LIAQUAT NATIONAL HOSPITAL AND MEDICAL COLLEGE

Institute for Postgraduate Medical Studies & Health Science

Blood Module II

24th February TO 20th April 2025

2025

STUDY GUIDE FOR BLOOD-2 MODULE

Module name: ***Blood-II*** *Year:* ***Three*** *Duration:* ***7 weeks (Feb – April 2025)***

Timetable hours: **Lectures, Case-Based Learning (CBL), Clinical Rotations, learning experience in LNH outreach centers, Laboratory, Practical, Demonstrations, Skills, Self-Study**

MODULE INTEGRATED COMMITTEE

MODULE COORDINATORS:	• Dr. Naila Raza
CO-COORDINATORS:	• Dr. Umm-E-Rabab • Dr. Haya Noor

FACULTY RESPONSIBLE FOR THE FACILITATION OF LEARNING

BASIC HEALTH SCIENCES	CLINICAL AND ANCILLARY DEPARTMENTS
COMMUNITY MEDICINE Dr. Saima Zainab	***FAMILY MEDICINE*** Dr. Rabeeya Saeed
FORENSIC MEDICINE Professor Syed Mukkaram Ali	***ONCOLOGY*** Dr. Naila Zahid
MICROBIOLOGY Professor Shaheen Sharafat	
PATHOLOGY Professor Naveen Faridi	
PHARMACOLOGY Professor Tabassum Zehra	

DEPARTMENT OF HEALTH PROFESSIONS EDUCATION

- Prof. Sobia Ali
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- Dr. Yusra Nasir
- Dr. Haya Noor

LNH&MC MANAGEMENT

- Professor KU Makki, Principal LNH&MC
- Dr. Shaheena Akbani, Director A.A & R.T LNH&MC

STUDY GUIDE COMPILED BY: Department of Health Professions Education

INTRODUCTION

WHAT IS A STUDY GUIDE?

It is an aid to:

- Inform students how the student learning program module has been organized
- Help students organize and manage their studies throughout the module
- Guide students on assessment methods, rules, and regulations

THE STUDY GUIDE:

- Communicates information on the organization and management of the module. This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of themodule.
- Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial, and case-based learning that will be implemented to achieve the module objectives.
- Provides a list of learning resources such as books, computer-assisted learning programs, web- links, and journals for students to consult to maximize their learning.
- Highlights information on the contribution of continuous and Term examinations on the student's overall performance.
- Includes information on the assessment methods that will be held to determine every student's achievement of objectives.
- Focuses on information about examination policy, rules, and regulations.

CURRICULUM FRAMEWORK

Students will experience an *integrated curriculum* similar to previous modules**.**

INTEGRATED CURRICULUM comprises system-based modules such as Blood-II, Locomotor-II, Respiratory system-II, CVS-II, and GIT & Liver II which links basic science knowledge to clinical problems. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have a better understanding of basic sciences when they repeatedly learn about clinical examples.

LEARNING EXPERIENCES: Case-based integrated discussions, and skills acquisition in the skills lab. Computer-based assignments, learning experiences in clinics, wards, and outreach centers

LEARNING METHODOLOGIES

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

- Interactive Lectures
- Small Group Discussion
- Case- Based Learning (CBL)
- Clinical Experiences
  - Clinical Rotations
- Practicals
- Skills session
- Self-Directed Learning

INTERACTIVE LECTURE: In a large group, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through questions, pictures, videos of patients' interviews, exercises, etc. Students are actively involved in the learning process.

SMALL GROUP DISCUSSION: This format helps students to clarify concepts and acquire skills or attitudes. Sessions are structured with the help of specific exercises such as patient cases, interviews, or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials, and self-study. The facilitator's role is to ask probing questions, summarize, or rephrase to help clarify concepts.

CASE-BASED LEARNING (CBL): A small group discussion format where learning is focused on a series of questions based on a clinical scenario. Students discuss and answer the questions by applying relevant knowledge gained previously in clinical and basic health sciences during the module and constructing new knowledge. The CBL will be provided by the concerned department. CBL will be provided by the concerned department.

CLINICAL LEARNING EXPERIENCES: In small groups, students observe patients with signs and symptoms in hospital wards, clinics, and outreach centers. This helps students to relate knowledge of basic and clinical sciences of the module and prepare for future practice.

