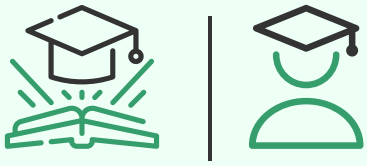
College of Medicine & Dentistry at The Hills

DEPARTMENT OF MEDICAL EDUCATION
COLLEGE OF MEDICINE AND DENTISTRY AT THE HILLS, ABBOTTABAD

Blood & Immunology-I

Module

Block-A (1st Year)
MBBS



Duration: 5 weeks

Year
2024-25

Contents

1 Vision

To be a leading institution in medical education, dedicated to cultivating a workforce of physicians and clinicians who excel in providing equitable, affordable, and exemplary healthcare while addressing the diverse health needs of our nation and the global community.

2 Mission

To deliver a transformative medical education that empowers future healthcare leaders to innovate in clinical care and health system design. Our mission is supported by a passionate and diverse faculty committed to fostering collaboration, upholding the highest ethical standards, and addressing healthcare disparities. We aim to inspire our students to engage with patients and communities, promoting inclusivity and teamwork in service to humanity.

3 List of abbreviations

Bio-L	Biochemistry Lecture	**OSPE**	Objectively Structured Practical Examination
Bio-P	Biochemistry Practical	**Paeds-L**	Pediatrics Lecture
Bio-SGD	Small Group Discussion in Biochemistry	**Patho-L**	Pathology Lecture
C.Med-L	Community Medicine Lecture	**Phar-L**	Pharmacology Lecture
DSL	Directed Self Learning	**Phy-L**	Physiology Lecture
FDT	Film/Demonstration/Tutorial	**Phy-P**	Physiology Practical
F.Med-L	Forensic Medicine Lecture	**Phy-SGD**	Small Group Discussion in Physiology
G.Anat-L	Gross Anatomy Lecture	**PBL**	Problem Based Learning
Histo-P	Histology Practical	**SDL**	Self-Directed Learning
IT	Information Technology	**SL**	Skill Lab
LGIS	Large Group Interactive Session	**SAQs**	Short Answer Questions
MCQs	Multiple Choice Questions	**SEQs**	Short Essay Questions
Med.Edu-L	Medical Education Lecture	**SGDs**	Small Group Discussions
PRIME	Professionalism and Communication Skills, Research, Identity Formation, Management and Leadership, Ethics		

4 Recommended List Of Icons

Introduction To Case

For Objectives

Critical Questions

Assessment

Resource Material

5 Overview of the Module/ Preface

Welcome to the Blood & Immunology-I Module study guide. This guide is designed to support effective teaching and efficient learning by managing student learning, focusing learning activities, and providing essential information on the study topics.

The module emphasizes integrating theoretical knowledge with practical applications to ensure a thorough educational experience. Core themes, including “Pallor & Swelling,” “Fever (Infection & Immunity),” and “Excessive Bleeding & Transfusion Reactions,” are carefully structured to enhance understanding of these critical concepts. Students will gain practical experience through evidence-based teaching in various settings such as hospitals and community environments, providing a well-rounded education.

This study guide is also an important reference for assessment and evaluation. It outlines the components to be assessed—knowledge, skills, and attitudes—and the corresponding assessment tools. These tools may include written examinations with Multiple Choice Questions and Short Essay Questions to evaluate theoretical knowledge, as well as performance assessments through Objective Structured Practical Examinations (OSPE) and Objective Structured Clinical Examinations (OSCE) to assess practical skills and clinical competence. This transparency helps students align their efforts with evaluation criteria, fostering accountability and preparation for academic success.

As future medical professionals, graduates can anticipate diverse career opportunities in clinical practice and research, both domestically and internationally. Overall, this study guide is an essential tool, offering clarity on module contents, instructional methods, faculty guidance, and assessment criteria. By engaging actively with this information, students can navigate their academic journey with confidence and purpose, maximizing their learning experience in medicine.

6 Introduction/ Organization of Module

6.1 Introduction:

The Blood and Immunology-I Module is designed to outline the knowledge, skills, and attitudes required of first-year medical students in the Basic Medical Sciences, including Anatomy, Physiology, and Biochemistry. This module introduces Clinical Sciences with a focus on body defense mechanisms and immunological disorders. As the second module of the first year of the MBBS program, it will culminate in a block assessment.

Spanning five weeks, the Blood and Immunology-I Module adopts a theme-based approach and will be delivered through Lectures, Small Group Discussions (SGDs), Directed Self-Learning (DSLs), and Practical Work.

The module encompasses the following themes:

Blood and Immunology-I Module		
S. No	**Theme**	**Duration**
1.	Pallor and Fatigue	01 Week
2.	Fever (Infection and Immunity)	02 Weeks
3.	Excessive Bleeding	01 Week
4.	Transfusion Reaction	01 Week

6.2 Rationale:

The rationale for the Blood module, is to provide first-year medical students with a foundational understanding of hematopoiesis and hemostasis at the molecular level. The module will cover the basic pathological processes involved in the development of anemias and explore the pharmacological aspects of blood-related disorders, including their community prevalence.

Through this module, students will gain insights into the presentations and management principles of common hematological, immunological, inflammatory, and neoplastic disorders, equipping them with essential knowledge for their medical education.

