# Jinnah Medical & Dental College

# BLOOD Module 1 & 2

# Study Guide


**MBBS**
**2021-22**

Knowledge is of no value unless you put it into practice

Anton Chekhov

# VISION

To set local and global standards for quality patient outcomes – creating a culture of excellence to promote a transformative experience for the 21st century clinicians, educators and researchers to benefit all humanity.

# MISSION

To develop well-rounded academicians, thinkers, clinicians and researchers by strengthening a global view, broadening intellectual foundations and teach effective communication. It is our aspiration to cultivate creative and critical thinking skills for problem solving, sensitive to cultural and ethical values and responsibilities. Our graduates will be role models and society leaders.

# Team Members of Blood Module I &II
# 2021-22

| Name | Committee | Department |
|---|---|---|
| Professor Dr. Muhammad Baqir Soomro | Member | Anatomy |
| Professor Dr. Shahid Ahsen | Member | Biochemistry |
| Professor Dr. Sadaf Fatima | Member | Physiology |
| Professor Dr. Sanower Ali | Member | Community Medicine |
| Professor Dr. Imran Afzal | Member | Forensic Medicine |
| Professor Dr.Mahdev Harani | Member | Pathogen & Microbiology |
| Professor Dr. Samia Pervaiz Khan | Member | Pharmacology |
| Dr. Zeelaf Shahid<br>Associate Director | Member | Medical Education |

# Introduction

Assalam - u-Alaikum and a very warm welcome to medical students in the Blood/ hematology module. This module has been developed to impart integrated teaching as a part of modular curriculum in Jinnah Medical & Dental College, Karachi. Blood 1 module (1st year) covered in 4 weeks and Blood 2 module (3rd year) covered in 5 weeks. The modules had been planned to study the normal composition and functions of blood in context of related clinical problems. This will benefit the learners to understand the basic information in relation to applied sciences.

In the foundation module you have studied the cell which is the basic structural and functional unit of the body. When cells group together to perform specific function, they form tissues and organs. Blood being the specialized connective tissue is one of the basic tissues essential for nourishment and viability of all body tissues. The general body needs of oxygen, nutrients, vitamins and minerals are fulfilled by blood. Being an excellent transport medium, blood also helps human body in transport of hormones to target tissues and excretion of wastes.

This module will comprehensively cover the components and functions of blood and immune system of body and their role in prevention of disease. Moreover, the study of plasma proteins, their types and role in homeostasis, and its biochemical aspects will be the part of this module.

## Rationale

It is designed to provide students with not only knowledge about basics of Blood but also develop their ability to apply information to solve problems

# JMDC CURRICULUM FRAMEWORK: MBBS 1-5 YEARS

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year 1** | **Module 1** | **EOM** | **Module 2** | **EOM** | **Module 3** | **EOM** | **Module 4** | **EOM** | **Module 5** | **EOM** | **Module 6** | **EOM* End of Exam** | | | | | | | | | | | | |
| | Foundation-1 8 weeks | | Blood-1 4 weeks | | Locomotor-1 8 weeks | | Respiratory-1 4 weeks | | CVS-1 4 weeks | | GIT-1 4 weeks | | | | | | | | | | | | | |
| **2** | **Module 7** | **EOM** | **Module 8** | **EOM** | **Module 9** | **EOM** | **Module 10** | **EOM** | **Module 11** | **EOM** | **Module 12** | **EOM** | | | | | | | | | | | | |
| | Head & Neck-1 **5** weeks | | Neurosciences-1 **7** weeks | | Special Senses **3** weeks | | Endocrine-1 **5** weeks | | Reproductive-1 **4**weeks | | Urinary-1 **5**weeks | | | | | | | | | | | | | |
| **3** | **Module 13** | **EOM** | **Module14** | **EOM** | **Module15** | **EOM** | **Module16** | **EOM** | **Module17** | **EOM** | **Module 18** | **EOM** | | | | | | | | | | | | |
| | Foundation 2 10 weeks | | Blood-2 5weeks | | Locomotor-2 4 weeks | | Respiratory-2 4 weeks | | CVS-2 5 weeks | | GIT-2 7weeks | | | | | | | | | | | | | |
| | **Clinical Rotations (Each Batch)** | | | | | | | | | | | | | | | | | | | | | | | |
| **R1** | **Medicine 2 weeks** | **WT** | **Psychiatry 2weeks** | **WT** | **Surgery 2 weeks** | **WT** | **Orthopedics 2 weeks** | **WT** | **OBS/ GYN 2 weeks** | **WT** | **Pediatrics 2 weeks** | **WT** | **Eye 2 weeks** | **WT** | **Ent 3 weeks** | **WT** | | | | | | | | |
| **R2** | **Medicine 2 weeks** | | **Psychiatry 2weeks** | | **Surgery 2 weeks** | | **Orthopedics 2weeks** | | **OBS/ GYN 2 weeks** | | **Pediatrics 2 weeks** | | **Eye 2 weeks** | | **Ent 3 weeks** | | | | | | | | | |
| **4** | **Module 19** | **EOM** | **Module 20** | **EOM** | **Module 21** | **EOM** | **Module 22** | **EOM** | **Module 23** | | **EOM** | **Module 24** | **EOM** | | | | | | | | | | | |
| | **Neuroscience-2 8 weeks** | | **Reproductive-2 weeks** | | **Head & Neck 2 weeks** | | **Endo 2 week** | | **Urinary 2 weeks** | | **Long courses** | **weeks** | | | | | | | | | | | | |
| | **Lectures** | | | | | | | | **ENT/ EYE** | | | | | | | | | | | | | | | |
| | **Clinical Rotations (Each Batch)** | | | | | | | | | | | | | | | | | | | | | | | |
| **R1** | **Medicine 3 weeks** | **WT** | **Psychiatry 3 weeks** | **WT** | **Surgery 3 weeks** | **WT** | **Orthopedics 3 weeks** | **WT** | **OBS/ GYN 3 weeks** | **WT** | **Pediatrics 3 weeks** | **WT** | **Eye 3 weeks** | **WT** | **Ent 3 weeks** | **WT** | | | | | | | | |
| **R2** | **Medicine 3weeks** | **WT** | **Surgery 3weeks** | | **WT** | **Eye 3weeks** | | **WT** | **Ent 3weeks** | | **WT** | | | | | | | | | | | | | |
| | **LECTURES** | | | | | | | | **R***= Rotation** | | | | | | | | | | | | | | | |
| **5** | **Medicine** | | **Surgery** | | | | **OBS/Gynae** | | | | **Pediatrics** | | | | | | | | | | | | | |
| | **Clinical Rotations** | | | | | | | | | | | | | | | | | | | | | | | |
| **R1** | **Medicine 4 weeks** | | **Surgery 4 weeks** | | | | **OBS/ GYN 4 weeks** | | | | **Pediatrics 4 weeks** | | | | | | | | | | | | | |
| **R2** | **Medicine 5 weeks** | | **Surgery 5 weeks** | | | | **OBS/ GYN 5 weeks** | | | | **Pediatrics 5 weeks** | | | | | | | | | | | | | |

**Final Exam**

## Students Assessment

There will be an end of rotation ward test after completion of clinical posting which will comprise the following components: -

### i. Written Assessment

The theory paper will have components of one – best type multiple – choice questions (MCQs).