- **CLINICAL ROTATIONS:** In small groups, students rotate in different wards like Medicine, Pediatrics, Surgery, Obs & Gyne, ENT, Eye, Family Medicine clinics, outreach centers & Community Medicine experiences. Here students observe patients, take histories and perform supervised clinical examinations in outpatient and inpatient settings. They also get an opportunity to observe medical personnel working as a team. These rotations help students relate basic medical and clinical knowledge in diverse clinical areas.

PRACTICAL: Basic science practical related to pharmacology, microbiology, forensic medicine, and community medicine have been scheduled for student learning.

SKILLS SESSION: Skills relevant to the respective module are observed and practiced where applicable in the skills laboratory.

SELF-DIRECTED Learning: Students assume responsibilities for their learning through individual study, sharing and discussing with peers, and seeking information from Learning Resource Center, teachers, and resource persons within and outside the college. Students can utilize the time within the college's scheduled hours of self-study.

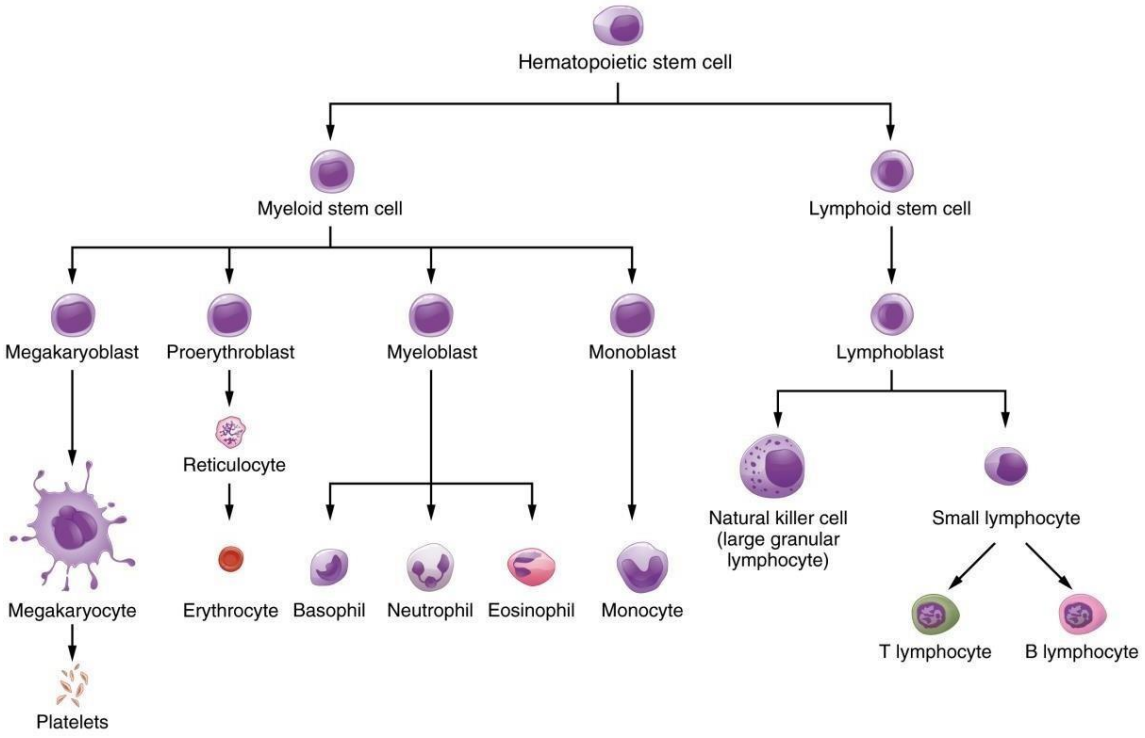
BLOOD-2 MODULE

INTRODUCTION

For MBBS third-year students, the Blood-2 module concentrates on knowledge and skills required for diagnosis and outlining the management plan of common hereditary, immunological, and neoplastic disorders of blood and its components. The module covers as well the principles and techniques of laboratory investigations essential for the diagnosis, and monitoring of the treatment of hematological disorders.

Because of its prevalence in Pakistan, adequate coverage is given to different types of anemia, thalassemia, and other related disorders. Moreover, the objectives include blood transfusion and blood donation practices to promote safe transfusion and appropriate use of blood components.

The Blood-2 module learning objectives take into consideration previously acquired pertinent knowledge in the Blood module of MBBS in the first year. The module integrates with related disciplines such as Community Medicine, Forensic Medicine, Microbiology, Hematology/ Pathology, and Pharmacology. It is expected that different learning experiences would help students build new knowledge, and enhance students' understanding and motivation to seek further knowledge.