6.3 Organization of the Study Guide:

The Blood & Immunology-I Module is a five-week, theme-based course organized into three key activities:

1. **“Pallor & Swelling” (one Weeks):** This segment introduces the hematopoietic system, blood, and porphyrins. Topics covered include the genesis of red blood cells, erythropoiesis, various types of anemia (including anemias of diminished erythropoiesis and hemolytic anemia), polycythemia, the epidemiology of blood-borne diseases, and the pharmacological treatment of anemia. It also addresses the chemistry of water-soluble vitamins, iron metabolism, the synthesis and degradation of heme, and hemoglobinopathies.

2. **“Fever/Infection & Immunity” (Two Weeks):** This section explores the microscopic, developmental, and gross anatomy of the hematopoietic system. It includes the physiology of white blood cells, the reticuloendothelial system, inflammation, leukemia, immunity, the immune system, immune responses, humoral immunity, cell-mediated immunity, immunity across different ages, the complement system, allergy and hypersensitivity, the chemistry of antibodies, and immunization.
3. **“Excessive Bleeding & Transfusion Reactions” (Two Week):** This part introduces hemostasis, blood coagulation, bleeding disorders, thrombotic disorders, and coagulation-modifying drugs. It also covers blood grouping, transfusion reactions, erythroblastosis fetalis, the major histocompatibility complex, the medicolegal significance of blood groups, and the epidemiology of blood-borne diseases.

The content of the Blood & Immunology-I Module will be delivered through various instructional methods, including Large Group Interactive Sessions, Directed Self-Learning, Self-Directed Learning, Small Group Discussions, and Practical Demonstrations.

7 Teaching Strategies:

The following teaching and learning methods are utilized to foster better understanding:

7.1 Large Group Formats:

a. **Interactive Lectures:** In large group settings, the lecturer introduces topics or common clinical conditions, explaining the underlying phenomena through interactive methods such as questions, visual aids, videos of patient interviews, and exercises. Students are actively engaged in the learning process.

b. **Directed Self-Learning:** Directed self-learning is an active approach where learners are provided with predefined learning objectives and receive guidance and supervision throughout the learning process. This method helps establish a strong foundation for independent and deep learning.

c. **Self-Directed Learning:** Students assume responsibility for their own learning through individual study, discussions with peers, and seeking information from the Learning Resource Center, teachers, and other resources both within and outside the college. Students can utilize designated college hours for self-study.

7.2 Small Group Formats:

a. **Small Group Discussions:** This format helps students clarify concepts, acquire skills, and develop attitudes. Sessions are structured around specific exercises, such as patient cases, interviews, or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials, and self-study. The facilitator's role is to ask probing questions, summarize, or rephrase to help clarify concepts.

b. **Practical Demonstrations:** Basic science practicals related to anatomy, biochemistry, and physiology are scheduled to enhance student learning.

c. **Problem-Based Learning (PBL):** In PBL sessions, students work in small groups to solve complex, real-world problems. This method encourages critical thinking, self-directed learning, and the application of knowledge in practical scenarios. Facilitators guide the process, helping students to develop problem-solving skills and integrate knowledge across disciplines.

d. **Journal Club:** The Journal Club involves students reviewing and presenting recent research articles. This activity promotes critical appraisal skills, keeps students updated with the latest scientific developments, and encourages the integration of evidence-based practices into their learning.

8 Assessment Strategies:

Assessments within the MBBS program at the College of Medicine and Dentistry at the Hills, Abbottabad consist of both formative and summative evaluations. These assessments are crucial for monitoring student progress and academic performance.

8.1 Formative Assessment:

Formative assessments, accounting for 10% of the total marks assigned to each block, serve as ongoing evaluations designed to provide feedback and promote learning. The allocation of this 10% can be determined in accordance with the blueprint of KMU and further distributed as per the recommendations of the academic council at the College of Medicine and Dentistry at the Hills, Abbottabad. Formative assessments are conducted after the completion of each module, ensuring students receive timely feedback to enhance their understanding and performance.

8.2 Summative Assessment:

Summative assessments, comprising 90% of the total assessment weighting, are conducted and overseen by KMU as part of the annual examination process. The summative annual examination is organized and conducted by KMU, which is responsible for evaluation and grading. This summative assessment evaluates students' comprehensive understanding of the curriculum and constitutes a significant portion of their final scores.

8.3 Assessment Tools:

Various assessment tools are employed to measure students' knowledge and competencies. These tools include:

1. **Written Examinations:** These include Multiple Choice Questions (MCQs) and Short Essay Questions (SEQs) that assess students' theoretical knowledge.
2. **Performance Assessments:** Objective Structured Practical Examinations (OSPE) and Objective Structured Clinical Examinations (OSCE) are used to evaluate practical skills and clinical competence.
3. **In-Training Assessments:** Clinical logbooks provide a comprehensive record of students' practical experiences and serve as a valuable tool for tracking their progress.
4. **Assignments:** Presentations, projects, and self-reflection assignments are included in the assessment process to enhance students' critical thinking and research skills.

8.4 Feedback Mechanism:

At the end of each module, a "Module Evaluation Form" will be provided to students, either in hard copy or online. Students will give their feedback on the "Course Content," "Learning Resources," "Teaching Methods," "Engagement & Motivation," and "Assessment Methods."

