



Form: Course Syllabus	Form Number	EXC-01-02-02A
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1.	Course Title	Blood and the Lymphoreticular System
2.	Course Number	0500371
3.	Credit Hours (Theory, Practical)	4 (3.5, 0.5)
	Contact Hours (Theory, Practical)	26 face-to-face lectures, 24 online lectures, and 5 laboratory sessions
4.	Prerequisites/ Corequisites	---
5.	Program Title	Doctor of Medicine
6.	Program Code	05
7.	School/ Center	School of Medicine
8.	Departments	Department of Anatomy and Histology Department of Physiology and Biochemistry Department of Pathology, Microbiology and Forensic Medicine Department of Pharmacology
9.	Course Level	Undergraduate
10.	Year of Study and Semester (s)	3rd year, First Semester
11.	Program Degree	MD
12.	Other Department(s) Involved in Teaching the Course	Department of Internal Medicine
13.	Learning Language	English
14.	Learning Types	☐ Face to face learning ☒ Blended ☐ Fully online
15.	Online Platforms(s)	☒ Moodle ☒ Microsoft Teams
16.	Issuing Date	10 October 2026
17.	Revision Date	25 September 2025

**18. Course Coordinator:**

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19. Other Instructors:

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20. Course Description:**DESCRIPTION**

The Blood and the Lymphoreticular System course aims to provide a comprehensive study of the hematopoietic and lymphatic systems, emphasizing both their normal structure and function as well as common pathological conditions. The MD students in this course will explore the cellular elements of blood and lymph, with a particular focus on the histology and physiology of the central and peripheral lymphoid organs, including the bone marrow, thymus, spleen, and lymph nodes. Key topics include the production, differentiation, and regulation of blood cells, along with their histologic, physiologic, and biochemical properties. The course also covers the principles of pro-coagulation and anti-coagulation factors, blood group systems, and the ultrastructure of normal and abnormal hemoglobin, highlighting the relationship between structural variations and functional implications. A special focus is placed on understanding diseases that affect the blood and lymphatic systems, such as red blood cell disorders, including various forms of anemia; white blood cell disorders involving quantitative and functional abnormalities; hematologic malignancies; diseases of the spleen and lymphatic organs; and infections that primarily target the red blood cells, lymphocytes, and phagocytes. Students will also be introduced to the clinical aspects of these disorders, including signs and symptoms, a brief discussion through PBL sessions, and will be introduced to the basic therapeutic



principles used in their management. This course is designed to build a strong foundation in hematology by integrating basic science with clinical application. Students will progress from learning the normal characteristics of blood and lymphatic cells to examining common pathological conditions and understanding the rationale behind pharmacologic interventions in a coordinated manner.

AIMS

Thus, the aim of this course is to introduce basic knowledge about the hematopoietic and lymphatic system in humans. The cellular element of the blood is the main focus, where students will learn their histologic, physiologic, and biochemical properties, explore blood microbes causing blood stream infections, then move to common pathologic conditions and pharmacologic drugs used in their treatment.