COURSE TOPICS, OBJECTIVES, AND TEACHING STRATEGIES

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

COMMUNITY MEDICINE

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Nutritional Anemia	Tutorial
• Define Anemia	
• Classify Anemia	
• List the causes of nutritional anemia	
• Explain the consequences of nutritional anemia	
• Discuss prevention and control of nutritional anemia	
2. Immunity, Vaccines, and Cold Chain	Tutorial
• Define Immunity	
• Explain the difference between Vaccination and Immunization	
• Describe Live and Killed Vaccines	
• Discuss the adverse reactions following immunization	
• Explain Cold Chain and its importance	
3. Expanded Program of Immunization	Tutorial
• Explain the objective of the EPI Programme	
• Describe immunization	
• Discuss the ongoing EPI program in Pakistan	
4. Cancer epidemiology and prevention	Interactive Lecture
• Define cancer and its epidemiology	
• Classify cancers	
• Discuss different carcinogens	
• Explain levels of prevention of cancer	
5. Malaria and prevention	Interactive Lecture
• Explain the epidemiology of Malaria	
• Discuss the risk factors of Malaria	
• List the types of Malarial Parasite	
• Name the Vector of Malaria	
• Discuss the complications of Malaria	
• Discuss the Prevention and Control of Malaria	
• Describe the National Control Programme of Pakistan	
6. Dengue fever and prevention	Interactive Lecture
• Explain the epidemiology of Dengue	
• Discuss risk factors of Dengue	
• List the Vectors of Dengue	
• Discuss the complications of Dengue fever	

• Discuss the prevention and control of Dengue	
7. Vaccination Center	
8. Prevalence of Thalassemia & Sickle cell disease	Interactive Lecture
• Describe Thalassemia	
• Classify different types of Thalassemia	
• Describe Sickle cell disease	
• List the different types of Sickle cell diseases	
• Discuss the prevalence of Thalassemia and Sickle cell diseases in Pakistan	

FAMILY MEDICINE

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Approach to patients with anemia	Interactive Lectures
• Discuss etiology, differential diagnoses, investigations relevant for anemia	
• Discuss the outline of management plan for the condition	
2. Approach to hematological malignancies	

FORENSIC MEDICINE

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Biological Stains (Blood)	Interactive Lecture.
• List the tests used to identify blood in a stain	
• Identify the tests used for determination of origin (species), age, source (Arterial or venous), blood groups, and sexing of bloodstain	
• Differentiate between antemortem and postmortem blood stains	
• Explain the role of bloodstain pattern analysis in forensic medicine	
• Describe the tests for blood stains (Physical, Microscopic, Chemical, Biological, Spectroscopic)	
2. Biological Stains (Seminal Stains)	Interactive Lecture
• Describe the composition of semen	
• List the criteria for a normal sperm count as per WHO	
• Discuss the medico-legal importance of seminal stains	
• Enumerate the various methods of collection of seminal material and determination of motility of sperms	
• Describe the physical, chemical, microscopic, electrophoretic, and immunological tests for the examination of seminal stains.	
• Explain the role of seminal stains in the determination of blood groups	

3. Analytic Techniques	Interactive Lecture
• Explain the methods, principles, and uses of the following analytic techniques:	
I. Thin Layer Chromatography	
II. Gas Chromatography	
III. High-Pressure Liquid Chromatography	

IV. Spectrophotometry	
V. Stass Otto process	
4. Laws to medical man – I	Interactive Lecture
• Describe Medical ethics, its background (Hippocratic Oath), and its significance	
• Explain the principles of Bioethics	
• List the duties of a doctor as advised by the international code of medical ethics	
• Discuss the regulatory council {Pakistan Medical Commission (PMC)}, its composition, functions, and its role in Medical and Dental Education	
5. Laws to medical man – II	Interactive Lecture
• List privileges & obligations of the registered medical practitioner	
• Describe Professional misconduct (Infamous conduct)	
• Explain the types of Consent and their role in relation to Medical Examination	
• List the criteria for giving valid consent	
• Describe the doctrine of informed consent (Rule of full disclosure)	
• Discuss the deviations/exemptions of consent	
6. Laws to medical man-III	Interactive Lecture
• Describe Professional negligence	
• List the types of negligence	
• Explain the following terms with examples:	
i. Res- Ipsa- Loquotar	
ii. Novus Actus Interveniens	
iii. Vicarious Liability	
7. Laws about a medical man – IV	Interactive Lecture
• Summarize 5 D'S for the plaintiff's success	
• Discuss briefly the following:	
i. Compensation for Medical Negligence	
ii. Defenses for the defendant's doctor	
iii. Defenses for reducing damages	
• List the salient features of the Transplantation of Human Organs & Tissues Act 2010	
• Explain Euthanasia, its types, and ethical issues related to it	
8. Hepatic Poisons- Alcohol	Interactive Lecture
• Enumerate the sources of alcohol and various concentrations of alcohol which affect human behavior with medicolegal	
• Explain the absorption, metabolism, and excretion of alcohol	
• Describe the signs and symptoms of alcohol intoxication	
• Discuss the procedure of examination of a drunkard by a medicolegal officer	
• Describe the preservation of specimens and Lab tests for alcohol detection	
• Discuss briefly chronic alcoholism, withdrawal syndromes, and Antabuse therapy	
• Enumerate the postmortem findings of alcoholism	
• Discuss Methyl Alcohol intoxication, its complications, and postmortem findings	
9. Blood grouping	Practical
• List the commonly used blood grouping systems	
• Discuss the medicolegal importance of ABO and Rh blood groups	
10. MedicoLegal report and examination of a person who consumed alcohol	

