

**BLOOD AND  
IMMUNOLOGY II  
MODULE  
STUDY GUIDE**

**3RD YEAR MBBS**

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## Vision and Mission of KGMC

### Khyber Medical University: Vision



Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

### Khyber Girls Medical College: Vision



Khyber Girls Medical College will promote health care leaders that are critical thinker, ethical, research oriented, culturally and professionally competent

### Khyber Girls Medical College: Mission



To develop competent health care leaders by ensuring appropriate policies, procedures which reflect ethical, cultural, community orientated and evidence based practices to achieve best possible health outcomes for society at large.

## Curriculum Committee KGMC

### Chair:

Professor Dr.Zahid Aman , Dean KGMC.

### Co-Chair:

Professor Dr Amin ul HAQ, Associate Dean KGMC.

### Clinical Sciences:

- Dr. Mohammad Noor Wazir ,Department of Medicine KGMCHMC
- Dr. Bushra Rauf Department of Gynae KGMCHMC.
- Dr. Sofia Iqbal, Department of Ophthalmology KGMCHMC.
- Dr. Said Amin Department of Medicine KGMCHMC.
- Dr. Ghareeb Nawaz Department of ENT KGMCHMC.
- Dr. Jamshed Alam Department of Surgery KGMCHMC.
- Dr. Ambreen Ahmad, Department of Pediatrics KGMCHMC.
- Dr. Ain-ul-Hadi Department of Surgery KGMCHMC.
- Dr. Fawad Rahim Department of Medicine KGMCHMC.

### Behavioral Sciences:

- Dr. Ameer Abbas Department of Psychiatry KGMCHMC.

### Medical Education

- Dr. Naheed Mahsood, Department of Medical Education, KGMC.
- Dr. Naveed Afzal Khan, Department of Medical Education, KGMC.

- Dr Onaiza Nasim , Department of Medical Education, KGMC

#### **Basic Sciences:**

- Dr. Amin-ul-Haq Department of Biochemistry, KGMC.
- Dr. Khalid Javed Department of Pathology, KGMC.
- Dr. Raheela Amin Department of Community Medicine, KGMC.
- Dr. Zubia Shah Department of Physiology, KGMC.
- Dr. Naheed Siddique Department of Forensic Medicine, KGMC.
- Dr. Shams Suleman Department of Pharmacology, KGMC.
- Dr. Shahab-ud-Din, Department of Anatomy, KGMC.

#### **Blood and Immunology**

1. Dr. Abdul Hameed Professor Department of **Pharmacology**.....**Member**
2. Prof. Dr. Sabina Aziz Department of **Community Medicine**.....**Member**
3. Prof. Dr. Bushra Rauf Department of **Gynae**.....**Member**
4. Prof. Dr. Samia Tabassum Department of **Gynae**.....**Member**
5. Dr. Khalid Khan Professor Department of **Pathology**..... **Member**
6. Dr. Saeed-ur-Rehman Professor Department of **Pathology**..... **Member**
7. Dr. Alia Qazi Associate Professor Department of **Community Medicine**.....**Member**
8. Dr. Shams Suleman Associate Professor Department of **Pharmacology**.....**Member**
9. Dr. Jamshed Alam Associate Professor Department of **Surgery B**.....**Member**
10. Dr. Yousaf Jan Assistant Professor Department of **Surgery B**.....**Member**
11. Dr. Naheed Siddiqui Assistant Professor Department of **Forensic Medicine**.....**Member**
12. Dr. Fawad Rahim Assistant Professor Department of **Medicine**.....**Member**
13. Dr. Ghazala Zarin Afridi Senior Lecturer Department of **Pathology**..... **Member**
14. Dr. Jahanzeb Khan Associate Professor Department of **Pediatric A**.....**Member**

## **Integrated curriculum:**

An integrated curriculum is all about making connections, whether to real life or across the disciplines, about skills or about knowledge. An integrated curriculum fuses subject areas, experiences, and real-life knowledge together to make a more fulfilling and tangible learning environment for students. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have better understanding of basic sciences when they repeatedly learn in relation to clinical examples. Case based discussions, computer-based assignments, early exposure to clinics, wards, and skills acquisition in skills lab are characteristics of integrated teaching program.

## **Outcomes of the curriculum:**

The outcomes of the curriculum of MBBS According to the PMDC are as follows

- Knowledgeable
- Skilful
- Community Health Promoter
- Problem-solver
- Professional
- Researcher
- Leader
- Rolemodel

## **KNOWLEDGE**

By the end of five year MBBS program the KGMC student should be able to;

1. Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
2. Manage the common prevalent diseases in community
3. Identify the common medical emergencies
4. Develop plan for prevention of common community diseases
5. Formulate a referral plan
6. Compose a prescription plan

## **PSYCHOMOTOR**

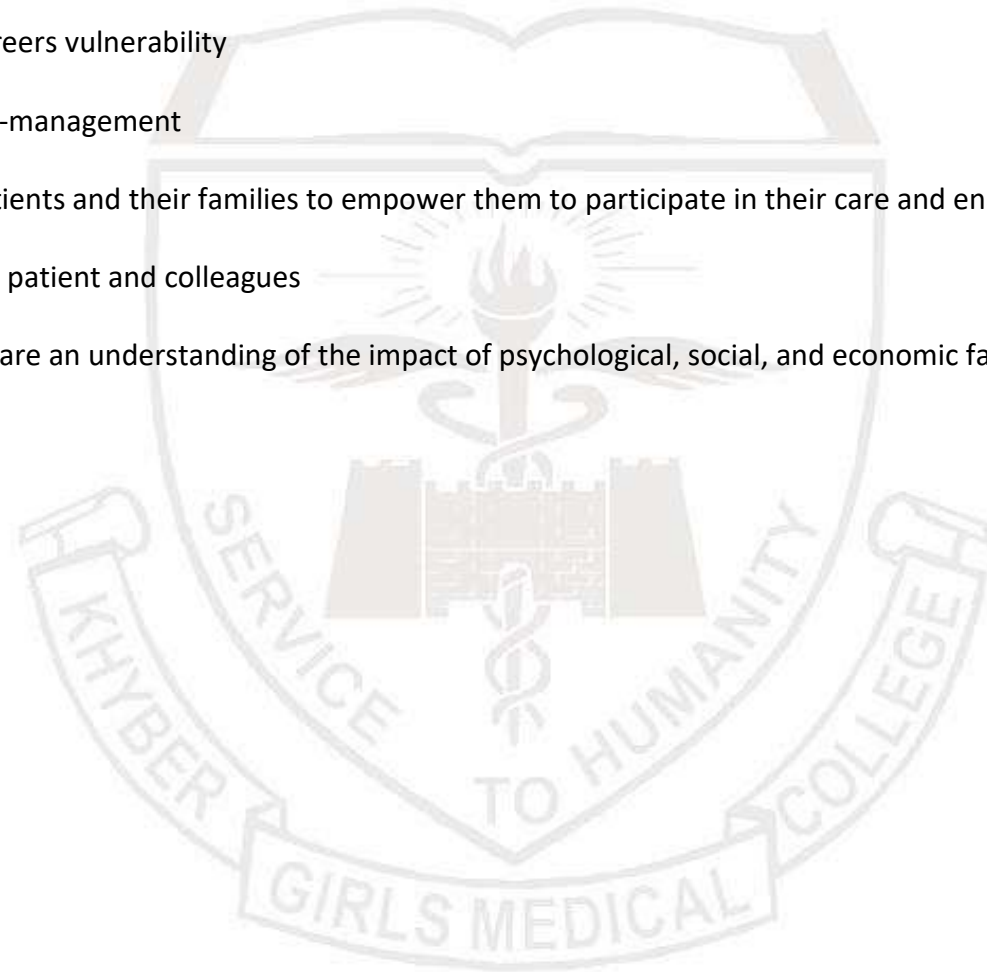
By the end of five year MBBS program the KGMC student should be able to;

1. Demonstrate the ability to perform the disease specific relevant examination
2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems

## **AFFECTIVE**

By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and caregivers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease





## Introduction to the Blood and Immunology system

**Immunology** is the study of the immune system and is a very important branch of the medical and biological sciences. The immune system protects us from infection through various lines of defence. If the immune system is not functioning as it should, it can result in disease, such as autoimmunity, allergy and cancer.





