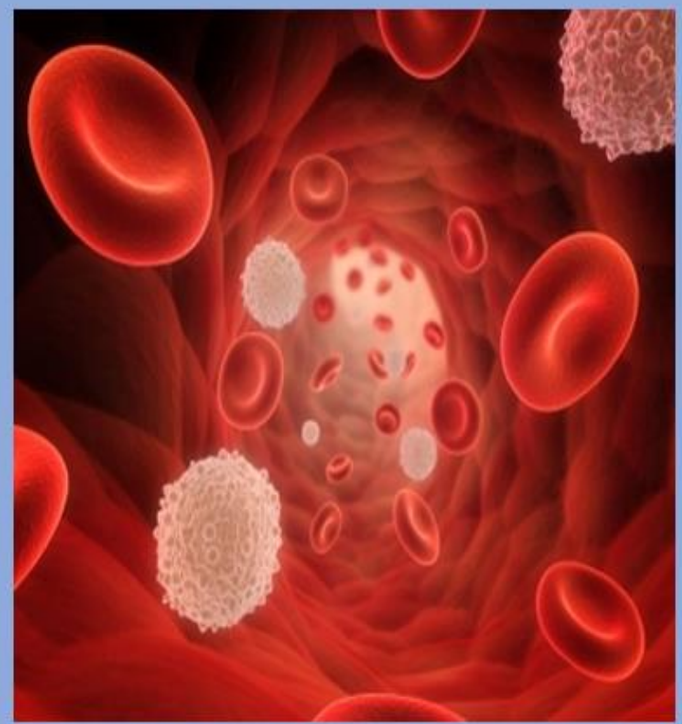
Department of Medical Education (DME)

Blood & Immunity Module

Study Guide
First Year MBBS 2022 - 2023



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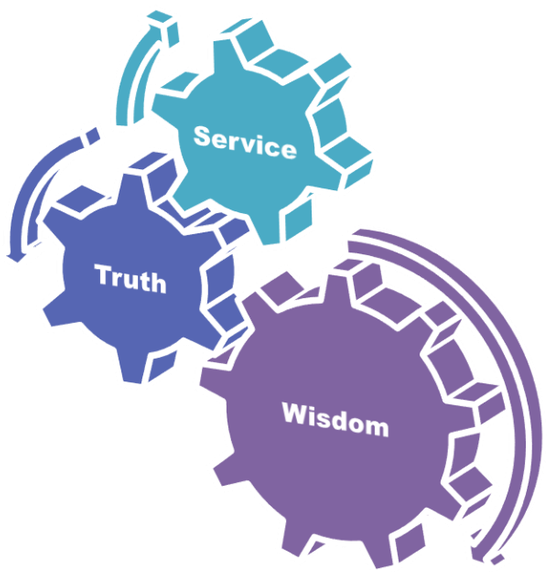
University Moto, Vision, Values & Goals

RMU Motto



Mission Statement

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

Vision and Values

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

Goals of the Undergraduate Integrated Modular Curriculum

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

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

First Year MBBS 2023

Study Guide

Blood and Immunity Module

Discipline wise Details of Modular Contents

Block	Subjects	Embryology	Histology	Gross Anatomy	CBL	SDL
II	• Anatomy	• Development of pharyngeal arches • Development of spleen • Development of thymus	• Spleen • Thymus • Lymph nodes • Tonsils	Lower Limb • Posterior compartment of leg to foot	• Ankle sprain • Flat foot	• Posterior compartment of leg and flexor retinaculum • Neurovascular organization of posterior compartment of leg • Foot joints • Ankle joints • Sole of foot • Spleen • Gait cycle
	• Physiology	• Plasma Proteins • Stages of erythropoiesis & factors affecting erythropoiesis • Hemoglobin & Hemoglobinopathies, Iron Metabolism • Red cell fragility, ESR & Red cell indices, Anemia & polycythemia • Fate of RBCs & Jaundice • Types of immunity, Physiology of innate immunity tolerance & auto immunity • Physiology of acquired immunity B-Cells • Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS • Composition of blood & Hemopoiesis • WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties • Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR • Blood coagulation • Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) • Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) • Physiological mechanism of temperature regulation • Role of Hypothalamus in temperature regulation • Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) • ABO & Rh Blood grouping system • Rh Blood grouping system and Erythroblastosis fetalis • Blood transfusion hazards • Tissue and organ transplantations				
	• Biochemistry	• Heme synthesis • Porphyria				

		• Breakdown of hemoglobin • Jaundice • Blood • Structure of hemoglobin and myoglobin • Types of Hemoglobin • Oxygen dissociation curve. • Abnormalities in Hemoglobin. • Hemoglobinopathies • Plasma proteins • Acute phase proteins & Albumin • Haptoglobin and transferring. • Ferritin and hemosiderin • Ceruloplasmin. • Antiproteases and amyloidosis • Immunoglobulins • AIDs • Folic acid. • Vitamin B12 • Iron
	• Bioethics & Professionalism	• Activity I • Activity II • Activity III
	• Research Club Activity (IUGRC)	• Student practical session no 3
	• Family Medicine	• Aproach to a Patient Aneamia
	• Vertical components	• The Holy Quran Translation Component
	• Vertical Integration	Clinically content relevant to Blood & Immunity module • Mediators of Inflammation (Pathology) • Anemia (Medicine) • Jaundice (Medicine) • Rh incompatibility and its significance -immune (Gynae & Obs)

Table of Contents

Blood and Immunity Module Team

Module Name	:	Blood and Immunity Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Isma Riaz
Co-coordinator	:	Dr. Isma Riaz
Reviewed by	:	Module Committee

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

Module Task Force Team		
1.	Coordinator	Dr. Isma Riaz (Senior Demonstrator of Biochemistry)
2.	DME Focal Person	Dr. Sidra Hamid (Assistant Professor of Physiology)
3.	Co-coordinator	Dr. Sajjad Hussain (Senior Demonstrator)
4.	Co-Coordinator	Dr. Isma Riaz (Senior Demonstrator of Biochemistry)
5.	Co-coordinator	Dr. Kamil Tahir (Senior Demonstrator of Physiology)

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3.	Deputy Director DME	Dr Shazia Zaib
4.	Module planner & Implementation coordinator	Dr. Sidra Hamid
5.	Editor	Muhammad Arslan Aslam

Module IV- Blood and Immunity Module

Rationale

Blood is a specialized connective tissue that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells.. Blood accounts for 8% of the human body weight. The average adult has a blood volume of roughly 5 liters, composed of plasma and several kinds of cells (occasionally called corpuscles); these formed elements of the blood are erythrocytes (red blood cells, RBCs), leukocytes (white blood cells), and thrombocytes (platelets). By volume, the red blood cells constitute about 45% of whole blood, the plasma about 54.3%, and white cells about 0.7%.
White blood cells are part of the body's immune system; they destroy and remove old or aberrant cells and cellular debris, as well as attack infectious agents (pathogens) and foreign substances.
The rationale behind is to introduce the students the basic constituents, functions and transport of various substances through blood.

Module Outcomes

By the end of the module, students will be able to:

Knowledge

- This module is expected to build students basic knowledge about normal structure, organization, functions and development of blood and immunity system.
- Used technology based Medical Education including
  Artificial Intelligence
- Appreciate concept and importance of
  Biomedical Ethics,
  Research
  Family Medicine

Skills

- Demonstrate effective skill for performing and interpreting various laboratory tests like Haemin crystal test.
- Demonstrate awareness of ethical, legal and social implecation of issues related to bioethics.

Attitude

- Demonstrate **professional attitude, team-building spirit and good communication specially in small group discussions.**

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

SECTION - I

Terms & Abbreviations

Contents

Tables & Figures

Table1. Domains of Learning According to Blooms Taxonomy

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

Teaching and Learning Methodologies / Strategies

Large Group Interactive Session (LGIS)

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

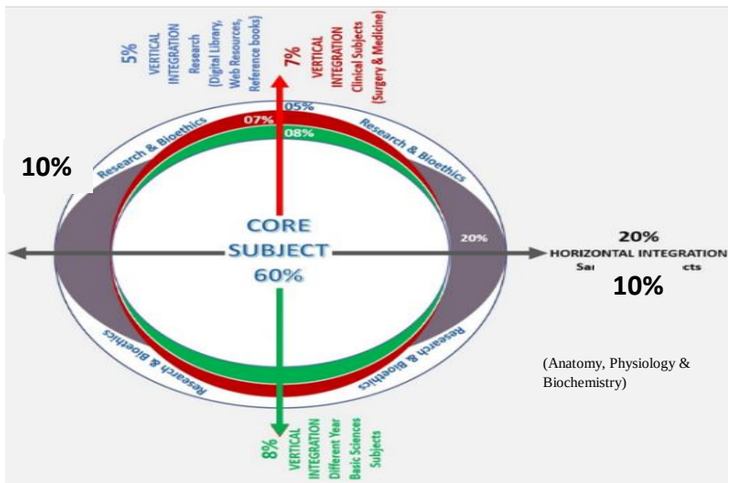


Figure 1. Prof Umar's Model of Integrated Lecture

Small Group Discussion (SGD)

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

Table 2. Standardization of teaching content in Small Group Discussions

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

Table 3. Steps of Implementaion of Small Group Discussions

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

Self Directed Learning (SDL)

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

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

  ii.OSPE station

Case Based Learning (CBL)

- It's a learner centered model which engages students in discussion of specific scenarios that typically resemble real world examples.
- Case scenario will be given to the students
- Will engage students in discussion of specific scenarios that resemble or typically are real-world examples.
- Learning objectives will be given to the students and will be based on
  i. To provide students with a relevant opportunity to see theory in practice
  ii. Require students to analyze data in order to reach a conclusion.
  iii. Develop analytic, communicative, and collaborative skills along with content knowledge.

Problem Based Learning (PBL)

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

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

Figure 2. PBL 7 Jumps Model

Practical Sessions/Skill Lab (SKL)

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

SECTION – II

Learning Objectives, Teaching Strategies & Assesssments

Contents

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

Horizontally Integrated Basic Sciences (Anatomy, Physiology & Biochemistry)

Anatomy Large Group Interactive Session (LGIS)

Topic	At the End of The Session Students Should Be Able To:	Learning Domain	Teaching Strategy	Assessment Tools
(General Histology) Lymph node	• Classify lymphoid tissue	C2	LGIS	MCQ SAQ VIVA
	• Define diffuse lymphoid tissue, nodular lymphoid tissue and lymphoid organs	C1		
	• Discuss the histological features of lymph node	C2		
	• Enlist functions of lymph node	C1		
	• Understand the supporting elements of lymph node	C2		
	• Describe filtration through lymph node	C2		
	• Discuss importance of high endothelial venules in lymph node	C2		
	• Discuss the clinical correlation of lymph node	C3		
	• How to use digital library	C3		
	• Read a research article	C3		
(General Histology) Thymus & Tonsil	• Describe the location and functions of thymus	C1	LGIS	MCQ SAQ VIVA
	• Enumerate different types of reticuloepithelial cells	C1		
	• Describe microscopic structure of thymus	C2		
	• Compare the histological structure of thymus and other lymphoid organs	C2		
	• Discuss blood thymus barrier	C2		
	• Describe general histological structure of tonsils	C2		
	• Differentiate palatine, lingual, and pharyngeal tonsils histologically	C2		
	• Discuss the clinicalcorrelation of thymus	C3		
	• Read a research article	C3		
	• How to use digital library	C3		
(General Histology) Spleen	• Describe the location and functions of spleen	C2	LGIS	MCQ SAQ VIVA
	• Describe microscopic structure of spleen	C2		
	• Differentiate between red and white pulp of spleen	C2		
	• Discuss blood circulation through spleen	C2		
	Discuss the clinical correlation of spleen	C3		

	• Read a research article	C3		
	• How to use digital library	C3		
(General Embryology) Development of Pharyngeal arches & pouches	• Define pharyngeal arches and pouches	C1	LGIS	MCQ SAQ VIVA
	• Discuss the components of pharyngeal arches and pouches	C2		
	• Describe the development and fate of each pharyngeal arch and pouches	C2		
	• Discuss the clinical correlation of pharyngeal arches and pouches	C3		
	• Read a research article	C3		
	• How to use digital library	C3		

Physiology Large Group Interactive Session (LGIS)