9 Table Of Specification

Block A Table of Specification						
Subject	**Weightage**	**No. of Hours Allocated in Time table**	**Assessment**			
			Foundation-I		**Blood & Immunology-I**	
			MCQs	**OSPE**	**MCQs**	**OSPE**
Gross Anatomy	12.89%	33	12	05	01	01
Histology	08.02%	21	10		04	
Embryology	07.81%	20	15		00	
Physiology	26.95%	69	10	02	22	05
Biochemistry	21.87%	56	14	03	12	01
PRIME including Research	05.46%	14	05	00	03	00
Pharmacology	01.95%	05	01	00	01	00
Pathology	03.12%	08	02	01	04	00
Community Medicine	03.51%	09	01	00	02	00
Forensic Medicine	01.17%	03	00	00	01	00
IT Skills	03.51%	09	00	00	00	00
Islamiyat	03.12%	08	00	00	00	00
Pak. Study	0.39%	01	00	00	00	00
Total	**100%**	**256**	**70**	**11**	**50**	**07**

10 Learning Objectives

10.1 General Learning Outcomes

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

Knowledge

1. Identify & describe the various cellular and non-cellular components of blood in relation to its Anatomy, Physiology & Biochemistry
2. Describe structure, synthesis and degradation of Hemoglobin
3. Describe the regulatory mechanisms of normal hemostasis and coagulation
4. Describe the conditions associated with dysfunction of cellular and non-cellular components of blood
5. Describe the basic characteristics of immune system.
6. Discuss the structure, functions and biochemical aspects of the Lympho-reticular system.
7. Explain the principles and clinical significance of ABO/RH blood grouping system
8. Explain the pathophysiology of various bleeding disorders
9. Identify the role of pharmacology in anemia and bleeding disorders.

Skills

1. Carry out practical work as instructed in an organized and safe manner
2. Make and record observations carefully & accurately.
3. Identify slide of Lymph node, thymus, tonsils and spleen under microscope
4. Determine percentage of formed blood elements.
5. Identify RBC and should be able to do its counting on counting chamber and to know normal values. And also classify Anemia morphologically. Determine the Hemoglobin with the apparatus and have knowledge of normal and abnormal value.
6. Identify WBC morphology and its different types, should be able to count them on counting chamber and to know the normal values. Diagnostic importance of each WBC.
7. Identify Platelets and should be able to do its counting on counting chamber and to know normal values. Its diagnostic importance in relation to bleeding disorders
8. Perform bleeding time and clotting time and to know normal values and its diagnostic importance in relation to bleeding disorders.
9. Perform Blood groups typing and Rh factor.
10. Perform ESR and to know its normal value and prognostic importance.

Attitude

1. Follow the basic laboratory protocols.
2. Demonstrate ability to give and receive feedback, respect for self and peers.
3. Demonstrate empathy and care to patients.

4. Develop respect for the individuality and values of others - (including having respect for oneself) patients, colleagues and other health professionals
5. Organize& distribute tasks
6. Exchange opinion & knowledge
7. Develop communication skills and etiquette with sense of responsibility.
8. To equip themselves for teamwork.

10.2 Specific Learning Outcomes

THEME–I: Pallor and Swelling

S No.	Topic	Learning Objectives	Teaching Strategy	Hours	Assessment Tools
		ANATOMY			
1	Introduction to hematopoietic system	Describe various components of hematopoietic system including their locations and their functions Describe surface anatomy and applied anatomy of main organs of hematopoietic system Define and classify lymphoid organs and lymphoid tissues	LGIS	1	**MCQs/ SEQs Viva**
		PHYSIOLOGY			
2	Introduction to Blood	Describe the composition and functions of blood Define Hematocrit Enlist the components of plasma Explain the difference between Serum and plasma	LGIS	1	**MCQs/SEQs Viva**
3	Red Blood Cells	Describe the structure, function, life span and normal count of Red Blood Cells. Define Haemopoiesis Classify haematopoietic stem cells Summarize the erythropoiesis sites during pre-natal and post-natal periods.	LGIS	1	**MCQs/SEQs Viva**
4	Red Blood Cells Genesis	Illustrate the stages of RBC development from	LGIS	1	**MCQs/SEQs Viva**

	Erythropoiesis	pluripotent hematopoietic stem cells to a mature RBC. Describe the erythropoiesis and factors regulating Erythropoiesis Describe the role of Vitamin B12 and Folic acid in RBC maturation. Describe the effects of deficiency of Vitamin B12 and Folic acid on RBC maturation.			
5	Erythropoietin	Describe source, control / regulation and functions of Erythropoietin Explain the role of Erythropoietin in RBC production. Describe the effects of high altitude and exercise on RBC production.	LGIS	1	**MCQs/SEQs Viva**
6	Anemia	Define and describe the different types of anemia Define hemolysis Describe the various red cell indices Interpret the diagnosis of anemia by using red cell indices Describe the effects of anemia on functions of circulatory system / human body	LGIS	1	**MCQs/SEQs Viva**
7	Polycythemia	Define and classify polycythemia Differentiate between primary and secondary Polycythemia	LGIS	1	**MCQs/SEQs Viva**
		BIOCHEMISTRY			
8	Introduction of Porphyrins	Define Porphyrins Describe Chemistry of Porphyrins. Enlist the types, metabolic causes and clinical presentation of different types of Porphyrias.	LGIS	1	**MCQs/SEQs Viva**
9	Iron metabolism	Describe the iron metabolism	LGIS	1	**MCQs/ SEQs**