• Explain the procedure of examination of a drunkard person	
• Discuss the medicolegal report of a person who consumed alcohol	Tutorial
11. Kerosene oil and petroleum products poisoning (Hydrocarbons)	Tutorial
• Describe the mode of action, signs, symptoms, treatment, postmortem findings, and medicolegal aspects of Kerosene oil and petroleum products poisoning	
12. Visit Blood Bank LNH	
13. Body Fluid Examination tests	

MICROBIOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Pathogens causing sepsis	Interactive Lecture/Small Group Discussion
• List the organisms causing sepsis & the clinical findings of staphylococcal infections	
• Describe the important properties and species of staphylococcus	
• Discuss diseases caused by staphylococcus	
• Describe the transmission and pathogenesis of staphylococcus	
• Discuss laboratory diagnosis, treatment, and prevention of staphylococcus infections	
2. Gram-negative rods: (Zoonotic organisms)	Interactive Lecture
• Discuss the important properties, pathogenesis, clinical findings, laboratory diagnosis, and prevention of Francisella, Yersinia, Pasteurella, Bartonella, Brucella	
3. Rickettsiae	
• Describe the important properties of Rickettsiae	
• Discuss diseases caused by Rickettsiae	
• Describe the transmission and pathogenesis of Rickettsiae	
• List the clinical findings of Rickettsial infections	
• Discuss laboratory diagnosis, treatment, and prevention of Rickettsiae	
4. Serological testing of bacterial and viral diseases	Interactive Lecture/Tutorial
• Discuss the diagnosis of infectious diseases on the basis of serology (Ab-based test)	
• Discuss the concepts of agglutination, precipitation and immunofluorescence, ELISA	
• Discuss identification in cell culture	
5. Arboviruses	Interactive Lecture/Tutorial
• Discuss in detail Dengue, Yellow fever, Chikungunya, and Ebola fever	
6. HIV I	Interactive Lecture/Tutorial
• Discuss the important properties of HIV	
• Summarize the replicative cycle of HIV	
• Describe the transmission, and epidemiology of HIV	
• Discuss pathogenesis related to HIV/ AIDS	
7. HIV II	Interactive Lecture/Tutorial
• Discuss the clinical findings of HIV/ AIDS	
• Discuss the laboratory diagnosis, immunity related to AIDS	
• Discuss the treatment and prevention of HIV and AIDS	
8. Blood and tissue protozoa I	

• Discuss the basic terminologies related to parasitology	Interactive Lecture/Tutorial
• Discuss the important properties of plasmodium, its pathogenesis, and epidemiology	
• Describe the clinical findings and laboratory diagnosis of Malaria	
• Describe the treatment and prevention of malaria	
9. Blood and tissue protozoa II	Interactive Lecture
• Discuss the important properties of Leishmania and Toxoplasma	
• Describe the pathogenesis, and clinical findings of Leishmaniasis and toxoplasma	
• Discuss laboratory diagnosis, treatment, and prevention of Leishmaniasis and toxoplasma	
10. Tissue nematodes I (Wuchereria, Onchocerca, Loa Loa, Dracunculus)	Interactive Lecture
• Discuss the important properties of tissue nematodes; Wuchereria, Onchocerca, Loa Loa, and Dracunculus	
• Describe the pathogenesis, and clinical findings of these nematodes	
• Discuss the laboratory diagnosis, treatment, and prevention of diseases caused by tissue Nematodes	
11. Tissue nematodes II (Toxocara, Trichenella, Ancylostoma, Angiostrongylus, Anisakis)	Interactive Lecture
• Discuss the important properties of tissue nematodes; Toxocara, Trichenella, Ancylostoma, Angiostrongylus, and Anisakis	
• Describe the pathogenesis, and clinical findings of these nematodes	
• Discuss laboratory diagnosis, treatment, and prevention of diseases caused by these nematodes	
12. Patient safety and infection control- Patient care & safety	
• Define Safety	
• Discuss the significance of building of a safety culture	
• Explain the integration of risk management activity	
• Describe the implementation of solutions to prevent harm	
• Explain the importance of involving patients and the public	

ONCOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Neoplastic disorders of WBC (Acute leukemia)	Interactive Lecture
• Discuss etiologic and pathogenetic factors of white cell neoplasms.	
• Define acute leukemia, acute lymphoblastic leukemia, and acute myeloblastic leukemia	
• Describe the pathogenesis, morphology, clinical presentation, and prognosis of acute lymphoblastic and acute myeloblastic leukemia	
2. Non-Hodgkin lymphoma	Interactive Lecture/Tutorial
• List the WHO classification of Non-Hodgkin Lymphomas	
• Discuss pathogenesis, morphology, and clinical features of Small lymphocytic lymphoma (chronic lymphocytic leukemia), Follicular Lymphoma, Diffuse Large B-Cell Lymphoma, Burkitt Lymphoma, Mantle Cell Lymphoma, Hairy Cell Leukemia	
3. Hodgkin lymphoma	

• Discuss the pathogenesis, morphology, and clinical presentation of Hodgkin Lymphoma (HL)	Interactive Lecture/Tutorial
• List subtypes of HL.	
• Differentiate between Hodgkin Lymphoma (HL) and Non-Hodgkin Lymphomas (NHL)	
• Enumerate the clinical staging of Hodgkin and Non-Hodgkin Lymphomas (Ann Arbor Classification)	
• Discuss the pathogenesis, morphology, and clinical presentation of Hodgkin Lymphoma	
4.Malignant Lymphomas	

PATHOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Classification of anemia	Tutorial
• Define anemia	
• Describe the morphologic characteristics and reference range of red cell indices	
• Classify anemia according to underlying mechanism and morphology	
• Discuss the effects of acute and chronic blood loss	
2. Anemia of diminished erythropoiesis I	Interactive Lecture
• List the types of anemia associated with red cell underproduction	
• Discuss the causes of megaloblastic anemia	
• Describe the peripheral blood findings/morphology in megaloblastic anemia	
• Define pernicious anemia	
• Discuss metabolism and the biochemical functions of vitamin B12	
• Describe the pathogenesis, morphology, and clinical features of pernicious anemia	
• List the causes of folate deficiency	
• Discuss the metabolic processes related to folic acid	
• List the chronic illnesses associated with anemia of chronic diseases	
• Discuss briefly the mechanism involved in anemia of chronic diseases	
• Discuss briefly the basis of anemia in renal failure, hepatocellular disease & endocrine disease	
3. Anemia of diminished erythropoiesis II	Tutorial
• Define aplastic anemia, pure red cell aplasia, myelophthisic anemia, polycythemia	
• List the causes of pure red cell aplasia & myelophthisic anemia	
• Describe the normal iron metabolism	
• Discuss the etiology of iron deficiency anemia	
• Describe the pathogenesis & clinical features of iron deficiency anemia	
• Discuss the morphological findings in the bone marrow and peripheral blood smear	
• Discuss the major causes of aplastic anemia	
• Describe the pathophysiology of aplastic anemia	
• Discuss briefly the morphology & clinical features of aplastic anemia	
• Discuss the causes of both types of polycythemia	