Topics	At the end of lecture students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Composition of blood & Hemopoiesis	1.Describe composition and general functions of blood 2.Explain the role of bone marrow in hemopoiesis and erythropoiesis 3.Draw steps of hemopoiesis 4. Define committed and uncommitted cells	1.C2 2. C2 3. C3 4. C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Plasma Proteins	1.Enumerate plasma proteins, their properties, sites of production and their functions. 2.Explain effects of deficiency of plasma proteins 3.Discuss conditions associated with decreased production and increased excretion of plasma proteins	C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties	1. Enumerate and explain various types of leukocytes and steps of leucopoiesis. 2. Explain the characteristics and functions. 3. Conditions in which these cells are increased and decreased. 4. Leukemias and their effects on the body	C1/C2 C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Stages of erythropoiesis & factors affecting erythropoiesis	1. Elaborate Morphological features of RBCs. 2. Describe the stages of production of RBCs. 3. Recall Life span of RBCs 4. Enumerate and explain factors which affect erythropoiesis. 5. Enlist sites of production of erythropoietin 6. Describe recombinant erythropoietin. 7. Explain mechanism of release and action of erythropoietin	C2 C1 C1 C2 C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Monocytes - macrophage system & lymphocytes	1. Explain the characteristics and functions of monocytes. 2. Explain monocyte-macrophage system; importance	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Hemoglobin & Hemoglobinopathies, Iron Metabolism	1. Discuss details about iron metabolism in body including iron absorption and storage. 2. Understand the structure, synthesis and functions of hemoglobin and its types. 3. Enlist different types of hemoglobinopathies	C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Process of inflammation and Lines of defense during inflammation	1. Describe the role of neutrophils and monocytes in inflammation. 2. Elaborate Lines of defense	1.C1, C2 2. C1, C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Red cell fragility, ESR & Red cell indices, Anemia & polycythemia	1. Define RBC fragility; importance; conditions in which fragility is changed. 2. Discuss various blood indices, give their formulae, co-related with different types of anemias. 3. Enumerate various types of anemias and polycythemias. 4. DIiscuss details about various types of anemias and polycythemia and their effect on circulatory system.	C1 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)	1. Explain thrombocytopoiesis. 2. Describe functions of platelets 3. Define hemostasis. 4. Explain steps of hemostasis	C2 C2 C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Fate of RBCs & Jaundice	1. Give life span of RBCs and explain their destruction. 2. Describe various types, compare and differentiate between various types of jaundice	C1, C2 C1, C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Blood coagulation	1. Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants	C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Types of immunity, Physiology of innate immunity tolerance & auto immunity	1. Define immunity and its types. 2. Compare and contrast innate and acquired immunity. 3. Difference between passive and active immunity	C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)	1. Explain Intravascular coagulation. 2. Discuss Bleeding disorders. 3. Enlist Types of hemophilia	1.C2 2.C2 3. C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of acquired immunity B-Cells	1. Enumerate various types of lymphocytes 2. Discuss their important characteristics and 3. Explain the mechanism of preprocessing	C1 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body)	• Discuss different Thromboembolic Conditions • Explain Pulmonary Embolism and clinical correlation • Enlist different Anticoagulant therapy	C2 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS	1. Define clone and explain the roles of T and B lymphocyte clones in immunity 2. Discuss the mechanisms involved in Immune Tolerance 3. Compare Type I and Type IV hypersensitivity reactions 4. Describe the process of immunization 5. Understand role of T-lymphocytes in transplants 6. Identify different types of tissue grafts	C1, C2 C2 C2 C1 C2 C1	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiological mechanism of temperature regulation	1. Explain Concept of temperature 2. Discuss Physiological mechanism of temperature regulation	C2 C2	LGIS	MCQ SEQ VIVA VOCE

				MCQ (LMS based Assessment, MST based Assessment) OSPE
ABO & Rh Blood grouping system	1. Enlist Blood group and its types 2. Explain Rh Blood Grouping System	C1 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Role of Hypothalamus in temperature regulation	1. Discuss Role of Hypothalamus in temperature regulation 2. Explain Temperature Regulating centers	C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Rh Blood grouping system and Erythroblastosis fetalis	1. Discuss Rh Blood Grouping System 2. Explain Erythroblastosis fetalis 3. Discuss Clinical correlation	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold)	1. Discuss Disorders of temperature regulation 2. Explain Concept of Fever 3. Clinical correlation Of Heat Stroke	1.C2 2.C2 3.C3	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Blood transfusion hazards. Tissue and organ transplantations	1. Discuss Blood transfusion hazards. 2. Explain Effect of blood transfusion on various organs 3. Explain Tissue and organ transplantations	C2 C2 C2	LGIS	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Biochemistry Large Group Interactive Session (LGIS)

Topics	At the end of lecture students should be able to	Learning Domain	Teaching Strategy	Assessment Tool
Blood	• Enlist various functions performed by blood.	C1	LGIS	MCQs SAQs
	• Describe Composition of blood.	C2		
Structure of hemoglobin and myoglobin	• Describe Structure of hemoglobin	C2	LGIS	MCQs SAQs
	• Describe structure of myoglobin.	C2		
	• Discuss Biochemical roles of hemoglobin and myoglobin.	C2		
Types of Hemoglobin	• Enlist various types of Hemoglobin.	C1	LGIS	MCQs SAQs
	• Describe Importance of heme and globin components	C2		
	• Interpret importance of HbA1c in diagnosis of Diabetes	C3		
Oxygen dissociation curve.	• Discuss Importance of oxygen dissociation curve.	C2	LGIS	MCQs SAQs
	• Enlist various factors affecting the curve.	C1		
Abnormalities in Hemoglobin.	• Elaborate congenital abnormalities in structure of Hemoglobin.	C2	LGIS	MCQs SAQs
	• Enlist Structural defects of hemoglobin	C1		
	• Discuss Preventive measures.	C2		
Hemoglobinopathies	• Discuss hemoglobinopathies.	C2	LGIS	MCQs SAQs
	• Enlist Types of thalassemia.	C1		
	• Discuss Familial counseling.	C2		
	• Elaborate Preventive measures.	C2		
Heme synthesis	• Describe enzymatic regulation of heme synthesis	C2	LGIS	MCQs SAQs
Porphyria	• Discuss various types of porphyria	C2		
Breakdown of hemoglobin	• Elaborate steps in the breakdown of hemoglobin.	C2	LGIS	MCQs SAQs
	• Describe Steps in synthesis of Bilirubin	C2		
Jaundice.	• Recall Normal level of S. Bilirubin.	C1		
	• Define jaundice.	C1	LGIS	MCQs SAQs
	• Recall normal level of Bilirubin	C1		
	• Enlist types of Jaundice.	C1		
	• Describe Biochemical tests to distinguish various types of jaundice.	C2	LGIS	

	• . Describe Physiological Jaundice	C2		
Plasma proteins	• Describe plasma proteins.	C2	LGIS	MCQs SAQs
	• Discuss Biochemical role of various plasma proteins.	C2		
	• Recall normal levels of plasma proteins	C1		
	• Illustrate Role of A/G ratio.	C3		
Acute phase proteins & Albumin	• Enlist various proteins raise in inflammation.	C1	LGIS	MCQs SAQs
	• Describe Role of albumin.	C2		
	• Discuss Role of C- reactive protein.	C2		
Haptoglobin and transferring	• Describe Structure of Haptoglobin and transferrin.	C2	LGIS	MCQs SAQs
	• Discuss biochemical Role of Haptoglobin and transferrin.	C2		
Ferritin and hemosiderin	• Describe biochemical role of ferritin and hemosiderin.	C2	LGIS	MCQs SAQs
	• Describe Hemosiderosis.	C2		
Ceruloplasmin.	• Describe biochemical role of ceruloplasmin.	C2	LGIS	MCQs SAQs
	• Discuss Wilson's disease.	C2		
Iron	• Recall Sources of iron.	C1	LGIS	MCQs SAQs
	• Describe Transport and absorption of iron.	C2		
	• Discuss hyper and hypo functions of iron.	C2		
Immunoglobulins	• Describe Structure of Immunoglobulin.	C2	LGIS	MCQs SAQs
	• Discuss biochemical role of various Immunoglobulin.	C2		
	• Elaborate Class switching.	C2		
AIDs	• Define AIDs	C1	LGIS	MCQs SAQs
	• Describe Immunological defects in AIDs.	C2		
	• Discuss various preventive measures.	C2		
Folic acid.	• Recall Sources of folic acid.	C1	LGIS	MCQs SAQs
	• Discuss deficiency effects of folic acid	C2		
	• Describe biochemical role of folic acid.	C2		
	• Recall Recommended Dietary allowance.	C1		
Vitamin B12	• Recall Sources of Vitamin B12	C1	LGIS	MCQs SAQs
	• Describe biochemical role of vitamin B12	C2		
	• Discuss Deficiency effects of B12	C2		

Anatomy Small Group Discussion (SGDs)

Topic	At the End Of The Session Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
Posterior Compartment of Leg (muscles) and flexor retinaculum	• Illustrate cutaneous innervation	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Describe superficial fascia & deep fascia.	C2		
	• Discuss superficial and deep muscle groups in posterior compartment	C2		
	• Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg	C2		
	• Discuss ruputured calcaneal tendon, calcaneal bursitis and accessory soleus muscle	C3		
	• How to use digital library	C3		
	• Read a research article	C3		
Posterior Compartment of Leg (Neurovascular organization)	• Describe origin, course relations, branches and tributaries of neurovascular bundle	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Discuss superficial veins i.e long and short saphenous veins	C2		
	• Palpate the posterior tibial pulse	C3		
	• Discuss clinical correlation related to venous return in leg	C3		
	• How to use digital library	C3		
	• Read a research article	C3		
Bones of Foot	• Enumerate the bones of foot	C1	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Identify different bones of foot	C1		
	• Discuss bony features and muscle attachment	C2		
	• Discuss fracture of metatarsals and os trigonum, avascular necrosis of head of talus	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		
Dorsum of foot	• Tabulate muscle on the dorsal aspect of foot	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Describe blood supply and nerve supply	C2		
	• Discuss cutaneous innervation of dorsum of foot	C2		
	• Palpate the dorsalis pedis artery on dorsum of foot	C3		
	• Discuss other clinicals related to the dorsum of the foot	C3		
	• Read a research article	C3		

	• How to use a digital library	C3		
Ankle Joint	• Describe the articular surfaces of ankle joint	C2	Skill Lab	MCQ SAQ VIVA OSPE
	• Describe the attachment of capsule	C2		
	• Enumerate the ligaments	C1		
	• Discuss the movements possible at ankle joint and muscles producing them	C2		
	• Discuss ankle sprain	C3		
	• Discuss different types of ankle injuries	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		
Joints of Foot	• Classify the joints of foot	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Discuss the articular surfaces, joint capsules, ligaments, movements and muscles producing movements	C2		
	• Discuss major ligaments in detail	C2		
	• Discuss tibial nerve entrapment	C3		
	• Discuss club foot, claw foot and other clinical conditions	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		
Sole of foot (Muscles)	• Identify Surface landmarks	C1	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Describe cutaneous innervation of sole of foot	C2		
	• Describe Plantar aponeurosis its attachments	C2		
	• Discuss flexor retinaculum	C2		
	• Discuss muscles in different layers of foot with origin, insertion, nerve supply and actions	C2		
	• Read a research article	C3		
	• How to use a digital library	C3		
Sole of foot (Neurovascular Organization)	• Enlist nerves and arteries present in sole of foot	C1	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Discuss route and relations of neurovascular bundle in sole of foot	C2		
	• Describe the formation of vascular arches of foot along with clinicals	C2, C3		
	• Discuss plantar fasciitis	C3		
	• Discuss other clinical correlations	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		

Arches of Foot and Gait Cycle	• Classify the arches of foot	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Describe different components of arches of foot	C2		
	• Discuss stability factors of arches of foot	C2		
	• Discuss pes planus (flat foot), club foot and other clinicals	C3		
	• Discuss gait cycle and its stages	C2		
	• Read a research article	C3		
	• How to use a digital library	C3		
Thymus, Tonsils	• Describe location of thymus and tonsils	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Discuss anatomical features of thymus and tonsils	C2		
	• Describe blood supply, venous drainage and lymphatic drainage of thymus and tonsils	C2		
	• Enumerate functions of thymus and tonsils	C1		
	• Discuss clinical correlations of thymus and tonsils	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		
Spleen	• Discuss the location of spleen	C2	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Enumerate anatomical relations of spleen	C1		
	• Discuss blood supply, venous drainage and lymphatic drainage of spleen	C2		
	• Discuss clinical correlations of spleen with special reference to splenectomy	C3		
	• Read a research article	C3		
	• How to use a digital library	C3		
Radiology and Surface Marking	• Identify different structures on radiographs	C3	SGD, Skill Lab	MCQ SAQ VIVA OSPE
	• Demonstrate the surface anatomy of various structures present in posterior compartment of leg and foot	P		
	• Demonstrate the surface anatomy of spleen, thymus and tonsils	P		

Physiology Small Group Discussion (SGDs)

Topics	At the end of discussion students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Functions & composition of blood, Hemopoiesis and Bone marrow	1.Describe composition and general functions of blood 2.Explain the role of bone marrow in hemopoiesis and erythropoiesis 3.Draw steps of hemopoiesis 4. Define committed and uncommitted cells 5.Correlate basic knowledge with clinical application	1.C2 2. C2 3. C3 4. C1 5.C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Hemoglobin & Hemoglobinopathies, Iron Metabolism	1. Discuss details about iron metabolism in body including iron absorption and storage 2. Understand the structure, synthesis and functions of hemoglobin and its types 3. Enlist different types of hemoglobinopathies 4. Correlate basic knowledge with clinical application	C2 C2 C1 C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)	1. Explain thrombocytopenia 2. Describe functions of platelets 3. Define hemostasis 4. Explain steps of hemostasis 5. Correlate basic knowledge with clinical application	C2 C2 C1 C2 C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiological mechanism of temperature regulation	1. Explain Concept of temperature 2. Discuss Physiological mechanism of temperature regulation 3. Correlate basic knowledge with clinical application	C2 C2 C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
	1. Elaborate Morphological features of RBCs 2. Describe the stages of production of RBCs	C2 C1		MCQ