10	Introduction to heme synthesis and degradation	Define heme and describe its structure and functions Describe the biochemical features of the hemoglobin molecules Describe Heme Synthesis on cellular and molecular level Describe Heme Degradation Describe the Regulation of Heme Synthesis. Describe the concept of Oxygen binding with hemoglobin Describe the normal picture of blood chemistry.	LGIS	1	**MCQs/SEQs Viva**
11	Haemoglobinopathies	Define Hemoglobinopathies and enlist the variants of hemoglobin Describe causes of Hemoglobinopathies Describe two major categories of hemoglobinopathies Describe the amino acid substitution in sickle cell disease. Define and Classify thalassemias. Explain the genetic defects in α and β thalassemias. Enlist the clinical features of α and β thalassemias	LGIS	1	**MCQs/SEQs Viva**
12	Water soluble vitamins	Discuss water soluble vitamins including Vitamin B complex Vitamin C Folic Acid	LGIS	1	**MCQs/SEQs Viva**
PATHOLOGY					
13	Anemias of diminished erythropoiesis	Define anemia List the factors for regulation of erythropoiesis Enlist the types of anemia	LGIS	1	**MCQs/SEQs**
14	Hemolytic anemia's	Define hemolytic anemia. Enlist types of hemolytic anemia.	LGIS	1	**MCQs/SEQs**
COMMUNITY MEDICINE					
15	Epidemiology of	Describe Epidemiology of	LGIS	1	**MCQs/SEQs**

	blood borne diseases	Iron Deficiency Anemia Describe prevention of different types of anemias in community			
PHARMACOLOGY					
16	Drugs used in the treatment of anemias	Enlist the drugs used in the treatment of iron deficiency & Megaloblastic anemia Describe the pharmacological basis/ role of iron in iron deficiency anemia (hypochromic normocytic anemia) Describe the pharmacological basis/ role of vit B12 and folic acid in megaloblastic anemia Describe the role of Erythropoietin in the treatment of Anemia (normochromic normocytic anemia)	LGIS	1	**MCQs/SEQs**
LAB WORK					
HISTOLOGY					
17	Lymphoid Tissues and Lymphoid Organs	Identify and describe the microscopic anatomy of lymph node, thymus, bone marrow and spleen under microscope Compare the histological features of lymph node, thymus and spleen	Demonstration / Practical	2	**OSPE**
PHYSIOLOGY					
18	Hemoglobin determination	Assist in phlebotomy while practicing aseptic procedure. Determine the hemoglobin (Hb) concentration in the given sample Estimation of hemoglobin by Sahli's method Determination of packed cell volume	Demonstration / Practical	2	**OSPE**
19	Blood cells	Identify and describe various blood cells under microscope.	Demonstration/ Practical	2	**OSPE**
20	RBC count	Determine the red blood cell (RBC) count in the given sample and calculate RBC	Demonstration/ Practical	2	**OSPE**

		indices			
DIRECTED SEF LEARNING					
ANATOMY					
21	Surface & Applied Anatomy of the main organs of hematopoietic system	Describe surface anatomy and applied anatomy of main organs of hematopoietic system	DSL	1	**MCQs/SEQs**
PHYSIOLOGY					
22	Red Blood Cells Genesis	Illustrate the stages of RBC development from pluripotent hematopoietic stem cells to a mature RBC. Describe the erythropoiesis and factors regulating erythropoiesis Describe the role of Vitamin B12 and Folic acid in RBC maturation. Describe the effects of deficiency of Vita- min B12 and Folic acid on RBC maturation.	DSL	1	**MCQs/SEQs**
BIOCHEMISTRY					
23	**Chemistry of Hemoglobin**	**Describe the biochemical features of the hemoglobin molecules** **Describe the concept of Oxygen binding with hemoglobin** **Describe the normal picture of blood chemistry.**	**DSL**	**1**	**MCQs/SEQs**

Theme-2 Fever (Infection and Immunology)

S.No.	Topic	Learning Objectives	Teaching Strategy	Hours	Assessment Tools
ANATOMY					
1	Gross anatomy of hematopoietic system	Locate, identify and describe the main gross external features of spleen, lymph node, thymus and tonsils Describe neurovascular	LGIS	1	MCQs/SEQs Viva

		supply of the mentioned structures Outline the surface anatomy of main lymph nodes, spleen, thymus and tonsils Enlist the causes of splenic injuries			
2	Histology of lymphoid tissues	Describe the overview of lymphatic tissue including MALT Identify and describe the histological features and functions of Lymph node Identify and describe the histological features and functions of Thymus Identify the locations of tonsils and describe the histological features and functions of Tonsils Describe the histological features and functions of spleen.	LGIS	1	MCQs/SEQs Viva
3	Embryology/ Developmental Anatomy of lymphoid tissue	Describe the development of lymphoid organs including lymph nodes, tonsils, thymus and spleen	LGIS	1	MCQs/SEQs Viva
		PHYSIOLOGY			
4	White Blood Cells	Classify white blood cells Describe the structure, function, life span and normal count of White Blood Cells Describe the stages of differentiation of white blood cells Describe the characteristics of WBCs	LGIS	1	MCQs/SEQs Viva
5	Reticulo-endothelial (Monocyte-Macrophage) system	Describe the components of reticulo-endothelial system (monocyte-macrophage system) Describe the role of	LGIS	1	MCQs/SEQs Viva

