun

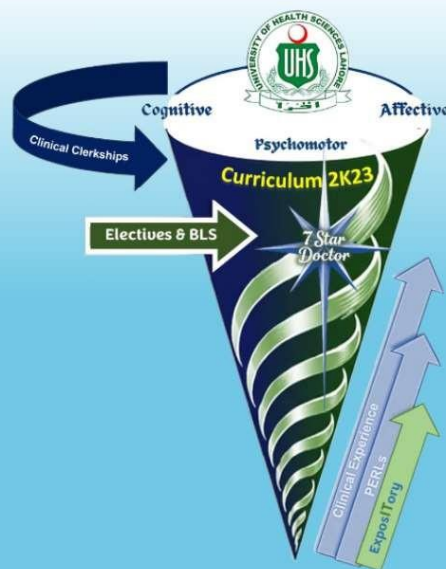






# Modular Integrated Curriculum 2K23

## Year 1 & 2



**Civics**

## 1. MODULE RATIONALE

Civics is part and parcel of life and the study of Civics has major thrust on improvement of the quality of life and welfare of human beings. This discipline enhances the approach towards rational behavior and daily life.

There is a need for us to know role of a citizen with specific reference to Global Village, the Citizen and Daily life issues, Citizenship, Rights and Responsibility, Role of Government and State, Implementation

Issues of Devolution plan, Social Welfare Institutions/ NGOs and their role at basic level, social interactions and the new discoveries in IT and mass media, relations with International Organizations and Pakistan and its neighbors. Civics goes beyond the cognitive level to deal with social values and attitudes. From the earliest stages of the course, it is important to respect students' opinions while helping them to develop a rationale for their opinions. This curriculum is adapted from Agha Khan University Examination Board curriculum for higher secondary examination.

## 2. VISION & MISSION

2.1: Vision: Building the personality and character of health professionals

2.2: Mission: Teaching Civics to undergraduate students of Health Sciences, building their personality and character, enabling them to apply these principles in patient care.

## 3. CURRICULUM DESIGN AND ORGANIZATION

3.1: Course Aim:

- To develop understanding of the social nature and significance of civics, its key concepts and civic life.
- To emphasize learning of related themes in a way that encourages creativity, curiosity, observation, exploration and questioning.
- To create awareness of the nature of civic life and the relationship between civics and other social sciences.
- To promote understanding about the ideology of Pakistan and the struggle of an independent state.
- To inculcate the behavior patterns of national character, and qualities of a good citizen, □ self-reliance, patriotism and leadership.
- To create a strong sense of national unity, integration and cohesion.

- To prepare students as future citizens, conscious of their positive role in a society and the world at large.

3.2: Mode of Delivery: The module will be taught in the form of interactive lectures.

3.3: Learning Experience: Classroom environment will be used.

3.4: Attendance: Eighty-five percent (85%) attendance is mandatory to be eligible to sit in the professional examination.

3.5: Assessment: The assessment will be done through two written assignments and two quizzes per year. The assignments will be based on the topics discussed during the year. One will be given after first half of the course will be completed for the year and second will be given at the completion of the course.

3.7: Module Faculty: At least one full time faculty member (Lecturer or above) will be hired to run the civics course throughout four years. The qualifications of the faculty member will be certified by the academic council of the college/institution to be declared as the teacher of civics.



LEARNING OUTCOMES	TOPICS
i. Define civics ii. Describe how civics can improve the citizenship iii. Illustrate the scope of civics iv. Discuss the nature of civics v. Give examples how civics can help in the national development	Civics-Meaning & Nature
i. Examine the significance of civics ii. Explain how civics is important to know the problems of daily life iii. Discuss how civics can help to bring improvements in the civics life of citizens iv. Evaluate how civics can improve the sense of love and respect for human relationship v. Discuss that studying civics can develop a sense of gratitude vi. Give examples how civics is important to develop the global unity	Significance and Utility
i. Compare civics with political science, history, economics, sociology and ethics	Relationship with Social Sciences
i. Describe the term harmonic relationship ii. Explain the harmonic relationship among different members of society. (Women, children and senior citizens) iii. Explain how harmonic relationship develop for respect of religion	Harmonic Relationship
i. Define the term individual in relation to civics ii. Define the term state iii. Explain the relation between an individual and a state iv. Describe the importance of an individual in a state v. Enlist the responsibilities of an individual in a state	Individual and state

<p>i. Identify the basic unit of social institution Discuss and characterize the different types of family</p> <p>ii. Give the importance of basic unit of social institution in the development of a state Enlist the responsibilities of family in general iii. Analyze your role for the betterment of the family Compare and contrast the impact of the deterioration of family in the western society and give examples</p>	<p>Family</p>
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C2K23 Year-01

<p>i. Define community</p> <p>ii. Explain the nature and significance of community iii. Discuss the role of a family in community</p> <p>iv. Analyze the role of an individual for the betterment of the community</p>	<p>Community</p>
<p>i. Define society</p> <p>ii. Elaborate the relation between an individual and society and society and state</p> <p>iii. Analyze the role of an individual for the betterment of society</p>	<p>Society</p>
<p>i. Define the term nation, nationality and ummah differentiate between nation and nationality distinguish between nation and ummah analyze the value, behavior and the pattern of society based on religions</p> <p>ii. Evaluate the characteristics of society developed by religions</p>	<p>Nation, Nationality</p>
<p>i. Trace the origin of state with reference to the theories of Divine Origin, Force and Social ii. Contract (Hobbs, Lock, Rousseau)</p> <p>iii. Describe the elements of a state (sovereignty, population, territory, Government) iv. Compare and distinguish the role of state, society and government</p>	<p>Origin and elements of State</p>

<p>i. Describe the functions of state</p> <p>ii. Describe the factors which are necessary for proper functioning of state</p> <p>iii. Analyze the situation when a state does not function properly</p> <p>iv. Describe the characteristics of a welfare state Analyze how a welfare state guarantees the equity and justice on the issues of gender, religion, and social classes</p>	<p>Functions of state. (Defense, law and order, welfare etc.)</p>
<p>i. Define the concept of sovereignty in west</p> <p>ii. Discuss different kinds of sovereignty</p> <p>iii. Explain Austin's concept of sovereignty</p> <p>iv. Analyze critically Austin's concept of sovereignty</p>	<p>Sovereignty</p>

C2K23 Year-01

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04

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MBBS 1<sup>st</sup> Professional

Block-1

Theme	Subject	Written Exam		Oral/Practical/Clinical Exam			
		MCQ (1 mark)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	40	40	04	-	01	46
Normal Function	Physiology applied/clinical	37	37	03	-	01	38
	Biochemistry applied/clinical	34	34	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	06	-	-	-	-
	Behavioral Sciences	05	05	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	13	13	1	-	-	8
	Pharmacology	05	05	1	-	-	8
CFRC	CF-I	-	-	-	01	-	05
PERLs	PERLs-I	-	-	-	01	-	05
Total		140	140	11 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

MBBS 1<sup>st</sup> ProfessionalBlock-2

Theme	Subject	Written Exam		Oral/Practical/Clinical Exam			
		MCQ (1 mark)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	55	55	05	-	01	54
Normal Function	Physiology applied/clinical	27	27	02	-	01	30
	Biochemistry applied/clinical	23	23	02	-	01	30
Disease Burden & Prevention	Community Medicine & Public Health	06	06	-	-	-	-
	Behavioral Sciences	04	04	-	-	-	-

Pathophysiology & pharmacotherapeutics	Pathology	15	15	01	-	-	08
	Pharmacology	10	10	01	-	-	08
CFRC	CF-I	-	-	-	01	-	05
PERLs	PERLs-I	-	-	-	01	-	05
Total		140	140	11 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

170

C2K23 Year-01

MBBS 1<sup>st</sup> Professional Block-3

Theme	Subject	Written Exam		Oral/Practical/Clinical Exam			
		MCQ (1 mark)	Marks	OSPE (8 marks each observed)	OSCE (5 marks each observed)	OSVE (14 marks each observed)	Marks
Normal Structure	Anatomy applied/clinical	32	32	03	-	01	38
Normal Function	Physiology applied/clinical	51	51	04	-	01	46
	Biochemistry applied/clinical	29	29	02	-	01	30

Disease Burden & Prevention	Community Medicine & Public Health	06	06	-	-	-	-
	Behavioral Sciences	02	02	-	-	-	-
Pathophysiology & pharmacotherapeutics	Pathology	15	15	01	-	-	08
	Pharmacology	05	05	01	-	-	08
CFRC	CF-I	-	-	-	01	-	05
PERLs	PERLs-I	-	-	-	01	-	05
Total		140	140	011 stations x 08 = 88	02 stations x 05 = 10	03 stations x 14=42	140

05

*Section*

VOLUME:01



# C-FRC

CLINICAL-FOUNDATION  
ROTATION CLERKSHIPS



Modular Integrated  
Curriculum 2K23



YEAR-01





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## LIST OF ABBREVIATIONS

Abbreviations	Subjects
A	Anatomy
Ag	Aging
B	Biochemistry
	Behavioral sciences
BhS	Civics
C	Community Medicine
CM	Clinical-Foundation Rotation Clerkship
	Cardiovascular
C-FRC	Endocrinology & Reproduction
CV	Ear Nose Throat
EnR	Foundation
	Forensic Medicine
ENT	Gastrointestinal tract
F	Gynecology and Obstetrics
FM	Hematopoietic & Lymphatic
GIT	Head & Neck and Special Senses
	Inflammation
GO	Medicine
HL	Musculoskeletal
HNSS	Neurosciences
IN	Ophthalmology
M	Orientation
MS	Physiology
	Pathology
NS	Pediatrics
O	Professionalism, Ethics, Research, Leadership
Or	Pharmacology
	Psychiatry
P	Quran and Islamiyat
Pa	Renal
Pe	Radiology
	Respiratory
PERLs	Surgery
Ph	
Psy	

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PREAMBLE

The Aim of Medical training is to deliver the best possible patient care. This is not possible until medical students are holistically trained to deliver standardized patient care, with management and counselling skills. The competencies given by PMDC for a graduating physician include: 1. Skillful

2. Knowledgeable
3. Community Health Promoter
4. Critical Thinker
5. Professional
6. Scholar
7. Leader and Role Model

All the above cannot be accomplished without a robust Clinical clerkship program.

The purpose of this document is to provide an outline to the UHS clinical clerkship program which will serve as a vertically integrated module throughout the five years of medical college, transitioning from Clinical Foundation (CF) in the first two years to Clinical Rotations (CR) in the third and fourth year and finally to a complete clinical clerkship (CC) in final year of MBBS.

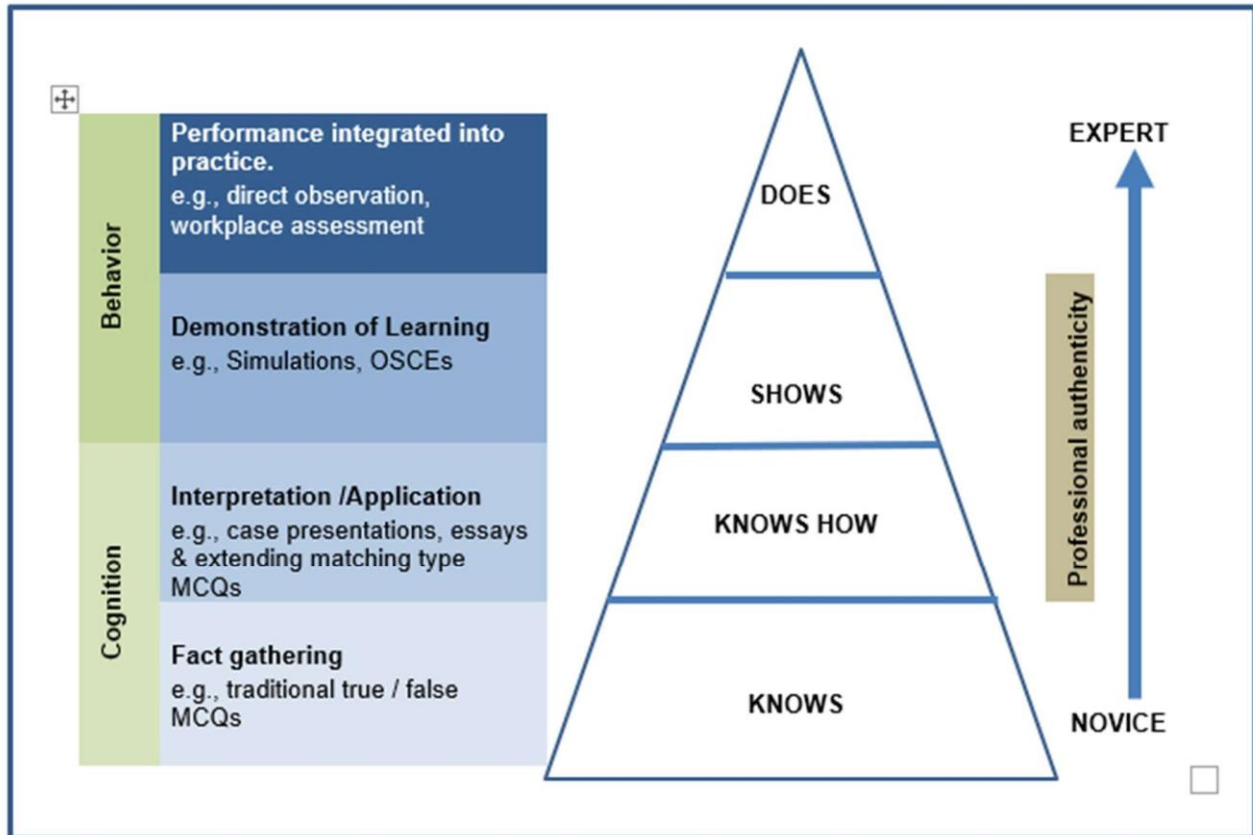
Keeping in view the 45 affiliated medical colleges under the umbrella of UHS, we have tried our best to devise a flexible program which colleges can tailor according to their capacities and resources. We are hopeful this innovative new step will lead to standardization of patient care for UHS lead colleges in the best possible way.