Stages of Erythropoiesis Factors Affecting Erythropoiesis (First week)	3. Recall Life span of RBCs 4. Enumerate and explain factors which affect erythropoiesis 5. Enlist sites of production of erythropoietin 6. Describe recombinant erythropoietin 7. Explain mechanism of release and action of erythropoietin	C1 C2 C1 C2 C2	SGD	SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of WBC (third week)	1. Enumerate and explain various types of leukocytes and steps of leucopoiesis 2. Explain the characteristics and functions 3. Conditions in which these cells are increased and decreased 4. Leukemias and their effects on the body	C1/C2 C2 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Physiology of platelets (Fourth week)	1. Explain thrombocytopenia 2. Describe functions of platelets 3. Define hemostasis 4. Explain steps of hemostasis	C2 C2 C1 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Blood transfusion hazards. Tissue and organ transplantations (Fifth week)	1. Discuss Blood transfusion hazards. 2. Explain Effect of blood transfusion on various organs 3. Explain Tissue and organ transplantations	C2 C2 C2	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE
Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) (Fifth week)	1. Discuss Disorders of temperature regulation 2. Explain Concept of Fever 3. Clinical correlation Of Heat Stroke	1.C2 2.C2 3.C3	SGD	MCQ SEQ VIVA VOCE MCQ (LMS based Assessment, MST based Assessment) OSPE

Biochemistry Small Group Discussion (SGDs)

Topic	At the End of Tutorial Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Blood	• Explain structure and biomedical role of hemoglobin & Myoglobin	C2	SGD	MCQs, SAQs Viva
	• Describe oxygen dissociation curve and its significance.	C2		
	• Types of Hb	C1		
Iron	• Describe sources, structure, Biochemical role and related diseases of iron.	C2	SGD	MCQs, SAQs Viva

Anatomy Self-Directed Learning (SDL)

Topics	Learning objectives	Learning Resources
Posterior compartment of leg and flexor retinaculum	• Illustrate cutaneous innervation • Describe superficial fascia & deep fascia. • Discuss superficial and deep muscle groups in posterior compartment • Tabulate origin, insertion, nerve supply and action of all muscles of posterior compartment of leg • Discuss ruptured calcaneal tendon, calcaneal bursitis and accessory soleus muscle	• Clinically Oriented Anatomy 9th Edition, **pg no.755** • https://www.youtube.com/watch?v=Bj4c7wGdIwc&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%3D%3D • https://www.sciencedirect.com/science/article/abs/pii/S1440244004800343 •
Neurovascular organization of posterior compartment of leg	• Describe origin, course relations, branches and tributaries of neurovascular bundle • Discuss superficial veins i.e long and short saphenous veins • Palpate the posterior tibial pulse • Discuss clinical correlation related to venous return in leg	• Clinically Oriented Anatomy 9th Edition, **pg no. 755** • https://www.youtube.com/watch?v=Bj4c7wGdIwc&pp=ygUTY29tcGFydG1lbnRzIG9mIGxlZw%3D%3D • https://www.mdpi.com/2077-0383/11/21/6448
Foot Joints	• Classify the joints of foot • Discuss the articular surfaces, joint capsules, ligaments, movements and muscles producing movements • Discuss major ligaments in detail • Discuss tibial nerve entrapment • Discuss club foot, claw foot and other clinical conditions	• Clinically Oriented Anatomy 9th Edition, **pg no. 808** • https://www.youtube.com/watch?v=Ex9KzkAYN-8&pp=ygUKZm9vdCBqb2ludA%3D%3D • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3180294/
Ankle joint	• Describe the attachment of capsule • Enumerate the ligaments • Discuss the movements possible at ankle joint and muscles producing them • Discuss ankle sprain • Discuss different types of ankle injuries •	• Clinically Oriented Anatomy 9th Edition, **pg no. 806** • https://www.youtube.com/watch?v=Ex9KzkAYN-8&pp=ygUKZm9vdCBqb2ludA%3D%3D • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3414868/

Sole of foot	• Identify Surface landmarks • Describe cutaneous innervation of sole of foot • Describe Plantar aponeurosis its attachments • Discuss flexor retinaculum • Discuss muscles in different layers of foot with origin, insertion, nerve supply and actions	• Clinically Oriented Anatomy 9th Edition, **pg no. 768-781** • https://www.youtube.com/watch?v=JorGDBbPzI&pp=ygUcc29sZSBvZiBmb290IGFuYXRvbXkgbGVjdHVyZQ%3D%3D • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3311689/
Spleen	• Discuss the location of spleen • Enumerate anatomical relations of spleen • Discuss blood supply, venous drainage and lymphatic drainage of spleen • Discuss clinical correlations of spleen with special reference to splenectomy	• Clinically Oriented Anatomy 9th Edition, **pg no. 487** • https://www.youtube.com/watch?v=3K5I6MMDA8M&pp=ygUOc3BsZWVuIGFuYXRvbXk%3D • https://www.sciencedirect.com/science/article/pii/S0046817782802232
Gait cycle	• Define the gait cycle • Discuss the stages of gait cycle	• Clinically Oriented Anatomy 9th Edition, **pg no. 701, 768-781** • https://www.youtube.com/watch?v=1u6d1CX7o9c&pp=ygUXZ2FpdCBjeWNsZSBiaW9tZWNoYW5pY3M%3D • https://www.sciencedirect.com/topics/engineering/gait-cycle

Physiology Self-Directed Learning (SDL)

Topics Of SDL	Learning Objectives	Learning Resources
ON CAMPUS Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)	1. Explain thrombocytopenia 2. Describe functions of platelets 3. Define hemostasis • Explain steps of hemostasis	• Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 564) (Chapter 03, Page 79) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 558) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 413) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 477,487) • https://my.clevelandclinic.org/health/symptoms/21999-hemostasis • https://www.sciencedirect.com/topics/neuroscience/hemostasis
Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)	1. Explain Intravascular coagulation 2. Discuss Bleeding disorders • Enlist Types of hemophilia	• Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 566) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, page 427) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. (Chapter 37, Page 484) • https://youtu.be/unp3vGsxlIA • https://www.hematology.org/education/patients/bleeding-disorders
(OFF CAMPUS): Composition of blood	1.Describe composition and general functions of blood 2.Explain the role of bone marrow in hemopoiesis and erythropoiesis 3.Draw steps of hemopoiesis • 4. Define committed and uncommitted cells	• Ganong's Review of Medical Physiology.25TH Edition. Section 05, Cardiovascular Physiology (Chapter 31, Page 553) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547,548) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page 347) (Chapter 20, Page 356) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Red blood cells, Anemia and Polycythemia. Section 06. (Chapter 33, Page 439) 1. https://accessmedicine.mhmedical.com/content.aspx?bookid=3047&sectionid=255121548 • 2.https://youtu.be/cm8IK24RRvA

Function of Plasma Proteins	1.Enumerate plasma proteins, their properties, sites of productions and their functions 2.Explain effects of deficiency of plasma proteins • 3.Discuss conditions associated with decreased production and increased excretion of plasma proteins	• Ganong's Review of Medical Physiology.25TH Edition. Section 05, Cardiovascular Physiology (Chapter 31, Page 563) • Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 547) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 19, Page 348,353) 1. https://www.ncbi.nlm.nih.gov/books/NBK531504/ 2.https://accessmedicine.mhmedical.com/content.aspx?bookid=1366&sectionid=73247095
WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties	Enumerate and explain various types of leukocytes and steps of leucopoiesis Explain the characteristics and functions Conditions in which these cells are increased and decreased • Leukemias and their effects on the body	• Textbook of Medical Physiology by Guyton & Hall.14th Edition. Resistance of the body to Infection. Section 06. (Chapter 34, Page 449,456,457) 1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9777002/ 2.https://youtu.be/TelOcCkZX7c
Monocytes - macrophage system & lymphocytes	Explain the characteristics and functions of monocytes. • Explain monocyte-macrophage system; importance	• Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 67) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood (Chapter 21, Page 371) (Chapter 22, Page 387) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 450-452) 1. https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system 2.https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-017-0392-4
Process of inflammation and Lines of defense during inflammation	1. Describe the role of neutrophils and monocytes in inflammation • Elaborate Lines of defense	• Ganong's Review of Medical Physiology.25TH Edition. Section 01, Immunity, Infection and Inflammation (Chapter 03, Page 81) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. Section 03, Blood) (Chapter 22, Page 384) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 454)

		1. https://youtu.be/WFm9j1rNkQs 2. .https://en.wikipedia.org/wiki/Inflammation 3. .https://www.verywellhealth.com/signs-of-inflammation-4580526
Red cell fragility, ESR & Red cell indices, Anemia & polycythemia	1. Define RBC fragility; importance; conditions in which fragility is changed. 2. Discuss various blood indices, give their formulae, co-relate with different types of anemias. 3. Enumerate various types of anemias and polycythemias. • Discuss details about various types of anemias and polycythemia and their effect on circulatory system.	1. Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 555) 2. Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 553) 3. Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 23, Page 407,409) 4. Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 34, Page 446,447) 1. https://www.sciencedirect.com/topics/medicine-and-dentistry/red-blood-cell-indices 2.https://youtu.be/QUHqYVK-Nhg 3. https://youtu.be/mOrRJBqm744
Blood coagulation	• Explain hemostasis, mechanism of blood coagulation, fibrinolysis and anticoagulants	1. Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. (Chapter 16, Page 559) 2. Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 24, Page 417) 3. Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 37, Page 479) 1. https://youtu.be/gExUCrpAKyQ 2. https://medlineplus.gov/lab-tests/coagulation-factor-tests/
ABO & Rh Blood grouping system	• Blood group and its types Rh Blood Grouping System	• Ganong's Review of Medical Physiology.25TH Edition. Section 05, (Chapter 31, Page 558) (Chapter 36, Page 473) • Physiological Basis of Medical Practice by Best & Taylor's.13th Edition. (Chapter 25, Page 432) • Textbook of Medical Physiology by Guyton & Hall.14th Edition. Section 06. (Chapter 36, Page 471) • https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/abo-blood-group-system • https://youtu.be/wfqnNuYIY78

Biochemistry Self-Directed Learning (SDL)

Topics Of SDL	Learning Objectives	Learning resources
Structure of hemoglobin and myoglobin	• Describe Structure of hemoglobin • Describe structure of myoglobin. • Discuss Biochemical roles of hemoglobin and myoglobin.	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 25-28) • https://doi.org/10.1016/j.bcmd.2017.10.006 • https://www.youtube.com/watch?v=Qv-KExGKAYw • Use digital library • https://chemed.chem.purdue.edu/genchem/topicreview/bp/1biochem/blood3.html
Types of Hemoglobin	• Enlist various types of Hemoglobin. • Describe Importance of heme and globin components • Interpret importance of HbA1c in diagnosis of Diabetes	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 33-34) • https://pubmed.ncbi.nlm.nih.gov/34200315/ • https://www.youtube.com/@DrAishwaryaKelkar • Use digital library • https://www.ucsfhealth.org/medical-tests/hemoglobin-electrophoresis#:~:text=Many%20different%20types%20of%20hemoglobin,have%20small%20amounts%20of%20HbF
Oxygen dissociation curve.	• Discuss Importance of oxygen dissociation curve. • Enlist various factors affecting the curve. •	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 28-32) • https://pubmed.ncbi.nlm.nih.gov/2650756/ • https://youtu.be/BYGPkRFvzOc • Use digital library • https://www.osmosis.org/learn/Oxygen-hemoglobin_dissociation_curve
Hemoglobinopathies	• Discuss hemoglobinopathies. • Enlist Types of thalassemia. • Discuss Familial counseling. • Elaborate Preventive measures.	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 03, page 35-39) • https://pubmed.ncbi.nlm.nih.gov/30193516/ • https://youtu.be/34u1sOLrgV0 • Use digital library • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163784/
Heme synthesis	• Describe enzymatic regulation of heme synthesis	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 277-279)

		• https://www.sciencedirect.com/science/article/pii/S0891584999002233 • Use digital library • https://www.youtube.com/watch?v=f-0n_eOK4JE • https://pubmed.ncbi.nlm.nih.gov/29126700/
Porphyria	• Discuss various types of porphyria	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 279-281) • https://pubmed.ncbi.nlm.nih.gov/20226990/ • https://www.mayoclinic.org/diseases-conditions/porphyria/symptoms-causes/syc-20356066#:~:text=Porphyria%20(por%2DFEAR%2De,the%20body's%20organs%20and%20tissues. • https://www.aacc.org/science-and-research/clinical-chemistry-trainee-council/trainee-council-in-english/pearls-of-laboratory-medicine/2012/porphyrias
Breakdown of hemoglobin	• Elaborate steps in the breakdown of hemoglobin. • Describe Steps in synthesis of Bilirubin • Recall Normal level of S. Bilirubin.	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 282-283) • https://www.sciencedirect.com/science/article/pii/S0891584999002233 • Use digital library • https://www.youtube.com/watch?v=f-0n_eOK4JE • https://pubmed.ncbi.nlm.nih.gov/29126700/
Jaundice	• Define jaundice. • Recall normal level of Bilirubin. • Enlist types of Jaundice. • Describe Biochemical tests to distinguish various types of jaundice. • Describe Physiological Jaundice	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 21, page 284-285) • https://pubmed.ncbi.nlm.nih.gov/14765767/ • https://www.youtube.com/watch?v=gIACp5js4MU • https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice

Plasma proteins	• Describe plasma proteins. • Discuss Biochemical role of various plasma proteins. • Recall normal levels of plasma proteins • Illustrate Role of A/G ratio.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 588-589) • http://ib.bioninja.com.au/options/option-d-human-physiology/d3-functions-of-the-liver/plasma-proteins.html • https://www.nottingham.ac.uk/nmp/sonet/rlos/bioproc/plasma_proteins/page_three.html • https://pubmed.ncbi.nlm.nih.gov/21544836/ • Use digital library
Acute phase proteins & Albumin	• Describe Role of albumin. • Discuss Role of C- reactive protein.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 590-592) • https://www.youtube.com/watch?v=xMSEl1ad0z8 • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053509/ • https://pubmed.ncbi.nlm.nih.gov/9971870/ • Use digital library
Haptoglobin and transferrin	• Describe Structure of Haptoglobin and transferrin. • Discuss biochemical Role of Haptoglobin and transferrin.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592) • https://pubmed.ncbi.nlm.nih.gov/23016887/ • https://www.youtube.com/watch?v=QR_hcSow4OI • https://pubmed.ncbi.nlm.nih.gov/7027909/ • Use digital library
Ferritin and hemosiderin	• Describe biochemical role of ferritin and hemosiderin. • Describe Hemosiderosis.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 592-594) • http://www.vivo.colostate.edu/hbooks/pathphys/topics/ferritin.html • https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831249/ • https://www.forthwithlife.co.uk/blog/whats-the-difference-between-ferritin-and-iron/ • Use digital library

Ceruloplasmin.	• Describe biochemical role of ceruloplasmin. • Discuss Wilson's disease.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 595-597) • https://pubmed.ncbi.nlm.nih.gov/12055353/ • https://www.youtube.com/watch?v=KCh-7Ghj0jY • https://www.mountsinai.org/health-library/tests/ceruloplasmin-blood-test • Use digital library
Antiproteases and amyloidosis	• Describe biochemical role of antiproteases and amyloidosis.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 597-598) • https://pubmed.ncbi.nlm.nih.gov/31986086/ • https://pubmed.ncbi.nlm.nih.gov/1719439/ • https://www.youtube.com/watch?v=CQ5q3phGdtQ • Use digital library
Immunoglobulins	• Describe Structure of Immunoglobulin. • Discuss biochemical role of various Immunoglobulin. • Elaborate Class switching.	• Harpers Illustrated biochemistry 30th edition (Chapter 49, page 599-603) • https://pubmed.ncbi.nlm.nih.gov/4188929/ • https://www.youtube.com/watch?v=29mlSMaD-cY • https://medlineplus.gov/lab-tests/immunoglobulins-blood-test/#:~:text=Immunoglobulins%20are%20also%20called%20antibodies,to%20destroy%20only%20those%20germs. • Use digital library
AIDs	• Define AIDs • Describe Immunological defects in AIDs. • Discuss various preventive measures.	• Mushtaq volume II, 7th edition (chapter 11 page – 333-338) • https://pubmed.ncbi.nlm.nih.gov/3277764/ • https://www.who.int/news-room/fact-sheets/detail/hiv-aids#:~:text=Acquired%20immunodeficiency%20syndrome%20(AIDS)%20is,tuberculosis%2C%20infections%20and%20some%20cancers. • https://www.cdc.gov/hiv/basics/whatishiv.html • Use digital library

Folic acid.	• Recall Sources of folic acid. • Discuss deficiency effects of folic acid • Describe biochemical role of folic acid. • Recall Recommended Dietary allowance.	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 378-379) • https://pubmed.ncbi.nlm.nih.gov/29777755/ • https://www.cdc.gov/ncbddd/folicacid/about.html • https://www.cdc.gov/ncbddd/folicacid/about.html#:~:text=When%20the%20baby%20is%20developing,the%20early%20brain%20and%20spine. • Use digital library
Vitamin B12	• Recall Sources of Vitamin B12 • Describe biochemical role of vitamin B12 • Discuss Deficiency effects of B12	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 28, page 379-381) • https://pubmed.ncbi.nlm.nih.gov/25824066/ • https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/ • https://www.youtube.com/watch?v=j-2xHmcKkcy • Use digital library
Iron	• Recall Sources of iron. • Describe Transport and absorption of iron. • Discuss hyper and hypo functions of iron.	• Lippincott Illustrated reviews of biochemistry 8th edition (Chapter 29, page 403-404) • https://pubmed.ncbi.nlm.nih.gov/34373750/ • https://www.youtube.com/watch?v=vSkb0kDacjs • https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/ • Use digital library

Histology Practicals Skill Laboratory (SKL)

Topic	At the End of The Session Students Should Be Able To:	Learning Domains	Teaching Strategy	Assessment Tools
Lymph node	• Identify lymph node under microscope	P	Skill Lab	OSPE
	• Focus the slide	P		
	• Draw the histological structure of lymph node	C2		
	• Enlist two identification points of lymph node	C1		
Thymus	• Identify the slide of thymus under light microscope	P	Skill Lab	OSPE
	• Focus the slide	P		
	• Draw the histological structure of thymus	C2		
	• Enlist two identifications points of thymus	C1		
Spleen	• Identify the slide of spleen under light microscope	P	Skill Lab	OSPE
	• Focus the slide	P		
	• Draw histological structure of spleen,	C2		
	• Enlist two identification points of spleen	C1		
Tonsils	• Identify the slide of tonsils under light microscope	P	Skill Lab	OSPE
	• Focus the slide	P		
	• Draw histological structure of tonsils	C2		
	• Write two identification points of tonsils	C1		

Physiology Practicals Skill Laboratory (SKL)

Topic	Learning Objectives	Learning Domains	Learning Strategy	Assessment Tools
Determination of Rh blood group	• Principle • Procedure • Methods • Types of blood groups • Clinical Correlations of blood transfusion	C1/C3 A3 P3	Practical/ skill lab	Viva Voce OSPE Video Assisted Assessment
Determination of Clotting time (CT)	• Procedure • Clinical importance • Recall Normal values	C1/C3 A3 P3	Practical/ skill lab	Viva Voce OSPE Video Assisted Assessment
Determination of Bleeding time (BT)	• Procedure • Clinical importance • Recall Normal values	C1/C3 A3 P3	Practical/ skill lab	Viva Voce OSPE Video Assisted Assessment
Recording of Body Temperature	• Principle • Procedure • Methods • Clinical Correlations	C1/C3 A3 P3	Practical/ skill lab	Viva Voce OSPE Video Assisted Assessment

Biochemistry Practical Skill Laboratory (SKL)

Topic	At the End of Practical Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Draw of Blood Technique	• How to draw blood	P	Skill Lab	OSPE
Quantitative Estimation of Serum Total Proteins	• Perform estimation of serum Protein • Describe Principal, method, normal blood level and clinical significance of S. Proteins	P	Skill Lab	OSPE
Hemin crystals Technique to draw blood	• Describe Preparation, shape and clinical significance of hemin crystals Illustrate Method and precautions to draw blood.	P	Skill Lab	OSPE
Estimation of S. Bilirubin	• Perform estimation of serum bilirubin • Describe Principal, method, normal blood level and clinical significance of S. Bilirubin	P	Skill Lab	OSPE

SECTION - III

Basic and Clinical Sciences (Vertical Integration)

Content

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

Case Based Learning Objectives (CBL)

Subjects	Topics	At the end of the session the student should be able to	Learning Domains
Anatomy	• Ankle sprain	Apply basic knowledge of subject to study clinical case.	C3
	• Flat foot	Apply basic knowledge of subject to study clinical case.	C3
Physiology	• Anemia	Apply basic knowledge of subject to study clinical case	C3
Biochemistry	• Thalassemia	Apply basic knowledge of subject to study clinical case.	C3
	• Jaundice	Apply basic knowledge of subject to study clinical case.	C3

Vertical Integration LGIS

Pathology

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Mediators of Inflammation	• Define inflammation	C1	LGIS	MCQ
	• Classify inflammation	C2		
	• Classify mediators of inflammation • Cell derived Plasma derived	C2		
	• Describe general features of mediators of inflammation	C1		

Medicine

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Jaundice	• Discuss Jaundice.	C2	LGIS	MCQs
	• Discuss various Types and Subtypes of Jaundice.	C2		
	• Discuss the signs and symptoms of a patient with Jaundice due to various Causes.	C2		
	• Discuss the workup for diagnosis of different type of Jaundice	C2		
	• Discuss Treatment of Various Causes of Jaundice.	C2		
	• Discuss the diagnostic workup and treatment.	C2		
	• Define Heat Stroke.	C1		
	• Discuss the clinical Presentation of Heat Stroke.	C2		
	• Discuss the diagnostic workup and management.	C2		

Family Medicine

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Anemia	• Define Anemia.	C1	LGIS	MCQs
	• Discuss various Types and Subtypes of Anemia.	C2		
	• Discuss the signs and symptoms of a patient with Anemia.	C2		
	• Discuss the workup for diagnosis of type of anemia.	C2		
	• Discuss Treatment of Various types of anemia.	C2		

Obstetrics & Gynecology

Topic	At the End of Lecture Students Should Be Able To	Learning Domain	Teaching Strategy	Assessment Tool
Rh incompatibility and its significance	• Know the basic pathophysiology of Rh sensitization	C2	LGIS	MCQs
	• Describe the fetal effects of Rh isoimmunization	C2		
	• Understand signs of fetal anemia	C2		
	• Describe role of Anti-D antibodies in prevention of Rh isoimmunization	C2		

Biomedical Ethics

Topics	At the end of session students should be able to:	Learning Domains	Teaching Strategy	Assessment Tools
Laboratory Ethics	At the end of the session students should be able to; • Understand the importance of taking permission before performing procedures (drawing blood, administering injections etc.) during laboratory sessions. A**1** • Show Respects other health professional team members and complete assigned task in professional manner. **A1** • Employ collaborative negotiation to resolve conflict, anger, confusion and misunderstanding. A2	A1 A1 A2	Short video demonstration on violation of Ethical principle of autonomy from suit CBEC Video resources	• Assignment based assessment involving real life case scenarios under aggregate Marks (Internal Assessment) • Assignment to be uploaded on LMS

Integrated Undergraduate Research Curriculum (IUGRC)

Topics	At the end of the session the student should be able to:	Learning Domains	Teaching Strategy	Assessment Tool
Practical session 3	In supervised session, after individual work sharing (PAL) on feedback and work assigned in last session (pr. session 2) on specific areas UEIH-Poster formation, students will be educated more on retrial and review of focused scientific information and extracting the relevant material for Posters: (Los): after this student will be able to • Present the individual work assigned before whole group. • Understand more, the techniques used to access, retrieve and review and source of Scientific literature • Make search string and perform literature search using Boolean operators • Access scientific databases and carry out an effective literature review using a number of sources or databases (PubMed). • Hold discussions • Refine their work towards a UEIH-Poster formation	C3 C3	Activity	MCQs