		monocyte macrophage system in immunity Explain the role of neutrophils, macrophages, basophils, eosinophils and monocytes in providing immunity against infections (immune system)			
6	Inflammation	Define inflammation Describe characteristics of inflammation (hallmark of inflammation) Describe the causes, sequence of events and cardinal signs of inflammation	LGIS	1	MCQs/SEQs Viva
7	Abnormal leukocyte counts/ Leukemia	Define Leukopenia and Leukocytosis and Leukemia	LGIS	1	MCQs/SEQs Viva
8	Introduction to immunity	Define and classify immunity Define antigen Define pathogen Enlist the tissues that contribute to immunity and explain their function Describe the functions of immune system Describe the structure and function of lymphatic system	LGIS	1	MCQs/SEQs Viva
9	Immune system	Enlist the three lines of defenses and outline their properties Describe the characteristics, origin and functions of cells of immune system Describe the types of immunity Enlist the innate defenses List the substances and cells that participate in adaptive immunity Compare the	LGIS	1	MCQs/SEQs Viva

		characteristics innate and acquired immunity Compare the active and passive immunity mechanism			
10	Immune response	Differentiate between primary and secondary immune response Describe the roles of cytokines, chemokines, and colony-stimulating factors in the immune response	LGIS	1	MCQs/SEQs Viva
11	Humoral and cell mediated immunity	Describe the role of T and B lymphocytes in immunity Describe the role of B lymphocytes in humoral immunity Describe cell mediated and humoral immunity Explain how helper T cells regulate the immune system Explain the function of cytotoxic T cells Describe the role of helper T cells Differentiate between humoral and cell mediated immunity	LGIS	1	MCQs/SEQs Viva
12	Complement system	Describe the complement system Explain how the complement system elicits the inflammatory response, lyses foreign cells, and increases phagocytosis Describe the two pathways that activate the complement system Compare Classic and alternate pathways of complement activation.	LGIS	1	MCQs/SEQs Viva
13	Immunity: extremes of ages	Compare the active and passive immunity Explain the transfer of passive immunity from mother to fetus and	LGIS	1	MCQs/SEQs Viva

		from mother to infant during breast-feeding Describe changes in immune response that occurs with aging			
14	Allergy & Hypersensitivity	Define allergy and allergen Describe the pathophysiology of allergy and hypersensitivity Define and classify the hypersensitivity reaction Compare the immediate and delayed hypersensitivity reactions List the diseases associated with hypersensitivity reactions	LGIS	1	MCQs/SEQs Viva
BIOCHEMISTRY					
15	Immunoglobulin's / Antibodies	Define Immunoglobulin's DESCRIBE Types of Immunoglobulin's Describe Structure of Immunoglobulin's Describe the mechanism of action of antibodies Explain biochemical role of each immunoglobulin in immunity	LGIS	1	MCQs/SEQs Viva
COMMUNITY MEDICINE					
16	Vaccinology	Define vaccine and immunization Explain the expanded program of immunization (EPI) in Pakistan	LGIS	1	MCQs/SEQs Viva
LAB WORK					
PHYSIOLOGY					
17	TLC determination	Determine the total leukocyte count (TLC) in the given sample	Demonstration / Practical	2	OSPE
18	DLC determination	Determine the differential leukocyte	Demonstration / Practical	2	OSPE

		count (DLC) in the given sample			
SMALL GROUP DISCUSSIONS					
ANATOMY					
19	Lymph Node	Explain what is meant by Hematopoietic system. Enumerate the organs included in Hematopoietic system. Explain histology of lymph Node	SGD	2	MCQs/SEQs
PHYSIOLOGY					
20	Clinical approach to a patient with Pallor	Understand the importance of proper history taking and physical examination in clinical evaluation of a patient with pallor Understand the different morphological features of Red blood cell Classify anemia on the basis of red cell morphology Understand the specific laboratory investigations to confirm and find out the cause of anemia	SGD	2	MCQs/SEQs
BIOCHEMISTRY					
21	Iron Metabolism	Explain the mucosal block theory of iron absorption Describe the storage and transport of iron Describe manifestations of iron deficiency	SGD	2	MCQs/SEQs
DIRECTED SELF LEARNING					
ANATOMY					
22	Developmental Anatomy of lymphoid tissue	Describe the development of lymphoid organs including lymph nodes, tonsils, thymus and spleen	DSL	1	MCQs/SEQs

23	Hematopoietic system	Describe various components of hematopoietic system including their locations and their functions Define and classify lymphoid organs and lymphoid tissues	DSL	1	MCQs/SEQs
		PHYSIOLOGY			
24	Anemia	Define and describe the different types of anemia Define hemolysis Describe the various red cell indices Interpret the diagnosis of anemia by using red cell indices Describe the effects of anemia on functions of circulatory system / human body	DSL	1	MCQs/SEQs
25	Reticuloendothelial System	Describe the components of reticulo-endothelial system (monocyte-macrophage system) Describe the role of monocyte macrophage system in immunity Explain the role of neutrophils, macrophages, basophils, eosinophils and monocytes in providing immunity against infections (immune system)	DSL	1	MCQs/SEQs
		BIOCHEMISTRY			
26	Water Soluble Vitamins	Define and Classify Vitamins Enlist Water Soluble Vitamins Discuss the chemistry of Water-Soluble Vitamins	DSL	1	MCQs/SEQs