#### How to use this logbook:

- Each clinical skill has an entry in this logbook along with the checklist to be filled by the supervisor in the ward.
- Number of entries per skill is also mentioned in the modular study guides.
- The Clinical supervisor must tick all boxes deemed fulfilled and give feedback to the student regarding their performance.

## MILLER'S PYRAMID

The basis to assess clinical skills is the Miller's pyramid. Different skills throughout the CFR-C module scale from Knows How (e.g., Interpretation of CXR) to does (administer IM injections etc.).





# **BLOCK-01**

## FOUNDATION MODULE

Objectives	Skill	Miller's Pyramid Level Reflected
Demonstrate steps of hand washing	Hand washing	Shows
Demonstrate the procedure of taking the pulse	Radial Pulse	Shows
Record the Respiratory Rate of patient	Respiratory Rate measurement	Shows
Demonstrate the procedure of taking the Blood Pressure	Blood Pressure	Shows
Demonstrate the process of wearing the gloves	Donning and Doffing	Shows

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR HANDWASHING (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)	
<b>STEP/TASK</b>		
<b>GETTING READY:</b>  1 moments of hand  has read the handwashing procedure and understands the 4  ontact with patient and/or their environment ii. orming a clean and/or aseptic procedure iii. ure to blood and/or body fluid iv. After contact : and/or their environment		
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>		
<b>THE PROCEDURE:</b>  1. Wet hands with  2. Apply soap and l thoroughly ces between fingers, backs of hands and wrists, rubbing  3 it vigorously. ow long handwashing procedure is		



4		
5. Rinse under runni		
6. Pat hands dry with paper towel.		
7. Turn off tap with paper towel		
SKILL/ACTIVITY PERFORMED SATISFACTORILY		
SIGNATURES OF SUPERVISOR		



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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR RADIAL PULSE (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)		
<b>STEP/TASK</b>			
<b>GETTING READY</b>			
1. Washed hands/ sanitized hands ment: watch with second hand.			
2. Prepared equip			
3. Explained proc ure to the patient and take consent			
4. Determined if e patient is taking any medications that may affect the pulse trate.			
5. Assisted the pa tient to a comfortable position			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
<b>THE PROCEDURE:</b>			



6	artery. Use the tip of the index and third fingers of your			
	the pulse in your radial artery between your wrist bone			
	the thumb side of your wrist.			
7	index and middle fingers over the vessel.			
8	first, adding pressure till feeling the pulsation			
SKILL/ACTIVITY PERFORMED SATISFACTORILY				
<b>POST PROCEDURE:</b>				
	ings with the facilitator			
9				
10.	Washed hands. the results as beats / minute and comment on, rate and			
11	rhythm			
SKILL/ACTIVITY PERFORMED SATISFACTORILY				
SIGNATURES OF SUPERVISOR				

## VITAL SIGNS REFERENCE RANGES

(Ref: EMT National Training - National Exams)

Ages	Heart Rate	Respiratory Rate	Systolic Blood Pressure	Temperature
Infancy (Birth to 1 Year)	100 to 160 (first 30 minutes) Settling around 120 bpm	40 to 60 initially 30-40 after first few minutes. 20-30 by one year	70 at Birth to 90 at 1 year	98-100
Toddler (12 to 36 Months) and Preschool Age (3 to 5 Years)	20 to 130 bpm	20 to 30	70 to 100 mmHg	96.8 – 99.6
	20 to 120 bpm	20 to 30	80 to 110 mmHg	
School-age Children (6 to 12 Years)	70 to 110 bpm	20 to 30	80 to 120 mmHg	98.6
Adolescence (13 to 18 Years)	55 to 105 bpm	12 to 20	100 to 120 mmHg	98.6
Early Adulthood (20 to 40 Years)	70 bpm average	16 to 20 (12-20 normal)	120/80 mmHg average	98.6

Middle Adulthood (41 to 60 Years)	70 bpm average	16 to 20 (12-20 normal)	120/80 mmHg average	98.6
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Place a “√” in case box if step/task is performed satisfactorily, an “X” if it is not performed satisfactorily, or N/O if not observed.

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

Date Observed: \_\_\_\_\_

Note: Respiratory rate is not taken in isolation, usually it is performed while checking radial pulse.

CHECKLIST FOR RESPIRATORY (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<p><b>GETTING READY</b></p> <ol style="list-style-type: none"> <li>1. Introduce yourself to the patient.</li> <li>2. Explain the procedure of radial pulse measurement and the procedure to the patient.</li> <li>3. Get patient's consent.</li> <li>4. Wash hands/sterilize hands.</li> <li>5. Prepare the necessary material (clock/watch).</li> <li>6. Prepare the necessary material (clock/watch).</li> </ol>			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
<p><b>THE PROCEDURE:</b></p> <p>Respiratory rate (see pulse checklist for reference).</p>			



6	ing the Respiratory rate (RR) while your hand is still on the			
7	ry (Do not inform your patient that you are taking			
the RR).				
8. Placed Observe the rise and fall of the patient's chest and count the number of respirations for another one full minute. (One respiration consists of one complete rise and fall of the chest, or the inhalation and exhalation of air).				
SKILL/ACTIVITY PERFORMED SATISFACTORILY				
SIGNATURES OF SUPERVISOR				



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

Date Observed: \_\_\_\_\_

CHECKLIST FOR BLOOD PRESSURE (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>GETTING READY:</b>			
1. Introduce yourself to the patient.			
2. Explain the procedure and reassure the patient. (blood pressure measurement)			
3. Get patient’s consent.			
4. Wash hands/sanitize hands			
5. Prepare the necessary material (clock/watch)			
6. Position the patient in a sitting position and uncover one of his /her arms. (Make sure the patient is relaxed and comfortable).			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
<b>THE PROCEDURE:</b>			
6. _____ ry valve (if it is mercury sphygmomanometer).			



7. Select an appropriately sized cuff and apply it to the upper arm ensuring that it fits securely. (The centre of the cuff bladder must be over brachial artery [the bladder should cover 80% of the circumference of the upper arm] and lower edge 2.5 cm above the			
ante-cubital fossa).			
8. Palpate the brachial or radial artery while inflating the cuff till the point where pulsation disappears and keep inflating the cuff 20-30 mmHg more.			
9. Slowly deflate the cuff, noting the pressure at which the pulse reappears. (This is the approximate level of the systolic blood pressure).			
10. Continue to deflate the cuff slowly at 2 mm Hg/second. Note the point at which Korotkoff sounds disappear completely as the diastolic pressure.			
11. Turn off the mercury valve (if it is mercury sphygmomanometer).			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
<b>POST PROCEDURE:</b>			
12. Wash hands.			
13. Document the findings			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			



SKILL/ACTIVITY PERFORMED SATISFACTORILY		
Signatures of Supervisor		

## HEMATOPOEITC AND LYMPHATIC MODULE

Objectives	Skill	Miller's Pyramid Level Reflected
Detail the steps of drawing blood from a vein.	*Venipuncture and blood collection	Knows how
Check for pallor in the conjunctiva, tongue, and palm of hands	Pallor	Shows

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



## COLLECTION

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR VENIPUNCTURE (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)	
<b>GETTING READY:</b>		
1. Identification of patient		
2. Washed hands/ sanitized hands		
3. Preparation: gloves, in place		
<b>SKILL/ACTIVITY DESCRIBED SATISFACTORILY</b>		
<b>THE PROCEDURE:</b>		
4. Explain procedure to the patient and obtain consent		
6. Clean the site with an antiseptic solution and allow it to dry		
7. Select an appropriate site for venipuncture, such as the antecubital fossa or the back of the hand		
7. Apply a tourniquet above the site to enhance vein distention		
8. Ask the patient to make a fist to further enhance vein distention		
9. Insert the needle into the vein at a 15–30-degree angle with the bevel up		



10. Once the needle is in the vein, release the tourniquet and apply pressure to the site with gauze or a cotton ball		
11. Remove the needle and apply pressure to the site for a few minutes		
12. Dispose of the needle and syringe in a sharp's container		
13. Label the specimen with the patient's information and send it to the lab for analysis		
SKILL/ACTIVITY DESCRIBED SATISFACTORILY		
Signatures of Supervisor		



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

Date Observed: \_\_\_\_\_

CHECKLIST FOR PALLOR (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)	
<b>GETTING READY:</b>  1. Identification of j 2. Presence of natural light		
<b>SKILL/ACTIVITY OBSERVED AND DESCRIBED SATISFACTORILY</b>		
<b>THE PROCEDURE:</b>  3. Obtain informed consent from the patient 4. Examine in natural light		
<b>EXAMINATION OF THE CONJUNCTIVA:</b>  5. Request the patient to look upwards and si gently downward, thereby exposing the lowe  The lower conjunctiva has a half-moon shape i. posterior rim: the posterior portion of the sclera. ii. anterior rim: the anterior or front portion o the eyelid.  Normally, the anterior rim is of bright red col rim which has relatively pale fleshy color.		

<p>6. Report pallor</p> <p>(Pallor is said to be present if the anterior rim is not markedly redder as compared to the posterior rim.) (Severe pallor is considered when both, anterior and posterior rims of the palpebral conjunctivae have the same very pale fleshy color.)</p>		
<p><b>EXAMINING THE TONGUE FOR PALLOR:</b></p> <p>7. Ask the patient to protrude the tongue and ol</p>		
<p>8. Report pallor (pallor is said to be present if the tongue and oral mucosa are visibly pale)</p>		
<p><b>EXAMINING THE HANDS FOR PALLOR:</b></p> <p>9. Holds the patient's hand gently and check: of the palm with his/her own palm.</p>		
<p>10. Reports pallor (severe pallor-very pale or white, some pallor-pale)</p>		
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>		
<p>Signatures of Supervisor</p>		





**BLOCK-02**

## MUSCULOSKELETAL AND LOCOMOTION MODULE

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

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

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

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

Date Observed: \_\_\_\_\_

<p style="text-align: center;"><b>CHECKLIST FOR BODY TEMPERATURE</b> (Some of the following steps/tasks should be performed simultaneously.)</p>	<p style="text-align: center;"><b>CASES</b> (Minimum 2 Entries)</p>		
<p><b>STEP/TASK</b></p>			
<p><b>GETTING READY:</b></p> <p>cold or hot food/drink further, check if the patient has recently taken</p> <p>in antiseptic (spirit) and wipe dry. If analogue thermometer, switch it on and it will show the room display.</p>			
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>			
<p><b>THE PROCEDURE:</b></p> <p>1 to procedure to the patient and get a verbal consent proceed.</p>			



2. Keep the thermometer bulb/probe under the patient’s tongue. Ask the patient to close the lips firmly around the thermometer but without biting it			
3. Keep it in place for at least 2 minutes.			
4. Read the temperature as soon as you pull out the instrument			
5. After use, clean the instrument with antiseptic and wipe it off			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			





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

Date Observed: \_\_\_\_\_

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

9. Repeat movements 6 and 7 passively.			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF UPPER LIMB STRENGTH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Adequately expose the arms of the patient.			
3. Perform the testing for power and strength, for each arm. Check for muscle wasting (wasted, highly developed or normal).			
4. Check for muscle wasting and muscle wasting.			
5. Ask the patient to raise both their arms simultaneously as strongly as they can while they resist resistance to this movement. Compare the arms.			
6. Ask the patient to extend and raise both arms in front of them as if holding a pizza. Ask the patient to keep their arms in place, close their eyes and count to 10. Normally their arms should stay in place.			



<p>7. Test the strength of wrist flexion by holding the patient's wrist from the front and asking them to "flex their hand up to their ear." Apply resistance at the wrist. Repeat and compare to the other arm.</p>			
<p>8. Ask the patient to extend their forearm against the examiner's resistance. Make certain that the patient begins their extension from a fully flexed position because this part of the movement is most sensitive to a loss in strength. This tests the triceps. Note any asymmetry in the other arm.</p>			
<p>9. Test the strength of wrist extension by asking the patient to extend their wrist while the examiner resists the movement. This tests the forearm extensors. Repeat with the other arm.</p>			
<p>10. Examine the patient's hands and test the patient's grip by having the patient hold the examiner's fingers in their fist tightly and instructing them not to let go while the examiner attempts to remove them. Normally the examiner cannot remove their fingers. This tests the forearm flexors and the intrinsic hand muscles. Compare the hands for strength asymmetry.</p>			
<p>11. Test the intrinsic hand muscles once again by having the patient abduct or "fan out" all of their fingers. Instruct the patient to not allow the examiner to compress them back in. Normally, one can resist the examiner from replacing the fingers.</p>			
<p>12. Test the strength of the thumb opposition by telling the patient to touch the tip of their thumb to the tip of their little finger. Apply resistance to the thumb with your index finger. Repeat with the other thumb and compare.</p>			
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>			
<p>Signatures of Supervisor</p>			





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Date Observed: \_\_\_\_\_

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



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Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF LOWER LIMB STRENGTH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Explain the procedure to the patient and get a verbal consent to proceed.			
2. Ensure adequate exposure of the knee joints while maintaining patient privacy.			
3. Inspect the alignment of both legs, both patellas. Check for varus/vulgus deformities, swellings. Inspect skin for any scars, plaques, erythema.			
4. Check swelling at level of joints			
5. Simultaneously assess and compare knee joint temperature using the back of your hands.			
6. Measure quadriceps with an inch tape 20 cm diameter above the tibial tuberosity and compare with other side.			
7. Ask the patient regarding any pain and discomfort and then start examining normal side of patient (in supine position)			
8. Flex the knee to 90 degrees, then feel along the joint line (quadriceps tendon → patella → patella tendon → tibial tuberosity → tibial plateau → femoral epicondyles and over course of medial collateral ligament and lateral collateral ligament → popliteal fossa) for ant swelling/ thickness/tenderness			
9. Test active then passive movements, keeping one hand on the knee to feel for crepitus. 1. Flexion (140°) 2. Extension (0°)			

10. Passively raise leg at ankle and look for knee hyperextension			
---	--	--	--

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

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Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF HIP JOINT EXAMINATION (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
STEP/TASK			
<b>THE PROCEDURE:</b>			
1                    dure to the patient and get a verbal consent to proceed.			
2                    exposure of the legs while maintaining patient le a covering sheet for the patient. Students nts of an opposite gender must be ( with a chaperon			
3                    they have any pain before proceeding			
4                    nd legs for any deformity, scarring or swelling			
5.                    .o walk to the end of the examination room and then ack whilst you observe their gait			
6                    down for next part pf the examination.			




SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			



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

Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF SHOULDER JOINT EXAMINATION (Some of the following steps/tasks should be performed simultaneously.)		CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>				
<b>THE PROCEDURE:</b>				
1	Explain the procedure to the patient and get a verbal consent to proceed.			
2	Expose the shoulder and arm and provide padding for the time when they are not being examined.			
3	With the patient standing for initial inspection and ask the patient about pain before proceeding for examination.			
4	Perform a general inspection looking for scars, alignment, and deformities.			
5	Measure the shoulder joint temperature using the tympanic membrane.			
6	Inspect the back of your hand for bony components of the shoulder girdle, noting any irregularities, and tenderness.			
7	With the patient in internal rotation and abduction, ask the patient to put their hands behind their head and point their elbows out to the side.			
8	With the patient in external rotation and adduction, ask the patient to place each hand on their hip and reach as far up their back as they are able.			
9	With the patient in shoulder flexion instruct the patient to raise their arms straight out in front of them, with their hands pointing up towards the ceiling.			
10	With the patient in shoulder extension, ask the patient to stretch their arms behind their back.			

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

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



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

Date Observed: \_\_\_\_\_

CHECKLIST FOR UPPER LIMB X-RAY (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Observe the A a. Alignment and joint space b. Bone texture c. Cortic			
2. or partial dis. Alignment will suggest a fracture/ complete .			
3. fracture site Position of the fragment distal to the			
4. the outline of each bone to see any step in the ray indicate a fracture			
5. re is identified, describe which bone is involved e fracture is located ( middle distal)/			
6. fracture extending all the way through the bone e fracture.			
7. e of complete fracture accordingly:  a. Transverse: fracture at right angles to the shaft b. Oblique: fracture at an angle to the shaft c. Spiral: caused by twisting injury d. Comminuted: 2 or more bone fragments e. Impacted: fractured bone forced together			

<p>8. Recognize an incomplete fracture as one not involving the whole cortex.</p>			
<p>9. Types of incomplete fractures include:</p> <ul style="list-style-type: none"> <li>a. Torus/Buckle: a bulge in the cortex</li> <li>b. Bowing: associated bend in the bone shaft</li> <li>c. Greenstick: bending of the shaft with a fracture on the convex surface</li> </ul> <p>Salter-Harris: involving the growth plate</p>			
<p>10. Identify an open fracture as having a puncture of the skin or an open wound identify closed fractures as not having any skin opening.</p>			
<p>11. Identify closed fractures as not having any skin opening.</p>			
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>			
<p>Signatures of Supervisor</p>			





## CARDIOVASCULAR-1 MODULE

Objectives	Skill	Miller's Pyramid Level Reflected
Auscultation of heart sounds	Heart sounds	Shows
Detection of ankle swelling/edema – pitting /non-pitting	Edema	Shows
Abdominal jugular reflex	JVP	Shows
Perform detection of pedal and carotid pulses	Pedal and carotid pulse	Shows
Perform cervical and axillary lymph node examination	Lymph node Examination	Shows

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR HEART SOUNDS (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Introduce yourself to the patient and explain the process to them.			
2. Obtain consent from the patient			
3. Position the patient in a comfortable position and expose their chest.			
4. Place the stethoscope on the patient's chest over the four auscultation points - aortic, pulmonary, tricuspid and mitral.			
5. Listen to the heart sounds in each area, first with the diaphragm and then with the bell			
6. Identify the S1 and S2 sounds. S1 is the first sound heard, which is produced by the closure of the atrioventricular valves. S2 is the second sound heard, which is produced by the closure of the semilunar valves			
7. Determine the heart rate and rhythm			

<p>8. Assess the intensity of the heart sounds - S1 and S2. S1 should be louder than S2 at the mitral area and vice versa at the aortic area.</p>			
<p>9. Assess the splitting of the heart sounds - S2 may split physiologically during inspiration and be heard as two distinct sounds</p>			
<p>10. Listen for any additional heart sounds such as S3 or S4 which may indicate pathological conditions.</p>			
<p>11. Thank the patient</p>			
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>			
<p>Signatures of Supervisor</p>			

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

Date Observed: \_\_\_\_\_

<b>CHECKLIST FOR EXAMINATION OF EDEMA</b> (Some of the following steps/tasks should be performed simultaneously.)	<b>CASES</b> (Minimum 3 Entries)
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CZKZ5 Year-01

**STEP/TASK**

<b>THE PROCEDURE:</b>			
1. Introduce yourself to the patient and explaining the procedure			
2. Take consent.			
3. Ask patient to remove shoes and socks			
4. Observe the patient's ankles for any visible swelling or changes in skin colour			
5. Release the pressure and observe the area for any indentation or "pit".			
6. If a pit is observed that is known as pitting edema			
7. If no pit is observed that is known as non-pitting edema			
8. Assess the extent of the edema by measuring the circumference of the ankle with a tape measure.			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF PEDAL AND CAROTID PULSE (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)																		
<b>STEP/TASK</b>																			
<b>THE PROCEDURE:</b> (Pedal pulse)																			
<p style="text-align: center;">ducing yourself to the patient and explaining the</p> <ol style="list-style-type: none"> <li>1. Begin by introducing yourself to the patient and explaining the introprocedure</li> <li>2. Take consent.</li> <li>3. Ask the patient to lie down flat on their back or sit up with their legs dangling over the edge of the examination table</li> <li>4. Identify the pedal pulse by locating the dorsalis pedis artery on the top of the foot, just lateral to the extensor hallucis longus tendon. Alternatively, locate the posterior tibial artery by palpating the groove between the medial malleolus and Achilles tendon.</li> <li>5. Place your index and middle fingers over the identified artery and apply gentle pressure until you feel the pulse.</li> <li>6. Assess the strength and regularity of the pulse.</li> </ol>	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> <tr><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td><td style="width: 30px; height: 30px;"></td></tr> </table>																		
<b>THE PROCEDURE:</b> (Carotid pulse)																			



<p>1. Identify the carotid pulse by locating the carotid artery on the side of the neck, just below the angle of the jaw</p>			
<p>2. Assess the strength and regularity of the pulse</p>			
<p>3. Record your findings accurately and thank the patient</p> <p><b>*Remember, it's important to be gentle when performing this examination and to explain the procedure to the patient beforehand. Also, it's important to avoid excessive pressure on the carotid artery to prevent potential complications, especially in elderly or hypertensive patients. DO NOT COMPRESS CAROTID SIMULTANEOUSLY ON BOTH SIDES</b></p>			
<p><b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b></p>			
<p>Signatures of Supervisor</p>			

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF JVP (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1.                    f to the patient and explain the procedure			
2.                   o lie down flat on their back			
3. Place your right hand on the patient's upper abdomen, just below the ribcage.			
4. Apply firm pressure for about 10 seconds			
5. Observe the neck veins for any visible distension			
6. If the jugular veins in the neck become more visible or distended, this is a positive abdomin-jugular reflex and indicates an elevated JVP			
7. If there is no change in the neck veins, this is a negative abdomin-jugular reflex and indicates a normal JVP			
8. Thank the patient			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			

Signatures of Supervisor	
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### CERVICAL AND AXILLARY LYMPH NODES

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR EXAMINATION OF LYMPH NODES (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. _____ self to the patient and explain the procedure			
2. Inspect the neck and axilla for any visible swelling or abnormality			
3. Palpate the cervical lymph nodes. Start by checking the pre-auricular nodes, then move on to the post-auricular, occipital, submental, submandibular, tonsillar, superficial cervical, deep cervical, supraclavicular nodes			
4. Palpate the cervical lymph nodes. Start by checking the pre-auricular nodes, then move on to the post-auricular, occipital, submental, submandibular, tonsillar, superficial cervical, deep cervical, supraclavicular nodes			



<p>5. Note the size, shape, and consistency of the lymph nodes.          Normal lymph nodes are usually small, soft, and movable          Enlarged lymph nodes may be hard, tender, or fixed</p>			
<p>6. Check for pain or tenderness</p>			
<p>7. Thank the patient</p>			
<p>SKILL/ACTIVITY PERFORMED SATISFACTORILY</p>			
<p>Signatures of Supervisor</p>			



## RESPIRATORY-1 MODULE

Objectives	Skill	Miller's Pyramid Level Reflected
Performance of chest compressions	CPR/Chest compressions	Shows
Detection of clubbing	Clubbing	Shows
Identify main organs of the thorax on CXR	CXR	Shows
Identification of pneumonic patch on chest x ray	Pneumonia CXR	Shows
Administering inhaler to a patient	Inhaler use	Shows

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR PERFORMANCE OF CHEST COMPRESSIONS (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Position the person on their back: Place the person on their back on a hard, flat surface			
2. Position yourself: Kneel beside the person's chest			
3. Place your hands: Place the heel of one hand on the center of the person's chest between the nipples. Place the other hand on top of the first hand			
4. Interlock your fingers: Interlock your fingers, making sure that pressure is not applied to the person's ribs			
5. Compress the chest: With your arms straight, press down on the person's chest using your upper body weight. Compress the chest at least two inches deep, but no more than 2.4 inches, at a rate of 100-120 compressions per minute.			
6. Allow the chest to return to its normal position: After each compression, release the pressure on the chest, but do not remove your hands.			
7. Repeat: Continue the cycle of compressions and releases until medical help arrives or the person starts breathing on their own.			

SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR CHECKING CLUBBING OF FINGERS (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1 Procedure: Introduce yourself to the patient, explain what you are doing and obtain their consent.			
2 Signs: Look at the shape of the nails. Clubbed fingers show exaggerated curvature of the nail bed, causing the nails to be rounded and wider than normal			
3 Signs: Look at the base of the nails. Clubbed fingers show enlargement of the soft tissues at the base of the nail			
4. Check for other signs: Look for other signs of underlying medical conditions that can cause clubbing, such as cyanosis (blue discoloration of the skin), coughing, difficulty breathing, or chest pain			
5. Ask about symptoms: Ask the patient about any symptoms they may be experiencing, such as shortness of breath, chest pain, or chronic cough			

6. Thank the patient			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR IDENTIFICATION OF ORGANS ON CXR (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 3 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Orient yourself to the image by identifying the left and right sides of the chest			
2. Identify the bony structures of the chest, including the ribs, sternum, and clavicles			
3. Identify the lungs, which will appear as dark areas on the X-ray film			
4. Look for the diaphragm, which is a thin, curved line separating the chest cavity from the abdominal cavity			
5. Identify the heart, which will appear as a slightly enlarged area in the middle of the chest			
6. Look for the aorta, which is the largest artery in the body and runs down the center of the chest			

7. Identify the trachea, which is a tube that runs down the center of the chest and divides into the left and right main bronchi			
8. Look for any abnormalities such as nodules, masses, or areas of consolidation in the lungs			
9. Report your findings			
<b>SKILL/ACTIVITY PERFORMED SATISFACTORILY</b>			
Signatures of Supervisor			

## IDENTIFICATION OF PNEUMONIC PATCH ON X-RAY

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR IDENTIFICATION OF PNEUMONIC PATCH (Some of the following steps/tasks should be performed simultaneously.)	CASES (Minimum 2 Entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. Look for the location of the patch: Look for an area of increased opacity on the chest x-ray. The patch is usually located in one or two lung fields			
2. Assess the location and size of the patch: Observe the shape of the patch. It may be round, oval, or irregular in shape. Note the size of the patch and whether it is increasing or decreasing in size			
3. Assess the density of the patch: Evaluate the density of the patch. It may be fluffy, and may be surrounded by a hazy or fuzzy border			
4. Look for air bronchograms: Identify air bronchograms, which are visible air-filled bronchi within the patch. These indicate that the surrounding lung tissue is consolidated			
5. Check for pleural effusion: Assess the presence of a pleural effusion, which is a buildup of fluid in the pleural space around the lungs. This can be seen as a dark area at the bottom of the lung field			
6. Consider the patient's clinical presentation: Review the patient's symptoms, such as cough, fever, and shortness of breath, which are commonly associated with pneumonia			
7. Report your findings			

SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			



## INHALER USAGE

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

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

Date Observed: \_\_\_\_\_

CHECKLIST FOR INHALER USAGE (Some of the following steps/tasks should be performed simultaneously.)	CASES (minimum 2 entries)		
<b>STEP/TASK</b>			
<b>THE PROCEDURE:</b>			
1. _____ are about to demonstrate to the patient			
2. Take off the cap o			
3 _____ nhaler well before using it to ensure proper mixing of the medication			
4. Hold the inhaler in your hand with your thumb on the bottom and your index and middle fingers on top			
5. Position the mouthpiece between your teeth and close your lips around it to form a tight seal (explain to the patient, do not insert in your mouth while doing demonstration)			
6. Begin to inhale slowly and deeply through your mouth as you press down on the canister to release the medication			
7. Wait for at least 30 seconds before repeating the above steps if another dose is required			
8. Recap the inhaler			
9. Instruct the patient, that incase a steroid inhaler is used, rinse mouth to prevent oral thrush			

SKILL/ACTIVITY PERFORMED SATISFACTORILY			
Signatures of Supervisor			

### Developed by

Dr Komal Atta  
 Director Medical Education  
 University Medical and Dental College  
 Faisalabad

Lt. Col. (R) Dr. Khalid Rahim Khan TI (M)  
 Ex-Director Medical Education  
 University of Health Sciences Lahore



A graphic for Section 06. It features a blue semi-circle with a dark grey border, containing the number '06' in a dark grey outline font. Below the semi-circle is a grey rectangular box with the word 'Section' written in a white, cursive font.