21. Program Intended Learning Outcomes (to be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program):

1. Demonstrate basic knowledge of normal human structure and function at molecular, genetic, cellular, tissue, organ, system and whole-body levels in terms of growth, development, and health maintenance. Analyze the basic molecular and cellular mechanisms involved in the causation and treatment of human disease and their influence on clinical presentation and therapy.
2. Collect, interpret, document, and communicate accurately a comprehensive medical history, including the psychological and behavioral factors, and a thorough organ-system-specific physical examination inclusive of the mental status of the patient.
3. Integrate and communicate collected clinical information in the construction of appropriate diagnostic and therapeutic management strategies to identify life-threatening conditions ensuring prompt therapy, referral, and consultation with relevant disciplines and skillfully perform basic medical procedures for general practice on patients with common illness, acute and chronic, taking into account environmental, social, cultural and psychological factors.
4. Demonstrate in-depth knowledge of the epidemiology and biostatistics of common diseases, and analyze the impact of ethnicity, culture, socioeconomic factors and other social factors on health, disease and individual patient's health care.
5. Communicate effectively and professionally, both orally and in writing, with patients, their families, and with other healthcare providers utilizing information technology resources in his/her scholarly activities and professional development with the ability to teach others, and to understand and respect other healthcare professionals' roles, and apply the principles of multidisciplinary teamwork dynamics and collaboration.
6. Apply scientific methods including evidence –based approach to the medical practice including problem identification, data collection, hypothesis formulation, etc., and apply inductive reasoning to problem solving and ensure that clinical reasoning and decision making are guided by sound ethical principles.
7. Demonstrate knowledge of scientific research methods and ethical principles of clinical research and be able to write research proposals or research papers.
8. Demonstrate professionally the skills needed for Quality improvement, lifelong learning, and continuous medical education including the ability to identify and address personal strength



and weakness, self-assess knowledge and performance, and develop a self-improvement plan.

22. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Describe in detail the fundamental morphological characteristics, structural organization, and functional roles of different blood cells and lymphatic organs, including their development and differentiation. Explain the principal metabolic pathways of erythrocytes in humans and their relevance to normal physiology and disease states.
2. Analyze a range of diseases affecting blood cells and the lymphoreticular system by classifying their types, describing their symptoms and underlying causes, and interpreting the biochemical, genetic, and molecular mechanisms that contribute to their pathogenesis and clinical presentation.
3. Identify the pharmacologic agents commonly used in the treatment of hematologic disorders, compare their mechanisms of action, and evaluate their side effects, contraindications, and appropriate clinical applications to ensure safe and effective patient care.
4. Recognize the most common microbial species associated with hematologic diseases, describe their structure, life cycle, and epidemiology, and critically evaluate the mechanisms by which they cause infections and alter hematologic function.
5. Examine and differentiate various types of blood cells using peripheral blood smears, histologic slides of lymphatic tissues and organs, and light microscopic images. Interpret laboratory tests used to assess blood parameters, explain their clinical significance, and theorize the rationale behind their application in diagnostic hematology.
6. Identify and illustrate the general signs and symptoms characteristic of hematologic diseases and demonstrate an understanding of the essential components of history taking, physical examination, and laboratory investigations required for accurate diagnosis and comprehensive evaluation of patients with blood disorders.
7. Exhibit professional behaviors, ethical conduct, and core values consistent with the responsibilities entrusted to healthcare professionals by patients, colleagues, and society, demonstrating integrity, accountability, and respect for others in all academic and clinical settings.



23. The matrix linking the intended learning outcomes of the course -CLO's with the intended learning outcomes of the program -PLOs:

Program ILOs ILOs of the course	CLO (1)	CLO (2)	CLO (3)	CLO (4)	CLO (5)	CLO (6)	CLO (7)
PLO (1)	✓	✓	✓	✓			
PLO (2)						✓	
PLO (3)							
PLO (4)							
PLO (5)							✓
PLO (6)					✓		
PLO (7)							
PLO (8)							