27	Qualitative Haemoglobinopathies	Describe the Qualitative Haemoglobinopathies Describe the amino acid substitution in sickle cell disease. Hemoglobin C disease & Hemoglobin SC disease.	DSL	1	MCQs/SEQs

Theme-3 (Excessive Bleeding)

1	Introduction to Hemostasis	Describe the structure, function, life span and normal count of Platelets. Define hemostasis Describe the role of platelets in hemostasis Outline the sequence of processes involved in hemostasis.	LGIS	1	MCQs/SEQs Viva
2	Blood Coagulation	Enlist the clotting factors Explain the role of calcium in coagulation Explain how clotting is prevented in the normal vascular system Outline the sequence of processes during blood coagulation Describe with the help of a flow diagram (or draw) intrinsic pathway of coagulation cascade Describe with the help of a flow diagram (or draw) extrinsic pathway of coagulation cascade Explain how the mechanism of clot dissolution.	LGIS	1	MCQs/SEQs Viva
3	Bleeding disorders	Describe the role of Vit K in clotting Describe the following bleeding disorders:	LGIS	1	MCQs/SEQs Viva

		• Vitamin K deficiency • Thrombocytopenia • Hemophilia Define Von Willebrand disease			
4	Thrombotic disorders	Describe the effects of low platelet count on Hemostasis Define thrombus/thrombi Define emboli/embolus Enlist the causes of thromboembolic conditions Describe Femoral venous thrombosis and pulmonary embolism	LGIS	1	MCQs/SEQs Viva
5	Coagulation modifying drug	Identify the site of action of following drugs in coagulation cascade • Aspirin, • Heparin, • Tranexamic acid • Vit K	LGIS	1	MCQs/SEQs
6	Clotting time determination	Determine the clotting time in the given sample	Demonstration / Practical	2	OSPE
7	Bleeding time determination	Determine the bleeding time in the given sample	Demonstration / Practical	2	OSPE
8	Prothrombin time determination	Determine the Prothrombin time (PT) in the given sample	Demonstration / Practical	2	OSPE
9	Histology of lymphoid tissues	Describe the histological features and functions of Lymph node, Thymus, Tonsils and Spleen.	DSL	1	MCQs/SEQs
10	Inflammation	Define inflammation	DSL	1	MCQs/SEQs

		Describe characteristics of inflammation. Describe the causes of inflammation. Describe the sequence of events and cardinal signs of inflammation.			
11	Quantitative Haemoglobinopathies	Enlist the Quantitative Haemoglobinopathies. Explain the genetic defects in α and β thalassemia. Enlist the clinical features of α and β thalassemia	DSL	1	MCQs/SEQs

Theme-4 (Transfusion Reaction)

1	Blood Grouping	Describe different types of blood groups Describe the genotype-phenotype relationships in blood groups. Interpret the plausible blood groups (A-B-O) in children of parents with known blood groups. Describe the role of agglutinogens and agglutinins in blood grouping Describe the antigens and antibodies of the O-A-B blood types/ Interpret the types of agglutinins present in individuals with a specific blood group Describe the process of agglutination	LGIS	1	MCQs/SEQs Viva
2	Transfusion reactions	Describe the antigens and antibodies of the Rh system Describe the principles of blood typing Explain universal donor and universal recipient blood groups Enlist the manifestations of transfusion reaction	LGIS	1	MCQs/SEQs Viva

3	Erythroblastosis fetalis	Define Rhesus incompatibility Describe erythroblastosis fetalis Describe the transfusion reactions resulting from mismatched O-A-B and Rh blood types	LGIS	1	MCQs/SEQs Viva
4	Major histocompatibility complex	Define autoimmunity Explain how immune reaction to self-antigens is avoided Define and classify Major Histocompatibility complex (MHC) Characterize the significance and function of major histocompatibility complex molecules	LGIS	1	MCQs/SEQs Viva
5	Medico-legal importance of blood groups	Describe the Medico-legal importance of blood groups in forensic work that is: • Personal Identity • Inheritance claims • DNA profiling • Disputed paternity and maternity	LGIS	1	MCQs/SEQs
6	Epidemiology of blood borne diseases	Identify important blood borne pathogens and how they are spread Discuss the epidemiology of blood borne disease transmission and the potential for HIV, HBV and HCV transmission. Identify routes of transmission of blood borne pathogens Discuss the best practices to perform safe blood transfusion. Identify potential exposure risks List important safeguards against blood borne pathogen disease	LGIS	1	MCQs/SEQs

7	Blood grouping	Determine the O-A-B and Rh blood group in the given sample	Demonstration /	2	OSPE

			Practical		
8	Blood smear preparation	Prepare blood smear by thumb prick method	Demonstration / Practical	2	OSPE
9	Blood Bank	Observe the process of blood donation, blood product separation, screening and storage and observe the process of blood transfusion	Demonstration / Practical	2	Formative
10	Immunity	Define and classify immunity Define antigen Define pathogen Enlist the tissues that contribute to immunity and explain their function Describe the functions of immune system Describe the structure and function of lymphatic system	DSL	1	MCQs /SEQs

11 Learning Opportunities and Resources

1. Anatomy
Books:
- *Clinical Anatomy by Regions* by Richard S. Snell (Latest Edition)
- *Gray's Anatomy for Students* (Latest Edition)
- *Clinically Oriented Anatomy* by K.L. Moore (Latest Edition)
- *Netter's Atlas of Human Anatomy* (Latest Edition)
- *Last's Anatomy* (Latest Edition)

Online Resources:
- TeachMeAnatomy – Comprehensive anatomy resource with diagrams and explanations.
- AnatomyZone YouTube Channel – 3D anatomy tutorials.