06

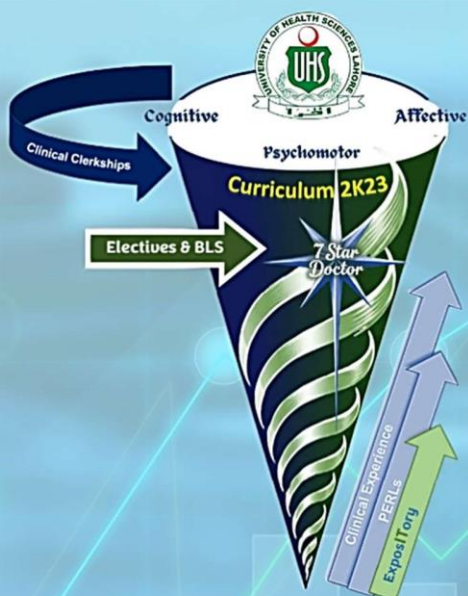
*Section*



University of Health  
Sciences Lahore

**Modular Integrated  
Curriculum 2K23**  
MBBS Year-01

**YEAR-1**

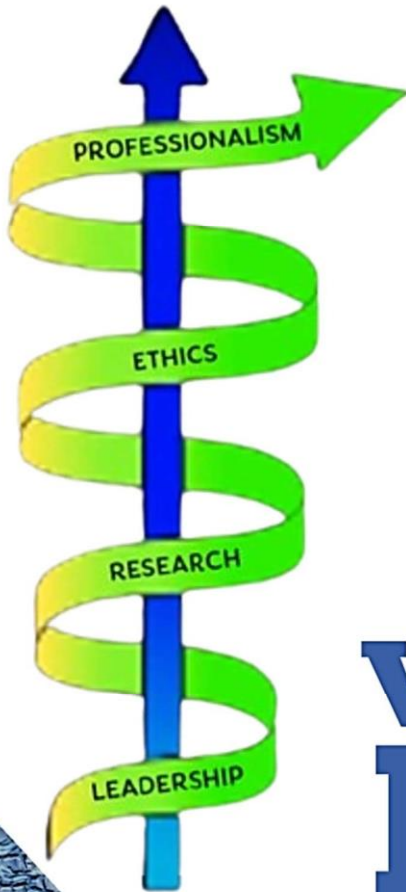


**PERLS**

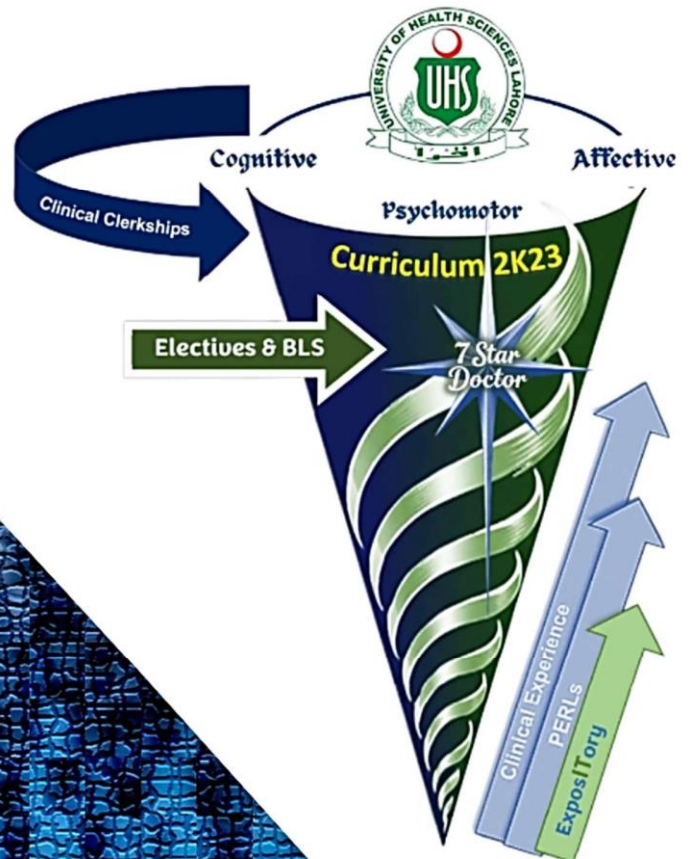


# Modular Integrated Curriculum 2K23

MBBS Year-1



# Volume-1 PERLs-1



## IMPLEMENTATION PLAN

C2K23 Year-01

This section includes the implementation strategy for the PERL Module. It is advised that the DME and facilitators from respective colleges involved in implementing PERLS should read this section carefully before initiating related instructional activities in respective colleges.

## PORTFOLIO TEMPLATE

A portfolio template is hereby given with proposed activities for the colleges to use /modify as per their resources. Please note that Portfolio can be hard-bound or e-portfolio depending on the individual college's decision.





MODULE RATIONALE

The UHS PERL module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership, aligning with the PMDC 7-Star Doctor (Professional, Ethical, Scholar, Leader, Communicator, Health Advocate, and Collaborator) framework. This framework emphasizes the multifaceted role of a physician, highlighting the need for a holistic approach to medical education. In an era where healthcare systems are constantly evolving, integrating these core areas is vital for developing well-rounded, responsible, and effective healthcare professionals.

1. Importance of Professionalism:

Professionalism is the cornerstone of medical practice, influencing patient trust and the overall quality of care. This module emphasizes the significance of professional behavior, including accountability, integrity, and respect for diversity, ensuring that students cultivate a strong ethical foundation as they progress through their medical education.

2. Ethical Decision-Making:

As future healthcare providers, students will face complex ethical dilemmas that require sound judgment and moral reasoning. This module focuses on key ethical principles, such as patient autonomy, equity, and justice in resource allocation, particularly in challenging areas like neoplasia and inflammation. Understanding these principles prepares students to advocate for their patients while navigating the intricate landscape of modern healthcare.

3. Research Competence:

Research plays a critical role in advancing medical knowledge and improving patient outcomes. By emphasizing evidence-based practice, this module encourages students to engage with scientific literature, develop robust literature search strategies, conduct research projects and apply research findings to clinical decision-making. This skill set is essential for fostering a culture of inquiry and continuous improvement within the healthcare profession.

4. Leadership Development:

Leadership is an integral part of effective healthcare delivery. This module prepares students to take on leadership roles, emphasizing teamwork, conflict resolution, and

effective communication. By fostering leadership skills, we aim to empower students to influence positive changes in their future workplaces and advocate for patient-centered care.

In summary, the UHS PERL module is designed to create a comprehensive learning experience that prepares medical students for the challenges and responsibilities they will face in their careers. By integrating Professionalism, Ethics, Research, and Leadership, we aim to cultivate competent, compassionate, and ethical healthcare professionals who are equipped to make informed decisions and lead with integrity in an ever-changing medical landscape.

## MODULE LEARNING OUTCOMES

- Exhibit accountability, integrity, and respect for diversity in all aspects of medical practice, embodying the principles of professionalism in clinical and academic settings.
- Analyze and apply ethical principles related to patient care, including autonomy, beneficence, non-maleficence, and justice, particularly in challenging situations such as end-of-life decisions and resource allocation.
- Develop and implement effective literature search strategies, critically evaluate scientific literature, and synthesize findings to inform clinical decision-making and practice.
- Participate in a comprehensive research project, from formulating a research question to data collection and analysis, culminating in the production of a publishable manuscript that meets academic and ethical standards.
- Demonstrate leadership skills through effective communication, conflict resolution, and teamwork, fostering a collaborative environment that enhances patient care and academic performance.
- Recognize and address the social determinants of health, advocating for equity in healthcare access and outcomes for diverse patient populations.
- Engage in self-assessment and reflective practices to identify strengths and areas for improvement, creating actionable plans for personal and professional growth throughout their medical education.
- Utilize effective verbal and non-verbal communication skills to engage with patients, families, and colleagues, ensuring clear and compassionate exchanges that enhance understanding and trust.

## SUBJECTS INTEGRATED IN THE MODULE

1. Professionalism
2. Ethics
3. Research
4. Leadership

## LEARNING RESOURCES

## 1. Professionalism:

- Azam, M. (2021). Mind maps for medicine. Scion Publishing. <https://scionpublishing.com/product/mind-maps-for-medicine/>
- Bin Abdulrahman, K. A., Khalaf, A. M., Bin Abbas, F. B., & Alanazi, O. T. (2021). Study habits of highly effective medical students. *Advances in Medical Education and Practice*, 12, 627–633. <https://doi.org/10.2147/AMEP.S309535>
- Bandaranayake, R. C. (2013). Study skills. In K. Walsh (Ed.), *Oxford textbook of medical education* (pp. 244–254). Oxford University Press. <https://doi.org/10.1093/med/9780199652679.003.0021>
- American Board of Internal Medicine Foundation, American College of Physicians Foundation, & European Federation of Internal Medicine. (2005). *Medical professionalism in the new millennium: A physician charter*. Retrieved from [https://www.abimfoundation.org/what-we-do/physiciancharter&#8203;;contentReference\[oaicite:0\]{index=0}](https://www.abimfoundation.org/what-we-do/physiciancharter&#8203;;contentReference[oaicite:0]{index=0})
- Barnhoorn, P. C., Houtlosser, M., Ottenhoff-de Jonge, M. W., Essers, G. T. J. M., Numans, M. E., & Kramer, A. W. M. (2019). A practical framework for remediating unprofessional behavior and for developing professionalism competencies and a professional identity. *Medical Teacher*, 41(3), 303–308. [https://doi.org/10.1080/0142159X.2018.1464133&#8203;;contentReference\[oaicite:1\]{index=1}](https://doi.org/10.1080/0142159X.2018.1464133&#8203;;contentReference[oaicite:1]{index=1})
- Guraya, S. S., Guraya, S. Y., Harkin, D. W., Ryan, Á., Mat Nor, M. Z. B., & Yusoff, M. S. B. (2021). Medical Education e-Professionalism (MEeP) framework; From conception to development. *Medical Education Online*, 26(1), 1983926. [https://doi.org/10.1080/10872981.2021.1983926&#8203;;contentReference\[oaicite:2\]{index=2}](https://doi.org/10.1080/10872981.2021.1983926&#8203;;contentReference[oaicite:2]{index=2})
- Kirk, L. M. (2007). Professionalism in medicine: Definitions and considerations for teaching. *Baylor University Medical Center Proceedings*, 20(1), 13–16. [https://doi.org/10.1080/08998280.2007.11928225&#8203;;contentReference\[oaicite:3\]{index=3}](https://doi.org/10.1080/08998280.2007.11928225&#8203;;contentReference[oaicite:3]{index=3})
- Al-Eraky, M. M. (2015). *Faculty development for medical professionalism in an Arabian context*. [Doctoral Thesis, Maastricht University]. Maastricht University. [https://doi.org/10.26481/dis.20150521ma&#8203;;contentReference\[oaicite:0\]{index=0}](https://doi.org/10.26481/dis.20150521ma&#8203;;contentReference[oaicite:0]{index=0})

□ Online Journals and Reading Materials through HEC Digital Library Facility

2. Ethics:

- World Health Organization. (2015). Global health ethics: Key issues. World Health Organization. <https://apps.who.int/iris/handle/10665/164576>
- World Health Organization. (2011). Standards and operational guidance for ethics review of health-related research with human participants. World Health Organization. <https://www.who.int/publications/i/item/9789241502948>
- World Health Organization. (2023). WHO Code of Ethics. World Health Organization.
- Harvey, J. C. (n.d.). Clinical ethics: The art of medicine. In *Military Medical Ethics*, Volume 1, Chapter 3.
- National Bioethics Committee. (2017). Guidelines and teachers handbook for introducing bioethics to medical and dental students. Healthcare Ethics Committee (HCEC).
- Varkey, B. (2021). Principles of clinical ethics and their application to practice. *Medical Principles and Practice*, 30(1), 17-28. <https://doi.org/10.1159/000509119>
- Pakistan Medical and Dental Council. (2018). Professional ethics and code of conduct.
- Online Journals and Reading Materials through HEC Digital Library Facility

3. Research

- Medical Statistics. 2nd Ed. by R. Turkwood.
- Biddle, K., Blundell, A., & Sofat, N. (2023). *Understanding clinical research: An introduction*. Scion Publishing. <https://scionpublishing.com/product/understandingclinical-research/>
- Harris, M., & Taylor, G. (2020). *Medical Statistics Made Easy* (4th ed.). Scion Publishing. <https://scionpublishing.com/product/medical-statistics-made-easy-fourth-edition/>
- Allen, A. K. (2012). *Research skills for medical students*. SAGE Publications, Inc. <https://doi.org/10.4135/9781526436016>
- Online Journals and Reading Materials through HEC Digital Library Facility

4. Leadership

- Wamboldt, R., & Loughran, N. (2017). *Communication skills for OSCEs*. Scion Publishing. <https://scionpublishing.com/product/communication-skills-for-osces/>
- Edmonstone, J. (2018). Leadership development in health care in low and middle-income countries: Is there another way? *International Journal of Health Planning and Management*, 33(4), e1193–e1199. <https://doi.org/10.1002/hpm.2606>
- National Center for Healthcare Leadership. (2018). *Health Leadership Competency Model 3.0*. Chicago, IL: National Center for Healthcare Leadership. <https://nchl.org>

- Chen T. Y. (2018). Medical leadership: An important and required competency for medical students. *Ci ji yi xue za zhi = Tzu-chi medical journal*, 30(2), 66–70. [https://doi.org/10.4103/tcmj.tcmj\\_26\\_18](https://doi.org/10.4103/tcmj.tcmj_26_18)





## INTRODUCTION

The UHS PERL Module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership. This guide provides facilitators with an overview of the module, instructional strategies, and resources to effectively engage students in their learning journey.