# Themes

<b>Pallor and Fatigue</b>	<b>1 week</b>
<b>Fever</b>	<b>1 week</b>
<b>Bleeding</b>	<b>1 week</b>

## General learning Outcomes:

By the end of Blood & Immunology II Module, 3rd year MBBS students will be able to:

1. Describe the pathophysiology and diagnosis of different types of anemia.
2. Explain the pathogenesis of different hematological malignancies.
3. Discuss the diagnostic approach to malignant hematological disorders.
4. Discuss the pathophysiology and diagnosis of bleeding disorders.
5. Discuss the rationale for immunomodulation and its impact on improving the therapeutic dynamics of autoimmune disorders and malignancies.
6. Describe the drugs for treating various types of anemia.
7. Write prescription for the prevention and treatment of iron-deficiency anemia.
8. Describe the application of blood groups in Forensic work
9. Describe the examination of blood stains
10. Describe the medico legal importance of blood as trace evidence

# Theme 1: Pallor and Fatigue

## PHYSIOLOGY

#	TOPICS	LEARNING OBJECTIVES	Teaching strategy	Assessment
1	<b>REDBLOOD CELLS</b>	Discuss the steps of Erythropoiesis with correlation to Red cell indices and its clinical implications.	LGF/SGD	MCQ

## PATHOLOGY

#	TOPICS	LEARNING OBJECTIVES	Teaching Strategy	Assessment
2	<b>RED BLOOD CELLS</b>	<p><b>SUBTOPIC: ANEMIAS</b></p> <ul style="list-style-type: none"> <li>• Discuss Physiologic basis of Anemia</li> <li>• Classify anemia's according to underlying mechanism</li> </ul> <p><b>1. BLOOD LOSS</b></p>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Describe the pathogenesis of blood loss anemia</li> </ul>		
		<p><b>HEMOLYTIC ANEMIAS</b></p> <p>2.a. Hereditary Spherocytosis</p> <ul style="list-style-type: none"> <li>○ Discuss the pathogenesis of HS</li> <li>○ Describe morphological changes in peripheral smear of HS patient</li> <li>○ Explain how will you diagnose a case of HS?</li> </ul>	LGF/SGD	MCQ
		<p>2.b. Sickle cell Anemia</p> <ul style="list-style-type: none"> <li>○ Discuss the morphology of RBCs in SA</li> <li>○ Describe the etiology and pathogenesis in SA</li> <li>○ Explain how will you diagnose a case of SA?</li> </ul>	LGF/SGD	MCQ

		<p>2.c. Thalassemia</p> <ul style="list-style-type: none"><li>○ Describe Thalassemia</li><li>○ Discuss the conditions contributing to the pathogenesis of beta-thalassemia</li><li>○ Explain the genetics of thalassemia</li><li>○ Describe the morphological changes physically and on peripheral smear</li><li>○ Explain how will you diagnose a case of alpha or beta thalassemia?</li></ul>	LGF/SGD	MCQ
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		<p>2.d. Glucose 6 phosphate dehydrogenase deficiency</p> <ul style="list-style-type: none"> <li>• Classify G6PD</li> <li>• Discuss the pathogenesis of G6PD with reference to oxidative injury of RBCs</li> <li>• Describe the morphology of RBCs in G6PD</li> <li>• Explain how will you diagnose a case of G6PD deficiency</li> </ul>	LGF/SGD	MCQ
		<p>2.e. Paroxysmal Nocturnal Hemoglobinuria</p> <ul style="list-style-type: none"> <li>○ Describe the pathophysiology of PNH</li> </ul> <p>How will you diagnose a case of PNH</p>	LGF/SGD	MCQ

		<p>2.f. Immune hemolytic anemia's</p> <ul style="list-style-type: none"> <li>○ Classify immune hemolytic anemia's</li> <li>○ Discuss the etiological mechanism of warm and cold antibody immune hemolytic anemia</li> <li>○ Explain the diagnostic workup of immune hemolytic anemia</li> </ul>	LGF/SGD	MCQ
		<p><b>2. ANEMIA'S OF DIMINISHED ERYTHROPOIESIS</b></p> <p>3.a. Iron deficiency anemia</p> <ul style="list-style-type: none"> <li>○ Discuss the pathophysiological mechanism of IDA</li> <li>○ Describe the clinical course and morphological changes in IDA</li> <li>○ Explain laboratory investigations for the diagnosis of IDA</li> </ul>	LGF/SGD	MCQ



		<p><b>3.b. Megaloblastic Anemia</b></p> <ul style="list-style-type: none"><li>○ Describe MA</li><li>○ Describe the pathogenesis of MA with respect to Vitamin B12 and Folic acid</li><li>○ Discuss the morphological changes in RBCs, WBCs and platelets in MA.</li><li>○ Explain how will you diagnose the cause of MA?</li></ul> <p><b>3. c. Aplastic Anemia</b></p> <ul style="list-style-type: none"><li>○ Enumerate causes of Aplastic anemia</li><li>○ Describe the pathophysiology of aplastic anemia</li><li>○ Diagnose a case of aplastic anemia</li></ul>		
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		<b>SUBTOPIC POLYCYTHEMIA:</b>  <b>1. POLYCYTHEMIA VERA</b> <ul style="list-style-type: none"> <li>○ Discuss the pathophysiology of polycythemia vera</li> <li>○ Describe the clinical course and morphological features of Polycythemia vera</li> <li>○ Explain how will you diagnose a case of Polycythemia vera?</li> </ul>	LGF/SGD	MCQ
<b>PATHOLOGY PRACTICALS</b>				
<b>1</b>	<b>Normal Complete blood count</b>	<ul style="list-style-type: none"> <li>○ Differentiate between a normal blood cells of different lineages</li> </ul>	Practical	Demo
<b>2</b>	<b>ABNORMAL PERIPHERAL SMEAR IN DIFFERENT ANEMIAS</b>	<ul style="list-style-type: none"> <li>○ Differentiate between a normal and an abnormal RBC</li> <li>○ Identify different shapes of RBCs.</li> </ul>	Practical	Demo

		<ul style="list-style-type: none"> <li>○ Identify the common types of Anemia on the basis of RBC morphology</li> </ul>		
<b>PHARMACOLOGY</b>				
<b>1</b>	<b>Drugs used in anemia</b>	<ul style="list-style-type: none"> <li>• Classify the drugs used in anemia</li> <li>• Describe pharmacokinetics of Iron</li> <li>• Describe the various oral and parenteral formulations of iron</li> <li>• Describe the adverse effects of iron therapy</li> <li>• Describe the drug treatment of Iron toxicity</li> <li>• Describe the various oral and parenteral preparations of cyanocobalamin (Vit B<sub>12</sub>)</li> <li>• Describe the clinical use of cyanocobalamin (Vit: B<sub>12</sub>)</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"><li>• Describe the clinical use of Folic acid</li><li>• Describe the pharmacological rationale of combining cyanocobalamin with folic acid and iron</li><li>• Describe the role of granulocyte colony stimulating factors (Filgrastim) and granulocyte monocyte colony stimulating factors in the treatment of leucopenia.</li><li>• Describe the role of thrombocyte colony stimulating factor (Oprelvekin) in the treatment of thrombocytopenia.</li></ul>		
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PHARMACOLOGY PRACTICAL				
	<b>Iron-deficiency anemia</b>	<ul style="list-style-type: none"> <li>○ Write prescription for a patient at risk of developing iron-deficiency anemia</li> <li>○ Write <b>Chart order</b> for treating an in-door patient with iron-deficiency anemia</li> </ul>	Practical	Demo
FORENSIC MEDICINE				
1	<b>FORENSIC EVIDENCE</b>	<ul style="list-style-type: none"> <li>○ Describe trace evidence</li> <li>○ Classify trace evidence.</li> <li>○ Describe Locard's exchange principle.</li> <li>○ Describe composition of blood and characteristics of different blood cells.</li> <li>○ Describe basic genetic principles related to blood groups and blood groups as hereditary factors.</li> </ul>	LGF/SGD	MCQ