4. Hemolytic anemia I	Interactive Lecture/Tutorial
• Describe extravascular & intravascular hemolysis	
• Discuss briefly the morphology of hemolytic anemia	
• Define hereditary spherocytosis	
• Describe the pathogenesis, morphology & clinical features of hereditary spherocytosis	
• Discuss the causes & pathogenesis of G6PD deficiency	
• Discuss briefly the ABO incompatibility and Rh- immunization	
5. Hemolytic anemia II	Interactive Lecture/Tutorial
• Define sickle cell disease, immune hemolytic anemia, and paroxysmal nocturnal hemoglobinuria (PNH)	
• Describe the pathogenesis, morphology & clinical features of sickle cell disease	
• Discuss the pathogenesis, manifestations & diagnosis of PNH	
• Classify immune hemolytic anemia	
• Discuss direct & indirect Coombs antiglobulin test	
• Discuss the causes of hemolytic anemia resulting from trauma to red cells	
6. Thalassemia syndrome	Interactive Lecture/Tutorial
• Define thalassemia syndrome	
• Classify thalassemia	
• Discuss the pathogenesis, the clinical syndromes, diagnosis & types of beta thalassemia	
• Discuss the morphology of beta thalassemia major/minor	
• Discuss the pathogenesis & types of alpha thalassemia	
7. Overview and classification of WBC disorders (Non-neoplastic)	Interactive Lecture/Tutorial
• Discuss briefly the pathogenesis, causes, morphology, and clinical features in neutropenia and leukocytosis.	
• List the causes of neutrophilia, eosinophilia, basophilia, monocytosis, and lymphocytosis.	
• Summarize lymphadenitis (acute and chronic nonspecific lymphadenitis patterns)	
8. Myeloproliferative disorders (MPD) and Myelodysplastic Syndrome (MDS)	Interactive Lecture
• Define MPD and MDS	
• Describe the pathogenesis, morphological findings, and clinical features of Chronic Myelogenous Leukemia, Polycythemia Vera, Essential Thrombocytosis, Primary Myelofibrosis, MDS	
9. Bleeding disorders I (Platelet disorders)	Interactive Lecture/Tutorial
• List the causes of thrombocytopenia	
• Discuss briefly the bleeding disorders caused by vessel wall abnormalities	
• Describe clinical presentation, and morphological findings in Immune Thrombocytopenic Purpura (ITP)	
• Differentiate between acute and chronic ITP	
• Discuss briefly Bernard-Soulier syndrome & Glanzmann thrombasthenia	
• Summarize drug-induced Thrombocytopenia	
10. Bleeding disorders II (DIC, Thrombotic Thrombocytopenic Purpura, Hemolytic Uremic Syndrome)	Interactive Lecture/Tutorial
• Discuss the etiology, pathogenesis, & clinical presentation of Thrombotic Thrombocytopenic Purpura and Hemolytic Uremic Syndrome	
• Define DIC	

• Describe the etiology and pathogenesis of DIC	
11. Coagulation disorders	Interactive Lecture/Tutorial
• Explain the factor VIII- Von Willebrand (vWF) Complex	
• Discuss the types and clinical presentation of Von Willebrand disease	
• Describe the genetic defects, clinical features, and lab findings in Hemophilia A & B	
	Interactive Lecture
13. Anemia of chronic diseases	Tutorial
• List the chronic illnesses associated with anemia of chronic diseases	
• Briefly discuss the mechanism involved in anemia of chronic diseases	
• Briefly discuss the basis of anemia in renal failure, hepatocellular disease &endocrine disease	
14. Examination of bone marrow	Practical
• List the types of bone marrow	
• Discuss sites for bone marrow procedures	
• List the indications for bone marrow examination	
• Discuss the M: E ratio	
• Diagnose common hematological conditions based on main morphological characteristics	

PHARMACOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Drugs used to treat Anemia and Hematopoietic Growth Factors	Interactive Lecture
• List the hematopoietic agents	
• Explain the basic and clinical pharmacology of drugs used to treat anemias (including Iron, Vit.B12, and Folic Acid)	
2. Coagulants & Anti-Coagulants	Small Group Discussion
• Classify coagulants, anti-coagulants,	
• Discuss basic and clinical pharmacology of anticoagulants, clinical uses, and adverse effects	
3. Fibrinolytic & Thrombolytic drugs	
• Classify fibrinolytic & thrombolytic drugs and describe their basic and clinical pharmacology	
4. Vasoactive Peptides	
• Classify vasoactive peptides	
• Discuss the clinical importance and properties of different vasoactive peptides	
• Describe the basic and clinical pharmacology of vasoactive peptides	
5. Introduction to Anti-Microbial Therapy	Interactive Lecture
• Explain the general principles of antimicrobial therapy	
• Classify and discuss mechanism(s) of action of antimicrobials	
• Discuss antimicrobial spectra of different drug classes and drug resistance mechanisms	
• List the clinical uses and their adverse effects	
6. Cell Wall Synthesis Inhibitors-I (β-Lactam Antibiotics)	Interactive Lecture
• Classify the types of Penicillin	
• Describe the basic and clinical pharmacology of Penicillin	