## MODULE OVERVIEW

- Professionalism: Focus on developing professional behavior and attitudes.
- Ethics: Emphasis on understanding and applying ethical principles in healthcare.
- Research: Development of research skills and critical appraisal abilities.
- Leadership: Enhancement of leadership qualities and communication skills.

## MODULE STRUCTURE

### 1. Professionalism

a. Focus: Development of professional behavior and attitudes essential for medical practice.

b. Key Topics:

- i. Professional identity formation
- ii. Accountability and integrity
- iii. Respect for diversity

### 2. Ethics

a. Focus: Understanding and applying ethical principles in healthcare. b. Key

Topics:

- i. Virtue ethics and moral character
- ii. Informed consent and patient autonomy
- iii. Bioethics and clinical ethics

### 3. Research

a. Focus: Developing research skills and critical appraisal abilities. b. Key Topics:

- i. Basics of academic writing
- ii. Literature searches and reviews
- iii. Evidence-based medicine and research methodologies

### 4. Leadership

a. Focus: Enhancing leadership qualities and communication skills. b. Key

Topics:

- i. Team dynamics and conflict resolution
- ii. Patient counseling and informed consent
- iii. Work-life balance and management skills

## MODULE IDEOLOGY

The UHS PERLs module is designed to provide a comprehensive and integrated approach to developing essential competencies in Professionalism, Ethics, Research, and Leadership for medical students throughout their undergraduate training.

#### Professionalism Module

The Professionalism module begins with the foundational attributes of a professional student or doctor, focusing on intrapersonal skills in the first year. As students progress to the second and third years, the emphasis shifts toward interpersonal skills relevant to various domains, culminating in the formation of a Professional Identity in the fourth year. This progression ensures that students develop not only self-awareness but also the ability to interact effectively and ethically with patients and colleagues.

#### Ethics Module

The Ethics module initiates discussions on virtue ethics, emphasizing the virtues and moral character expected of medical students and professionals. In the second year, students delve into bioethics, followed by clinical ethics and research ethics in the third and fourth years. This structure helps students navigate the complexities of ethical dilemmas in medical practice, ensuring they are prepared to make informed, compassionate decisions that respect patient autonomy and promote justice.

#### Research Module

The Research module begins with the basics of academic writing, introducing students to the structure of a manuscript and critical appraisal through Journal Club Meetings and presentations in the first year. In the second year, the focus shifts to literature searches, summarization, and reviews, incorporating the use of artificial intelligence to enhance research capabilities. The third

year introduces evidence-based medicine as a treatment guide in disease management, followed by research design, methodology, clinical audits, and patient safety, culminating in the development of a draft ethical approval proposal. This systematic approach equips students with the skills to conduct meaningful research and contribute to the advancement of medical knowledge.

#### Leadership Module

The Leadership module starts with personal qualities and communication skills in the first year, emphasizing the importance of effective interaction in healthcare settings. In the second year, the focus expands to teamwork dynamics, patient counseling, informed consent, conflict resolution, and work-life balance. The third year emphasizes management skills, including project management (aligned with research projects), entrepreneurship, and the use of innovation, such as AI in research and team leadership in healthcare setups. Finally, the fourth-year centers on professional identity, self-evaluation, digital transformation in healthcare, public health initiatives, health reforms, and advocacy. Throughout this module, mentoring sessions are integrated to provide role modeling and support, reinforcing the development of a strong professional identity among undergraduate MBBS students.

The UHS PERL module was developed through a scientific approach, involving the systematic identification of content via extensive literature searches, national and international guidelines, and recommendations from content contributors. This initial framework was presented to a panel of 10 invited experts in a modified e-Delphi round for validation.

During this process, the experts evaluated the module's content and provided constructive feedback, identifying areas for improvement. In the second round, a consensus was reached regarding the relevance of the module content, as well as its depth and scope tailored to the appropriate MBBS year.

Following the module development and validation, two independent reviewers were engaged to assess the sequencing and flow of the topics. Their review focused on ensuring logical coherence and identifying any additional revisions necessary to enhance the module's clarity and effectiveness. Further, the review was requested from an early career doctor who had recently graduated from an affiliated medical college in order to involve their suggestions for improvement.

This rigorous development and validation process ensures that the UHS PERL module meets the highest educational standards and effectively prepares medical students for their professional journey.

## LEARNING OBJECTIVES EXPLANATION

The learning objectives for the UHS PERL module are crafted to enhance students' comprehension and practical application of core competencies in Professionalism, Ethics, Research, and Leadership. Each objective consists of an Initial Learning Objective and an Actionable Learning Objective, guiding both instructional methods and portfolio assignments. Example: Work-Life Balance (Leadership) Learning Objective:

- Understand the importance of maintaining a healthy work-life balance, focusing on strategies for managing personal well-being while fulfilling professional commitments to ensure optimal mental and physical health.

Actionable Learning Objective:

- "Students will create a personal plan that outlines strategies for achieving work-life balance, including time management, self-care practices, and setting boundaries between personal and professional life." Instructional Strategies:
  - Use interactive discussions to explore the concept of work-life balance.
  - Facilitate workshops where students can share experiences and strategies.
  - Implement guided planning sessions where students can outline their personal plans with facilitator support.
  - Encourage peer feedback sessions for students to share and refine their plans collaboratively.

Proposed Portfolio Entry:

- "Submit a reflection on your work-life balance plan. Include specific strategies you intend to implement to manage stress and maintain your well-being while meeting your academic and professional responsibilities." Portfolio Guidance:
  - Ensure students understand the importance of documenting their plans and reflections as a means to monitor their progress and make adjustments as needed.

- Provide a rubric that emphasizes clarity, depth of reflection, and practical application in their submissions.

To enhance student engagement and promote a deeper understanding of the material, the following instructional strategies can (not limited to ) be employed:

1. **Active Learning:** Incorporate activities that require students to actively participate, such as problem-solving exercises, team-based in learning, group discussions, and hands-on simulations.
2. **Collaborative Learning:** Utilize small group work to encourage peer interaction and knowledge sharing, fostering a sense of community and collaborative problem-solving.
3. **Flipped Classroom:** Assign readings or videos for students to review before class, allowing class time to focus on discussions and practical applications of the material.
4. **Case-Based Learning:** Present real-world scenarios for students to analyze, encouraging critical thinking and the application of theoretical knowledge to practical situations.
5. **Technology Integration:** Leverage digital tools and online platforms to facilitate interactive learning experiences, such as virtual simulations, discussion forums, and collaborative projects.
6. **Mentoring and Peer Support:** Encourage mentorship opportunities where students can receive guidance from peers or professionals, fostering a supportive learning environment.

### PORTFOLIO ENTRY WITH PEEL CONCEPT

As part of the UHS PERL module, students will maintain a portfolio that incorporates the PEEL (Point, Evidence, Explanation, Link) concept for reflective entries:

1. **Point:** State the main idea or argument you want to discuss in your reflection or analysis.
2. **Evidence:** Provide supporting evidence or examples from your experiences, coursework, or relevant literature.
3. **Explanation:** Explain how the evidence supports your point, including its significance and implications for your learning.
4. **Link:** Connect your point to broader themes in the module or your overall personal and professional development.

Portfolio Guidance:

- Portfolio can be in hard bound or e-portfolio. A template for portfolio entry has been attached.
- Encourage students to use the PEEL framework to structure their reflections clearly and coherently. This will aid in their understanding of the material and enhance their ability to articulate their thoughts and learning experiences effectively.

## ROLE IN EVALUATION OF THE PERL MODULE

As a facilitator, your role in the evaluation of the UHS PERL module is crucial for ensuring its effectiveness and relevance. Key responsibilities include:

1. **Monitoring Student Progress:** Regularly assess student engagement and understanding through formative assessments, feedback, and participation in discussions and activities.
2. **Collecting Feedback:** Gather feedback from students regarding their learning experiences, instructional strategies, and the relevance of module content. This information is vital for continuous improvement.
3. **Evaluating Learning Outcomes:** Review the alignment of students' performances with the stated learning outcomes. Analyze assessment results to identify trends and areas needing improvement.
4. **Reflecting on Teaching Practices:** Engage in self-reflection and peer evaluation to assess your own teaching methods. Consider what strategies worked well and where adjustments may be needed to enhance student learning.
5. **Implementing Changes:** Based on evaluation findings, propose and implement changes to instructional methods, content delivery, or assessment strategies to better meet the needs of future cohorts.

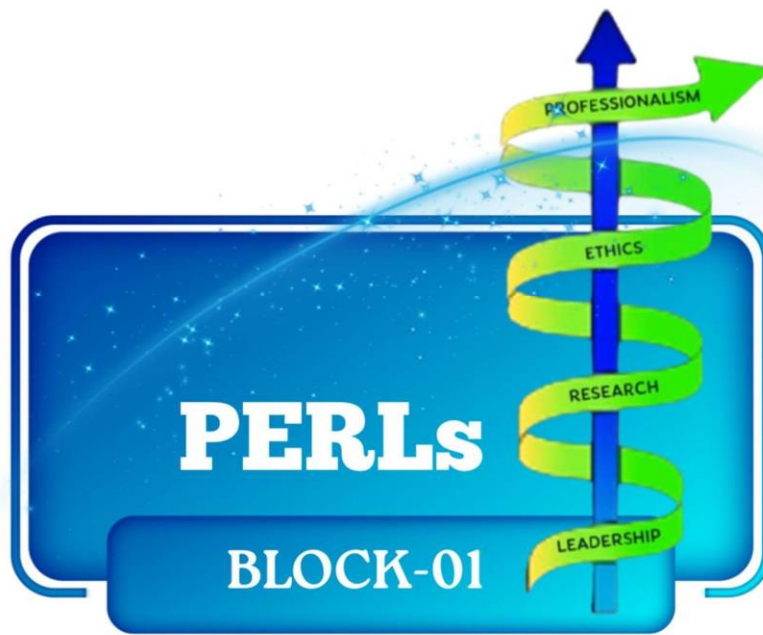
## CONCLUSION

As a facilitator of the UHS PERL module, your role is crucial in guiding students through the complexities of Professionalism, Ethics, Research, and Leadership. By utilizing diverse instructional strategies and fostering an engaging learning environment, you will help students develop the competencies necessary for their future roles as healthcare professionals.









ORIENTATION				
*Proposed Sequence of Topics Men oned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				Total Hours = 10.5
*Research (R) in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.				
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
PERLs1-001	Professionalism	History of Medical Profession	<ul style="list-style-type: none"> <li>• Discuss the origins of Medicine in Ancient Civilizations</li> <li>• Explain the key Figures in Medical History (Hippocrates, Avicenna, Florence Nightingale)</li> <li>• Discuss modernization of Medicine and Technological Advances</li> <li>• Introduce the development of Medical Education and Licensing</li> </ul>	-
PERLs1-002		Reflective Doctor	<ul style="list-style-type: none"> <li>• Discuss the concept of reflective practice and its importance in medical professionalism, including self-awareness, critical thinking, and continuous improvement.</li> <li>• Write a reflective entry after a learning experience, identifying key lessons, areas for improvement, and how these insights will influence their future practice.</li> </ul>	

PERLs1-003	Ethics	Hippocratic Oath taking	<input type="checkbox"/> Explain the history and Significance of the Hippocratic Oath	
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			<ul style="list-style-type: none"> <li>• Discuss the importance of Professional Integrity and Moral Conduct</li> <li>• Explain the need for lifelong Commitment to Patient Care and Wellbeing</li> <li>• Describe ethical Principles in the Oath: Autonomy, Beneficence, Nonmaleficence, and Justice</li> </ul>	-
PERLs1-004	Research	Introduction to Research	<ul style="list-style-type: none"> <li>• Describe research, inquiry, and evidencebased medicine.</li> <li>• Identify the importance of research in the practice of medicine</li> </ul>	-

PERLs1-005	Leadership	The Doc learner- S Skills

PERLs1-006	Leadership	Role Modelling/ Mentoring Session I	<ul style="list-style-type: none"> <li>Participate in the first mentoring session.</li> <li>Introduce yourself to your assigned mentor.</li> <li>Discuss their strengths and weaknesses with their mentor, receive feedback, and collaboratively create an action plan for personal and professional development</li> </ul>	Submit a summary of your mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.
PERLs1-007	Computer/ IT	Academic Writing-IT Skills	<ul style="list-style-type: none"> <li>Demonstrate the use of essential IT skills for academic writing, including word processing software (e.g., Microsoft Word), formatting documents, and essential editing tools to enhance the quality of academic papers.</li> <li>Practice creating and formatting a simple document using a word processing tool, applying basic formatting features like headings, bullet points, and spacing to organize their writing.</li> </ul>	

### FOUNDATION-I

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

Total Hours = 7.5

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

Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
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PERLs1-008		Introduct medical Professio
PERLs1-009	Professionalism	Respons Accounta Medical S
PERLs1-010	Ethics	Code Conduct: of h professio

			<p>identify key responsibilities expected of them as medical students. Reflect on the importance of following these guidelines in maintaining professionalism and being aware of actions for misconduct (academic, nonacademic/disciplinary).</p>	<p>medical student. Include how adherence to these rules shapes your journey toward becoming a responsible healthcare professional.</p>
PERLs-1-011	Leadership	Personal Qualities: Self Directed Learner	<ul style="list-style-type: none"> <li>• Develop the ability to become a self-directed learner by setting achievable long-term and short-term goals and effectively managing time to meet academic and personal milestones.</li> <li>• Create a personal plan that includes both long-term and short-term academic goals and a weekly time schedule to help manage their studies and personal responsibilities.</li> </ul>	<p>Submit a personal learning plan outlining your long-term and short-term goals, as well as a detailed weekly time schedule. Reflect on how this plan will support your academic success and personal development as a self-directed learner</p>