2	<b>BLOOD GROUP SYSTEMS</b>	<ul style="list-style-type: none"> <li>○ Describe different blood groups systems.</li> <li>● Grouping based on red cell antigens</li> <li>● Grouping based on blood proteins</li> <li>● Grouping based on enzymes</li> <li>● Grouping based on white cell antigens.</li> <li>○ Describe different methods for blood group determination. <ul style="list-style-type: none"> <li>● Direct agglutination</li> <li>● Ring test</li> <li>● Gel diffusion</li> <li>● Immune-electrophoresis</li> <li>● Indirect agglutination</li> </ul> </li> </ul>	LGF/SGD	MCQ
		Describe the application of blood in forensic work. (medico legal importance)	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>• Inheritance claims</li> <li>• Rh hazards</li> <li>• Transfusion errors and adverse reactions</li> <li>• DNA profiling</li> <li>• Disputed paternity and maternity</li> </ul>		
<b>COMMUNITY MEDICINE</b>				
<b>1</b>	<b>EPIDEMIOLOGY OF DISEASES OF BLOOD &amp; BLOOD FORMING ORGANS</b>	<ol style="list-style-type: none"> <li>1. Differentiate between diseases of blood, blood forming organs and blood borne infections</li> <li>2. Describe the population at risk of nutritional anemia in Pakistan.</li> <li>3. Explain effective public health strategies for prevention of different types of anemia's in a community in Pakistan</li> </ol>	LGF/SGD	MCQ

		<ol style="list-style-type: none"> <li>4. Describe risk factors for different nutritional anemia's.</li> <li>5. Describe effective public health strategies for prevention of different types of anemia's in Pakistan</li> </ol>		
<b>FIELD VISIT</b>				
<b>1</b>	<b>VISIT TO BLOOD BANK OF A TERTIARY CARE HOSPITAL</b>	<ol style="list-style-type: none"> <li>1. Explain safe blood transfusion practices</li> <li>2. List the common pathogens that cause blood borne infections which may be acquired from unsafe blood transfusion practices.</li> <li>3. List the most common transfusion reactions seen in a blood bank in a local teaching hospital in Pakistan</li> </ol>	Practical	Assignment



		<p>4. Communicate with health care staff effectively</p> <p>5. Describe the standard operating procedures (SOP's) of blood transfusion</p>		
<b>PEADS</b>				
<b>1</b>	<b>Thalassemia</b>	Describe Classification, Laboratory Investigation and management of Thalassemia	LGF/SGD	MCQ
<b>MEDICINE</b>				
<b>1</b>	<b>Sickle Cell Anemia</b>	Discuss the pathophysiology, investigations and management of Sickle Cell Anemia.	LGF/SGD	MCQ

## Theme 2: FEVER

Learning objectives			Teaching strategy	Assessment
Physiology				
1	<b>WHITE BLOOD CELLS</b>	Classify the different types of white blood cells, Polymorph's, Lymphocytes and Plasma cells and their disorders.	LGF/SGD	MCQ

## PATHOLOGY

<b>2</b>		<p><b>SUBTOPIC: MYELOID NEOPLASM</b></p> <p><b>1. ACUTE MYELOGENOUS LEUKEMIA</b></p> <ul style="list-style-type: none"> <li>○ Classify acute myelogenous leukemias according to FAB.</li> <li>○ Discuss the pathophysiology of AML.</li> </ul>	LGF/SGD	MCQ
		<ul style="list-style-type: none"> <li>○ Describe the morphological features of AML.</li> <li>○ Explain how will you proceed for diagnosis of AML?</li> </ul>	LGF/SGD	MCQ
		<p><b>2. CHRONIC MYELOGENOUS LEUKEMIA</b></p> <ul style="list-style-type: none"> <li>○ Discuss the pathophysiology of CML.</li> <li>○ Describe the peripheral blood findings in CML</li> <li>○ Explain how will you proceed for diagnosis of CML?</li> </ul>	LGF/SGD	MCQ

		<p><b>MYELOYDYSPLASTIC SYNDROME (MDS)</b></p> <ul style="list-style-type: none"> <li>○ Enlist types of MDS.</li> <li>○ Discuss causes, pathogenesis and Morphology.</li> <li>○ Interpret blood and bone marrow changes in patient with MDS.</li> <li>○ Discuss symptoms and diagnostic strategies for patient with MDS.</li> </ul> <p><b>SUBTOPIC: LYMPHOID NEOPLASMS</b></p> <ul style="list-style-type: none"> <li>○ Enumerate Lymphoid neoplasm</li> <li>○ Classify lymphoid neoplasms according to WHO classification.</li> </ul>	LGF/SGD	MCQ
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		<p><b>1. ACUTE LYMPHOCYTIC LEUKEMIA</b></p> <ul style="list-style-type: none"> <li>○ Discuss the pathophysiology of Acute lymphocytic leukemia</li> <li>○ Discuss the morphological features of ALL</li> <li>○ Explain how will you diagnose a case of ALL?</li> </ul>	LGF/SGD	MCQ
		<ul style="list-style-type: none"> <li>○ <b>CHRONIC LYMPHOCYTIC LEUKEMIA</b> Discuss the pathophysiology of Chronic lymphocytic leukemia</li> <li>○ Describe the distinguishing morphological features of CLL</li> <li>○ Explain the diagnostic workup for a case of CLL</li> </ul>	LGF/SGD	MCQ
		<p><b>1. PLASMA CELL DISORDER</b></p>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Describe the pathogenesis of multiple myeloma</li> <li>○ Describe the molecular genetics involved in multiple myeloma</li> <li>○ Discuss the type of multiple myeloma</li> <li>○ Enlist the clinical features.</li> </ul>		
		<p><b>SUBTOPIC: LYMPHOMAS</b></p> <p><b>1. HODGKIN' S LYMPHOMA</b></p> <ul style="list-style-type: none"> <li>○ Classify Hodgkin's lymphoma</li> <li>○ Discuss the etiology and pathogenesis of Hodgkin's lymphoma</li> <li>○ Describe the morphological changes and clinical course of the disease in Hodgkin's Lymphoma</li> </ul>	LGF/SGD	MCQ
		<p><b>2. NON-HODGKIN' S LYMPHOMA</b></p> <ul style="list-style-type: none"> <li>○ Enlist Non-Hodgkin's lymphoma</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Describe the basic pathologic classification of NHL (the WHO classification).</li> <li>○ Describe the predisposing factors to developing NHL, including infectious agents associated with development of specific lymphomas.</li> <li>○ Describe the morphologic features of lymph nodes involved in Non-Hodgkin lymphoma</li> <li>○ Enlist the lab investigations required for diagnosis of NHL</li> </ul>		
<b>2</b>	<b>IMMUNITY</b>	<ul style="list-style-type: none"> <li>○ Describe the functions and types of immunity.</li> <li>○ Enlist the three lines of defenses and outline their properties</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Describe the characteristics, origin and functions of cells of immune system</li> <li>○ Compare innate and acquired immunity</li> <li>○ Compare the mechanism of active and passive immunity</li> </ul>		
<b>3</b>	<b>HUMERAL IMMUNITY</b>	<ul style="list-style-type: none"> <li>○ Describe the role of T and B lymphocytes in immunity</li> <li>○ Describe the role of B lymphocytes in humeral immunity</li> <li>○ Describe humeral immunity</li> <li>○ Explain how helper T cells regulate the immune system</li> <li>○ Differentiate between humeral and cell mediated immunity</li> </ul>	LGF/SGD	MCQ