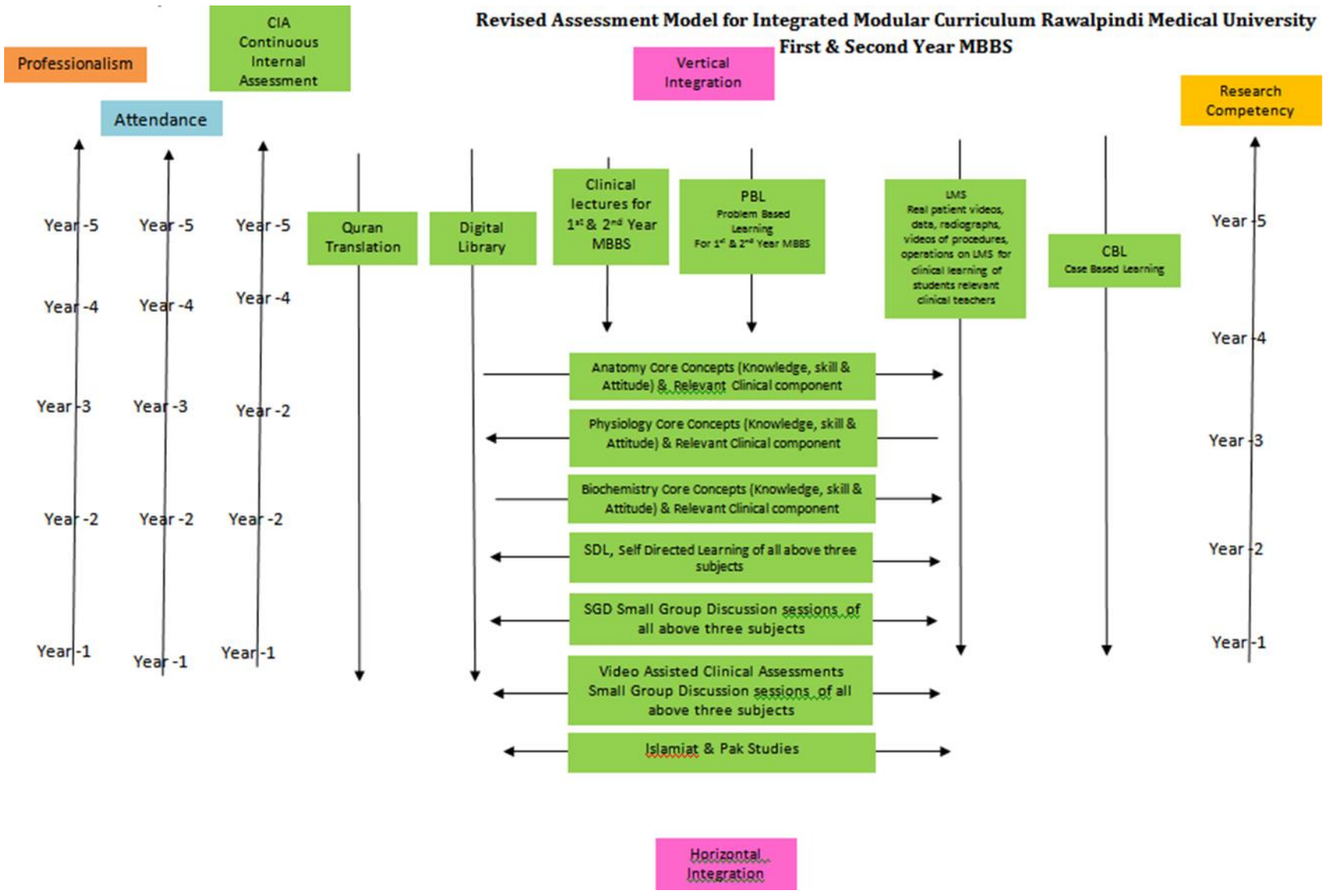
SECTION - IV

Assessment Policies

Contents

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

Assessment Policies



Gauge for Continuous Internal Assessment (CIA)

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

*50% and above is Passing Marks.

Gauge for attendance percentage

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

90% is eligibility criteria for appearing in professional examination.

Assessment plan

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

Types of Assessment:

The assessment is formative and summative.

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

Modular Assessement

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

Block Assessement

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

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

Table 4-Assessment Frequency & Time in Blood and Immunity Module

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

Learning Resources

Subjects	Resources
Anatomy	A. Gross Anatomy 1. Gray's Anatomy by Prof. Susan Standring 42th edition, Elsevier. 2. Clinical Anatomy for Medical Students by Richard S. Snell 10th edition. 3. Clinically Oriented Anatomy by Keith Moore 9th edition. 4. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 16th edition, Vol-I, II and III B. Histology 1. B. Young J. W. Health Wheather's Functional Histology 6th edition. 2. Medical Histology by Prof. Laiq Hussain 7th edition. 3. Junqueira's Basic Histology C. Embryology 1. Keith L. Moore. The Developing Human 11th edition. 2. Langman's Medical Embryology 14th edition. D. Website 1. https://my.clevelandclinic.org/health/articles/9117-male-reproductive-system 2. https://teachmeanatomy.info/pelvis/female-reproductive-tract/ 3. https://www.kenhub.com/en/start/pelvis-and-perineum E. YouTube 1. https://www.youtube.com/watch?v=G0ZuCilCu3E 2. https://www.youtube.com/watch?v=50iuBgTQCrQ F. HEC Digital Library 1. https://www.sciencedirect.com/science/article/pii/S0015028220304350 2. https://link.springer.com/article/10.1007/s11356-021-16581-9 3. https://link.springer.com/chapter/10.1007/978-3-030-30766-0_25 https://onlinelibrary.wiley.com/doi/abs/10.1111/and.13712 3. https://www.youtube.com/watch?v=50iuBgTQCrQ

Physiology	A. Textbooks: **1.** 1.Textbook of Medical Physiology by Guyton And Hall.14th edition. **2.** 2.Ganong's Review of Medical Physiology.25TH Edition B. Reference Books: **3.** Human Physiology by Lauralee Sherwood 10th edition. **4.** Human Physiology by Dee Unglaub Silver thorn. 8TH Edition. **5.** Best & Taylor Physiological Basis of Medical Practice 13th edition. 6. Berne & Levy Physiology 7th edition. C. Website **1.** https://www.ncbi.nlm.nih.gov/books/NBK531504/ **2.** https://en.wikipedia.org/wiki/Inflammation **3.** https://www.verywellhealth.com/signs-of-inflammation-4580526 **4.** https://www.hematology.org/education/patients/bleeding-disorders D. YouTube **1.** https://youtu.be/cm8IK24RRvA **2.** https://youtu.be/TelOcCkZX7c **3.** https://youtu.be/ZLuACVlG77U **4.** https://youtu.be/WFm9j1rNkQs E. HEC Digital Library **1.** https://www.sciencedirect.com/science/article/pii/S0006497121070403 **2.** https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/mononuclear-phagocyte-system **3.** https://www.sciencedirect.com/topics/medicine-and-dentistry/hemoglobinopathy **4.** https://www.sciencedirect.com/topics/neuroscience/hemostasis F. Physiology Journals 1. https://accessmedicine.mhmedical.com/content.aspx?bookid=1366&sectionid=73247095 2. https://www.msdmanuals.com/professional/hematology-and-oncology/anemias-caused-by-hemolysis/overview-of-hemoglobinopathies 3. https://derangedphysiology.com/main/cicm-primary-exam/required-reading/haematological-system/Chapter%20012/structure-function-production-and-fate-red-blood-cells 4. https://www.healthline.com/health/thermoregulation

Biochemistry	Textbooks 1. Harper's Illustrated Biochemistry 30th edition. 2. Lippincott biochemistry 8th edition B. Reference Books 1.Lehninger Principle of Biochemistry 8th edition. 2. Biochemistry by Devlin 7th edition. C. Website • https://chemed.chem.purdue.edu/genchem/topicreview/bp/1biochem/blood3.html https://www.ucsfhealth.org/medical-tests/hemoglobin-electrophoresis#:~:text=Many%20different%20types%20of%20hemoglobin,have%20small%20amounts%20of%20HbF • https://my.clevelandclinic.org/health/diseases/15367-adult-jaundice https://pubmed.ncbi.nlm.nih.gov/23016887/ http://www.vivo.colostate.edu/hbooks/pathphys/topics/ferritin.html https://www.osmosis.org/learn/Oxygen-hemoglobin_dissociation_curve https://www.sciencedirect.com/science/article/pii/S0891584999002233 https://pubmed.ncbi.nlm.nih.gov/9971870/ D. YouTube https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3163784/ https://www.youtube.com/watch?v=f-0n_eOK4JE https://youtu.be/34u1sOLrgVo https://www.aacc.org/science-and-research/clinical-chemistry-trainee-council/trainee-council-in-english/pearls-of-laboratory-medicine/2012/porphyrias https://www.youtube.com/watch?v=gIACp5js4MU https://www.nottingham.ac.uk/nmp/sonet/rlos/bioproc/plasma_proteins/page_three.html https://www.youtube.com/watch?v=xMSEl1ad0z8 https://www.youtube.com/watch?v=QR_hcSow4OI https://www.youtube.com/watch?v=KCh-7Ghj0jY E. HEC Digital Library • https://doi.org/10.1016/j.bcmd.2017.10.006 • https://pubmed.ncbi.nlm.nih.gov/34200315/ • https://pubmed.ncbi.nlm.nih.gov/2650756/ https://pubmed.ncbi.nlm.nih.gov/30193516/ https://pubmed.ncbi.nlm.nih.gov/29126700/

	https://www.mayoclinic.org/diseases-conditions/porphyria/symptoms-causes/syc-20356066#:~:text=Porphyria%20(por%2DFEAR%2De,the%20body's%20organs%20and%20tissues. https://pubmed.ncbi.nlm.nih.gov/14765767/ http://ib.bioninja.com.au/options/option-d-human-physiology/d3-functions-of-the-liver/plasma-proteins.html https://pubmed.ncbi.nlm.nih.gov/21544836/ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3053509/ https://pubmed.ncbi.nlm.nih.gov/7027909/ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4831249/ https://pubmed.ncbi.nlm.nih.gov/12055353/ https://pubmed.ncbi.nlm.nih.gov/20226990/ F. Biochemistry Journals • https://pubs.acs.org/journal/bichaw • https://academic.oup.com/jb • https://www.hindawi.com/journals/bri/

SECTION - V

Time Table

Integrated Clinically Oriented Modular Curriculum for first Year MBBS

Blood and Immunity Module Time Table

First Year MBBS

Session 2022-2023

Batch- 50

Blood and Immunity Module Team

Module Name	:	Blood and Immunity Module
Duration of module	:	05 Weeks
Coordinator	:	Dr. Isma Riaz
Co-coordinator	:	Dr. Isma Riaz
Reviewed by	:	Module Committee

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

Module Task Force Team		
1.	Coordinator	Dr. Isma Riaz (Senior Demonstrator of Biochemistry)
2.	DME Focal Person	Dr. Sidra Hamid (Assistant Professor of Physiology)
3.	Co-coordinator	Dr. Sajjad Hussain (Senior Demonstrator)
4.	Co-Coordinator	Dr. Isma Riaz (Senior Demonstrator of Biochemistry)
5.	Co-coordinator	Dr. Kamil Tahir (Senior Demonstrator of Physiology)

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

Discipline Wise Details of Modular Contents

Block	Subjects	Embryology	Histology	Gross Anatomy	CBL	SDL
II	• Anatomy	• Development of pharyngeal arches • Development of spleen • Development of thymus	• Spleen • Thymus • Lymph nodes • Tonsils	Lower Limb • Posterior compartment of leg to foot	• Ankle sprain • Flat foot	• Posterior compartment of leg and flexor retinaculum • Neurovascular organization of posterior compartment of leg • Foot joints • Ankle joints • Sole of foot • Spleen • Gait cycle
	• Physiology	• Plasma Proteins • Stages of erythropoiesis & factors affecting erythropoiesis • Hemoglobin & Hemoglobinopathies, Iron Metabolism • Red cell fragility, ESR & Red cell indices, Anemia & polycythemia • Fate of RBCs & Jaundice • Types of immunity, Physiology of innate immunity tolerance & auto immunity • Physiology of acquired immunity B-Cells • Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS • Composition of blood & Hemopoiesis • WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties • Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR • Blood coagulation • Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) • Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) • Physiological mechanism of temperature regulation • Role of Hypothalamus in temperature regulation • Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) • ABO & Rh Blood grouping system • Rh Blood grouping system and Erythroblastosis fetalis • Blood transfusion hazards • Tissue and organ transplantations				
	• Biochemistry	• Heme synthesis • Porphyria • Breakdown of hemoglobin				

		• Jaundice • Blood • Structure of hemoglobin and myoglobin • Types of Hemoglobin • Oxygen dissociation curve. • Abnormalities in Hemoglobin. • Hemoglobinopathies • Plasma proteins • Acute phase proteins & Albumin • Haptoglobin and transferring. • Ferritin and hemosiderin • Ceruloplasmin. • Antiproteases and amyloidosis • Immunoglobulins • AIDs • Folic acid. • Vitamin B12 • Iron
	• Bioethics & Professionalism	• Activity I • Activity II • Activity III
	• Research Club Activity (IUGRC)	• Student practical session no 3
	• Family Medicine	• Aproach to a Patient Aneamia
	• Vertical components	• The Holy Quran Translation Component
	• Vertical Integration	Clinically content relevant to Blood & Immunity module • Mediators of Inflammation (Pathology) • Anemia (Medicine) • Jaundice (Medicine) • Rh incompatibility and its significance -immune (Gynae & Obs)

Categorization of Modular Contents

Anatomy

Category A*	Category B**	Category C***			
		Demonstrations / SGD	**CBL**	**SKL/Practical's**	**Self-Directed Learning (SDL)**
• General Embryology	• General Histology	• Posterior compartment of leg and flexor retinaculum • Posterior compartment of leg (Neurovascular organization) • Bones of the foot • Dorsum of foot (Muscles and Neurovascular organization) • Ankle joint (ankle sprain) • Joints of foot • Sole of foot (Muscles) • Sole of foot (Neurovascular organization) • Arches of foot • Spleen • Thymus and tonsils • Radiology and surface marking	• Ankle sprain • Flat foot	• Lymph node • Spleen • Thymus • Tonsil	• Posterior compartment of leg and flexor retinaculum • Neurovascular organization of posterior compartment of leg • Foot joints • Ankle joints • Sole of foot • Spleen • Gait cycle

Category A*: By Professor

Category B:** By Associate & Assistant Professors

Category C*:** By Senior Demonstrators & Demonstrators

Teaching Staff / Human Resources of Department of Anatomy

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1.	Professor of Anatomy department	01
2.	Associate Professor	01
3.	Assistant professor of Anatomy department (AP)	01
4.	Demonstrators of Anatomy department	04