### ii. Practical / lab examination:

This will comprise Objective Structured Clinical Examination (OSCE) The OSCE will have both observed and non-observed stations. The end of clinical posting will be of 2 hours duration. This will comprise the following components:

The OSPE/ OSCE will be conducted in batches. The students will be having different patterns of OSPE/OSCE in the basic and clinical subjects.

**Summary of marks of each module exam**

**Theory (BCQs) = 100 marks**

**OSPE (10 stations) = 100 marks**

**Total = 200 marks**

**Internal Assessment:**

• Continuous monitoring of attendance and practical assessment in short groups By Mini CEX and logbooks.

• It may be in the form of MCQs (BCQs), Ward tests, and OSCE.

• Internal assessment carries 20% weightage

**Course Evaluation:**

Course evaluation will be obtained through a feedback form which will be posted on the JMC website

**Mandatory Policy:**

**Eligibility for sitting in Professional Examinations is as follows:**

- 75% overall Class Attendance
- 75% Attendance all Clinical Wards with passing marks in all Clinical Ward Tests.
- Minimum 40% aggregate marks on all Internal Examinations (Module Tests, Midterm, Pre-Professional Examinations)
- MBBS 1$^{st}$Year: Complete all Professional Communication assignments with passing marks
- MBBS 1$^{st}$& 2$^{nd}$Year: Obtain passing marks in Behavioral Sciences & Research Module assessments
- MBBS 2$^{nd}$Year: Presentation in Journal club at least twice in a year
- MBBS 4$^{th}$& Final Year: CPC Presentation at least once in a year
- Skills Labs: Must be completed with passing marks
- Research Paper must be completed before MBBS 4 Professional Examination

**Failure to Meet the Eligibility Requirements:**

- A Student failing to meet the above listed eligibility for sitting in the professional examination will NOT be allowed to sit in 1st attempt of the Professional Examination.

  The college has the right to withhold all students who however, not met the eligibility requirements from sitting in the 1st attempt.
- Such students who have been withheld from sitting in the 1st attempt of the Professional exam because of failure to meet the eligibility requirements will be allowed only to sit in the retake of that examination.

  It is expected that deficiency in requirements of Professional communication assignments, Behavioral Sciences & Research Module assessments, journal Club presentations, CPC, Skills Labs must be made up and fulfilled before a student will allowed to sit in the retake exam.

**Details of ATTENDANCE POLICY**

The CR is responsible to bring attendance sheets from Student Affairs Office to each class. At the end of class, the attendance sheet must be signed and returned by the faculty member to the Student Affairs Office. No attendance sheets from students will be accepted.

These attendances will be compiled together as follows:

**LECTURE ATTENDANCE** = # Lectures Attended / Total # of Lectures

**PRACTICAL ATTENDANCE** = # Practicals Attended / Total # of Practicals

**TUTORIAL ATTENDANCE** = # Tutorials Attended / Total # of Tutorials

**NOTE**: All tutorials will be conducted by a Senior Faculty Member (AP or above), assisted by a Junior Faculty Member (Lecturer)

**FINAL CLASS ATTENDANCE =**

**%Lecture Attendance + %Tutorial Attendance + %Practical Attendance**

**3**

## Teaching / Learning Methods

The teaching learning sessions of this module will be of diverse types:

a. Large group interactive sessions (LGIS)
b. Small group teaching will include tutorials and, case – based learning session.
c. Problem – based learning sessions.
d. Practical session will comprise sessions on early exposure to clinical methods and practical laboratory demonstrations.
e. Seminars: on different topics, in which students will make oral presentations on different aspects of the allocated topic.
f. Self-directed learning sessions: This is the time during which students are expected to revise what they have learnt in the class, clear their concepts by consulting different textbooks, reference material and prepare their assignments and projects.

## Main Content Areas

### Anatomy

- Development of blood
- Lymphoid tissue, Immune system
- Lymph node and Thymus
- Spleen and Tonsils

### Biochemistry

- Structure and Types of Hemoglobin
- Oxygen Dissociation Curves of Hemoglobin
- Abnormalities of Hemoglobin Synthesis
- Hemoglobinopathies
- Iron Metabolism

### Physiology

- Vitamin B12& Folic Acid Deficiency
- Composition of blood
- Erythropoiesis and factors affecting erythropoiesis
- Blood groups

### Community medicine

- Nutritional Anemia
- Immunity types, Vaccines and Cold Chain
- Expanded Program of Immunization
- Cancer epidemiology and prevention
- Malaria and prevention

### Forensic Medicine

- Biological Stains (Blood)
- Biological Stains (Seminal Stains)
- Classification of anemia

### Pathology

- Anemia of diminished erythropoiesis I (Megaloblastic anemia)
- Anemia of diminished erythropoiesis II
- Hemolytic anemia I & II
- Thalassemia syndrome
- Neoplastic disorders (Acute leukemia)
- Overview and classification of WBC disorders (Non-neoplastic)
- Non-Hodgkin lymphoma
- Bleeding disorders II
- Coagulation disorders
- Transfusion

**Pharmacology**

- Drugs used to treat anemia & Hematopoietic growth factors
- Coagulants & Anti-coagulants
- Fibrinolytic & Thrombolytic drugs
- Vasoactive peptides

# GENERAL LEARNING OBJECTIVES:

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

### ANATOMY

- **I**dentify the gross structure and functions of haemopoietic system
- Identify and describe the blood forming organs, and the locations where blood is formed
- Describe the development of components of lymphoid system
- Describe the gross structure, location and histological features of lymphoid organs
- Identify the lymphoid organs under microscope

### PHYSIOLOGY

- Describe hemopoiesis and functions of different blood cells.
- Explain physiological basis of different hematological disorders and transfusion reactions.
- Comprehend the role of immune system in defense against microorganism

### BIOCHEMISTRY

- Outline the types, structure, functional importance and disorders related to hemoglobin and myoglobin.
- Describe heme proteins, heme metabolism, porphyrins, porphyrias and jaundice.
- Explain the role of plasma proteins and immunoglobulins in health and disease.