4	<b>CELL MEDIATED IMMUNITY</b>	<ul style="list-style-type: none"> <li>○ Explain the Specificity of immune response</li> <li>○ Describe cell mediated components of Cell mediated immunity (CMI),</li> <li>○ Explain types of cells in CMI system</li> <li>○ Describe T-cell activation and diversity</li> <li>○ Illustrate Schematic representation of T cell activation and diversity</li> <li>○ Differentiate between Primary and secondary immune response</li> </ul>	LGF/SGD	MCQ
5	<b>ANTIBODIES</b>	<ul style="list-style-type: none"> <li>○ Describe antigen and antibodies.</li> <li>○ Differentiate BW Monoclonal and polyclonal antibodies.</li> <li>○ Classify immunoglobulin</li> <li>○ Illustrate structure (diagram) of immunoglobulin A.</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Describe important functions of immunoglobulin</li> <li>○ Explain How antibodies neutralize toxins, microbes and viruses</li> <li>○ Illustrate class switching of immunoglobulin</li> <li>○ Explain transfer of immunity from mother to fetus and from mother to infant during breast-feeding</li> </ul>		
<b>6</b>	<b>ALLERGY &amp; HYPERSENSITIVITY</b>	<ul style="list-style-type: none"> <li>○ Describe the pathophysiology of allergy and hypersensitivity with examples</li> <li>○ Compare immediate and delayed hypersensitivity reactions</li> <li>○ Enlist the diseases associated with hypersensitivity reactions</li> </ul>	LGF/SGD	MCQ
<b>7</b>		<ul style="list-style-type: none"> <li>○ Describe Immunotolerance.</li> </ul>		

	<b>IMMUNE TOLERANCE</b>	<ul style="list-style-type: none"> <li>○ Describe Immunological unresponsiveness of the body especially to self-antigens.</li> <li>○ Explain the role of immune system in protecting the human body.</li> <li>○ Distinguishing between types of immunotolerance</li> <li>○ Explain the mechanism of graft rejection and graft vs host disease.</li> </ul>	LGF/SGD	MCQ
<b>8</b>	<b>AUTOIMMUNE DISEASES</b>	<ul style="list-style-type: none"> <li>○ Describe Autoimmunity.</li> <li>○ Discuss Pathogenesis of Autoimmune diseases.</li> <li>○ Explain the factors leading to Autoimmune Diseases.</li> </ul>	LGF/SGD	MCQ
<b>9</b>	<b>IMMUNODEFICIENCY DISEASES</b>	<ul style="list-style-type: none"> <li>○ Describe immunodeficiency</li> <li>○ Differentiate between Autoimmune and immunodeficiency diseases.</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"> <li>○ Classify Congenital and acquired Immunodeficiency diseases.</li> <li>○ Describe the pathogenesis of HIV.</li> </ul>		
<b>10</b>	<b>COMPLEMENT</b>	<ul style="list-style-type: none"> <li>○ Describe complement.</li> <li>○ Describe components of the Complement System</li> <li>○ Describe the synthesis of complements</li> <li>○ Describe pathways of activation and inactivation of complement</li> <li>○ Describe important functions of each component of complement system</li> <li>○ Describe the diseases associated with deficiency of the complement proteins</li> </ul>	LGF/SGD	MCQ

PRACTICALS				
1	Abnormal white cell smears	<ul style="list-style-type: none"> <li>○ Describe causes of leukocytosis</li> <li>○ Differentiate leukemias from normal causes of leukocytosis</li> </ul>	PRACTICAL	DEMO
PHARMACOLOGY				
	Immune modulator drugs	<ul style="list-style-type: none"> <li>● Classify immunomodulating drugs</li> <li>● Describe the role of corticosteroids as immunosuppressant agents.</li> <li>● Describe mechanism of action of immunophilin ligands.</li> <li>● Describe clinical uses and adverse effects of immunophilin ligands.</li> <li>● Describe mechanism of action of enzyme inhibitors.</li> <li>● Describe clinical uses and adverse effects of enzyme inhibitors.</li> </ul>	LGF/SGD	MCQ

		<ul style="list-style-type: none"><li>• Describe mechanism of action of cytotoxic agents as immunosuppressant</li><li>• Describe clinical uses and adverse effects of cytotoxic agents</li><li>• Describe mechanism of action of immunosuppressive antibodies used as immunosuppressant</li><li>• Describe clinical uses and adverse effects of immunosuppressive antibodies</li><li>• Describe mechanism of action of monoclonal antibodies</li><li>• Describe clinical uses and adverse effects of monoclonal antibodies</li><li>• Describe mechanism of action of immunostimulant drugs</li></ul>		
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		<ul style="list-style-type: none"> <li>• Describe clinical uses and adverse effects of immunostimulant drugs</li> <li>• Describe the advantages and disadvantages of various combinations of Immuno-modulating drugs</li> </ul>		
<b>FORENSIC MEDICINE</b>				
<b>1</b>	<b>FORENSIC LAB PROCEDURES</b>	<ul style="list-style-type: none"> <li>○ Describe Forensic Lab Systems</li> <li>○ Describe Forensic Lab Procedures</li> <li>• Forensic histopathology</li> <li>• Naked eye examination</li> <li>• Histological examination</li> <li>• Forensic histochemistry</li> <li>• Steam distillation</li> <li>• Micro-diffusion analysis</li> <li>• Stas-Otto method</li> <li>• Colour reaction method</li> </ul>	PRACTICAL	MCQ

		<ul style="list-style-type: none"> <li>• Chromatography</li> <li>• Spectroscopy</li> <li>• Electrophoresis</li> <li>• Radio-activation technique</li> <li>• Detection of insecticide compounds</li> </ul>		
<b>FORENSIC MEDICINE PRACTICALS</b>				
1	<b>Microscopic examination of animal and human blood</b>	Perform Microscopic examination of animal and human blood.	PRACTICAL	DEMO
2	<b>Examination of blood stains under ultraviolet light</b>	Perform examination of blood stains under ultraviolet light.	PRACTICAL	DEMO