Contact Hours (Faculty)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	2 * 04 = 08 hours
2.	Small Group Discussions (SGD)	2*16 =32 hours
3.	Practical / Skill Lab	1.5 * 20 = 30 hours

Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours
1.	Large Group Interactive Session (LGIS)	1 * 4 = 04 hours
2.	Small Group Discussions (SGD)	2*16=32 hours
3.	Practical / Skill Lab	1.5 * 4 = 6 hours
4.	Self-Directed Learning (SDL)	2* 4 = 8 hours

Physiology

Category A*	Category B**	Category C***				
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**	**SDL**
• Monocytes - macrophage system & lymphocytes • Process of inflammation and Lines of defense during inflammation	• Plasma Proteins • Stages of erythropoiesis & factors affecting erythropoiesis • Hemoglobin & Hemoglobinopathies, Iron Metabolism • Red cell fragility, ESR & Red cell indices, Anemia & polycythemia • Fate of RBCs & Jaundice • Types of immunity, Physiology of innate immunity tolerance & auto immunity • Physiology of acquired immunity B-Cells • Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS • Composition of blood & Hemopoiesis • WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties • Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR • Blood coagulation • Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) • Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy			1. Determination of Rh blood group 2. Determination of Clotting time (CT) 3. Determination of Bleeding time (BT) 4. Recording of Body Temperature	1. Functions & composition of blood, Hemopoiesis and Bone marrow 2. Hemoglobin & Hemoglobinopathies, Iron Metabolism 3. Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) 4. Physiological mechanism of temperature regulation 5. Stages Of Erythropoiesis Factors Affecting Erythropoiesis (First week) 6. Physiology of WBC (third week) 7. Physiology of platelets (Fourth week) 8. Blood transfusion hazards. Tissue and organ transplantations (Fifth week) 9. Disorders of temperature regulation (Fever, Heat stroke,	1. SDL On Campus Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR) 2. Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) 3. SDL Off Campus Composition of blood 4. Functions of Plasma Proteins 5. WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties 6. Monocytes - macrophage system & lymphocytes 7. Process of inflammation and Lines of defense

	(Heparin, warfarin, Prevention of blood clotting outside the body) • Physiological mechanism of temperature regulation • Role of Hypothalamus in temperature regulation • Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) • ABO & Rh Blood grouping system • Rh Blood grouping system and Erythroblastosis fetalis • Blood transfusion hazards. Tissue and organ transplantations				Exposure of body to extreme cold) (Fifth week)	during inflammation 8. Red cell fragility, ESR & Red cell indices, Anemia & polycythemia 9. Blood coagulation 10. ABO & Rh Blood grouping system

Category A*: By HOD and Associate Professor

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

Category C*:** By Demonstrators and Residents

Teaching Staff / Human Resource of Department of Physiology

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

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of TeachingStrategies	Total Hours
1.	Large Group Interactive Session (LECTURES)	11 x 2 = 22 hours
2.	Small Group Discussions (SGD)/CBL	20 x 1.5 hour = 30 hours + 6 hours= 36 hours
3.	Problem Based Learning (PBL)	---
4.	Practical / Skill Lab	20 x 1.5 hour = 30 hours
5.	Self-Directed Learning (SDL)	2x1 = 2hours (on campus) 8x1 = 8 hours (off campus)

Biochemistry

Category A*	Category B**	Category C***			
LGIS	**LGIS**	**PBL**	**CBL**	**Practical's**	**SGD**
• Heme synthesis • Porphyria • Breakdown of hemoglobin • Jaundice	• Blood • Structure of hemoglobin and myoglobin • Types of Hemoglobin • Oxygen dissociation curve. • Abnormalities in Hemoglobin. • Hemoglobinopathies • Plasma proteins • Acute phase proteins & Albumin • Haptoglobin and transferring • Ferritin and hemosiderin • Ceruloplasmin. • Antiproteases and amyloidosis • Immunoglobulins • AIDs • Folic acid. • Vitamin B12 • Iron		• Thalassemia • Jaundice	• Estimation of Bilirubin by spectrophometer • Estimation of total protein by spectrophometer • How to draw blood technique • Haemin crystals	• Types of Hb and oxygen dissociation curve • Iron

Category A*: By HOD and Assistant Professor

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

Category C*:** (By All Demonstrators)

Teaching Staff / Human Resource of Department of Biochemistry

Sr. #	Designation of Teaching Staff / Human Resource	Total number of teaching staff
1	Assistant professor of biochemistry department (AP)	01
2	Demonstrators of biochemistry department	07

Contact Hours (Faculty) & Contact Hours (Students)

Sr. #	Hours Calculation for Various Type of Teaching Strategies	Total Hours (Faculty)	Total Hours (student)
1.	Large Group Interactive Session (LECTURES)	2 * 12 = 24 hours	12
2.	Small Group Discussions (SGD)	1.5 * 5*4 = 30 hours	06
3.	Problem Based Learning (PBL)	Zero	zero
4.	Practical / Skill Lab	1.5 * 5*4 = 30 hours	6
5.	Self-Directed Learning (SDL)	----------	06

Blood and Immunity Module (First Week)
(24-07-2023 To 29-07-2023)

Date/Day	8:00am-9:00am	9:00am – 10:00am	10:00am-11:00am		11:00am-12:00pm		12:00-12:20pm	12:20pm – 2:00pm	Home Assignments (2HRS)
24-07-23 MONDAY	**SGD/DISSECTION**		**PBL-SESSION-I**		**PHYSIOLOGY (LGIS)**		**Break**	Practical & SGD/CBL Topics & venue mentioned at the end	SDL physiology Composition of blood
	Posterior Compartment of Leg & Flexor Retinaculum		PBL Team-I		Composition of blood & Hemopoiesis	Plasma Proteins			
			(Physiology Batch Teachers of First Year MBBS)		Dr Sheena (Even)	Dr. Sidra (Odd)			
25-07-2023 TUESDAY	**SGD/DISSECTION**		**BIOCHEMISTRY (LGIS)**		**PHYSIOLOGY (LGIS)**			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Functions of plasma protein
	Posterior Compartment of Leg (Neurovascular Organization)		Types of Hb & O2 Dissociation Curve	Heme Synthesis & Porphyria	Plasma Proteins	Composition of blood & Hemopoiesis			
			Dr. Isma (Even)	Dr. Aneela (Odd)	Dr. Sidra (Even)	Dr Sheena (Odd)			
26-07-2023 WEDNESDAY	**SGD/DISSECTION**		**BIOCHEMISTRY (LGIS)**		**PHYSIOLOGY (LGIS**			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Structure of hemoglobin, Types of Hb & O2 Dissociation Curve
	Bones of the foot		Heme Synthesis & Porphyria	Types of Hb and structure of Hb and myoglobin	WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties	Stages of erythropoiesis & factors affecting erythropoiesis			
			Dr. Aneela (Even)	Dr. Isma (Odd)	Dr Sheena (Even)	Dr. Sidra (Odd)			
27-07-2023 THURSDAY	**Ashura Holidays**								
28-07-2023 FRIDAY									
29-07-2023 SATURDAY	**8:00 AM – 9:00 AM**		**9:00 AM – 10:00AM**		**10:00AM – 12:00 PM**		**12:00-12:20pm**	**12:20pm – 2:00pm**	2HRS
	BIOCHEMISTRY (LGIS)		**Practical & SGD/CBL**		**ANATOMY (LGIS)**		**Break**	**Practical & SGD/CBL** Topics & venue mentioned at the end	SDL Anatomy Posterior Compartment of Leg
	Types of Hb and structure of Hb and myoglobin	Heme Synthesis & Porphyria	Practical & SGD/CBL Topics & venue mentioned at the end		Development of pharyngeal arches	Development and histology Lymph node			
	Dr. Isma (Even)	Dr. Aneela (Odd)			Prof. Dr. Ayesha Yousaf (even)	Dr. Mohtasham Hina (Associate prof.) (odd)			

	PATHOLOGY (LGIS)	
	Mediators of inflammation	
	Dr. Saeed (Even)	Dr. Iqbal (Odd)

Topics for Practical with Venue
• Lymph node (Anatomy Histology Practical) Venue-Histology laboratory • Draw of blood technique (Biochemistry Practical) Venue- Biochemistry laboratory • Determination of Rh blood group (Physiology –practical) Venue – Physiology Lecture Hall No 5

Topics for Small Group Discussion & CBLs With Venue
• Physiology SGD - Functions & composition of blood, Hemopoiesis and Bone marrow (Basement)) • Biochemistry SGD: Types of Hb and oxygen dissociation curve (Venue: Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

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

Venue for first Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
B	91-180	Dr. Qurat Ul Ain	Lecture Hall No. 03 Anatomy Lecture Hall
C	181- 270	Dr. Zaneera	New Lecture Theater complex no. 3
D	271 onwards	Dr. Ali Raza	New Lecture Theater complex no. 2

Venue for first Year Batches for PBL & SGD Team-II

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

Sr. No	Batch	Roll no	Names of Teachers					
			Biochemistry					Physiology
			Monday	Tuesday	Wednesday	Thursday	Saturday	
1.	Batch – A	01-70	Dr. Rahat B (Practical)	Dr. Almas C (Practical)	Dr. Nayyab D (Practical)	Dr. Nayyab A (Practical)	Dr. Rahat E (Practical)	Dr. Sheena
2.	Batch –B	71-140						Dr. Uzma
3.	Batch – C	141-210	Dr. Nayyab D (SGD)	Dr. Rahat E (SGD)	Dr. Almas A (SGD)	Dr. Isma C (SGD)	Dr. Nayyab E (SGD)	Dr. Fahad
4.	Batch –D	211-280						Dr. Maryam Abbas
5.	Batch -E	281-onwards						Dr. Fareed

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

Topic Details of SDL Biochemistry
• Types of Hb
• O2 Dissociation Curve

Blood and Immunity Module (Second Week)
(31-07-2023 To 05-08-2023)

Date/Day	8:00am-9:00am	9:00am – 10:00am	10:00am-11:00am		11:00am-12:00pm		12:00- 12:20pm	12:20pm – 2:00pm	Home Assignments (2HRS)
31-07-23 MONDAY	SGD/DISSECTION		ANATOMY (LGIS)		PHYSIOLOGY (LGIS)		Break	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties
	Dorsum of Foot (Muscles and Neurovascular Organization)		Development of pharyngeal arches	Development and histology Lymph nod	Stages of Erythropoiesis Factors Affecting Erythropoiesis	WBCs classification & formation. Neutrophils, Eosinophils & Basophils and their properties			
			Prof. Dr. Ayesha Yousaf (Odd)	Dr. Mohtasham Hina (Associate prof.) (Even)	Dr. Sidra (Even)	Dr. Sheena (Odd)			
01-08-2023 TUESDAY	/DISSECTION/CBL		BIOCHEMISTRY (LGIS)		PHYSIOLOGY (LGIS)			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Monocytes - macrophage system & lymphocytes
	Ankle Joint (Ankle Sprain)		Hemoglobinopathies	Heme degradation & Jaundice	Monocytes - macrophage system & lymphocytes	Hemoglobin & Hemoglobinopathies, Iron Metabolism			
			Dr. Nayyab (Odd)	Dr. Aneela (Even)	Prof. Dr. Samia Sarwar / Dr. Sheena (Even)	Dr. Sidra (Odd)			
02-08-2023 WEDNESDAY	SGD/DISSECTION		BIOCHEMISTRY (LGIS)		PHYSIOLOGY (LGIS)			Practical & SGD/CBL Topics & venue mentioned at the end	BIOCHEMISTRY SDL Heme Synthesis & Porphyria
	Joints of Foot		Aids	Plasma proteins functions, Albumin	Hemoglobin & Hemoglobinopathies, Iron Metabolism	Monocytes -macrophage system & lymphocytes			
			Dr. Almas (Even)	Dr. Isma (Odd)	Dr. Sidra (Even)	Prof. Dr. Samia Sarwar / Dr. Sheena (Odd)			
03-08-2023 THURSDAY	SGD/DISSECTION		PBL		PHYSIOLOGY (LGIS)			Practical & SGD/CBL Topics & venue mentioned at the end	BIOCHEMISTRY SDL Plasma proteins functions, Albumin, AIDs
	Dissection		PBL session 2		Process of inflammation and Lines of defense during inflammation	Red cell fragility, ESR & Red cell indices, Anemia & polycythemia			
					Prof. Dr. Samia Sarwar / Dr. Sheena (Even)	Dr. Sidra (Odd)			
04-08-2023 FRIDAY	8:00 AM – 9:00 AM	9:00 AM – 10:00AM	10:00AM– 11:00AM		11:00AM—12:00PM				
	Family Medicine (LGIS)	QURAN TRANSLATION	BIOCHEMISTRY (LGIS)		PHYSIOLOGY (LGIS)			SDL Anatomy Neurovascular organization of posterior compartment of leg	
	Anemia	Muaamlaat-3 / Muaasharat-1	Aids	Plasma proteins functions, Albumin	Red cell fragility, ESR & Red cell indices, Anemia & polycythemia	Process of inflammation and Lines of defense during inflammation			
	Dr. Umer Daraz (Even) / Dr. Iqra (Odd)	Mufti Naeem (Even) / Abdul Wahid (Odd)	Dr. Almas (Odd)	Dr. Isma (Even)	Dr. Sidra (Even)	Prof. Dr. Samia Sarwar / Dr. Sheena (Odd)			
	8:00 AM – 9:00 AM	9:00 AM – 10:00AM	10:00AM – 11:00 AM		11:00AM – 12:00 PM		12:00-12:20pm	12:20pm – 2:00pm	2HRS
05-08-2023 SATURDAY	SGD/DISSECTION		BIOCHEMISTRY (LGIS)		PHYSIOLOGY (LGIS)		Break	**Practical & SGD/CBL** Topics & venue mentioned at the end	SDL Anatomy joints of Foot
	Sole of Foot (Muscles)		Vit K	Haptoglobin, ceruloplasmin	Fate of RBCs & Jaundice	Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)			
			Dr. Almas (Even)	Dr. Isma (Odd)	Dr. Sidra (Odd)	Dr. Fareed (Even)			