24. Topic Outline and Schedule:

Week	Lecture	Topic	SLO	Descriptors **	Learning Methods	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
4	PBL-1	Clinical Case presentation	Describe the general signs and symptoms related to hematologic diseases and list examples of some clinical cases	S C	Blended	Moodle/ MS TEAMS	Asynchronous Lecturing	Written exam/ Online activities and assignments	
4	PBL-2	Clinical Case discussion	Evaluate the major points in taking history, physical exam and laboratory investigations from patients with hematologic diseases	C	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	
3	MICRO1	Overview of the Hematopoietic & Lymphoreticular Infections + Erythrocyte infections	Classify infections of the HLS and list the causative agents. Identify the etiology of malaria, babesiosis, and B19 virus infection, understand their pathogenesis, clinical features, diagnosis, management and prevention.	K	Blended	Moodle/ MS TEAMS	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A6, A7
3	MICRO2	Infections of lymphocytes (1)	Understand the basic characteristics of HIV, recognize the general clinical features and stages of HIV infection, identify key diagnostic approaches, and outline the main principles of prevention, treatment, and public health control strategies	K	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A6, A7
4	MICRO3	Infections of lymphocytes (2)	Describe the key pathogens that infect lymphocytes including EBV, CMV, HTLV-1, measles virus, and HHV-8; recognize the general clinical features and outline the basic principles of diagnosis, management, and prevention	K	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A6, A7
4	MICRO4	Infections of phagocytes	Identify the main pathogens that infect phagocytic cells, recognize the general clinical features of diseases such as brucellosis, typhoid fever, tularemia, Q fever, leishmaniasis, histoplasmosis, leprosy, and cat scratch disease, and outline the basic principles of diagnosis, treatment, and prevention	K	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A6, A7
1	H1	Introduction to Blood: Structure and Laboratory Techniques	Explain why blood is classified as a specialized connective tissue based on origin, presence of extracellular matrix, and cellular components. List and describe the main components of blood: plasma, formed elements (erythrocytes, leukocytes, thrombocytes). Demonstrate the correct technique for preparing a peripheral blood smear. Identify stains used in hematology (Wright, Giemsa, Leishman) and their staining properties.	K	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A1



			Explain how staining differentiates cellular components (nucleus, granules, cytoplasm).						
1	H2	Erythrocytes and Thrombocytes	Describe the normal size, shape, and staining characteristics of erythrocytes in peripheral blood smears. Explain the composition of the erythrocyte plasma membrane and the role of submembranous cytoskeletal proteins in maintaining shape and flexibility. Identify the rouleaux formation of erythrocytes in histological preparations and explain the factors that promote it. Define terms related to normal and abnormal erythrocyte size, shape and staining reaction. Describe the histological features of thrombocytes under light microscope. Outline the ultrastructural features of thrombocytes under electron microscopy and correlate with their physiological functions in hemostasis and clot formation.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A1
1	H3	Leukocytes – Granulocytes	Compare erythrocytes and granulocytes in terms of shape, size, number, origin, and maturation Identify the histological features of each type of granulocytes. Differentiate granulocytes based on nuclear morphology, cytoplasmic granules, size, life span, phagocytic activity and motility. Compare the correlation between microscopic features and immune functions of the three granulocytes.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A1
1	H4	Leukocytes – Agranulocytes	Describe the histological features of monocytes and cells of the mononuclear phagocyte system in various tissues and explain their functional roles in phagocytosis and antigen presentation. Correlate histological localization of macrophage-like cells (Kupffer cells, alveolar macrophages, microglia, dendritic cells) with their organ-specific functions. Differentiate between T lymphocytes, B lymphocytes, and natural killer cells based on histological and functional features. Describe histological differences between active (blast/activated) and inactive (small/resting) lymphocytes,	K	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A1



			including size, nuclear chromatin, and cytoplasmic characteristics. Explain how histological techniques (immunohistochemistry, immunofluorescence) can be used to distinguish lymphocyte subtypes. Describe the structure and function of major histocompatibility complex (MHC) molecules and their role in antigen presentation. Explain the concept of antigen presentation to T cells by professional antigen-presenting cells.						
1	H5	Bone Marrow and Hematopoiesis 1	List the sequential sites of hematopoiesis during fetal life (yolk sac, liver, spleen, bone marrow). Identify the cellular components of red and yellow bone marrow under light microscopy. Differentiate between red marrow and yellow marrow and their roles postnatally. List the stages of erythrocyte development from proerythroblast to mature erythrocyte. Differentiate between different stages in erythropoiesis based on morphology. Explain the role of the bone marrow in clearance of aged erythrocytes.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A1
2	H6	Hematopoiesis 2	List the stages of granulocyte development from myeloblast to mature neutrophil, eosinophil, and basophil. Differentiate between the stages of granulopoiesis based on nuclear morphology and cytoplasmic granules. Outline the stages of thrombocyte formation from megakaryoblast to mature platelet. Describe the stages of monocytopoiesis. Explain the role of stromal cells and growth factors in regulating hematopoiesis.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A1
2	H7	Lymphatic Organs I – Organization of lymphatic System, Lymph Nodes	Outline the organization of lymphatic system and explain the organization of lymphoid tissues into primary lymphoid organs and secondary lymphoid organs. Describe the histological features and structural adaptations of lymphatic capillaries and larger lymphatic vessels that facilitate unidirectional lymph flow. Describe the circulation of lymph through lymphatic capillaries, vessels, lymph nodes, trunks, and ducts and their drainage territories.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A1