### COMMUNITY MEDICINE

- List the causes, symptoms & signs, prevention and control of nutritional anemia
- Describe Immunity types, Vaccines and Cold Chain
- Discuss Dengue fever, Malaria, Thalassemia and Sickle cell disease

### FORENSIC MEDICINE

- Describe Biological stains (Blood and Seminal stains)
- Discuss analytic techniques and blood grouping

**PATHOLOGY & MICROBIOLOGY**

- Discuss anemia, anemia of diminished erythropoiesis.
- Describe hemolytic anemia and Thalassemic syndrome
- Classify WBC Disorders
- Discuss neoplastic and non-neoplastic disorders
- Discuss blood and tissue protozoa and tissue nematodes

**PHARMACOLOGY**

- Describe the coagulants and anti-coagulants
- Discuss microbial therapy.
- Describe cell wall synthesis inhibitors and protein synthesis inhibitors
- Discuss Anti metabolites and fluoroquinolones

# Recommended Reading Material

## Anatomy

**A. GROSSANATOMY**

1. K.L. Moore, Clinically Oriented Anatomy
2. Richard L. Drake, Gray's anatomy for students

**B. HISTOLOGY**

1. B. Young J. W. Health Wheather's Functional Histology
2. di Fiore's Atlas of histology and functional correlations

**C. EMBRYOLOGY**

1. Keith L. Moore. The Developing Human
2. Langman's Medical Embryology

## Biochemistry

**TEXT BOOKS**

1. Harper's Illustrated Biochemistry
2. Lippincott's Illustrated reviews of Biochemistry
3. Lehninger's Principles of Biochemistry
4. Biochemistry by Devlin

## Physiology

**A. TEXTBOOKS**

1. Textbook of Medical Physiology by Guyton And Hall
2. Human Physiology by Lauralee Sherwood
3. Berne & Levy Physiology
4. Best &Taylor Physiological Basis of Medical Practice

**B. REFERENCEBOOKS**

1. Ganong's Review of Medical Physiology

**Community Medicine**

- Public Health and Community Medicine by Shah Ilyas Ansari, 8th Edition
- Park's Textbook of Preventive and Social Medicine by K Park 24th Edition Epidemiology and Biostatistics:
- Epidemiology by Leon Gordis, Fifth Edition
- Basic Statistics for the Health Sciences by Jan W. Kuzma, Fifth Edition.

**Forensic Medicine**

- Gautam Biswas Book of Forensic Medicine
- Parikh's Book of Forensic Medicine

**Pathology**

- Basis of Pathology by Robbins & Cotran
- Review of Microbiology by Livingston

**Pharmacology**

- Katzung. Basic & Clinical Pharmacology. 14$^{th}$ Edition.
- Katzung & Trevor's. Pharmacology. 12$^{th}$ Edition.
- Rang & Dales. Pharmacology.

## Blood Module 1

## Organization

**Time requirements: Basic Medical Sciences**

| | |
|---|---|
| • Anatomy | 26 Hours |
| • Physiology | 28 Hours |
| • Biochemistry | 24 Hours |
| | **78 Hours** |

## Blood Module II

## Organization

**Time requirements:**

| | |
|---|---|
| • Community Medicine | 10 Hours |
| • Forensic Medicine | 7 Hours |
| • Pathology & Microbiology | 35 Hours |
| • Pharmacology | 22 Hours |
| | **74 Hours** |

**Total = 152 Hours**

# Blood-1 Module

# ANATOMY

| S. NO. | LEARNING OBJECTIVES By the end, the student should be able to | Content | TEACHING Activity Duration | ASSESSMENT |
|---|---|---|---|---|
| | **Embryology** | | | |
| 1 | • Define hematopoiesis<br>• List the sites and sources of hematopoiesis before and after birth<br>**(K)(S)** | Development of blood | LGIS 50 Mins + Practical 90 mins + Tutorial 90 mins | MCQs<br>OSPE |
| | **HISTOLOGY** | | | |
| 1 | • Name the components of immune system and lymphoid tissue<br>• Differentiate between central lymphoid organs and peripheral lymphoid organs<br>• Describe the structure of lymph nodes<br>• Describe the structure and histological appearance of thymus<br>• Discuss the clinical anatomy of lymphoid Organs<br>• Identify lymph node and Thymus under microscope and explain their histological features in the given slide<br>**(K)(S)** | Lymphoid tissue, Immune system and Thymus | LGIS 50 Mins + Practical 90 mins + Tutorial 90 mins | MCQs<br>OSPE |
| 2 | • Define the structure and location of tonsils and spleen<br>• Describe histological features of tonsils and spleen<br>• Identify spleen and tonsils under microscope and explain their histological features in the given slide<br>**(K)(S)** | Spleen and Tonsils | LGIS 50 Mins + Practical 90 mins | MCQs<br>OSPE |

# BIOCHEMISTRY

| S.NO. | LEARNING OBJECTIVES<br><br>By the end of module, the students should be able to | Content | TEACHING Activities (Duration) | ASSESSMENT |
|---|---|---|---|---|
| 1. | • Explain the structure of hemoglobin.<br>• Describe the types of hemoglobin<br>• Discuss the biochemical function of hemoglobin<br>• Discuss the clinical significance of hemoglobin<br>**(K)** | Structure and Types of Hemoglobin | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's |
| 2. | • Explain the biochemical basis of oxygen dissociation curve.<br>• Describe the Oxygen dissociation curve for Hemoglobin<br>• Describe the Oxygen dissociation curve for Myoglobin<br>• Describe the factors affecting binding of oxygen with hemoglobin<br>• Describe the Allosteric Effectors of Oxygen dissociation curve<br>• Explain transportation of oxygen and carbon dioxide through hemoglobin<br>**(K)** | Oxygen Dissociation Curves of Hemoglobin | LGIS<br>50 Mins | MCQ's |
| 3. | • Explain the pathway of hemoglobin synthesis and degradation<br>• List the abnormalities of Hemoglobin synthesis<br>• Classify and discuss the Porphyries.<br>**(K)(S)** | Abnormalities of Hemoglobin Synthesis | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |
| 4 | • List the Hemoglobinopathies<br>• Explain the biochemical, genetic and clinical significance of Thalassemia.<br>• Explain the biochemical, genetic and clinical significance of Sickle cell anemia.<br>**(K)(S)** | Hemoglobinopathies | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |
| **5** | • Discuss Iron metabolism in the body with its abnormalities.<br>• Describe the biochemical functions, dietary sources, recommended daily intake and distribution of iron in the body.<br>• Explain the mechanism of absorption, transport, storage and elimination of iron.<br>• Discuss the clinical significance of Iron deficiency and Iron overload.<br>**(K)(S)** | Iron Metabolism | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |

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|---|---|---|---|---|
| | • Discuss the factors regulating Erythropoiesis<br>• Discuss Vitamin B12 metabolism in the body.<br>• Describe the biochemical functions, dietary sources and recommended daily intake of Vitamin B12.<br>• Discuss the clinical significance of Vitamin B12 deficiency.<br>• Discuss Folic acid metabolism in the body.<br>• Describe the biochemical functions, dietary sources and recommended daily intake of Folic acid.<br>• Discuss the clinical significance of Folic acid deficiency<br>**(K)(S)** | Vitamin B12& Folic Acid Deficiency | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |
| | • Discuss Vitamin E metabolism in the body.<br>• Describe the biochemical functions, dietary sources and recommended daily intake of Vitamin E.<br>• Discuss the clinical significance of Vitamin E deficiency<br>• Discuss Vitamin K metabolism in the body.<br>• Describe the biochemical functions, dietary sources and recommended daily intake of Vitamin K.<br>• Discuss the clinical significance of Vitamin K deficiency<br>**(K)(S)** | Vitamin E | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |
| | • Explain the composition of plasma and plasma proteins.<br>• Explain the difference between plasma and serum<br>• Discuss the separation techniques of plasma proteins<br>• Describe the individual plasma proteins and their biological functions<br>• Discuss the clinical abnormalities related to plasma proteins.<br>**(K)(S)** | Plasma Proteins | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |
| | • Classify immunoglobulins<br>• Differentiate between immunoglobulin's and antibodies<br>• Describe the chemical structure of immunoglobulins<br>• Discuss the biochemical functions of immunoglobulin in human body<br>• Discuss the clinical significance of immune deficiency diseases<br>**(K)(S)** | Immunoglobulins | LGIS<br>50 Mins<br>+<br>Tutorial<br>90 mins | MCQ's<br>OSPE |

# BIOCHEMISTRY PRACTICALS

| S. NO. | LEARNING OBJECTIVES | Content | TEACHING Activities (Duration) | ASSESSMENT |
|---|---|---|---|---|
| 1. | 1. Explain the principle of electrophoresis<br>2. Demonstrate the technique of Electrophoresis<br>3. Discuss the applications of electrophoresis<br>4. Explain the principle of ELISA<br>5. Demonstrate the technique of ELISA<br>6. Discuss the applications of ELISA<br>7. Interpret clinical conditions correlated with their laboratory investigations<br>**(K)(S)** | Electrophoresis & ELISA | Demonstration<br>90 mins | OSPE |
| 2 | 1.Discuss the samples used for biochemical analysis<br>2.Demonstrate & Explain the uses of the blood collection tubes<br>3.Collect the blood specimen for biochemical analysis (IV & IM techniques)<br>4.Separate the plasma from the blood sample<br>5.Separate the serum from the blood sample<br>6.Interpret clinical conditions correlated with their laboratory investigations.<br>**(K)(S)** | Specimen collection | Demonstration<br>90 mins | OSPE |
| 3 | 1.Explain the principle of Spectrophotometry<br>2. Demonstrate the technique of Spectrophotometry.<br>3. Illustrate the component parts of a Spectrophotometer.<br>4. Explain the significance of making blank solution<br>5.Explain the significance of transmittance and optical density<br>6. Perform analysis of analyte in the sample by Spectrophotometry.<br>7.Calculate the concentration of the analyte in the sample by Spectrophotometry<br>8.Explain the principle of Flame Photometry<br>9.Explain the technique of Flame Photometry.<br>10.Explain the significance of using deionized water in Flame Photometry<br>11.Demonstrate the use of Flame photometer<br>12.Calculate the concentration of the analyte in the sample by Flame Photometry<br>13.Interpret clinical conditions correlated with their laboratory investigations.<br>**(K)(S)** | Spectrophotometry & Flame Photometry | Demonstration<br>90 mins | OSPE |

| | | | | |
|---|---|---|---|---|
| 4 | • Interpret the plasma protein levels in different diseases<br>• Estimate the plasma protein levels by Spectrophotometry using the Kit Method.<br>• Interpret clinical conditions correlated with their laboratory investigations.<br>**(K)(S)** | Plasma Protein Estimation by Kit Method | Demonstration 90 mins | OSPE |

# PHYSIOLOGY

| S. NO. | LEARNING OBJECTIVES | Contents | LEARNING Activities (Duration) | ASSESSMENT |
|---|---|---|---|---|
| 1. | 1. Describe the components of blood and their functions<br>2. Describe the functions of blood<br>3. State the normal value of RBCs, WBCs and Platelets<br>**(K)** | Composition of blood | LGIS<br>50 MINS | MCQs |
| 2. | 1. Discuss the different stages of RBCs formation<br>2. List factors necessary for erythropoiesis.<br>3.Discuss the significance of Reticulocyte count<br>4.Discuss the role of Erythropoietin.<br>**(K)** | Erythropoiesis and factors affecting erythropoiesis | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 3. | 1. Describe the morphological & etiological classification of anemia<br>2. Discuss the significance of red cell indices and its normal values.<br>3.Discuss the etiology & microscopic picture of Megaloblastic and iron deficiency anemia<br>4.Discuss the etiology hemolytic anemia<br>5.Discuss various types of Polycythemia<br>**(K)** | Anemia &Polycythemia | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 4. | 1. Explain the ABO (classical) and Rh system of blood grouping & their inheritance pattern.<br>2. Define Agglutinogen, agglutinin & agglutination.<br>3. List various Rh antigens & Rh immune response.<br>4. Name the transfusion reactions associated with mismatched blood transfusion.<br>**(K)** | Blood groups | LGIS<br>50 MINS<br>+<br>CBL<br>90 MINS<br>(Tutorial) | MCQs |
| 5. | 1. Describe the events in Hemostasis<br>2. Explain the mechanism of formation of platelet plug<br>3. Describe the role of Prothrombin in blood coagulation and clot formation.<br>**(K)** | Hemostasis | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 6. | 1. Explain intrinsic and extrinsic pathway for coagulation.<br>2. Enumerate the clotting factors<br>3. Describe the role of clotting factors in coagulation.<br>**(K)** | Clotting cascade & bleeding disorders. | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |

| | | | | |
|---|---|---|---|---|
| 7. | 1. Explain the following hemorrhagic and Thrombo- embolic conditions:<br>• Hemophilia<br>• Thrombocytopenia<br>• Disseminated Intravascular Coagulation.<br>2.Discuss the role of commonly used anticoagulants<br>3.Explain the fibrinolytic mechanism and role of plasmin in lysis of blood clots.<br>4. Discuss the role of fibrin & anti-thrombin III in anticoagulation.<br>**(K)** | Hemorrhagic & thromboembolic conditions and Fibrinolytic mechanism | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 8. | 1.Discuss leukopoiesis and inflammation<br>2.Differentiate among the types of WBCs on the basis of their function and physical characteristics<br>**(K)** | White blood cells | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 9. | 1. Explain the significance of in body defense mechanism<br>2. List various macrophages in different tissues of body.<br>3. Discuss the role of passive immunity against infection.<br>**(K)** | Reticuloendothelial system | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 10. | 1.Describe immunity & its types<br>2.Discuss types & functions of T lymphocytes<br>3.Discuss the structure and mechanism of action of antigen and antibody<br>4.Describe the complement system<br>5.Describe the allergy and hypersensitivity reactions<br>**(K)** | Immunity<br>Antigen, antibody structure<br>Humoral immunity<br>Cell mediated immunity | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 11. | 1. Discuss the following types of hypersensitivity and allergic reactions:<br>• Urticaria<br>• Anaphylaxis<br>• Hay fever<br>2. Discuss the role of Ig E in Immunity.<br>**(K)** | Allergy and Hypersensitivity | LGIS<br>50 MINS<br>+<br>SGD<br>90 MINS<br>(Tutorial) | MCQs |
| 12. | 1. Demonstrate peripheral blood smear<br>**(S)** | Blood smear | Practical | OSPE |
| 13. | 1. Determine Erythrocyte Sedimentation Rate<br>**(S)** | ESR | Practical | OSPE |
| 14. | 1. Perform tests for A, B, O, & Rh blood grouping<br>**(S)** | Blood group | Practical | OSPE |
| 15. | 1. Perform tests of bleeding time and clotting time.<br>**(S)** | BT and CT | Practical | OSPE |
| 16. | 1. Perform differential leukocyte count<br>**(S)** | DLC | Practical | OSPE |