2. Histology
Books:
- *Textbook of Histology* by Junqueira (Latest Edition)
- *diFiore's Atlas of Histology with Functional Correlations* (Latest Edition)
- *Atlas of Human Histology* by Wheater's (Latest Edition)
- *Textbook of Histology* by Laiq Hussain (Latest Edition)

Online Resources:
- Histology Guide – A virtual histology lab with slides and explanations.
- Armando Hasudungan YouTube Channel – Educational videos on histology and related topics.

3. Embryology
Books:
- *Langman's Medical Embryology* (Latest Edition)
- *The Developing Human* by Keith L. Moore (Latest Edition)

Online Resources:
- Embryology at UNSW – Detailed embryology resource from the University of New South Wales.
- Dr. Najeeb Lectures YouTube Channel – In-depth video lectures on embryology and other basic medical sciences.

4. Physiology
Books:
- *Textbook of Medical Physiology* by Guyton and Hall (Latest Edition)
- *Ganong's Review of Medical Physiology* (Latest Edition)

Online Resources:
- Vivo Interactive Physiology – Interactive tutorials on physiology topics.
- PhysioPathoPharmaco YouTube Channel – Physiology explanations and tutorials.

5. Biochemistry
Books:
- *Harper's Illustrated Biochemistry* (Latest Edition)
- *Lippincott's Illustrated Review: Biochemistry* (Latest Edition)

Online Resources:

- MedlinePlus Biochemistry – Basic biochemistry concepts with clinical correlations.
- Osmosis YouTube Channel – Visual and concise videos on biochemistry and other medical topics.

6. Pharmacology

Books:

- *Katzung's Basic and Clinical Pharmacology* (Latest Edition)

Online Resources:

- Pharmacology YouTube Channel by Ninja Nerd – Detailed pharmacology lectures and notes.
- GoodRx Pharmacology Resources – Practical applications of pharmacology in medicine.

7. Pathology

Books:

- *Robbins Basic Pathology* (Latest Edition)

Online Resources:

- PathologyOutlines.com – An online pathology resource with a focus on differential diagnosis.
- Dr. John Minarcik YouTube Channel – Free pathology lectures and tutorials.

8. Community Medicine

Books:

- *Essential Community Medicine* (Latest Edition)
- *K. Park's Textbook of Preventive and Social Medicine* (Latest Edition)

Online Resources:

- CDC Public Health – Extensive resources on public health and community medicine.
- Public Health England YouTube Channel – Videos on various community health topics.

9. Forensic Medicine

Books:

- *Parikh's Textbook of Medical Jurisprudence, Forensic Medicine, and Toxicology* (Latest Edition)

Online Resources:

- Forensic Medicine Online – Detailed forensic medicine resources for students.
- Forensic Pathology Lectures YouTube Channel – Educational videos on forensic pathology.

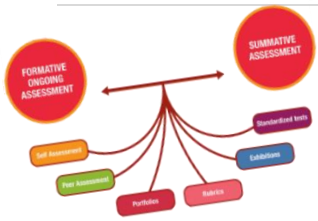
10. General Medicine

Books:

- *Davidson's Principles and Practice of Medicine* (Latest Edition)

Online Resources:

- Medscape – Comprehensive resource for clinical medicine and continuing medical education.
- Geeky Medics YouTube Channel – Clinical skills and general medicine tutorials.



12 Examination and Methods of Assessment:

12.1 Examination Instructions:

- **Arrival Time:** Students must arrive at the examination venue at least 15 minutes before the scheduled start time. Latecomers arriving 15 minutes after the start of the exam will not be allowed to enter the examination hall, and if permitted, they will not receive extra time.
- **Identification:** Students without a College ID Card and a white Lab Coat will not be permitted to sit for the exam.
- **Emergency Protocol:** In case of an emergency, such as a medical issue, students should immediately inform the examination supervisor.
- **Prohibited Items:** Students are required to submit any prohibited items, such as mobile phones, smartwatches, electronic devices, books, notes, or any unauthorized materials, before entering the examination hall.
- **Conduct:** Students must maintain complete silence within the examination hall. Any communication with fellow students is strictly prohibited, and all invigilator instructions must be followed without exception.
- **Attendance:** Students must properly mark their attendance during the examination.
- Leaving the Hall: No student will be allowed to leave the examination hall before half of the exam time has elapsed. The exam paper must be properly handed over to the examiner before leaving.
- **Compliance:** Failure to adhere to these guidelines may result in disqualification from the examination.