Topics for Practical with Venue	Topics for Small Group Discussion & CBLs With Venue
• Spleen (Anatomy Histology Practical) Venue-Histology Laboratory • Estimation of bilirubin by Spectrophotometer (Biochemistry Practical) Venue- Biochemistry Laboratory • Determination of Clotting time (CT) (Physiology Practical) Venue – Physiology Lab	• Physiology SGD- Hemoglobin & Hemoglobinopathies, Iron Metabolism (Venue: Lecture Hall No 5) • Biochemistry CBL – Thalassemia (Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

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

Venue for first Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
B	91-180	Dr. Qurat Ul Ain	Lecture Hall No. 03 Anatomy Lecture Hall
C	181- 270	Dr. Zaneera	New Lecture Theater complex no. 3
D	271 onwards	Dr. Ali Raza	New Lecture Theater complex no. 2

Venue for first Year Batches for PBL & SGD Team-II

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

Sr. No	Batch	Roll no	Names of Teachers					
			Biochemistry					Physiology
			Monday	Tuesday	Wednesday	Thursday	Saturday	
1.	Batch – A	01-70	Dr. Almas B (Practical)	Dr. Almas C (Practical)	Dr. Rahat D (Practical)	Dr. Almas A (Practical)	Dr. Almas E (Practical)	Dr. Sheena
2.	Batch –B	71-140						Dr. Uzma
3.	Batch – C	141-210	Dr. Nayyab D (SGD)	Dr. Uzma E (SGD)	Dr. Uzma A (SGD)	Dr. Uzma C (SGD)	Dr. Uzma E (SGD)	Dr. Fahad
4.	Batch –D	211-280						Dr. Maryam Abbas
5.	Batch -E	281-onwards						Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

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

Topic Details of SDL Biochemistry

- Structure of hemoglobin
- Types of Hb
- O2 Dissociation Curve

Blood and Immunity Module (Third Week)
(07-08-2023 To 12-08-2023)

Date/Day	8:00am-9:00am	9:00am – 10:00am	10:00am-11:00am	11:00am-12:00pm	12:00-12:20pm	12:20pm – 2:00pm	Home Assignments (2HRS)
07-08-2023 MONDAY	**SGD/DISSECTION**		**Biochemistry (LGIS)**	**PHYSIOLOGY (LGIS)**	**B r e a k**	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Process of inflammation and Lines of defense during inflammation
	Sole of Foot (Neurovascular Organization)		Vitamin k / Haptoglobin, ceruloplasmin	Fate of RBC & Jaundice / Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR)			
			Dr. Almas (Even) / Dr. Isma (Odd)	Dr. Sidra (Even) / Dr. Fareed (Odd)			
08-08-2023 TUESDAY	**SGD/DISSECTION**		**BIOMEDICAL ETHICS**	**PHYSIOLOGY (LGIS)**		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Red cell fragility, ESR & Red cell indices, Anemia & polycythemia
	Dissection		Activity 1	Blood coagulation / Types of immunity, Physiology of innate immunity tolerance & auto immunity			
				Dr. Fareed (Even) / Dr. Sidra (Odd)			
09-08-2023 WEDNESDAY	**SGD/DISSECTION**		**ANATOMY(LGIS)**	**PHYSIOLOGY (LGIS)**		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Structure of hemoglobin Folic acid & Vitamin B-12
	Arches of Foot		Histology of Thymus and Tonsils / Histology and Development of Spleen	Types of immunity, Physiology of innate immunity tolerance & auto immunity / Blood coagulation			
			Dr. Mohtasham Hina (Associate prof.) (Even) / Dr. Arslan (Asst. Prof (Odd)	Dr. Sidra (Even) / Dr. Fareed (Odd)			
10-08-2023 THURSDAY	**SGD/DISSECTION**		**Physiology (LGIS)**	**Physiology (LGIS)**		Practical & SGD/CBL Topics & venue mentioned at the end Online SDL Evaluation	SDL Biochemistry Heme synthesis Vitamin K
	Gait cycle		Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia) / Physiology of acquired immunity B-Cells	Physiology of acquired immunity B-Cells / Concept of intravascular anticoagulants and bleeding disorders (Vit K deficiency, hemophilia and thrombocytopenia)			
			Dr. Fareed (Even) / Dr. Sidra (Odd)	Dr. Sidra (Even) / Dr. Fareed (Odd)			
11-08-2023 FRIDAY	**8:00 AM – 9:00 AM**	**9:00 AM – 10:00AM**	**10:00AM– 11:00AM**	**11:00AM—12:00PM**		SDL Anatomy Sole of Foot	
	Biochemistry (LGIS)	**QURAN TRANSLATION**	**Physiology (LGIS)**	**ANATOMY(LGIS)**			
	Vitamin 9 and vitamin B12 / Transferrin, ferritin	Muaamlaat-3 / Muaasharat-1	Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body) / Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS	Histology of Thymus and Tonsils / Histology and Development of Spleen			
	Dr. Almas (Even) / Dr. Isma (Odd)	Mufti Naeem (Odd) / Abdul Wahid (Even)	Dr. Fareed (Even) / Dr. Sidra (Odd)	Dr. Mohtasham Hina (Associate prof.) (Odd) / Dr. Arslan (Asst. Prof (Even)			
	8:00 AM – 9:00 AM	**9:00 AM – 10:00AM**	**10:00AM – 11:00 AM**	**11:00AM – 12:00 PM**	**12:00-12:20pm**	**12:20pm – 2:00pm**	2HRS
12-08-2023 SATURDAY	**SGD/DISSECTION**		**Biochemistry (LGIS)**	**Physiology (LGIS)**	**B r e a k**	**Practical & SGD/CBL** Topics & venue mentioned at the end	SDL Anatomy Spleen
	Thymus, Tonsils and Spleen		Vitamin 9 and vitamin B12 / Transferrin, ferritin	Physiology of acquired immunity T-Cells. Allergy and Hypersensitivity reactions, Auto-immune diseases and AIDS / Thromboembolic condition (DVT, Pulmonary Embolism, DIC) Anticoagulant therapy (Heparin, warfarin, Prevention of blood clotting outside the body)			
			Dr. Almas (Odd) / Dr. Isma (Even)	Dr. Sidra (Even) / Dr. Fareed (Odd)			

Topics for Practical with Venue
• Thymus (Anatomy Histology Practical) Venue-Histology Laboratory • Quantitative estimation of serum total proteins (Biochemistry Practical) Venue- Biochemistry Laboratory • Determination of Bleeding time (BT) (Physiology Practical) Venue – Physiology Lab

Topics for Small Group Discussion & CBLs With Venue
• Physiology SGD- Platelet formation & function. hemostasis, blood coagulation tests (BT, CT, PT, APTT and INR (Venue: Lecture Hall No 5) • Biochemistry CBL – Jaundice (Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

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

Venue for first Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
B	91-180	Dr. Qurat Ul Ain	Lecture Hall No. 03 Anatomy Lecture Hall
C	181- 270	Dr. Zaneera	New Lecture Theater complex no. 3
D	271 onwards	Dr. Ali Raza	New Lecture Theater complex no. 2

Venue for first Year Batches for PBL & SGD Team-II

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

Sr. No	Batch	Roll no	Names of Teachers					
			Biochemistry					Physiology
			Monday	Tuesday	Wednesday	Thursday	Saturday	
1.	Batch – A	01-70	Dr. Rahat B (Practical)	Dr. Almas C (Practical)	Dr. Rahat D (Practical)	Dr. Almas A (Practical)	Dr. Rahat E (Practical)	Dr. Sheena
2.	Batch –B	71-140						Dr. Uzma
3.	Batch – C	141-210	Dr. Uzma D (SGD)	Dr. Uzma E (SGD)	Dr. Nayyab A (SGD)	Dr. Uzma C (SGD)	Dr. Nayyab E (SGD)	Dr. Fahad
4.	Batch –D	211-280						Dr. Maryam Abbas
5.	Batch -E	281-onwards						Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

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

Topic Details of SDL Biochemistry

- Structure of hemoglobin
- Types of Hb
- O2 Dissociation Curve

Blood and Immunity Module (Fourth Week)
(14-08-2023 To 19-08-2023)

Date/Day	8:00am-9:00am	9:00am – 10:00am	10:00am-11:00am	11:00am-12:00pm	12:00-12:20pm	12:20pm – 2:00pm	Home Assignments (2HRS)
14-08-2023 MONDAY	**Independence Day**						
15-08-2023 TUESDAY	**MEDICINE (LGIS)** Jaundice Dr. Umer Daraz (Even) / Dr. Iqra (Odd)	**BIO MEDICAL ETHICS** **(CLUB ACTIVITY 2)**	**PHYSIOLOGY (LGIS)** ABO & Rh Blood grouping system / Physiological mechanism of temperature regulation Dr. Fahad (Even) / Dr. Shazia (Odd)	**PHYSIOLOGY (LGIS)** Physiological mechanism of temperature regulation / ABO & Rh Blood grouping system Dr. Shazia (Even) / Dr. Fahad (Odd)	**B r e a k**	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Red cell fragility, ESR & Red cell indices, Anemia & polycythemia
16-08-2023 WEDNESDAY	**SGD/DISSECTION** Radiology and Surface Marking		**Physiology (LGIS)** Rh Blood grouping system and Erythroblastosis fetalis / Role of Hypothalamus in temperature regulation Dr. Fahad (Even) / Dr. Shazia (Odd)	**Physiology (LGIS)** Role of Hypothalamus in temperature regulation / Rh Blood grouping system and Erythroblastosis fetalis Dr. Shazia (Even) / Dr. Fahad (Odd)		Practical & SGD/CBL Topics & venue mentioned at the end	SDL Physiology Monocyte & Macrophage System Online Clinical Evaluation
17-08-2023 THURSDAY	**GYNAE OBS (LGIS)** Rh incompatibility and its significance Dr. Shama (Even) / Dr. Ruqqia (Odd)	**Physiology (LGIS)** Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) / Blood transfusion hazards. Tissue and organ transplantations Dr. Shazia (Odd) / Dr. Fahad (Even)	**IUGRC** Student practical session no 3			Practical & SGD/CBL Topics & venue mentioned at the end	SDL Biochemistry Immunoglobulins, iron
18-08-2023 FRIDAY	**8:00 AM – 9:00 AM** **BIO MEDICAL ETHICS** **(CLUB ACTIVITY-3)**	**9:00 AM – 10:00AM** **QURAN TRANSLATION** Muaasharat-2 / Muaamlaat-4 Abdul Wahid (Even) / Mufti Naeem (Odd)	**10:00AM– 11:00AM** **Physiology (LGIS)** Disorders of temperature regulation (Fever, Heat stroke, Exposure of body to extreme cold) / Blood transfusion hazards. Tissue and organ transplantations Dr. Shazia (Even) / Dr. Fahad (Odd)	**11:00AM—12:00PM** **Biochemistry (LGIS)** Immunoglobulins / Iron Dr. Uzma (Even) / Dr. Isma Riaz (Odd)		SDL Anatomy Tonsil	
	8:00 AM – 9:00 AM	**9:00 AM – 10:00AM**	**10:00AM – 11:00 AM**	**11:00AM – 12:00 PM**	**12:00-12:20pm**	**12:20pm – 2:00pm**	2HRS
19-08-2023 SATURDAY	**SGD/DISSECTION** Dissection		**Biochemistry (LGIS)** Immunoglobulins / Iron Dr. Uzma (Odd) / Dr. Isma (Even)	Practical & SGD/CBL Practical & SGD// CBLof 14th August batch Topics & venue mentioned at the end	**B r e a k**	Practical & SGD/CBL Topics & venue mentioned at the end	SDL Anatomy Gait Cycle

Topics for Practical with Venue

- Tonsils (Anatomy Histology Practical) Venue-Histology Laboratory
- Haemin crystals (Biochemistry Practical) Venue- Biochemistry Laboratory
- Recording of Body temperature (BT) (Physiology Practical) Venue – Physiology Lab

Topics for Small Group Discussion & CBLs With Venue

- Physiology SGD- Physiological mechanism of temperature regulation (Venue: Lecture Hall No 5)
- Biochemistry CBL – iron (Lecture Hall No 2)