# Week 4

## End of Blood Module

## Blood Module 1 Test Theory

## Blood Module 1 Test OSCE

# Blood-2 Module

# Community Medicine Lectures

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Nutritional Anemia<br>• Define Anemia<br>• Classify Anemia<br>• List the causes of nutritional anemia<br>• List the signs and symptoms of nutritional anemia<br>• Predict the consequences of nutritional anemia<br>• Discuss prevention and control of nutritional anemia<br>**(K)** | Nutritional Anemia | LGIS<br>50mins | MCQs |
| 2. | Immunity types, Vaccines and Cold Chain<br>• Define Immunity<br>• Explain the difference between Vaccination and Immunization<br>• Describe Live and Killed Vaccines<br>• Discuss the adverse reactions following immunization<br>• Explain Cold Chain and its importance<br>**(K)** | Immunity types, Vaccines and Cold Chain | LGIS<br>50mins | MCQs |
| 3. | Expanded Program of Immunization<br>• Explain the objective of EPI Program<br>• Describe immunization<br>• Discuss the ongoing EPI program in Pakistan<br>**(K)** | Expanded Program of Immunization | LGIS<br>50mins | MCQs |
| 4. | Cancer epidemiology and prevention<br>• Define Cancer<br>• Classify cancers<br>• Discuss the epidemiological evidence of cancer<br>• Discuss different carcinogens<br>• Describe Primary, Secondary and Tertiary prevention of cancer<br>**(K)** | Cancer epidemiology and prevention | LGIS<br>50mins | MCQs |
| 5. | Malaria and prevention<br>• List the types of Malarial Parasites<br>• Name the Vectors of Malaria<br>• Describe the etiological factors and epidemiology of Malaria<br>• Discuss the Prevention and Control of Malaria<br>**(K)** | Malaria and prevention | LGIS<br>50mins | MCQs |

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| 6. | Dengue Fever and prevention<br>• Name the vectors of Dengue<br>• Describe the etiological factors and epidemiology of Dengue<br>• Discuss the epidemiology of Dengue Fever with special reference to Pakistan<br>**(K)** | Dengue Fever and prevention | LGIS<br>50mins | MCQs |
| 7. | Prevalence of Thalassemia & Sickle cell disease<br>• Describe Thalassemia<br>• Classify different types of Thalassemia<br>• Describe Sickle cell disease<br>• List the different types of Sickle cell diseases<br>• Discuss the prevalence of Thalassemia and Sickle cell diseases in Pakistan<br>**(K)** | Prevalence of Thalassemia & Sickle cell disease | LGIS<br>50mins | MCQs |

# Forensic Medicine Lectures

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Biological Stains (Blood)<br>• List the tests used to identify blood in a stain<br>• Identify the tests used for determination of origin (species), age, source (Arterial or venous), blood groups and sexing of blood stain<br>• Differentiate between ante-mortem and postmortem blood stains<br>• Explain the role of blood stain pattern analysis in forensic medicine<br>• Describe the tests for blood stains (Physical, Microscopic, Chemical, Biological, Spectroscopic)<br>**(K)** | Biological Stains (Blood) | LGIS<br>50mins | MCQs |
| 2. | Biological Stains (Seminal Stains)<br>• Describe the composition of semen<br>• List the criteria for normal sperm count as per WHO<br>• Discuss the medico legal importance of seminal stains<br>• Enumerate the various methods of collection of seminal material and determination of motility of sperms<br>• Describe the physical, chemical, microscopic, electrophoretic, and immunological tests for the examination of seminal stains.<br>• Explain the role of seminal stains in determination of blood groups<br>**(K)** | Biological Stains (Seminal Stains) | LGIS<br>50mins | MCQs |
| 3. | Analytic Techniques<br>• Explain the methods, principles and uses of the following analytic techniques:<br>I. Thin Layer Chromatography<br>II. Gas Chromatography<br>III. High Pressure Liquid Chromatography<br>IV. Spectrophotometry<br>V. Stass Otto process | Analytic Techniques | LGIS<br>50mins | MCQs |

# Forensic Medicine Tutorial

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Blood grouping<br>• List the commonly used blood grouping systems<br>• Discuss the medico legal importance of ABO and Rh blood groups<br>**(K)** | Blood grouping | SGDs<br>1hour<br>(Tutorials) | MCQs |

# Pathology Lectures

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Classification of anemia<br>• Define anemia<br>• Describe morphologic characteristics and reference range of red cell indices<br>• Classify anemia according to underlying mechanism and morphology<br>• Discuss the effects of acute and chronic blood loss<br>**(K)** | Classification of anemia | LGIS<br>50mins | MCQs |
| 2. | Anemia of diminished erythropoiesis I (Megaloblastic anemia)<br>• List the types of anemia associated with red cell underproduction<br>• Discuss the causes of megaloblastic anemia<br>• Describe the peripheral blood findings/morphology in megaloblastic anemia<br>• Define pernicious anemia<br>• Discuss metabolism and its biochemical functions of vitamin B12<br>• Describe the pathogenesis, morphology and clinical features of pernicious anemia<br>• List the causes of folate deficiency<br>• Discuss the metabolic processes related to folic acid<br>**(K)** | Anemia of diminished erythropoiesis I (Megaloblastic anemia) | LGIS<br>50mins | MCQs |
| 3. | Anemia of diminished erythropoiesis II<br>• Define aplastic anemia, pure red cell aplasia, myelophthisic anemia, polycythemia<br>• List the chronic illnesses associated with anemia of chronic diseases<br>• List the causes of pure red cell aplasia & myelophthisic anemia<br>• Describe the normal iron metabolism<br>• Discuss the etiology of iron deficiency anemia<br>• Describe the pathogenesis & clinical features of iron deficiency anemia<br>• Discuss the morphological findings in bone marrow and peripheral blood smear<br>• Briefly discuss the mechanism involved in anemia of chronic diseases<br>• Discuss the major causes of aplastic anemia<br>• Describe the pathophysiology of aplastic anemia<br>• Briefly discuss the morphology & clinical features of aplastic anemia<br>• Briefly discuss the basis of anemia in renal failure, hepatocellular disease & endocrine disease<br>• Discuss the causes of both the types of polycythemia<br>**(K)** | Anemia of diminished erythropoiesis II | LGIS<br>50mins | MCQs |