12.2 Internal Assessment Score (10% of Total Marks):

The Internal Assessment Score for 1st Year MBBS will be distributed as follows:

- **Total Marks for 1st Year MBBS: 700**
  Internal Assessment Marks: 70 (10% of Total Marks)

Distribution of 20 Marks for Block Papers for First Year MBBS will be as under:

Block	Block A	Block B	Block C	Total
Marks	07	6.5	6.5	20

Distribution of 15 Marks for Block OSPE will be as under:

Block	Block A	Block B	Block C	Total
Marks	05	05	05	15

Distribution of 20 marks for Class Test/ End of Module Exam & Assignments for 1st Year MBBS will be as under:

Subject (Theory)	Block A	Block B	Block C	Total
Class Test/ End of Module Exam	04	3.5	3.5	11
Assignments	03	03	03	09

Total	07	6.5	6.5	20

Distribution of 15 marks for Presentations, Attitude/ Behavior for 1st Year MBBS will be as under:

Subject (OSPE)	Block A	Block B	Block C	Total
Presentations	03	03	03	09
Attitude/ Behavior	**02**	**02**	**02**	**06**
Total	05	05	05	15

12.3 External assessment: (total 90% Marks)

- To appear in any university examination, more than 75% attendance in all disciplines is mandatory for the students.
- The Paper A will be comprised of 120 MCQs. The distribution of 90% Marks for Paper A Written Exam will be as under:

Blueprint for Theory Paper A			
Subject	**Foundation-I Module**	**Blood & Immunology-I Module**	**Total MCQs**
Gross Anatomy	12	01	13
Histology	10	04	14
Embryology	15	00	15
Physiology	10	22	32
Biochemistry	14	12	26
Pathology	02	04	06
Pharmacology	01	01	02
Community Medicine	01	02	03
Forensic Medicine	00	01	01
PRIME	05	03	08
Total	**70**	**50**	**120**

- The distribution of OSPE stations for Paper A Practical Exam will be as under:

Blueprint for OSPE Paper A		
Specialty	**Practical**	**No. of Stations**
Foundation Anatomy	Operating The Microscope Anatomical terms H& E staining Histology of Simple Epithelia Histology of Stratified Epithelia Histology of Glands	5
Foundation Biochemistry	PH and buffer solutions Detection of Polysaccharides in a given Solution Detection of Monosaccharide's Detecting of Reducing and non-reducing Sugars	3

Foundation Physiology	Lab Equipment's Oral temperature Capillary Blood Sampling	2
Foundation Pathology	Sterilization Tissue Processing	1
Blood Physiology	Hb determination Blood count TLC and DLC determination Bleeding time & Clotting time determination Prothrombin time determination Blood grouping	5
Blood Anatomy	Blood histology Histology of lymph nodes	1
Blood biochemistry	Estimation of plasma proteins in serum Preparation of protein free filtrate	1
Total		**18**

13 For inquiry and troubleshooting

Please contact
Department Of Medical Education

14 Module Evaluation Form

MBBS Year: _____ Block: _____ Module: _____

1. (Unsatisfactory) 2 (Fair) 3 (Satisfactory) 4 (Good) 5 (Excellent)

Category: Course Contents

No.	Question	1	2	3	4	5
1	To what extent did the course contents align with the stated learning objectives of the module?					
2	How clear and comprehensive were the course materials provided in this module?					
3	Were the core topics adequately covered, ensuring a well-rounded understanding of the subject?					
4	How current and up-to-date were the course contents in reflecting recent advancements?					
5	Did the module incorporate real-world applications and case studies effectively?					
	Category: Learning Resources					
6	Were the learning resources (e.g., textbooks, online materials, laboratory facilities) readily available and easily accessible?					
7	How helpful were additional learning resources such as supplementary readings or multimedia content?					
8	Did the module offer adequate support for research and independent study?					
9	Were digital resources and online platforms effectively utilized to enhance the learning experience?					
10	Were there sufficient opportunities for hands-on practice and practical application of knowledge?					
	Category: Teaching Methods					
11	How well did instructors engage with students and create a supportive learning environment?					
12	Were diverse teaching methods (e.g., lectures, group discussions, simulations) effectively employed?					
13	How responsive were instructors to questions, concerns, and feedback from students?					
14	To what extent did instructors provide timely and constructive feedback on assignments and assessments?					
15	Were opportunities for collaborative learning and peer-to-peer interactions encouraged and facilitated?					
No.	**Category: Engagement and Motivation**					
16	To what extent did the module use real-world examples and practical applications to engage students?					
17	How well were active learning techniques (e.g., problem-solving, case studies) integrated into the curriculum?					
18	Did the module provide opportunities for students to pursue their individual interests within the subject matter?					
19	Were assessments designed to challenge and motivate students to excel in their studies?					
Category: Inclusivity and Diversity						

20	How well did the module accommodate different learning styles and preferences among students?					
21	Were efforts made to include diverse perspectives, cultures, and backgrounds in the curriculum?					
22	How effectively were accommodations provided for students with varying levels of prior knowledge?					
	Category: Overall					
No.	**Question**	**1 (Very Poor)**	**2 (Poor)**	**3 (Fair)**	**4 (Good)**	**5 (Excellent)**
23	How would you rate the overall quality of this module?					

15 Students Diary/Notes

S.NO	DATE	TOPICS	PENDING/COMPLETED	COMMENTS

PROGESS:_________________


College of Medicine & Dentistry at The Hills