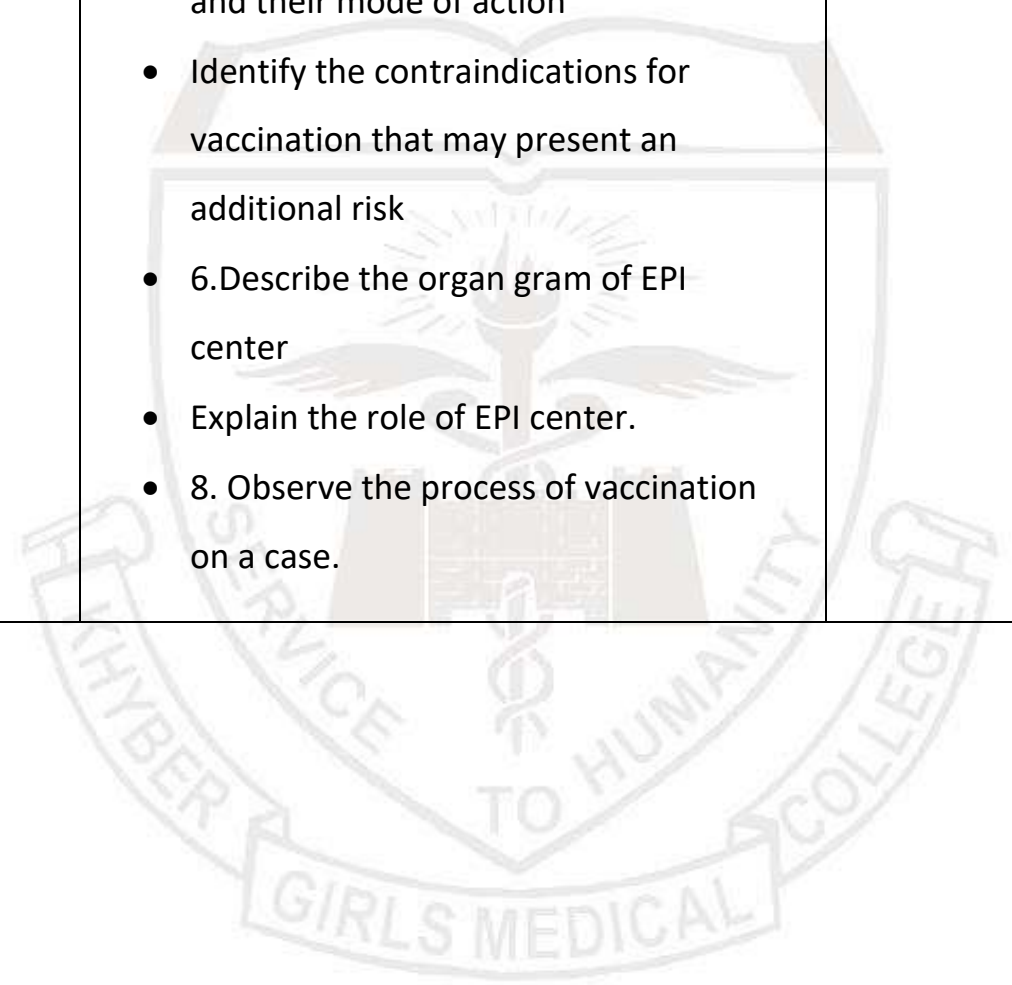
3	<b>Different pattern of stains</b>	Identify different pattern of stains.	PRACTICAL	DEMO
<b>COMMUNITY MEDICINE</b>				
1	<b>IMMUNIZATION</b>	<ol style="list-style-type: none"> <li>1. Explain the importance of vaccination in the control of infectious diseases</li> <li>2. Describe the basic principles of vaccination</li> <li>3. List the main types of vaccine and illustrate them with examples</li> <li>4. Describe vaccines that are associated with adverse reactions</li> <li>5. Explain the difference between live attenuated and inactivated vaccines</li> <li>6. Describe the role of vaccines in preventing disease.</li> </ol>	LGF/SGD	MCQ

		<p>7. Differentiate between vaccination and immunization</p> <p>8. Describe the strategies used from community medicine's perspective to promote vaccination in communities. (EPI)</p> <p>9. Explain various programs of vaccination in Pakistan with particular reference to EPI.</p> <p>10. Describe the factors responsible for success and failure of vaccination programs in Pakistan.</p>		
2	<b>EPIDEMIOLOGY OF BLOOD BORNE DISEASES INFECTIONS</b>	<p>1. List the important blood borne diseases in Pakistan as prioritized by the National Institute of health (NIH)</p>	LGF/SGD	MCQ

		<ol style="list-style-type: none"> <li>2. Discuss the global burden of blood borne diseases &amp; compare with Pakistan</li> <li>3. Describe important blood borne pathogens</li> <li>4. Explain the evidence based public health practices to reduce transmission of blood borne infectious disease</li> <li>5. Explain the evidence based best practices and procedures for safe blood transfusion and prevention of needle stick injury</li> </ol>		
<b>FIELD VISIT</b>				
1		<ul style="list-style-type: none"> <li>• Observe administration of different vaccines as part of Expanded Program of immunization (EPI)</li> </ul>	Practical	Assignment

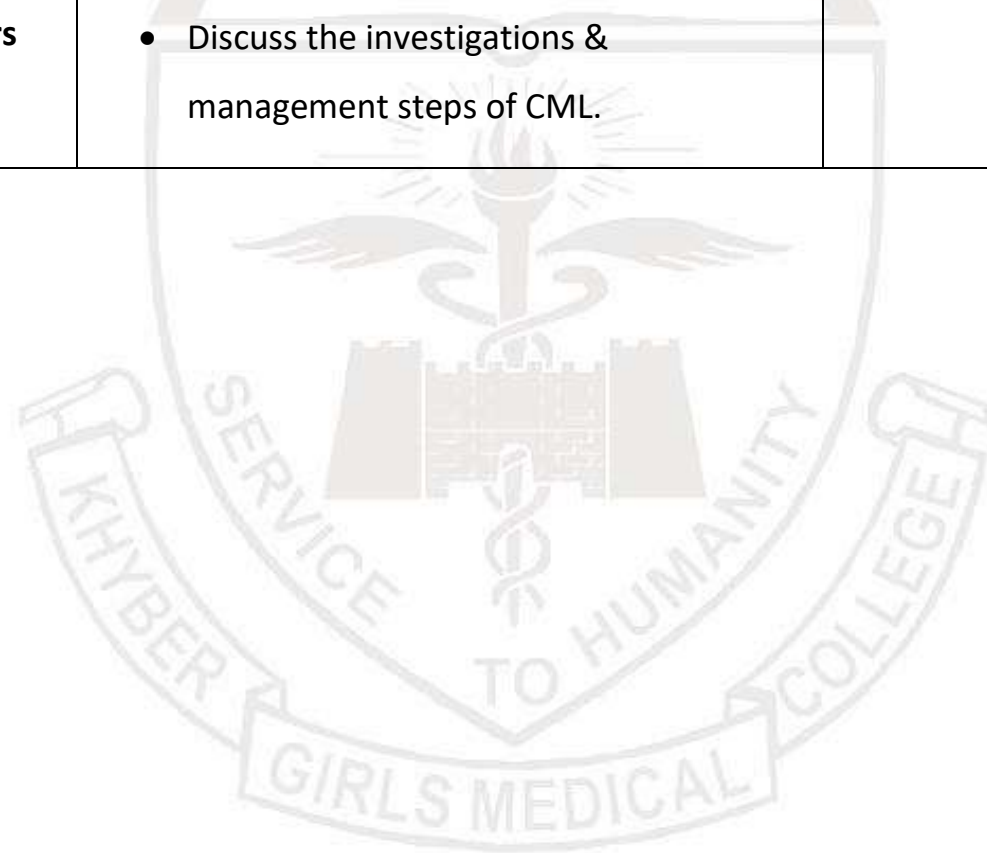
	<p><b>Visit to basic health care unit EPI center</b></p>	<p>schedule of Pakistan at the vaccination center.</p> <ul style="list-style-type: none"> <li>• List and explain the route of administration and mechanism of storage and maintenance of cold chain of each vaccine in the EPI schedule (support with images where possible)</li> <li>• List the different components of each vaccine in the EPI schedule including the adjuvants, preservatives and explain their relevance to the vaccine.</li> <li>• Differentiate between live attenuated vaccines, conjugate vaccines, subunit vaccines, and</li> </ul>		
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		<p>toxoid vaccines in the EPI schedule and their mode of action</p> <ul style="list-style-type: none"><li>• Identify the contraindications for vaccination that may present an additional risk</li><li>• 6. Describe the organ gram of EPI center</li><li>• Explain the role of EPI center.</li><li>• 8. Observe the process of vaccination on a case.</li></ul>		
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## MEDICINE

1	<b>Myeloproliferative Disorders (MPN)</b>	<ul style="list-style-type: none"><li>• Classify myeloproliferative neoplasms.</li><li>• Discuss the investigations &amp; management steps of CML.</li></ul>	LGF/SGD	MCQ
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# Theme 3: BLEEDING

## PHYSIOLOGY

S.NO	TOPIC	Learning Objectives	Teaching Strategy	Assessment
1	Platelets	<p>Enumerate the causes of thrombocytopenia.</p> <p>Explain the intrinsic and extrinsic pathways of Coagulation</p>	LGF/SGD	MCQ