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| 4. | Hemolytic anemia I<br>• Describe extravascular & intravascular hemolysis<br>• Briefly discuss morphology of hemolytic anemia<br>• Define hereditary spherocytosis<br>• Describe the pathogenesis, morphology & clinical features of hereditary spherocytosis<br>• Discuss the causes & pathogenesis of G6PD deficiency<br>• Briefly discuss the ABO incompatibility and Rh-immunization<br>**(K)** | Hemolytic anemia I | LGIS<br>50mins | MCQs |
| 5. | Hemolytic anemia II<br>• Define sickle cell disease, immunohemolytic anemia and paroxysmal nocturnal hemoglobinuria (PNH)<br>• Describe the pathogenesis, morphology & clinical features of sickle cell disease<br>• Discuss the pathogenesis, manifestations & diagnosis of PNH<br>• Classify immunohemolytic anemia<br>• Discuss direct & indirect Coombs antiglobulin test<br>• Discuss the causes of hemolytic anemia resulting from trauma to red cells<br>**(K)** | Hemolytic anemia II | LGIS<br>50mins | MCQs |
| 6. | Thalassemia syndrome<br>• Define thalassemia syndrome<br>• Classify thalassemia<br>• Discuss the pathogenesis, the clinical syndromes, diagnosis & types of bet thalassemia<br>• Discuss the morphology of beta thalassemia major/minor<br>• Discuss the pathogenesis & types of alpha thalassemia<br>**(K)** | Thalassemia syndrome | LGIS<br>50mins | MCQs |
| 7. | Overview and classification of WBC disorders (Non-neoplastic)<br>• Briefly discuss pathogenesis, causes, morphology and clinical features in neutropenia and leukocytosis.<br>• List the causes of neutrophilia, eosinophilia, basophilia, monocytosis, lymphocytosis.<br>• Summarize lymphadenitis (acute and chronic nonspecific lymphadenitis patterns)<br>**(K)** | Overview and classification of WBC disorders (Non-neoplastic) | LGIS<br>50mins | MCQs |
| 8. | Neoplastic disorders (Acute leukemia)<br>• Discuss etiologic and pathogenetic factors of white cell neoplasms.<br>• Define acute leukemia, acute lymphoblastic leukemia, and acute myeloblastic leukemia.<br>• Describe the pathogenesis, morphology, clinical presentation, and prognosis of acute lymphoblastic and acute myeloblastic leukemia<br>**(K)** | Neoplastic disorders (Acute leukemia) | LGIS<br>50mins | MCQs |
| 9. | Non-Hodgkin lymphoma<br>• List the WHO classification of Non-Hodgkin Lymphomas<br>• Discuss pathogenesis, morphology, clinical features of Small lymphocytic lymphoma (chronic lymphocytic leukemia), Follicular Lymphoma, Diffuse Large B-Cell Lymphoma, Burkitt Lymphoma, Mantle Cell Lymphoma, Hairy Cell Leukemia<br>**(K)** | Non-Hodgkin lymphoma | LGIS<br>50mins | MCQs |

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| 10. | Hodgkin's lymphoma<br>• Discuss pathogenesis, morphology, and clinical presentation of Hodgkin Lymphoma (HL)<br>• List subtypes of HL.<br>• Differentiate between Hodgkin Lymphoma (HL) and Non-Hodgkin Lymphomas (NHL)<br>• Enumerate the clinical staging of Hodgkin and Non-Hodgkin Lymphomas (Ann Arbor Classification)<br>• Discuss the pathogenesis, morphology, and clinical presentation of Hodgkin Lymphoma **(K)** | Hodgkin's lymphoma | LGIS<br>50mins | MCQs |
| 11. | Myeloproliferative disorders (MPD) and Myelodysplastic Syndrome (MDS)<br>• Define MPD and MDS.<br>• Describe pathogenesis, morphological findings, clinical features of Chronic Myelogenous Leukemia, Polycythemia Vera, Essential Thrombocytosis, Primary Myelofibrosis, MDS **(K)** | Myeloproliferative disorders (MPD) and Myelodysplastic Syndrome (MDS) | LGIS<br>50mins | MCQs |
| 12. | Bleeding disorders I<br>• List the causes of thrombocytopenia<br>• Briefly discuss the bleeding disorders caused by vessel wall abnormalities<br>• Describe clinical presentation, morphological findings in Immune Thrombocytopenic Purpura (ITP)<br>• Differentiate between acute and chronic ITP<br>• Briefly discuss Bernard-Soulier syndrome & Glanzmann thrombasthenia<br>• Summarize drug-induced Thrombocytopenia **(K)** | Bleeding disorders | LGIS<br>50mins | MCQs |
| 13. | Bleeding disorders II<br>• Discuss etiology, pathogenesis, & clinical presentation of Thrombotic Thrombocytopenic Purpura and Hemolytic Uremic Syndrome<br>• Define DIC<br>• Describe the etiology and pathogenesis of DIC **(K)** | Bleeding disorders II | LGIS<br>50mins | MCQs |
| 14. | Coagulation disorders<br>• Explain the factor VIII-vWF Complex<br>• Discuss the types and clinical presentation of Von Willebrand Disease<br>• Describe the genetic defects, clinical features, and lab findings in Hemophilia A & B **(K)** | Coagulation disorders | LGIS<br>50mins | MCQs |
| 15. | Transfusion<br>• Discuss the complications of blood Transfusion **(K)** | Transfusion | LGIS<br>50mins | MCQs |
| 16. | Staphylococcus (Pathogens causing sepsis)<br>• List the organisms causing sepsis & the clinical findings of staphylococcal infections<br>• Describe the important properties and species of staphylococcus<br>• Discuss diseases caused by staphylococcus<br>• Describe the transmission and pathogenesis of staphylococcus<br>• Discuss laboratory diagnosis, treatment and prevention of staphylococcus infections **(K)** | Staphylococcus (Pathogens causing sepsis) | LGIS<br>50mins | MCQs |