7. Cell Wall Synthesis Inhibitors-II (Cephalosporins & Others)	Interactive Lecture
• Classify Cephalosporins	
• Describe the basic and clinical pharmacology of cephalosporins and other drugs	
• Classify cell wall synthesis inhibitors	
• Discuss their pharmacokinetics and dynamics, and their clinical importance	
8. Protein Synthesis Inhibitors-I & II	Interactive Lecture
• Describe the basic and clinical pharmacology of protein synthesis inhibitors	
• Classify protein synthesis inhibitors	
• Discuss their pharmacokinetics and dynamics, and clinical importance	
9. Anti-Metabolites (Sulfonamides & Trimethoprim)	Interactive Lecture
• Classify Sulfonamides and Trimethoprim	
• Explain the pharmacokinetics, pharmacodynamics, adverse effects, and their clinical uses	
• Describe basic and clinical pharmacology	
• List clinical uses and adverse effects	
10. Fluoroquinolones	Interactive Lecture
• Classify Fluoroquinolones	
• Describe basic and clinical pharmacology	
• List clinical uses and adverse effects	
11. Drug treatment of Malaria & Dengue	Tutorial
• Classify the drugs used to treat malaria	
• Discuss their pharmacokinetics, pharmacodynamics, and resistance	
• Discuss the clinical importance of anti-malarial agents and drugs used in dengue fever	
12. Anti-Metabolites and Fluoroquinolones	Interactive Lecture
• Classify anti-metabolites and fluoroquinolones	
• Discuss their pharmacokinetics and pharmacodynamics, clinical uses, and adverse effects	
13. Anti-Viral Drugs-I	Small Group Discussion
• Classify drugs used in the treatment of various viral infections (except drugs used in viral hepatitis)	
• Discuss their mode of action, pharmacokinetics, pharmacodynamics, and adverse effects	
• Classify anti-viral drugs	
• Discuss their pharmacokinetics and pharmacodynamics	
• Discuss the clinical importance of anti-viral agents (except drugs used in viral hepatitis)	
14. Anti-Protozoal Drugs-I (Anti-Malarial Drugs)	Interactive Lecture
• Classify antiprotozoal drugs	
• Classify the drugs used to treat malaria	
• Discuss their pharmacokinetics and pharmacodynamics, resistance	
• Discuss the clinical importance of anti-malarial agents and drugs used in dengue fever	
• Describe their clinical uses and adverse effects	
15. Anti-Cancer Drugs-I & II	Case- Based Learning (CBL)
• Describe the causes of cancer and discuss the rationale for cancer chemotherapy	
• Classify anticancer drugs according to cell cycle specificity	
• Discuss the basic and clinical pharmacology of anti-cancer drugs	
16. Anti-Fungal Drugs	Case-Based Learning (CBL)
• Classify anti-fungal drugs	
• Discuss the basic and clinical pharmacology of antifungal drugs	

Surgery

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Metabolic Response to Injury	Interactive Lecture
• Discuss the basic concepts in homeostasis	
• Describe the graded nature of response to injur	
• Explain the mediators of the metabolic response to injury	Interactive Lecture
• Explain the metabolic stress response to surgery and trauma: the 'ebb and flow' model	
• Discuss the changes in body composition following injury	
• List the avoidable factors that compound the response to injury.	
2. Fluid & Electrolytes	
• Define the body fluid compartments, minimal obligatory output, daily fluid and electrolyte requirements for normal individuals.	
• Explain the fluid and electrolyte requirements in the pre-operative, peri-operative and postoperative period (insensible fluid losses, maintenance fluid requirements, individual patient's fluid requirements, replacement fluid and electrolytes, Macronutrient requirements, Crystalloids and colloids fluids, isotonic, hypertonic, hypotonic fluids).	
• Describe the management of fluid overload	
3. Wound Healing	
• Classify wound closure and healing	Interactive Lecture
• Describe the types of wounds	
• Describe the phases of normal wound healing	
• Factors influencing wound healing	
• Explain the various types of abnormal wound healing and their treatment: Hypertrophic Scar & Keloids	
• Differentiate between acute and chronic wounds	Interactive Lecture
• Explain the management of acute and chronic wounds, scars and contractures	
• Discuss Compartment syndrom	
• Classify Sulfonamides and Trimethoprim	
• Explain the pharmacokinetics, pharmacodynamics, adverse effects, and their clinical uses	
• Describe basic and clinical pharmacology	
• List clinical uses and adverse effects	

Skills Lab

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Injection Techniques	Tutorial
• Arterial Cannulation	
• Intravenous Cannulation	
2. Vertebral Column Injury	
Equipment / material needed	
• Gloves	
• Needles	
• Sterile gauze	