## PATHOLOGY

1	PLATELETS AND COAGULATION SYSTEM	<p><b>SUBTOPIC: BLEEDING DISORDERS</b></p> <p><b>1. THROMBOCYTOPENIA</b></p> <ul style="list-style-type: none"> <li>○ Enlist causes of Thrombocytopenia</li> <li>○ Describe the pathogenesis of immune thrombocytopenic purpura</li> <li>○ List thrombotic micro angiopathies.</li> <li>○ Explain the diagnostic plan for ITP</li> </ul>	LGF/SGD	MCQ
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		<p><b>2. VoN WILLE BRAND DISEASE</b></p> <ul style="list-style-type: none"> <li>○ Classify VWD</li> <li>○ Enlist investigations required for diagnosis of VWD</li> </ul>		
		<p><b>3. HEMOPHILIA</b></p> <ul style="list-style-type: none"> <li>○ Discuss the pathogenesis of hemophilia A and B</li> <li>○ Describe the clinical course of the disease.</li> <li>○ Enlist the laboratory investigation for diagnosing a case of hemophilia</li> </ul> <p><b>4. DISSEMINATED INTRAVASCULAR COAGULOPATHY</b></p> <ul style="list-style-type: none"> <li>○ Enlist major disorders associated with DIS</li> </ul>	LGF/SGD	MCQ



		<ul style="list-style-type: none"> <li>○ Discuss the pathophysiology of DIC</li> <li>○ Explain the morphological changes in DIC</li> <li>○ Explain how will you diagnose DIC?</li> </ul>		
<b>2</b>	<b>Transfusion medicine</b>	<ul style="list-style-type: none"> <li>○ Describe various blood component preparation</li> <li>○ Identify indications for different blood components</li> <li>○ Describe transfusion reactions associated with blood transfusion</li> </ul>	LGF/SGD	MCQ
<b>PATHOLOGY PRACTICAL</b>				
<b>1</b>	<b>Coagulation tests</b>	<p>Interpret Prothrombin time and activated partial thromboplastin time</p> <ul style="list-style-type: none"> <li>○ Interpret bleeding time and clotting time</li> </ul>	Practical	Demo

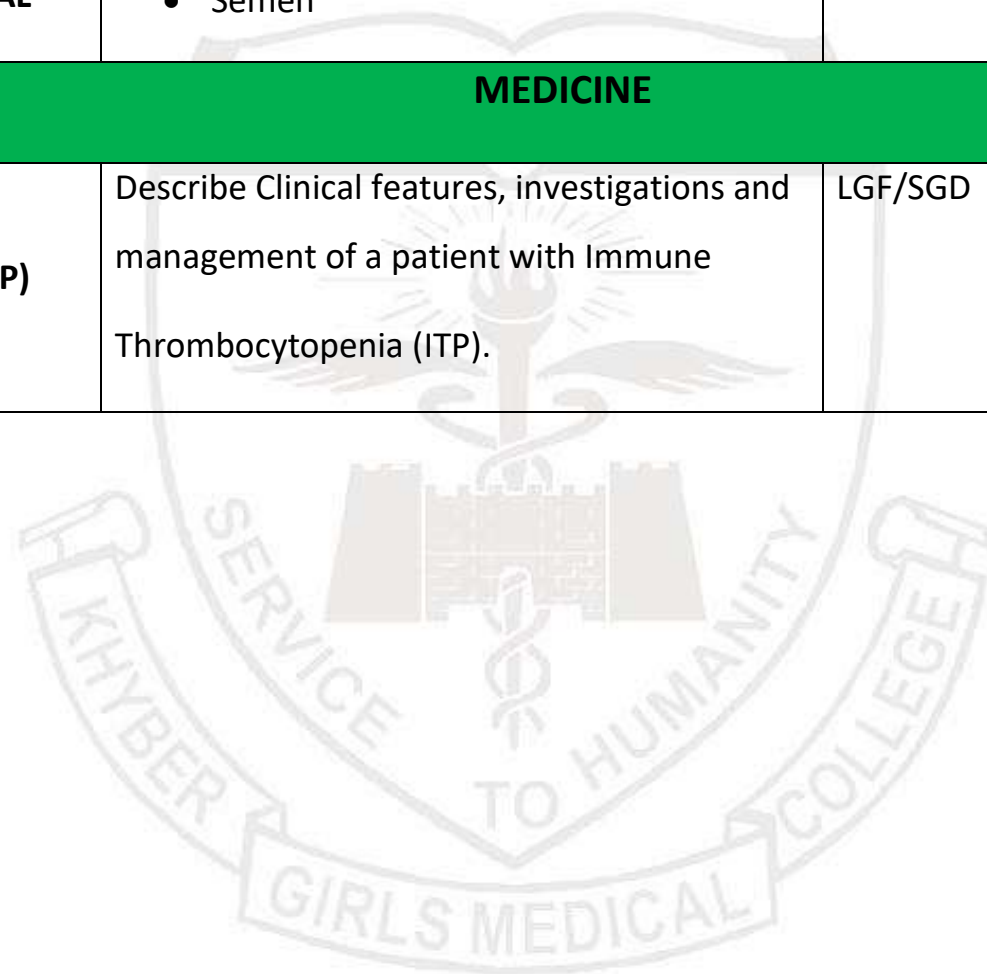
## PHARMACOLOGY

1	<b>Anti-plasmin (antifibrinolytic) drugs</b>	<p>Describe mechanism of action of Anti-plasmin (antifibrinolytic) drugs</p> <p>Describe clinical uses and adverse effects of Anti-plasmin (antifibrinolytic) drugs</p>	LGF/SGD	MCQ
2	<b>Drug treatment of Haemophilia</b>	<p>Describe the drug treatment for various types of Haemophilia</p> <p>Describe the role of Desmopressin in the treatment of haemophilia</p>	LGF/SGD	MCQ

## FORENSIC MEDICINE

1	<b>BLOOD STAINS</b>	<ul style="list-style-type: none"> <li>○ <b>Describe examination of blood stains.</b></li> <li>● Physical examination</li> <li>● Chemical examination</li> <li>● Physicochemical examination</li> <li>● Micro chemical examination</li> <li>● Spectroscopic examination</li> <li>● Immunological and enzymological methods for species determination</li> </ul> <p>Describe the medico legal importance of blood stains.</p>	LGF/SGD	MCQ
2	<b>COLLECTION AND PRESERVATION</b>	<ul style="list-style-type: none"> <li>○ <b>Describe the collection and preservation of biological material</b></li> <li>● Blood</li> <li>● Swabs and smears</li> </ul>	LGF/SGD	MCQ

	<b>OF BIOLOGICAL MATERIAL</b>	<ul style="list-style-type: none"> <li>• Saliva</li> <li>• Semen</li> </ul>		
<b>MEDICINE</b>				
<b>1</b>	<b>Platelets (ITP)</b>	Describe Clinical features, investigations and management of a patient with Immune Thrombocytopenia (ITP).	LGF/SGD	MCQ



## Teaching and learning strategies:

The following teaching learning methods are used to promote better understanding:

- Interactive Lectures
- Hospital Clinic visits
- Small Group Discussion
- Skills session
- Self-Directed Study



### **Interactive lectures:**

An interactive lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture-based class of any size. Interactive lectures are classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

- The instructor might begin the interactive segment with an engagement trigger that captures and maintains student attention.
- Then the instructor incorporates an activity that allows students to apply what they have learned or give them a context for upcoming lecture material.

- As the instructor feels more comfortable using interactive techniques he or she might begin to call upon a blend of various interactive techniques all in one class period.