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| 17. | Gram negative rods: (Zoonotic organisms)<br>• Discuss the important properties, pathogenesis, clinical findings, laboratory diagnosis and prevention of Francisella, Yersinia, Pasteurella, Bartonella<br>**(K)** | Gram negative rods: (Zoonotic organisms) | LGIS<br>50mins | MCQs |
| 18. | Rickettsia<br>• Describe the important properties of Rickettsia<br>• Discuss diseases caused by Rickettsia<br>• Describe the transmission and pathogenesis of Rickettsia<br>• List the clinical findings of Rickettsia infections<br>• Discuss laboratory diagnosis, treatment and prevention of Rickettsia<br>**(K)** | Rickettsia | LGIS<br>50mins | MCQs |
| 19. | Arboviruses<br>• Discuss in detail Dengue, Yellow fever, Chikungunya, and Ebola fever<br>**(K)** | Arboviruses | LGIS<br>50mins | MCQs |
| 20 | HIV (I&II)<br>• Discuss the important properties of HIV<br>• Summarize the replication cycle of HIV<br>• Describe transmission, and epidemiology of HIV<br>• Discuss pathogenesis, clinical findings, laboratory diagnosis and immunity related to HIV<br>• Describe the treatment and prevention of HIV<br>**(K)** | HIV (I&II) | LGIS<br>50mins | MCQs |
| 21 | Blood and tissue protozoa, I<br>• Discuss the basic terminologies related to parasitology<br>• Discuss the important properties of plasmodium, its pathogenesis and epidemiology<br>• Describe the clinical findings and laboratory diagnosis of Malaria<br>• Describe the treatment and prevention of malaria<br>**(K)** | Blood and tissue protozoa, I | LGIS<br>50mins | MCQs |
| 22 | Blood and tissue protozoa II<br>• Discuss the important properties of Leishmania<br>• Describe the pathogenesis, clinical findings of Leishmaniasis<br>• Discuss laboratory diagnosis, treatment and prevention of Leishmaniasis<br>**(K)** | Blood and tissue protozoa II | LGIS<br>50mins | MCQs |
| 23 | Tissue nematodes I (Washeteria, Onchocercid, Loa Loa, Dracunculus)<br>• Discuss the important properties of tissue nematodes; Washeteria, Onchocercid, Loa Loa, and Dracunculus<br>• Describe the pathogenesis, clinical findings of these nematodes<br>• Discuss the laboratory diagnosis, treatment and prevention of diseases caused by tissue nematodes<br>**(K)** | Tissue nematodes I | LGIS<br>50mins | MCQs |

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| 24 | Tissue nematodes II (Toxocara, Trichinella, Ancylostomiases, Angiostrongyliasis, Anisakis)<br>• Discuss the important properties of tissue nematodes; Toxocara, Trichinella, Ancylostomiases, Angiostrongyliasis, and Anisakis<br>• Describe the pathogenesis, clinical findings of these nematodes<br>• Discuss laboratory diagnosis, treatment and prevention of diseases caused by these nematodes<br>**(K)** | Tissue nematodes II | LGIS<br>50mins | MCQs |

# Pathology Tutorial

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Interpretation of Complete Blood Count<br>• Interpret the reports of Complete Blood Count<br>**(K)** | Interpretation of Complete Blood Count | SGDs<br>1hour<br>(Tutorials) | MCQs |
| 2. | Bleeding disorders<br>• Interpret bleeding disorders based on data provided<br>**(K)** | Bleeding disorders | SGDs<br>1hour<br>(Tutorials) | MCQs |
| 3. | Examination of bone marrow<br>• List types of bone marrow<br>• Discuss sites for bone marrow procedures<br>• List the indications for bone marrow examination<br>• Discuss M:E ratio<br>• Diagnose common hematological conditions based on main morphological characteristics.<br>**(K)** | Examination of bone marrow | SGDs<br>1hour<br>(Tutorials) | MCQs |

# Pathology Practical

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Reticulocyte count<br>• Determine the percentage of reticulocytes in the given sample of anticoagulated blood<br>**(K)** | Reticulocyte count | Demonstrations<br>90 mins | |

# Pharmacology Lectures

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Drugs used to treat anemia & Hematopoietic growth factors<br>• Enumerate hematopoietic<br>• Explain kinetics & dynamics of the drugs used for the treatment of anemia (including Iron, Vit. B12 / Folic Acid) | Drugs used to treat anemia & Hematopoietic growth factors | LGIS 50mins | MCQs |
| 2. | Coagulants & Anti-coagulants<br>• Discuss classification with basic clinical pharmacology of anticoagulants | Coagulants & Anti-coagulants | LGIS 50mins | MCQs |
| 3. | Fibrinolytic & Thrombolytic drugs<br>• Classify fibrinolytic & thrombolytic drugs<br>**(K)** | Fibrinolytic & Thrombolytic drugs | LGIS 50mins | MCQs |
| 4. | Vasoactive peptides<br>• Classify the vasoactive peptides<br>• Discuss the clinical importance and properties of different vasoactive peptides<br>• Describe the basic and clinical pharmacology of vasoactive peptides.<br>**(K)** | Vasoactive peptides | LGIS 50mins | MCQs |
| 5. | Introduction to anti-microbial therapy<br>• Explain the general principles of antimicrobial therapy and their classes and mechanism(s) of action<br>• Discuss the antimicrobial spectra of different drug classes, incidence of drug resistance and its mechanisms, and clinical uses<br>**(K)** | Introduction to anti-microbial therapy | LGIS 50mins | MCQs |
| 6. | Cell wall synthesis Inhibitors I (β-lactam antibiotics)<br>• Classify Cell Wall synthesis Inhibitors and Penicillin<br>• Describe the basic and clinical pharmacology of penicillin<br>• Explain pharmacokinetics and dynamics of penicillin<br>**(K)** | Cell wall synthesis Inhibitors I | LGIS 50mins | MCQs |

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| 7. | Cell wall synthesis inhibitors-II (Cephalosporins & Others)<br>• Describe basic and clinical pharmacology of Cephalosporins and other drugs<br>• Explain kinetics and dynamics of Cephalosporins and other drugs<br>**(K)** | Cell wall synthesis inhibitors-II | LGIS<br>50mins | MCQs |
| 8. | Protein synthesis Inhibitors-I &II<br>• Describe the basic and clinical pharmacology of Protein synthesis inhibitors<br>• Explain classification, Pharmacokinetics and dynamics of these drugs<br>**(K)** | Protein synthesis Inhibitors-I &II | LGIS<br>50mins | MCQs |
| 9. | Anti-metabolites (Sulfonamides & Trimethoprim)<br>• Classify Sulfonamides and Trimethoprim<br>• Explain their pharmacokinetics, dynamics, and their clinical uses<br>**(K)** | Anti-metabolites (Sulfonamides & Trimethoprim) | LGIS<br>50mins | MCQs |
| 10. | Fluoroquinolones<br>• Classify the Fluoroquinolones<br>• Explain their pharmacokinetics, dynamics and clinical uses<br>**(K)** | Fluoroquinolones | LGIS<br>50mins | MCQs |
| 11. | Anti-viral drugs I<br>• Classify various drugs used in the treatment of various viral infections (Except Hepatic Viral) with their pharmacokinetics and dynamics<br>**(K)** | Anti-viral drugs I | LGIS<br>50mins | MCQs |
| 12. | Antiprotozoal Drugs-I (Anti-malarial drugs)<br>• Discuss different classes of Anti-protozoal drugs, their pharmacokinetics and dynamics<br>• Classify Anti-malarial drugs<br>• Explain their pharmacokinetic and dynamics<br>**(K)** | Antiprotozoal Drugs-I (Anti-malarial drugs) | LGIS<br>50mins | MCQs |
| 13. | Immunomodulant and Suppressants Drugs I & II<br>• Classify Immunosuppressants & Immunomodulant<br>• Explain their kinetics and dynamics<br>• Describe their basic and clinical pharmacology<br>• Explain their importance and the conditions in which they are needed<br>**(K)** | Immunomodulant and Suppressants Drugs I & II | LGIS<br>50mins | MCQs |
| 14. | Anticancer Drugs I & II<br>• Enumerate causes of cancer<br>• Discuss rationale of cancer chemotherapy<br>• Classify different anticancer drugs according to the functions and cell cycle specificity<br>• Discuss their basic and clinical Pharmacology<br>**(K)** | Anticancer Drugs I & II | LGIS<br>50mins | MCQs |