PERLs-  
1-012

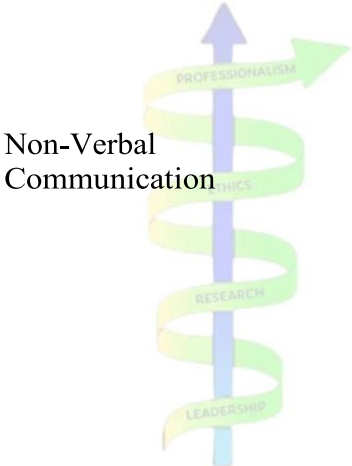
Verbal  
Commun

HEMATOPOETIC & LYMPHATIC

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

Total Hour

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

Code	Domain	Topic	Specific Learning Objectives	Propos Portfolio
PERLs-1-013	Leadership	<p>Non-Verbal Communication</p> 	<p>□ Discuss the role of nonverbal communication, including body language, facial expressions, and gestures, in effectively conveying messages and building rapport in healthcare settings</p> <p>□ Practice using appropriate non-verbal communication during simulated patient interactions or group discussions, such as eye contact, posture, and active listening cues.</p>	<p>Submit reflection group ac or sim interaction where conscious used verbal communication to enhance interaction. Discuss h impacted ability to or communication effectively.</p>

ti

PERLs-1-014	Research	Scientific Writing	<ul style="list-style-type: none"><li>• Differentiate between types of scientific publications, including editorials, original articles, systematic reviews, case reports, meta-analyses, and narrative reviews.</li><li>• Identify different forms of scientific writing in published journals.</li></ul>	
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C2K23 Year-01



SECTION-I	
to manage	Total Hours = 06
<p>ment of Community Medicine as a program. At the end of the fourth year, tion.</p>	
Objectives	Proposed Portfolio Entry
<p>hical and significance of the human body in education anatomy appreciate the of body medical</p>	<p>e of of                  Write a Code of                  Conduct in                  professional Hall,                  behaviours with                  Anatomy                  Laboratories                  /museums                  human                  tissue/remains.</p>
<p>y virtues healthcare including courage, humility, altruism, and their role in practice. case or e or more virtues, w these l patient es.</p>	<p>Write a reflective entry on a case or scenario where healthcare professionals demonstrated one or more of these virtues, discussing how these traits influenced patient care and outcomes</p>

written electronic skills, clarity, and	Submit a sample professional email or electronic communication (e.g., a message to a
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C2K23 Year-01

both clinical emails health practice ar and l to a r peer, format,	faculty member) that demonstrates clarity, appropriate tone, and adherence to communication protocols.
--	--

the giving ack nciples like the 2 Stars romote while positive edback g the chnique ve) or h' (two nd one ement) ivity or .	Submit the feedback given to you by your peer during class activity with the identification of areas for improvement and an action plan.
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<p>basic research the format Methods, and its scientific components manuscript IMRAD</p> <p>edge of writing</p>	
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C2K23 Year-01

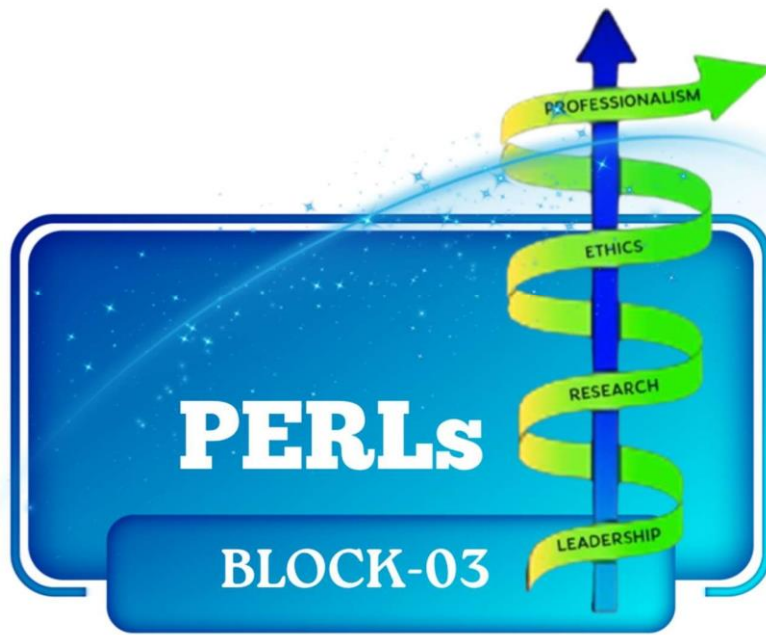
	<p>an original article to the portfolio, labelling its key components.</p>	
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<ul style="list-style-type: none"> <li>• Define patient autonomy and understand its foundational role in medical ethics, recognizing that every patient has the right to make informed decisions regarding their own healthcare.</li> <li>• Describe necessary components of informed decision-making, including the provision of accurate information, understanding of risks and benefits, patient comprehension, and the patient's ability to voluntarily make choices free from coercion.</li> <li>• Appreciate the responsibilities of healthcare providers in ensuring that patients receive all necessary information and support to make autonomous decisions, including</li> </ul>	<p>Submit a reflective case study analyzing how patient autonomy was handled in a clinical situation. Discuss whether the patient was fully informed, how their preferences were respected, and the role of healthcare providers in ensuring the patient's right to make decisions about their own care.</p>
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	effective communication and respecting cultural, religious, or personal values.	
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**PERLs**

**BLOCK-03**

PROFESSIONALISM

ETHICS

RESEARCH

LEADERSHIP

CARDIOVASCULAR-I				
*Proposed Sequence of Topics Men oned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				Total Hours = 09
*Research (R) in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.				
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
PERLs1-020	Professionalism	Digital Identity	<ul style="list-style-type: none"> <li>Understand the concept of digital identity, focusing on the impact of a healthcare professional's digital footprint and the importance of maintaining professional conduct in online spaces</li> <li>Analyze their current digital footprint, identify areas where they can improve their online presence to reflect professionalism and develop a plan for maintaining appropriate online conduct.</li> </ul>	Submit evidence of your digital footprint.

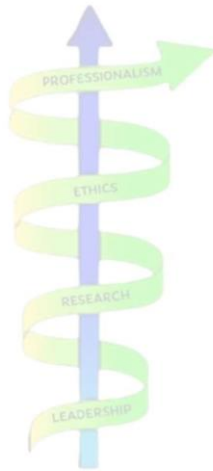
<p>PERLs1-021</p>	<p>Ethics</p>	<p>Justice Resource Allocation in</p>	<ul style="list-style-type: none"> <li>Describe the ethical principle of justice in healthcare, focusing on the fair allocation of limited resources and how healthcare professionals can make ethical decisions to ensure equity in patient care.</li> <li>Analyze a case where healthcare resources e.g. Ventilators are limited in CCU, evaluating how justice and fairness principles were applied in resource allocation and proposing ways to</li> </ul>	<p>Submit a case analysis discussing the ethical challenges of resource allocation in healthcare, focusing on how justice was applied or compromised. Propose strategies for making fair and equitable decisions in future resourceconstrained scenarios.</p>
			<p>ensure equitable distribution.</p>	

PERLs1-022	Leadership	Asking Feedback for	<ul style="list-style-type: none"> <li>• Discuss the importance of seeking constructive feedback as a leadership skill to foster personal growth, enhance team performance, and improve communication within healthcare settings.</li> <li>• Discuss the critical principles of seeking constructive feedback, including openness to criticism, active listening, and using feedback for personal and professional growth.</li> <li>• Practice seeking constructive feedback by asking specific, open-ended questions to peers or mentors about their performance and demonstrating active listening and reflection on the feedback received.</li> </ul>	Submit a list of areas where you want feedback from your mentor in the upcoming mentor meeting.
PERLs1-023		Role Modelling/ Mentoring Session II	<input type="checkbox"/> Participate in a mentoring session where they will discuss their strengths and weaknesses with their mentor, receive feedback, and collaboratively create an action plan for personal and professional development	Submit a summary of your progress from your last mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.
PERLs1-024		Receiving Feedback	<input type="checkbox"/> Describe the principles of receiving feedback effectively, including openness, self-	Submit a reflection on how you received feedback during a task or project.

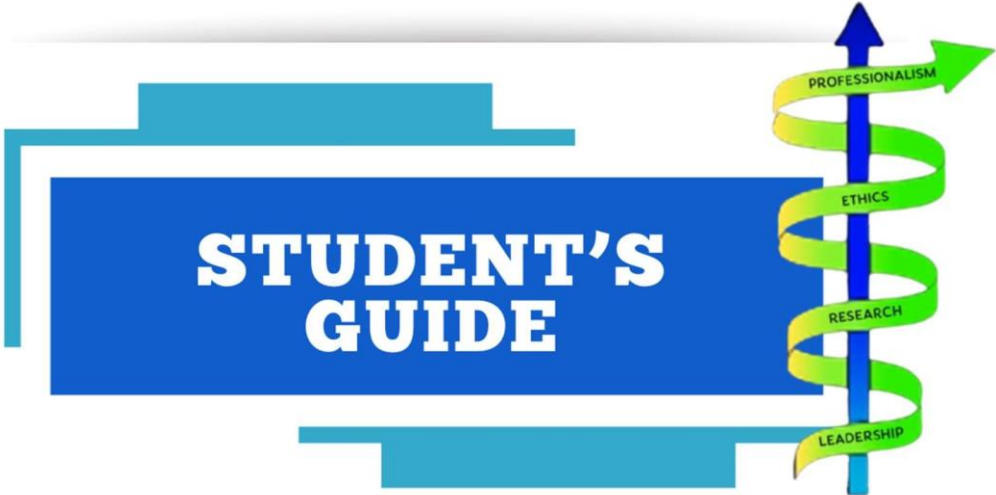
			<p>awareness, and using feedback constructively to improve performance and personal development.</p> <p><input type="checkbox"/> Practice receiving feedback by actively listening, acknowledging the feedback, and reflecting on how it can be applied to improve their performance in academic or clinical tasks.</p>	<p>Discuss how you responded to the feedback and how you plan to incorporate it into your personal or professional development</p>
PERLs1-025	Research	Research Types	<ul style="list-style-type: none"> <li>• Identify different types of health research (basic, clinical, applied, public health).</li> <li>• Differentiate between quantitative and qualitative research approaches.</li> </ul>	

RESPIRATORY-I				
*Proposed Sequence of Topics Men oned below. Medical Colleges are at liberty to manage according to their resources. Topics can switch within each Block				Total Hours = 4.5
*Research (R) in the PERL curriculum will be delivered by the Department of Community Medicine as a longitudinal component from the first to the fourth year of the MBBS program. At the end of the fourth year, students' research projects will be assessed through a dedicated PERL station.				
Code	Domain	Topic	Specific Learning Objectives	Proposed Portfolio Entry
PERLs1-026	Ethics	Digital Ethics	<ul style="list-style-type: none"> <li>The principles of digital ethics, including proper netiquette, maintaining confidentiality in online spaces, and the legal and ethical implications of online harassment and misconduct.</li> <li>Identify examples of ethical and unethical online behaviour, focusing on netiquette, confidentiality, and how to prevent and address online harassment by relevant laws.</li> </ul>	Make a poster for Netiquette in using your Class Social Media Groups.
PERLs1-027	Professionalism	Integrity Honesty	& <ul style="list-style-type: none"> <li>Describe the importance of integrity and honesty in academic and clinical environments, focusing on demonstrating ethical behaviour in assignment submissions and during examinations.</li> <li>Commit to completing and submitting assignments and exams with honesty and integrity, reflecting on the significance of these values in their academic and future professional practice.</li> </ul>	Submit an incident report of a case of cheating in an exam and provide recommendations on how it should have been handled.

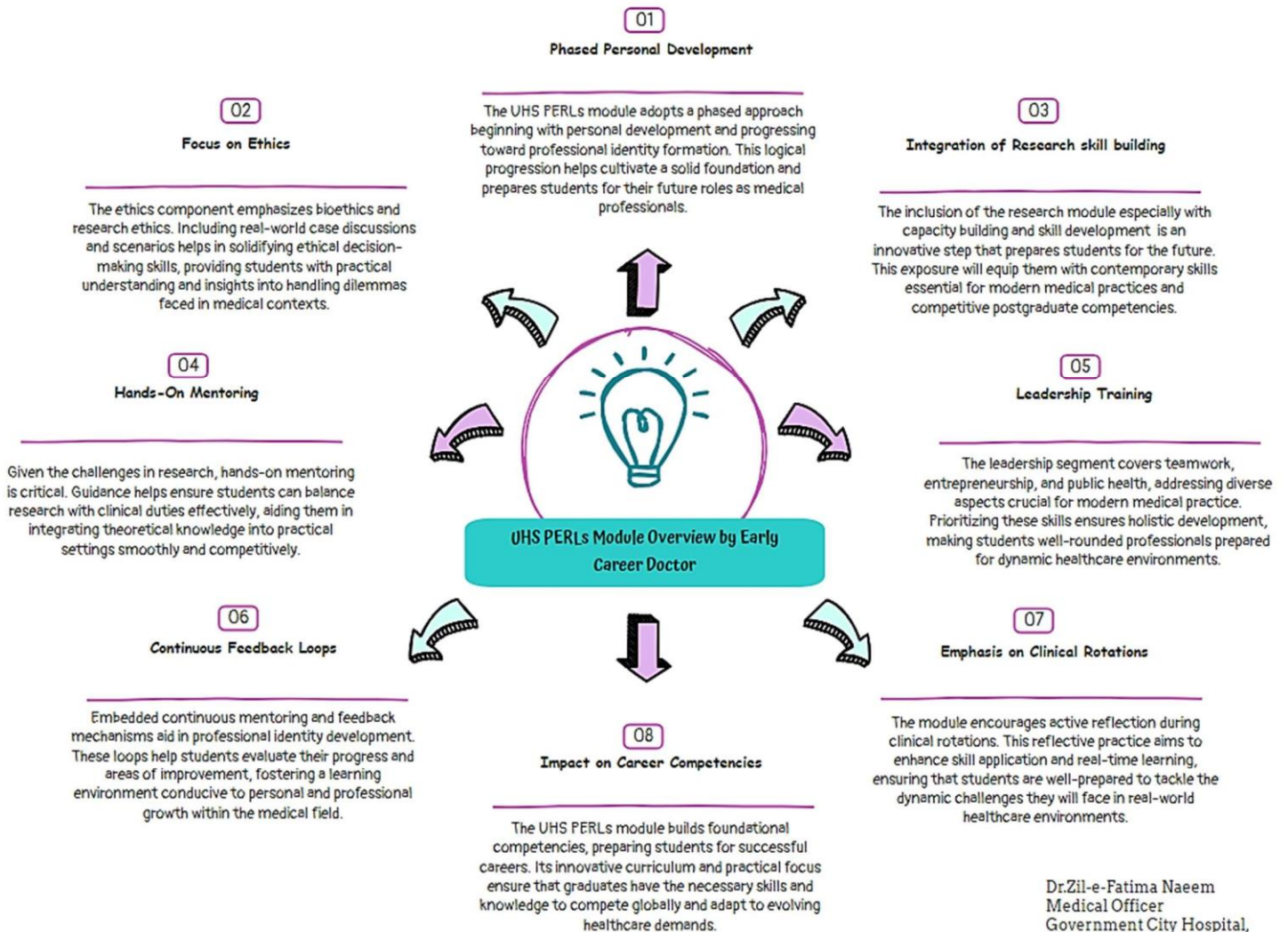
<p>PERLs1-028</p>	<p>Research</p>	<p>Scientific article understanding &amp; Research ethics</p>	<ul style="list-style-type: none"> <li>□ Present the main features of a selected scientific article to peers, demonstrating understanding of its structure and findings.</li> <li>□ Explain the basic principles of research ethics (e.g., consent, confidentiality, authorship, plagiarism).</li> </ul>
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## What your Seniors say



Dr.Zil-e-Fatima Naeem  
 Medical Officer  
 Government City Hospital,  
 Toba Tek Singh, Punjab

## INTRODUCTION

The UHS PERL Module is designed to equip medical students with essential competencies in Professionalism, Ethics, Research, and Leadership. This guide provides facilitators with an overview of the module, instructional strategies, and resources to effectively engage students in their learning journey.