### **Hospital/Clinic Visits:**

In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

### **Small Group Discussion (SGD):**

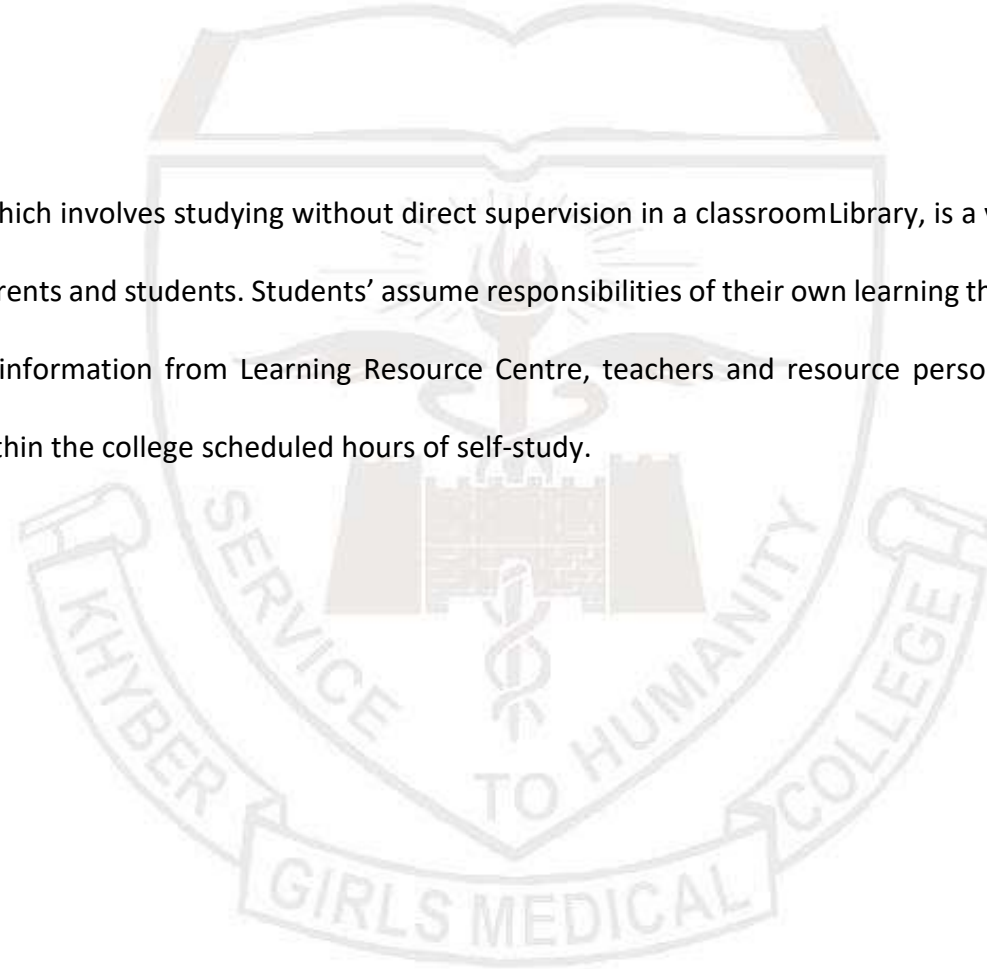
The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. This format helps students to clarify concepts acquire skills or attitudes. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

**Skills Practical Session:**

Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Laboratories of various departments.

**Self-Directed Learning (SDL):**

Self-directed learning, which involves studying without direct supervision in a classroom/Library, is a valuable way to learn and is quickly growing in popularity among parents and students. Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Centre, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.



## Time Table:

The timetables for the module will be shared via Edmodo and the notice boards in advance.

## Assessment Tools:

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQs). The assessment of practical knowledge involves oral, spot, or objective structured practical examinations (OSPE).

### Multiple Choice Questions (MCQs):

- Multiple choice questions (MCQs) are a form of assessment for which students are asked to select the best choice from a list of answers.
- MCQ consists of a stem and a set of options. The stem is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the key and the incorrect answers called distractors.
- Correct answer carries one mark, and incorrect 'zero mark'. There is NO negative marking.
- Students mark their responses on specified computer-based sheet designed for the college.
- The block exam will comprise of 120 MCQs and will be compiled according to the shared blueprint.

### Objective Structured Practical Examination (OSPE)



- The content may assess application of knowledge, or practical skills.
- Student will complete task in define time at one given station.
- All the students are assessed on the same content by the same examiner in the same allocated time.
- A structured examination will have observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which students will have to answer the questions related to the given pictures, models or specimens the provided response sheet.
- Rest station is a station where there is no task given, and in this time student can organize higher thoughts.
- The Block OSPE will be comprise of 20 examined station and 5 rest stations. The stations will be assigned according to the shred blueprint. There will be 8 stations for viva of core subjects like Pathology, Pharmacology, Forensic Medicine and Community Medicine (2 station for viva of each core subject) and 2 clinical station and rest of 10 out of 20 stations will be assigned according to shared blue prints.

## Internal Evaluation:

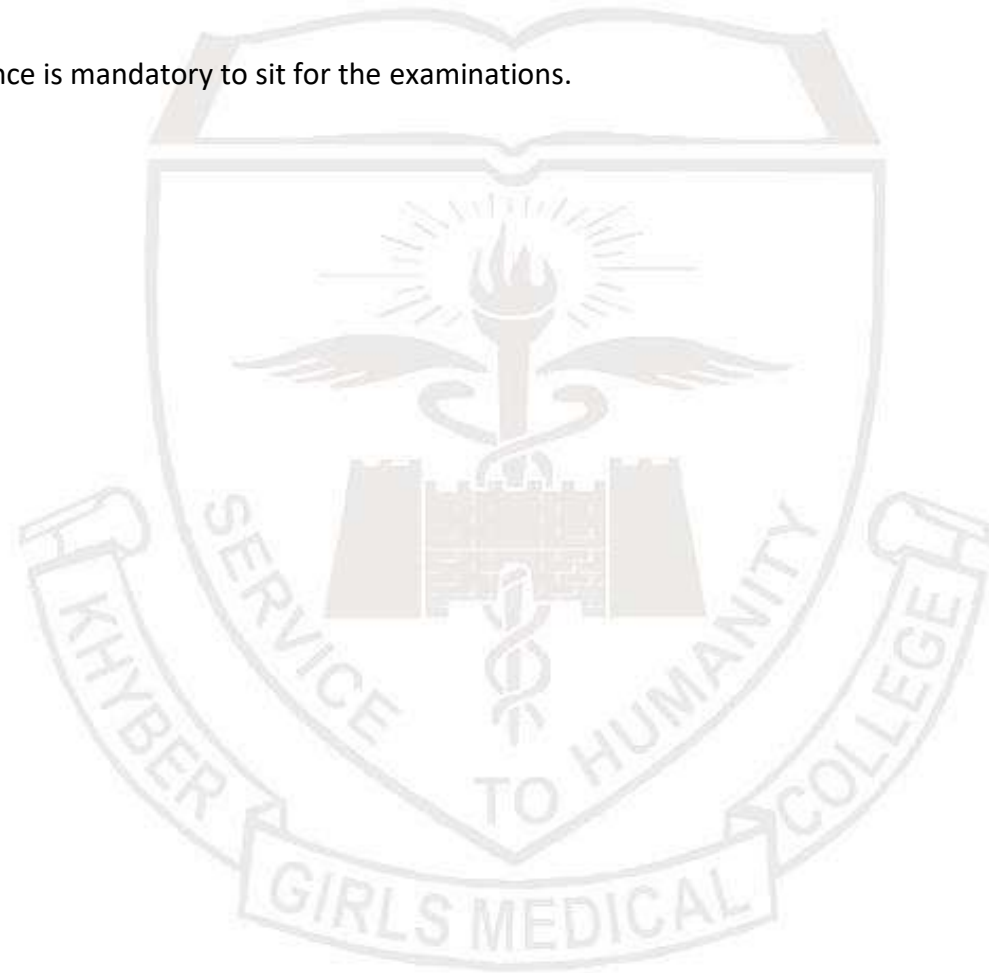
Internal evaluation is a process of quality review undertaken within an institution for its own ends. 10% marks of internal evaluation will be added to final marks. This 10% will be based on

<b>Marks obtained</b>	<b>14 out of total 40 marks of internal assessment in block H Paper</b>

<b>Marks obtained</b>	<b>14 out of total 40 marks of internal assessment in block H OSPE</b>

## Attendance Requirement:

More than 75% attendance is mandatory to sit for the examinations.