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# Pharmacology Tutorials

| S No | Learning Objectives<br>By the end of the session, students will be able to: | Content Areas | Learning Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | Classify pharmacokinetics & dynamics of these agents and their clinical importance:<br>1. Coagulants, Anti-coagulants, Fibrinolytic & Thrombolytic Agents<br>2. Cell wall Synthesis Inhibitors<br>3. Protein synthesis inhibitors<br>4. Antimetabolites and Fluoroquinolones<br>5. Anti-Viral drugs<br>6. Anti-malarial drugs<br>7. Immunomodulant and Suppressants Drugs<br>8. Anti-Cancer drugs<br>**(K)** | Classification, pharmacokinetics & dynamics of these agents and their clinical importance: | SGDs<br>1hour<br>(Tutorials) | MCQs |

# Medical Education Lectures / Workshop

| S.NO | Learning Objectives (domain) At the end of session, student will be able to: | Content Areas | Teaching Activity (Duration) | Assessment |
|---|---|---|---|---|
| 1. | **Introduction to Medical Education**<br>• Appreciate the journey of medical education from learning biomedical to clinical science. **(K)** | • Plan of medical education in college<br>• Organization of undergraduate medical curriculum<br>• Integrated Curriculum | LGIS<br>50 mins | – |
| 2. | **Skills of Succeeding in a Medical College – 1**<br>• Describe the methods of learning knowledge in a medical college. **(K)** | • Difference in teaching and learning in school / college and a medical institution<br>• Learning knowledge<br>• Learning skills | LGIS<br>50 mins | – |
| 3. | **Problem – based Learning**<br>• Describe the basis of problem – based learning. **(K)**<br>• Follow the process / steps of problem – based learning session. **(S)** | • Basics of problem-based learning<br>• Process / steps of problem – based learning<br>• Practical demonstration of PBL session | Workshop<br>(2 hours) | – |
| 4. | **Medical Professionalism**<br>• Describe the basics of medical professionalism and outline the behavioral descriptors of students. **(K)** | • History of medical professionalism<br>• Principals of medial professionalism<br>• Behaviors required from medical students | LGIS<br>50 mins | – |

**Learning resource**: How to succeed at medical school, Dason Evans & Jo Brown, 2009

# TIME TABLES

# Jinnah Medical & Dental College
## MBBS I - Batch 24 (2021)
## Blood Module 2021 - WEEK 1

Lecture Venue: LH101

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|---|---|---|---|---|---|---|---|---|
| MON April 26 ABC | FOUNDATION MODULE TEST | | | | | | | |
| TUES April 27 DEF | FOUNDATION MODULE TEST | | | | | | | |
| WED April 28 ABC | 8:00-9:30 ABC – Professional Communication No Zoom for DEF | | | 9:45-10:35 PYSIOLOGY Blood Composition Dr. Sulail | 10:40-11:30 Erythropoiesis Dr. Sadaf | | 11:45-12:45 PHYSIOLOGY PRACTICAL Peripheral Blood Film Preparation/ESR M24026-M24050 (Dry Lab) SKILLS LAB Gloving & Sharps Disposal M24001-M24025 (Wet Lab) | |
| THUR April 29 DEF | 8:00-8:50 PHYSIOLOGY Hemoglobin & Iron Metabolism Dr. Sara | 8:55-9:45 BIOCHEMISTRY Hemoglobin Types & Structure Dr. Shahid | | 10:30-11:30 PHYSIOLOGY PRACTICAL Peripheral Blood Film Preparation/ESR M24076-M24100 (Dry Lab) SKILLS LAB Gloving & Sharps Disposal M24051-M24075 (Wet Lab) | | | 11:45-12:45 PHYSIOLOGY PRACTICAL Peripheral Blood Film Preparation/ESR M24051-M24075 (Dry Lab) SKILLS LAB Gloving & Sharps Disposal M24076-M24100 (LH101) | |
| FRI April 30 ABC | 8:00-8:50 PHYSIOLOGY Anemia 1- Classification & RBC Indices Dr. Sadaf | 8:55-9:45 BIOCHEMISTRY Oxygen Dissociation Curve Dr. Shahid | | 10:15-11:05 PHYSIOLOGY Hemolytic, Megaloblastic & Deficiency Anemias Dr. Sadaf | | | 11:45-12:45 PHYSIOLOGY PRACTICAL Peripheral Blood Film Preparation/ESR M24001-M24025 (Dry Lab) SKILLS LAB Gloving & Sharps Disposal M24026-M24050 (Wet Lab) | |

**Jinnah Medical & Dental College**
**MBBS 3 - Batch 22**
**BLOOD MODULE–Week 1**

Lecture Venue: Wednesday (AB), Thursday (CD), Friday (EF): JMDC LH 103; Monday, Tuesday, Saturday: LH1 & LH 2 Korangi

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|---|---|---|---|---|---|---|---|
| MON 12 April | CLINICS (Rotation 6; Week 1) (9:00 – 12:00) | | | | SELF STUDY | | |
| TUES 13 April | CLINICS (Rotation 6; Week 1) (9:00 – 12:00) | | | | SELF STUDY | | |
| WED 14 April | 8:30-9:20 | 9:30-10:20 | 10:30-11:20 | 12:00-1:30 | | 1:45-3:15 | |
| | FOUNDATION MODULE TEST | | | | | | |
| THURS 15 April | FOUNDATION MODULE TEST | | | | | | |
| FRI 16 April | 8:00-8:50 PATHOLOGY Anemia Classification | 9:00-9:50 PHARMA Anemia Treatment Drugs & Hematopoietic Growth Factors Dr. Samia | 10:00-10:50 PATHOLOGY Diminished Erythropoiesis (IDA) | 11:00-11:50 PHARMA Coagulants & Anti-Coagulants Dr. Nasir Ali | | PRAYER | |
| SAT 17 April | CLINICS (Rotation 6; Week 1) (9:00-12:00) | | | | 12:00-1:00 COMMUNITY MEDICINE Nutritional Anemia Dr. Shagufta | SELF STUDY | |

**TRANSPORT WILL LEAVE JMDC FOR KORANGI AT 8:15 AM MONDAY, TUESDAY.**

# Week 5

## End of Blood Module

## Blood Module 2 Test Theory

## Blood Module 2 Test OSCE