## MODULE STRUCTURE

## 5. Professionalism

a. Focus: Development of professional behavior and attitudes essential for medical practice.

b. Key Topics:

- i. Professional identity formation
- ii. Accountability and integrity
- iii. Respect for diversity

## 6. Ethics

a. Focus: Understanding and applying ethical principles in healthcare. b. Key

Topics:

- i. Virtue ethics and moral character
- ii. Informed consent and patient autonomy
- iii. Bioethics and clinical ethics

## 7. Research

a. Focus: Developing research skills and critical appraisal abilities. b. Key

Topics:

- i. Basics of academic writing
- ii. Literature searches and reviews
- iii. Evidence-based medicine and research methodologies

## 8. Leadership

a. Focus: Enhancing leadership qualities and communication skills. b. Key

Topics:

- i. Team dynamics and conflict resolution
- ii. Patient counseling and informed consent
- iii. Work-life balance and management skills

# MODULE IDEOLOGY

The UHS PERLs module is designed to provide a comprehensive and integrated approach to developing essential competencies in Professionalism, Ethics, Research, and Leadership for medical students throughout their undergraduate training.

#### Professionalism Module

The Professionalism module begins with the foundational attributes of a professional student or doctor, focusing on intrapersonal skills in the first year. As students progress to the second and third years, the emphasis shifts toward interpersonal skills relevant to various domains, culminating in the formation of a Professional Identity in the fourth year. This progression ensures that students develop not only self-awareness but also the ability to interact effectively and ethically with patients and colleagues.

#### Ethics Module

The Ethics module initiates discussions on virtue ethics, emphasizing the virtues and moral character expected of medical students and professionals. In the second year, students delve into bioethics, followed by clinical ethics and research ethics in the third and fourth years. This structure helps students navigate the complexities of ethical dilemmas in medical practice, ensuring they are prepared to make informed, compassionate decisions that respect patient autonomy and promote justice.

#### Research Module

The Research module begins with the basics of academic writing, introducing students to the structure of a manuscript and critical appraisal through Journal Club Meetings and presentations in the first year. In the second year, the focus shifts to literature searches, summarization, and reviews, incorporating the use of artificial intelligence to enhance research capabilities. The third year introduces evidence-based medicine as a treatment guide in disease management, followed by research design, methodology, clinical audits, and patient safety, culminating in the development of a draft ethical approval proposal. This systematic approach equips students with the skills to conduct meaningful research and contribute to the advancement of medical knowledge.

### Leadership Module

The Leadership module starts with personal qualities and communication skills in the first year, emphasizing the importance of effective interaction in healthcare settings. In the second year, the focus expands to teamwork dynamics, patient counseling, informed consent, conflict resolution, and work-life balance. The third year emphasizes management skills, including project management (aligned with research projects), entrepreneurship, and the use of innovation, such as AI in research and team leadership in healthcare setups. Finally, the fourth-year centers on professional identity, self-evaluation, digital transformation in healthcare, public health initiatives, health reforms, and advocacy. Throughout this module, mentoring sessions are integrated to provide role modeling and support, reinforcing the development of a strong professional identity among undergraduate MBBS students.

## MODULE DEVELOPMENT AND VALIDATION

The UHS PERL module was developed through a scientific approach, involving the systematic identification of content via extensive literature searches, national and international guidelines, and recommendations from content contributors. This initial framework was presented to a panel of 10 invited experts in a modified e-Delphi round for validation.

During this process, the experts evaluated the module's content and provided constructive feedback, identifying areas for improvement. In the second round, a consensus was reached regarding the relevance of the module content, as well as its depth and scope tailored to the appropriate MBBS year.

Following the module development and validation, two independent reviewers were engaged to assess the sequencing and flow of the topics. Their review focused on ensuring logical coherence and identifying any additional revisions necessary to enhance the module's clarity and effectiveness. Further, the review was requested from an early career doctor who had recently graduated from an affiliated medical college in order to involve their suggestions for improvement. This rigorous development and validation process ensures that the UHS PERL module meets the highest educational standards and effectively prepares medical students for their professional journey.

## ASSESSMENT AND EVALUATION

- **Portfolio:** Throughout the module, you will be required to maintain a portfolio that includes reflections, case analyses, and evidence of your learning experiences. This portfolio will serve as a demonstration of your growth and understanding of the module content.
- **Participation:** Engage actively in discussions, group work, and role-playing exercises to enhance your learning and application of the concepts.
- **OSCE Exam:** At the end of the module, you will participate in an Objective Structured Clinical Examination (OSCE) as a summative assessment. This exam will evaluate your practical skills, including communication, clinical reasoning, and the application of professionalism and ethical principles in simulated patient scenarios along with leadership and research skills.

## EVALUATION: YOUR FEEDBACK

As part of the UHS PERL module, we value your feedback to continually improve the learning experience. Your insights will help us understand the effectiveness of the module and identify areas for enhancement.

FEEDBACK AREAS:

1. Module Content:
  - a. Was the content relevant and appropriate for your learning needs?
  - b. Were the topics covered comprehensively?
2. Teaching Methods:
  - a. Did the teaching methods (lectures, discussions, practical exercises) support your learning?
  - b. How effective were the mentoring sessions in reinforcing your understanding?
3. Assessments:
  - a. Did the assessments (portfolio, OSCE exam) accurately reflect your knowledge and skills?
  - b. Were the expectations for the assessments clear and achievable?
4. Resources:
  - a. Were the provided resources (reading materials, online tools) helpful for your learning?
  - b. Is there any additional resource you would suggest?

### 5. Overall Experience:

- a. What aspects of the module did you find most beneficial?
- b. What suggestions do you have for improving the module in the future?

### FEEDBACK SUBMISSION:

Please provide your feedback using the following format to the Department of Medical Education in your College:

- Strengths: What worked well?
- Areas for Improvement: What could be improved?
- Additional Comments: Any other thoughts or suggestions?

Your feedback is essential for refining the UHS PERL module and ensuring it meets the needs of future students. Thank you for your participation.

## PEEL PORTFOLIO TEMPLATE

At the end of this guide, you will find the PEEL (Point, Evidence, Explanation, Link) portfolio template, which will help you structure your reflections and analyses effectively.

1. Point: State the main idea or point you want to discuss.
2. Evidence: Provide evidence or examples to support your point.
3. Explanation: Explain how the evidence relates to your point and its significance.
4. Link: Connect your point to broader themes in the module or your personal development.

## CONCLUSION

The UHS PERL Module aims to equip you with the essential competencies needed to thrive as a future healthcare professional. Your engagement, critical thinking, and commitment to learning will be key to your success in this module. Embrace the challenges and opportunities for growth and make the most of the available resources and support.

Developed by

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HOD Medical Education  
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Lt. Col. (R) Dr. Khalid Rahim Khan TI (M)  
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07

*Section*



**Modular Integrated  
Curriculum 2K23  
MBBS Year-01**

**EXPOSITORY**

**Volume: 01**

**Modular Integrated**

**Curriculum 2K23**





**YEAR-01**

Modular Integrated

Curriculum 2K23

**EXPOSITORY**

## Module Rationale

To integrate Expository Writing with an Introduction to Information Technology (IT) course for undergraduate medical students, we can align the IT skills taught each year with the writing tasks and objectives. The aim is to enhance students' digital literacy and writing skills, which is crucial for modern medical practice.

This integrated spiral of Expository Writing and IT ensures that as students advance in their medical education, they also develop digital literacy skills. These skills complement their writing abilities and prepare them for modern medical practice, where digital communication, research, and data management are essential. By the end of the 4-year program, students will be proficient in writing and using technology to support their work as healthcare professionals.

Year 1: Expository Writing I – Foundations in Academic Writing +  
Introduction to IT: Basic Digital Literacy

THEORY

Code	Subject: Expository writing & IT		Total Hours =10
	Specific Learning Outcome	Integrating Disciplines	Topics

EXP-01	<p>Expository Writing Focus:</p> <ol style="list-style-type: none"> <li>1. To write expository essays using planning, prewriting, organizing, drafting, revising, editing, and proofreading strategies.</li> <li>2. To edit own written work using the checklist, for fixing errors.</li> <li>3. To sketch a template of a formal outline for the sequencing of the essay</li> <li>4. To write patient history and simple case reports.</li> </ol> <p>IT Integration:</p> <ol style="list-style-type: none"> <li>5. Word, Google Docs), internet search strategies, and using online libraries (e.g., PubMed, Google Scholar).</li> </ol> <p>Writing Application:</p> <ol style="list-style-type: none"> <li>6. To use word processing tools to draft and format essays, case reports, and patient histories.</li> <li>7. Introduction to citation management tools (e.g., Zotero, Mendeley) for</li> </ol>	PERLS, Anatomy, Physiology & Biochemistry	<ul style="list-style-type: none"> <li>• Step by step process of expository writing which includes planning, prewriting, organizing, drafting, revising, editing and proofreading.</li> <li>• Brain storming process for generating ideas for selection of topics.</li> <li>• idea mapping for the organization of an essay.</li> <li>• Self-editing of the essays.</li> <li>• Template for sequencing of the essay.</li> <li>• Writing patient history and basic case reports</li> <li>• Basic computer and internet skills (Microsoft Word, Google Scholar)</li> <li>• Use of digital writing assistance</li> </ul>
	referencing sources in essays.		(Grammarly) - Introduction to citation tools (e.g., Zotero, Mendeley)

Developed by

Dr. Ambreen Khalid  
Professor of Physiology  
Central Park Medical College, Lahore

Lt. Col. (R) Dr. Khalid Rahim Khan TI (M)  
Ex-Director Medical Education  
University of Health Sciences Lahore







**Department of Medical  
Education**

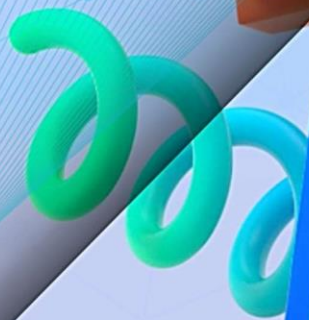
*Innovating &  
Strategizing Healthcare  
Academia*

**Volume-01**

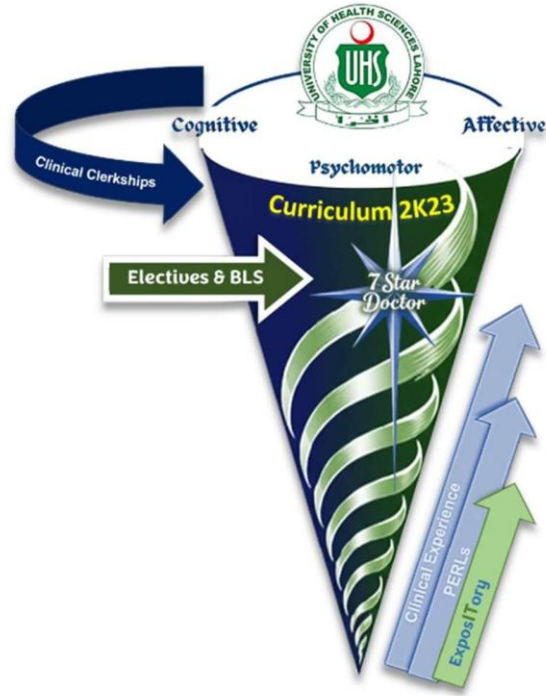


# **STUDENT PORTFOLIO**

**YEAR-01**







MODULE: ORIENTATION

DATE FROM: \_\_\_\_\_

DATE TO: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

C2K23 Year-01

egies for time management, that demonstrates how you

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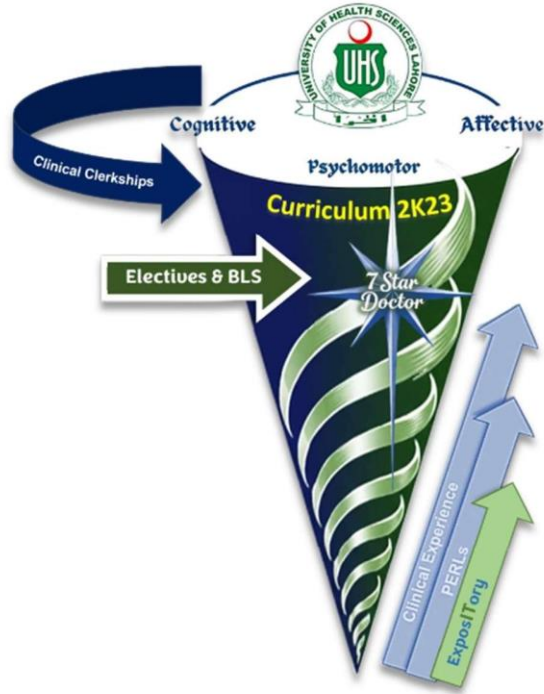
Roll No:	
Assignment Topic:	
Date:	
Submit a summary of your mentoring session, including feedback, areas identified for improvement, and the action plan you developed with your mentor to enhance your professional growth.	