Schedule for Practical / Small Group Discussion

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

Venue for first Year Batches for Anatomy Dissection / Small Group Discussion

Batches	Roll No	Anatomy Teacher	Venue
A	01-90	Dr. Urooj Shah	Lecture Hall No. 04 Anatomy Lecture Hall
B	91-180	Dr. Qurat Ul Ain	Lecture Hall No. 03 Anatomy Lecture Hall
C	181- 270	Dr. Zaneera	New Lecture Theater complex no. 3
D	271 onwards	Dr. Ali Raza	New Lecture Theater complex no. 2

Venue for first Year Batches for PBL & SGD Team-II

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

Sr. No	Batch	Roll no	Names of Teachers					
			Biochemistry					Physiology
			Monday	Tuesday	Wednesday	Thursday	Saturday	
1.	Batch – A	01-70	Dr. Almas B (Practical)	Dr. Rahat C (Practical)	Dr. Almas D (Practical)	Dr. Almas A (Practical)	Dr. Rahat E (Practical)	Dr. Sheena
2.	Batch –B	71-140						Dr. Uzma
3.	Batch – C	141-210	Dr. Uzma D (SGD)	Dr. Nayyab E (SGD)	Dr. Uzma A (SGD)	Dr. Isma C (SGD)	Dr. Nayyab E (SGD)	Dr. Fahad
4.	Batch –D	211-280						Dr. Maryam Abbas
5.	Batch -E	281-onwards						Dr. Fareed

Venues for Large Group Interactive Session (LGIS) and SDL

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

Topic Details of SDL Biochemistry

- Structure of hemoglobin
- Types of Hb
- O2 Dissociation Curve

Blood and Immunity Module (Fifth Week)
(21-08-2023 To 26-08-2023)

Date/time	9:00am - 12:00pm	12:00-02:00pm
21-08-2023 MONDAY	Anatomy Theory Paper	
22-08-2023 TUESDAY	Physiology Theory Paper & Video Assisted Quiz	
23-08-2023 WEDNESDAY	Biochemistry Theory Paper & Allied	
24-08-2023 THURSDAY	Anatomy /Physiology Viva Voce	
25-08-2023 FRIDAY	Anatomy /Physiology Viva Voce	
26-08-2023 SATURDAY	SDL For Upcoming Module	

Note: Timetable Subject to Change According To The Current Circumstances

(Logistic details of Assessments will be notified separately)

SECTION VI

Table of Specification (TOS) For Blood & Immunity Module Examination for First Year MBBS

Sr. #	Discipline	No. of MCQs (%)	No. of MCQs according to cognitive domain			No. of SEQs (%)		No. of SEQs according to cognitive domain			Viva voce	Integrated OSPE	Total Marks
			C1	C2	C3	No. of items	Marks	C1	C2	C3			
1.	Anatomy	20	10	5	5	4	20	1	1	2	60	45 (15 Stations)	145
2.	Physiology	30	18	9	3	4	20	1	2	1	50	18	118
3.	Biochemistry	13	5	4	1	3	10	0.5	1.5	-	-	10	33
Total Marks													296
Table of Specification for Clinical Subjects													
1.	Quran translation	10 (2SEQs)											10
2.	Research, Artificial Inteliligence & Innovation	5											5
3.	Family Medicine	2											2
5.	Medicine	5											5
6.	Pathology	5											5
7.	Gynae/ Obs	5											5
8.	Bioethics & Professionalism	2											2
													34
Grand Total												330	

Table of Specification for Gross OSPE

Anatomy

Block II- Lower Limb					
1	Bones and Joints of Hip and thigh Region	30%	50%	20%	3
2	Muscles and Neurovascular of Hip				3
3	Muscles and Neurovascular of Anterior and medial Compartment of Thigh				3
4	Muscles and Neurovascular of Posterior Compartment of Thigh				3
5	Bones and Joints of knee and leg				3
6	Muscles and Neurovascular of Anterior Compartment of Leg				3
7	Muscles and Neurovascular of Lateral and Posterior Compartment				3
8	Bones and Joints of ankle and Foot				3
9	Muscles and Neurovascular of Foot				3
10	Radiology of Lower Limb				3
				Total	**30**

Table of Specification for Integrated OSPE

Anatomy

Block II- MSK-II and Blood & Immunity					
Development of Musculoskeletal System, vertebral column, and limbs					3
Development of Lymphoid Organs	30%	50%	20%		3
Microscopic anatomy of muscle and skin					3
Microscopic anatomy of Lymphoid Organs					3
Practical Copy					3
				Total	15

Physiology

Block – II (MSK-II & Blood Module)							
1.	Block – II (MSK-II & Blood Module)	Determination of Total leukocyte Count (TLC)	30%	50%	20%	1 A	1
2.		Estimation of Red Blood Cell (RBC) count				1 B	1
3.		Determination of platelet count				1 C	1
4.		Determination of Differentiate leukocyte Count (DLC)				2	3
5.		Determination of ABO blood groups				3 A	1.5
6.		Determination of Rh blood groups				3 B	1.5
7.		Determination of Clotting Time (CT)				4 A	1.5
8.		Determination of Bleeding Time (BT)				4 B	1.5
9.		Recording of body temperature				5 A	1.5
10.		Demonstration of Triple response				5 B	1.5
11.		Practical notebook / sketch copy				6	3
						Total	**18**

Biochemistry

	Block – II (MSK-II & Blood Module)	**Color test for amino acids(observed)**		**90%**	**10%**	**1**	**2**
1.	Block – II (MSK-II & Blood Module)	Biuret test and ninhydrin	100%			2	2
2.		Quantitative estimation of serum total proteins				1B	1
3.		Heat coagulation	100%			2A	1
4.		Paper chromatography				2B	1
5.		Blood draw technique	100%			3	2
6.		Quantitative estimation of serum bilirubin	100%			4	2
7.		Hemin crystal					
8.		instruments		90%	10%	4	2
9.		Practical notebook		80%	20%	5	2
						Total	**10**

Annexure I

(Sample MCQ, SEQ & OSPE Papers)

RAWALPINDI MEDICAL UNIVERSITY, RWP
ANATOMY DEPARTMENT
1st Year MBBS MCQs Module Exam (BLOOD & IMMUNITY)

1. A 21-year-old boy had a motorcycle accident. On x-ray groove in the lower surface of the cuboid bone was destroyed. Which of the following muscle tendons is most likely damaged?

a. Flexor hallucis longus
b. Peroneus brevis
c. Peroneus longus
d. Tibialis anterior
e. Tibialis posterior

3. A patient reported to hospital with the complaint of difficulty in walking and pain in the left leg. He gave history of an audible snap during a forceful push-off emergency car breaks (plantarflexion with the knee extended). It was followed immediately by sudden calf pain and dorsiflexion of the foot. He might be suffering from?

a. Calcaneal tendinitis
b. Ruptured calcaneal tendon
c. Gastrocnemius strain
d. Common peron

5. Student of first year was asked to auscultate the posterior tibial pulse during assessment. While auscultating which landmarks are important?

a. Between lateral malleolus and medial border of calcaneal tendon
b. Between medial malleolus and medial border of calcaneal tendon
c. Between lateral malleolus and lateral border of calcaneal tendon
d. Between 1st and 2nd metatarsals
e. Between 2nd and 3rd metatarsals

2. A professional runner without any history of trauma complaint of pain in the sole of foot and heel. The pain was aggravated during start of walk and after sitting but relieved after 5-10 minutes of activity. His condition could be due to

a. Deep infection of the foot
b. Plantar fasciitis
c. Fatigue
d. Arthritis of ankle joint
e. Sprain of the ankle joint

4. During medical examination, students were asked to examine patient with “tarsal tunnel syndrome”. Which of the following symptoms are commonly associated with this?

a. Sharp pain radiating down the front of the thigh.
b. Tingling and numbness along the lateral side of the foot.
c. Weakness during ankle joint extension
d. Burning sensation along the inner side of leg and sole of the foot.
e. Flattening of lateral arch of the foot

RAWALPINDI MEDICAL UNIVERSITY, RWP
PHYSIOLOGY DEPARTMENT
1st Year MBBS MCQs Module Exam (BLOOD & IMMUNITY)

1. Maintenance of blood viscosity is mainly a function of :
   a. Plasma proteins
   b. Erythocytes
   c. Thrombocytes
   d. Albumin
   e. Gamma globulins

2. The HIV virus mainly targets the immune cells which are back bone of cell mediated immunity , these cells are:
   a. B-cells
   b. Cytotoxic T cells
   c. Helper T cells
   d. Memory cells
   e. Suppressor T cells

3. A Rh-negative mother having her second pregnancy terminated because of fetal death due to Rh-incompatibility, the type of agglutinin involved in this case would be:
   a. 1gM
   b. 1gG
   c. 1gE
   d. 1gA
   e. 1gD

4. Thalasemic children usually suffer from iron over load. Insoluble storage form of iron secondary to iron-overload is termed as:
   a. Ferritin
   b. Apoferritin
   c. Hemopexin
   d. Hemosiderin
   e. Ferroheme

5. When blood is allowed to clot, the fluid left behind is known as :
   a. Plasma
   b. Lymph
   c. Tissue fluid
   d. Tissue gel
   e. Serum

RAWALPINDI MEDICAL UNIVERSITY, RWP
PHYSIOLOGY DEPARTMENT
1st Year MBBS SEQs Module Exam (BLOOD & IMMUNITY)

Q.1	Discuss three different causes of anemia and what is obligatory degradation of proteins and how it can be prevented?	(3,2)
Q.2	Define Immunity. What are different classifications of granulocytes (write any two). Write four causes of neutrophilia?	(1,2,2)
Q.3	Define Land Steiners Law, Secretors and non- Secretors. Write down briefly on Incompatible blood transfusion, stating two complications of incompatible blood transfusion.	(3,2)

RAWALPINDI MEDICAL UNIVERSITY, RWP
BIOCHEMISTRY DEPARTMENT
1st Year MBBS SEQs Module Exam (BLOOD & IMMUNITY)

1. Iron is transported in the body in the form of:
   a. Ferritin
   b. Hemosiderin
   c. Transferrin
   d. Hemoglobin
   e. Myoglobin

2. The normal serum value for total bilirubin is up to:
   a. 10mg/dl
   b. 5mg/dl
   c. 50mg/dl
   d. 1mg/dl
   e. 15mg/dl

3. Chocolate cyanosis is a classic presentation of
   a. Thalassemia
   b. Hemoglobin SC disease
   c. Hemoglobin C disease
   d. Sickle cell anemia
   e. Methemoglobinemia

4. Vitamin K is required for
   a. Change of prothrombin into thrombin
   b. Synthesis of prothrombin
   c. Change of fibrinogen into fibrin
   d. Formation of thromboplastin
   e. Fibrinolysis

SEQ

Q. a. Explain the functions and clinical significance of Albumin. 2.5

b. Describe pathway of synthesis of heme. 2.5

1. ----Includes rules of conduct that may be used to regulate our activities concerning the biological world.

a. Bio-piracy
b. Biosafety
c. Bioethics
d. Bio-patents
e. Bio-logistic

2. The right of patients having self-decision is called.

a. Justice
b. Autonomy
c. Beneficence
d. Veracity
e. Fidelity

3. Following is not code of ethics.

a. Integrity
b. Objectivity
c. Confidentiality
d. Behaviour
e. Autonomy

4. -------in the context of medical ethics, if it's fair and balanced

a. Justice
b. Autonomy
c. Beneficence
d. Veracity
e. Fidelity

5. ------Principle requiring that physicians provide, positive benefits

a. Justice
b. Autonomy
c. Beneficence
d. Veracity
e. Fidelity

Rawalpindi Medical University Department of Anatomy

Block-II OSPE 1st Year MBBS

Station No. 1 (Observed Station)

Histology sketch copy will be assessed for

a. Complete index (1)

b. Complete and signed diagrams (1)

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

d. Punctuality (1)

e. Neatness (1)

Station No. 2 (Gross Anatomy)

Core Concept - Learning Domain (C2)

I. On the cadaver/model,

a. Identify Red (1)

b. Identify Yellow (1)

c. Identify Green (1)

Rawalpindi Medical University Department of Physiology

Block-II OSPE 1st Year MBBS

Station No.1 Time Allowed: 2 Minutes

a. What is the preferred dilution ratio for RBC count & platelet count? (0.5, 0.5)

b. Write the composition of Hayem's Fluid. (1)

c. How would you interpret a platelet count of 80,000 /mm^3? (1)

Station No.2 Time Allowed: 2 Minutes

a. Identify the cells labeled A & B. (0.5)

b. Points of Identification. (1.5)

c. What is the power of objective lens used for identifying the cells and how much (0.5, 0.5)
was the total magnification achieved?

Rawalpindi Medical University Department of Biochemistry
Block-II OSPE 1st Year MBBS

Station No. 2 Time Allowed: 2 Mins

Observed station

Perform Biuret test 03

Station No. 1 Time Allowed: 2 Mins

Observed Station

Perform Lead Sulfide test. 03

Rawalpindi Medical University Department of Anatomy
Block-II Video Asissted Quiz 1st Year MBBS

I. What is this clinical condition? (1)

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

Rawalpindi Medical University Department of Biochemistry
Block-II Video Asissted Quiz 1st Year MBBS

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