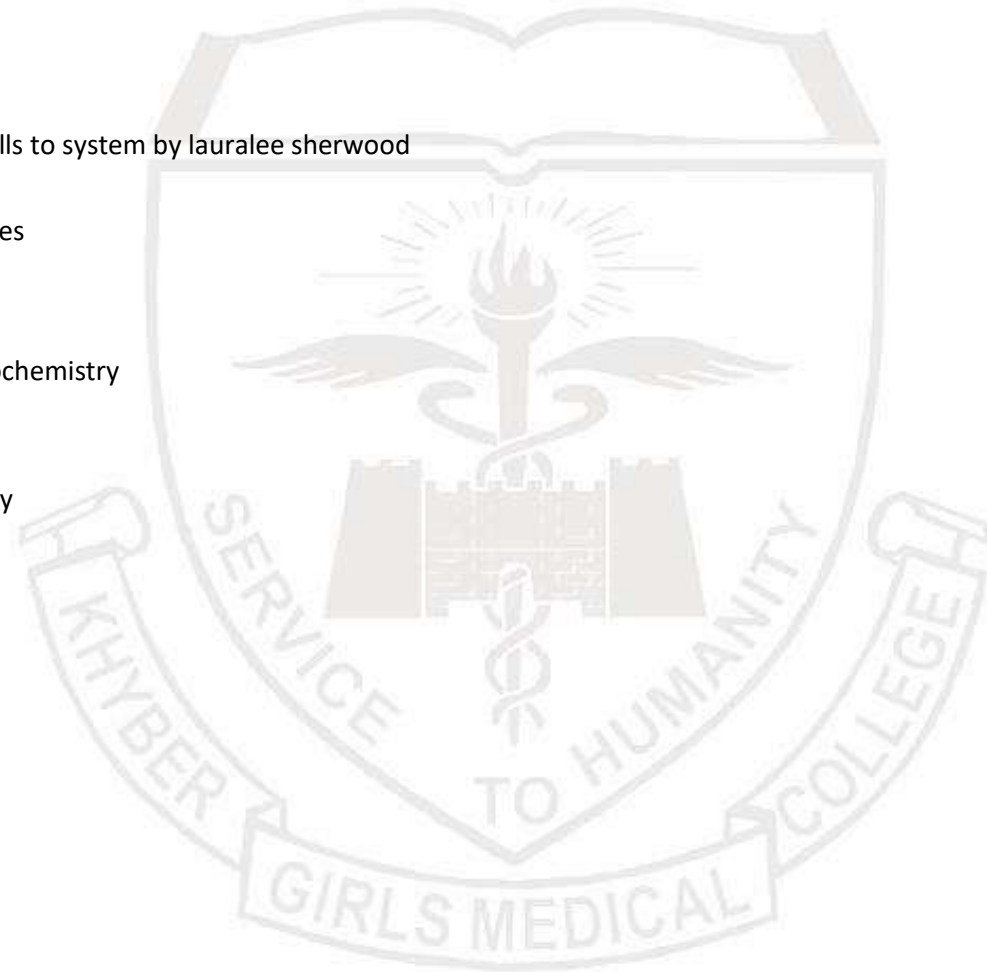
## Learning Resources for Students

### Physiology

- Guyton and Hall physiology
- Ganong physiology
- Human Physiology from cells to system by lauree sherwood
- BRS Physiology
- Neuroscience by Dale Purves

### Biochemistry

- Chatterjee text book of Biochemistry
- Harpers Biochemistry
- Lippincotts Biochemistry
- Satya Narayan biochemistry

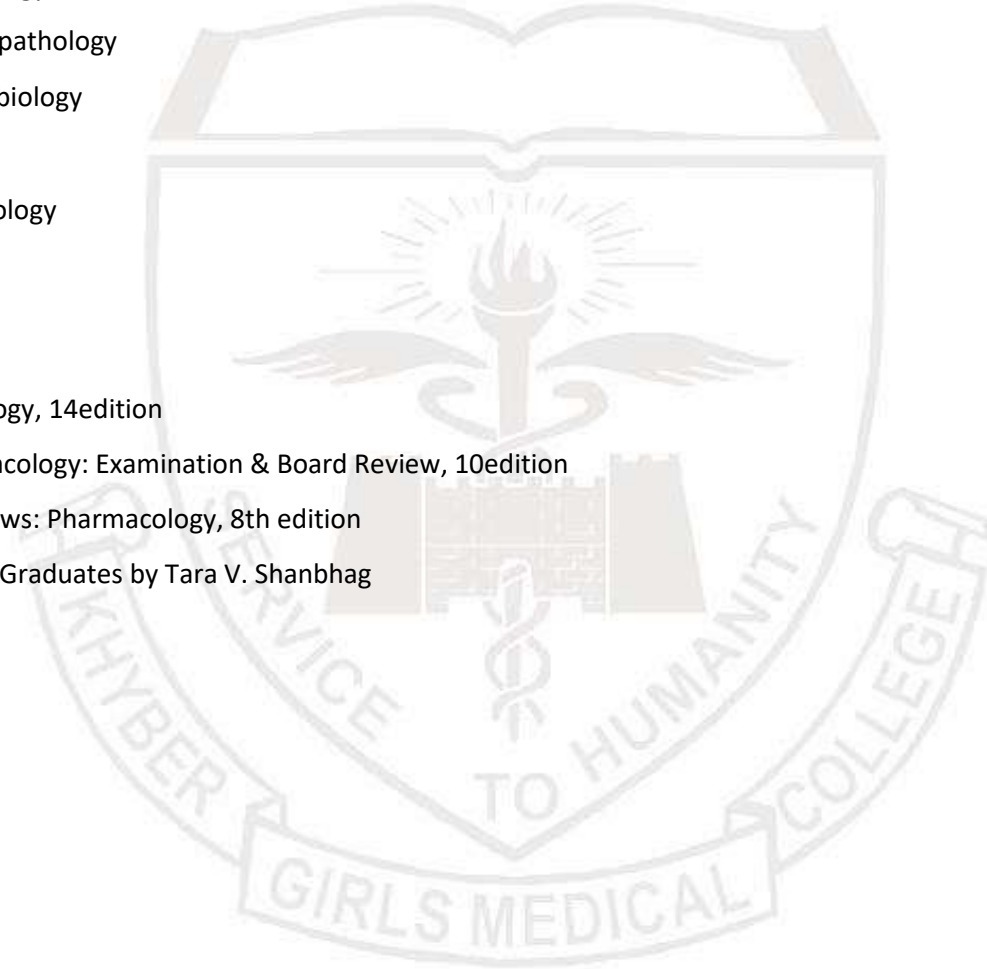


## **PATHOLOGY**

- Robbins textbook of pathology
- Harsh mohan text book of pathology
- Levison text book of microbiology
- Paniker parasitology
- Chatterjee book of parasitology

## **PHARMACOLOGY**

- Basic & Clinical Pharmacology, 14edition
- Katzung & Trevor's Pharmacology: Examination & Board Review, 10edition
- Lippincott Illustrated Reviews: Pharmacology, 8th edition
- Pharmacology for Medical Graduates by Tara V. Shanbhag



## FORENSIC MEDICINE

- Parikh's textbook of Medical Jurisprudence and Toxicology.
- Principles and Practice of Forensic Medicine by Nasir R Awan
- Forensic medicine and toxicology principals and practice by Krishan Vij
- Knights forensic pathology by Bernard knight, Pekka saukko
- Forensic medicine and toxicology Nagesh Kumar G rao

Apart from these resource learning ,students can consult books available in library or recommended by the specialty experts.