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Facilitator Remarks:

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MODULE: FOUNDATION-I

DATE FROM: \_\_\_\_\_

DATE TO: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

Roll No:	
Assignment Topic:	
Date:	

Submit a reflective entry discussing what professionalism means in the context of healthcare. Use a case or example to highlight key professional behaviours you observed or practiced.

Facilitator Remarks:

Roll No:	
Assignment Topic:	
Date:	
Submit a reflective entry discussing what professionalism means in the context of healthcare. Use a case or example to highlight key professional behaviours you observed or practiced.	
Facilitator Remarks:	



Roll No:	
Assignment Topic:	
Date:	
Submit a personal learning plan outlining your long-term and short-term goals, as well as a detailed weekly time schedule. Reflect on how this plan will support your academic success and personal development as a self-directed learner	

Facilitator Remarks:	
Roll No:	
Assignment Topic:	
Date:	
<p>Submit a reflection on a group activity where you practiced verbal communication skills. Highlight how you conveyed information clearly and effectively, and reflect on areas where you can improve your verbal communication in academic or clinical settings.</p>	

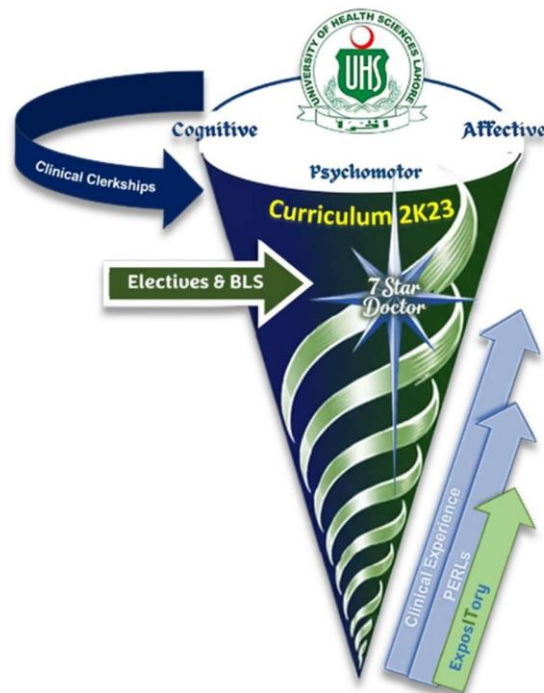
Facilitator Remarks:	
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Roll No:	
Assignment Topic:	
Date:	
Evidence of Attendance Record.	

Facilitator Remarks:	



## Curriculum 2K23 (MBBS Year-1)



### MODULE: HEAMTOPOIETIC & LYMPHOID-I

DATE FROM: \_\_\_\_\_

DATE TO: \_\_\_\_\_

CHECKED BY:	296
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Roll No:	
Assignment Topic:	
Date:	
Submit the identified components on the manuscript	

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Facilitator Remarks:	
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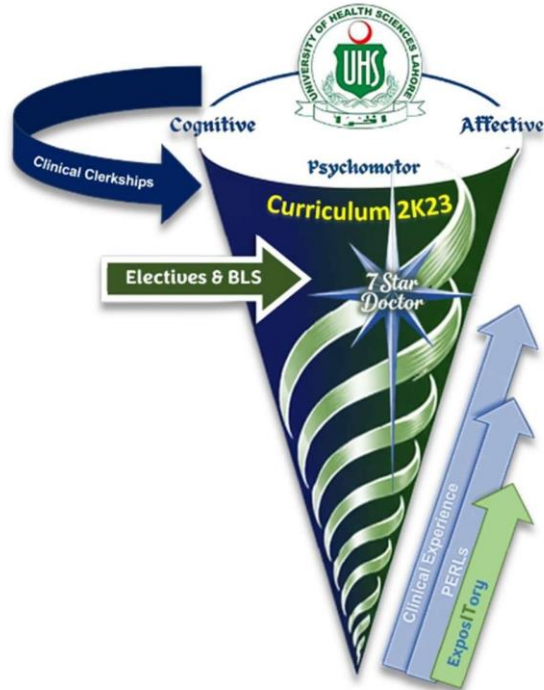
Roll No:	
Assignment Topic:	
Date:	

Submit a reflection on a group activity or simulated interaction where you consciously used nonverbal communication to enhance the interaction. Discuss how it impacted your ability to lead or communicate effectively

Facilitator Remarks:



## Curriculum 2K23 (MBBS Year-1)



### MODULE: MUSCULOSKELETAL & LOCOMOTION-I

DATE FROM: \_\_\_\_\_  
DATE TO: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

Roll No:	
Assignment Topic:	
Date:	
Write a Code of Conduct of professional behaviours in Anatomy Hall, Laboratories /Museums with human tissue/remains	

Facilitator Remarks:

Roll No:	
Assignment Topic:	
Date:	
Write a reflective entry on a case or scenario where healthcare professionals demonstrated one or more of these virtues, discussing how these traits influenced patient care and outcomes	

Facilitator Remarks:	
Roll No:	
Assignment Topic:	
Date:	
Submit a sample professional email or electronic communication (e.g., a message to a faculty member) that demonstrates clarity, appropriate tone, and adherence to communication protocols.	

<b>Facilitator Remarks:</b>	

<b>Roll No:</b>	
<b>Assignment Topic:</b>	
<b>Date:</b>	

Submit the feedback given to you by your peer during class activity with the identification of areas for improvement and an action plan.

Facilitator Remarks:

Roll No:

Assignment Topic:

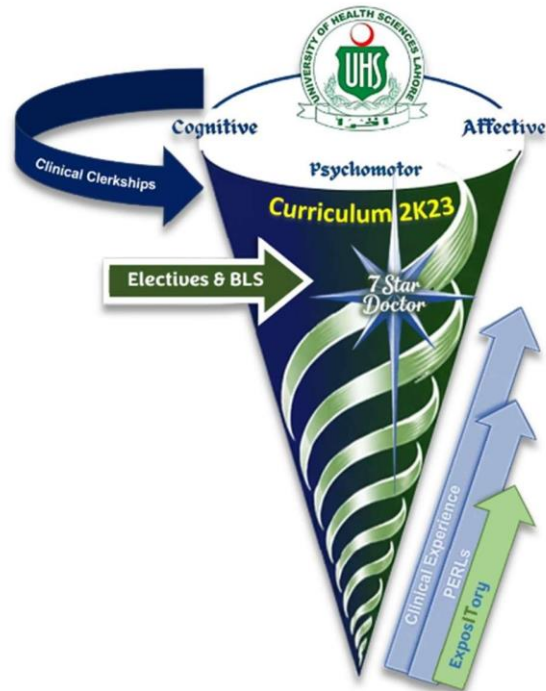
Date:	
Submit an Article Critique report highlighting areas for improvement	
Facilitator Remarks:	

Roll No:	
Assignment Topic:	
Date:	
<p>Submit a reflective case study analyzing how patient autonomy was handled in a clinical situation. Discuss whether the patient was fully informed, how their preferences were respected, and the role of healthcare providers in ensuring the patient's right to make decisions about their own care.</p>	

Facilitator Remarks:	
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## Curriculum 2K23 (MBBS Year-1)



### MODULE: CARDIOVASCULAR-I

DATE FROM: \_\_\_\_\_ DATE  
TO: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

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Roll No:	
Assignment Topic:	
Date:	
Submit evidence of your digital footprint.	
Facilitator Remarks:	

ethical challenges of resource allocation in healthcare, focusing on the most vulnerable. Propose strategies for making fair and equitable decisions

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Roll No:	
Assignment Topic:	
Date:	
Submit a list of areas where you want feedback from your mentor in the upcoming mentor meeting.	

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Facilitator Remarks:	
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Roll No:	
Assignment Topic:	
Date:	

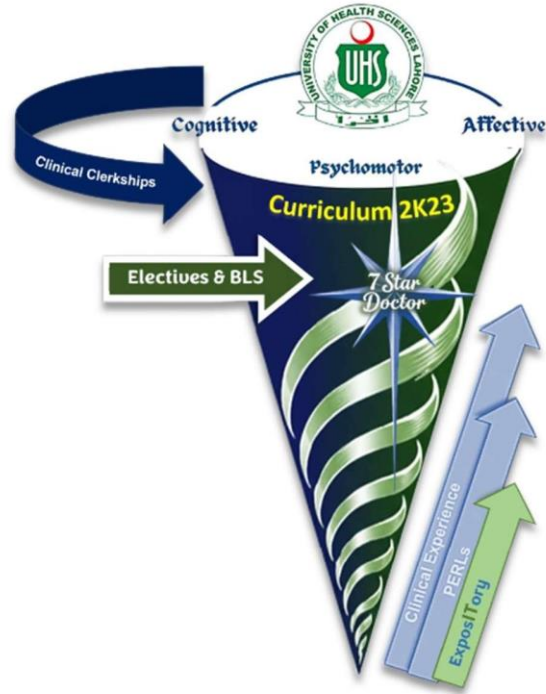
Submit Article Critique report

Facilitator Remarks:



Curriculum 2K23

(MBBS Year-1)



MODULE: RESPIRATORY-I

DATE FROM: \_\_\_\_\_ DATE  
TO: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

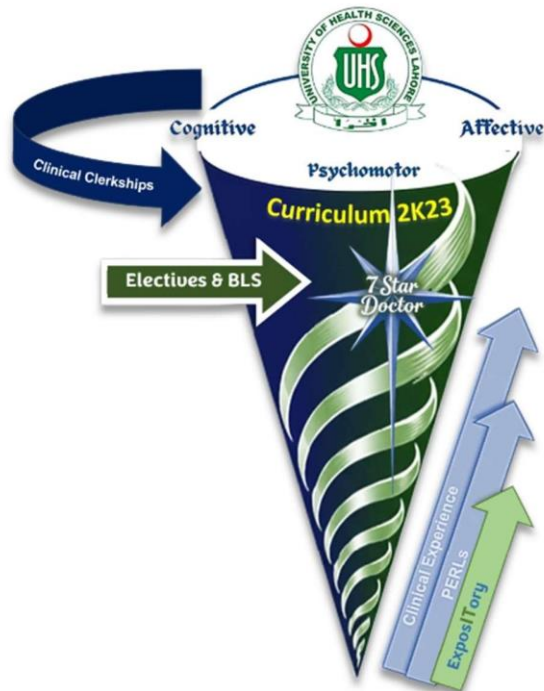
Roll No:	
Assignment Topic:	
Date:	
Make a poster for Netiquette in using your Class Social Media Groups.	
Facilitator Remarks:	

ecommendations on how it





## Curriculum 2K23 (MBBS Year-1)



MODULE: Portfolio Expository Writing I & Basic IT Skills

DATE FROM: _____ DATE
TO: _____

CHECKED BY: _____
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Roll No:	
Assignment Topic:	Patient History Template
Date:	
Complete a patient history template and submit a formatted document showing the correct use of medical terminology and clear structure.	

Facilitator Remarks:

Roll No:	
Assignment Topic:	Annotated Bibliography
Date:	

Create an annotated bibliography on a given medical topic using c

Facilitator Remarks:	
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Roll No:	
Assignment Topic:	IT Skills Journal
Date:	

Document learning progress in basic IT skills (e.g., using Word, performing internet research) with screenshots showing task completion.

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Facilitator Remarks:	
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Roll No:	
Assignment Topic:	Expository essay
Date:	
Edit your essay using a checklist for self-editing.	

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Roll No:	
Assignment Topic:	Reflective Essay
Date:	

Write an essay reflecting on your experience regarding learning this module, using word processing tools.

Facilitator Remarks:



# SKILL ACQUISITION WORKSHOPS



### Workshop Schedule for MBBS students

The Following Skill Acquisition Workshops are included in the “Modular Integrated Curriculum 2K23 Final version”:

Sr. No.	Course Name	Academic Year	Duration	Eligibility
1.	Basic Life Support	1 <sup>st</sup> Year / 2 <sup>nd</sup> Year	2 days	Eligibility requirement for appearing in the 4 <sup>th</sup> Professional Examination
2.	Advanced Life Support	3 <sup>rd</sup> Year / 4 <sup>th</sup> Year	1 day	Eligibility requirement for appearing in the Surgical Clerkship examination
3.	Cardiac First Response	3 <sup>rd</sup> Year / 4 <sup>th</sup> Year	1 day	Eligibility requirement for appearing in the Medicine Clerkship examination
4.	Trauma first responders	3 <sup>rd</sup> Year / 4 <sup>th</sup> Year	1 day	Eligibility requirement for appearing in the Surgical Clerkship examination
5.	Emergency Neonatal Resuscitation	3 <sup>rd</sup> Year / 4 <sup>th</sup> Year	1 day	Eligibility requirement for appearing in the Pediatrics Clerkship examination

6.	Emergency Obstetrics Resuscitation	3 <sup>rd</sup> Year / 4 <sup>th</sup> Year	1 day	Eligibility requirement for appearing in the Gynecology / Obstetrics Clerkship Examination
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**University of  
Health Sciences  
Lahore**



**Department of Medical  
Education**

*Innovating & Strategizing  
Healthcare Academia*