Longitudinal Curriculum

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Research	Tutorial
• Inferential Statistics: Point Estimates	
• Confidence Interval	Lecture
• Hypothesis Testing	
2. Bioethics	Small Group
• Common Terminologies	
• **3. Patient Safety**	Lecture
• Drug Safety	

Apart from attending daily scheduled sessions, students too should engage in self-study to ensure that all the objectives are covered

LEARNING RESOURCES

SUBJECT	*RESOURCES*
COMMUNITY MEDICINE	**TEXTBOOKS** 1. Preventive and Social Medicine by K Park 2. Community Medicine by M Illyas 3. Basic *Statistics* for the Health Sciences by Jan W Kuzma
FORENSIC MEDICINE	**TEX BOOKS** 1. Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002. 2. Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005. **REFERENCE BOOKS** 3. Knight B. Simpson's Forensic Medicine. 11th ed.1993. 4. Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004 5. Krishan VIJ. Tex book of forensic medicine and toxicology (principles and practice). 4th ed. 2007 6. Dikshit P.C. Textbook of forensic medicine and toxicology. 1st ed. 2010 7. Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010. 8. Rao. Atlas of Forensic Medicine (latest edition). 9. Rao.Practical Forensic Medicine 3rd ed,2007. 10. Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993 11. Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999 **CDs:** 1. Lectures on Forensic Medicine. 2. Atlas of Forensic Medicine. **WEBSITES:** www.forensicmedicine.co.uk
MICROBIOLOGY	**TEX BOOK** 1. Jawetz Melnick & Adelbergs Medical Microbiology 28 E 28th Edition
HEMATOLOGY/ PATHOLOGY	**TEXTBOOKS** 1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD **WEBSITES:** 1. http://www.hematology.org/Educators/High-School.aspx#a2 2. http://imagebank.hematology.org/
PHARMACOLOGY	**A. TEX BOOKS** 1. Lippincott Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung

ADDITIONAL LEARNING RESOURCES

Hands-on Activities/ Practical	Students will be involved in Practical sessions and hands-on activities that link with the hematology module to enhance their learning.
Labs	Utilize the lab to relate the knowledge to the specimens and models available.
Skills Lab **Iv cannulation**	A skills lab provides the simulators to learn basic skills and procedures. This helps build the confidence to approach the patients. https://opentextbc.ca/clinicalskills/chapter/6-8-iv-push-medications-and-saline-lock-flush/
Videos	Video familiarizes the student with the procedures and protocols to assist patients.
Computer Lab/CDs/DVDs/Internet Resources:	To increase their knowledge students should utilize the available internet resources and CDs/DVDs. This will be an added advantage to increase learning.
Self Learning	Self Learning is scheduled to search for information to solve cases, read through different resources, and discuss among peers and with the faculty to clarify the concepts.

ASSESSMENT METHODS:

- **Best Choice Questions(BCQs)** also known as MCQs (Multiple Choice Questions)
- **Objective Structured Practical/Clinical Examination (OSPE or OSCE)**

Internal Evaluation

- Students will be assessed comprehensively through multiple methods.
- 20% marks of internal evaluation will be added to JSMU final exam. That 20% may include class tests, assignments, practicals, and the internal exam which will all have specific marks allocation.

Formative Assessment

The individual department may hold a quiz or short answer questions to help students assess their learning. The marks obtained are not included in the internal evaluation

For JSMU Examination Policy, please consult the JSMU website!

More than 75% attendance is needed to sit for the internal and final examinations

LNH&MC EXAMINATION N RULES & REGULATIONS

- Students must report to the examination hall/venue, 30 minutes before the exam.
- **The exam will begin sharply at the given time.**
- No student will be allowed to enter the examination hall after 15 minutes of the scheduled examination time.
- Students must sit according to their roll numbers mentioned on the seats.
- **Cell phones are strictly not allowed in the examination hall.**
- If any student is found with a cell phone in any mode (silent, switched off, or on) he/she will not be allowed to continue their exam.
- No students will be allowed to sit in the exam without University Admit Card, LNMC College ID Card, and Lab Coat
- Students must bring the following stationary items for the exam: Pen, Pencil, Eraser, and Sharpener.
- Indiscipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

SCHEDULE

WEEKS	3RD YEAR	MONTH
10 WEEKS	FOUNDATION II MODULE	16th December 2025
		19th February 2025
7 WEEKS	BLOOD II MODULE	24th February 2025
		20th April 2025
Mid-Term Examination*		

- *Final dates will be announced later