			Identify the major lymph node groups in the body (cervical, axillary, inguinal, mesenteric, etc.) and their anatomical locations. Identify the main histological regions of a lymph node: cortex, paracortex, medulla, trabeculae, and sinuses. Describe the structure of lymphoid follicles and germinal centers. Explain the flow of lymph through the lymph node and its role in immune surveillance. Explain lymphocyte recirculation and antigen presentation in nodes and relate histological features to lymphocyte activation and immune response. Recognize common pathological changes in lymph nodes under microscopy.						
2	H8	Lymphatic Organs II – Spleen and MALT	Describe the gross anatomy of the spleen, including external features, location and relations to surrounding organs. List the main vascular structures of spleen and their branching patterns, and describe the structural features of blood vessels and sinusoids that support open versus closed circulation. Differentiate histologically between white pulp and red pulp and identify their cellular components. Describe the structure of splenic cords and sinusoids. Explain the roles of the spleen in blood filtration, immune response, and clearance of aged erythrocytes. Identify the histological organization of tonsils, Peyer's patches, and appendix. Explain the role of MALT in mucosal immunity and antigen sampling, and relate structural features to defense mechanisms against pathogens entering through mucosal surfaces. Differentiate between MALT and encapsulated lymphoid organs histologically.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A1
3	H9	Lymphatic Organs III – Thymus and T cell Development	Explain the embryonic development of thymus Identify the thymic lobules, cortex, medulla, and Hassall's corpuscles under light microscopy. Describe the histological differences between cortex and medulla in terms of cell density and type.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A1



			Describe the development of lymphocytes from common lymphoid progenitor cells. Differentiate between B-cell, T-cell, and NK-cell lineages and their maturation sites. Explain the role of the thymic microenvironment (epithelial stromal cells) in T-cell maturation. Correlate histological features of thymic cortex and medulla with sites of positive and negative selection.						
3	H10LAB	Histology Lab 1 (Histology of Blood Cells and Primary Lymphoid Organs)	Explain the embryonic development of thymus. Identify the thymic lobules, cortex, medulla, and Hassall's corpuscles under light microscopy. Describe the histological differences between cortex and medulla in terms of cell density and type. Describe the development of lymphocytes from common lymphoid progenitor cells. Differentiate between B-cell, T-cell, and NK-cell lineages and their maturation sites (bone marrow vs thymus). Explain the role of the thymic microenvironment (epithelial stromal cells) in T-cell maturation. Describe the processes of positive selection and negative selection. Correlate histological features of thymic cortex and medulla with sites of positive and negative selection.	S	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A1
3	H11LAB	Histology lab 2 (Histology of Secondary Lymphoid Organs)	Identify erythrocytes, granulocytes and agranulocytes in blood smears and marrow sections. Identify hematopoietic precursor cells in bone marrow smears. Identify various lymphatic organs by their light microscopic structure (bone marrow, thymus, lymph node, spleen, tonsils and MALT). Apply knowledge of blood and lymphoid organ histology to identify cells, structures, or functional correlations under timed or interactive conditions. (Game-based learning). Apply knowledge of blood, hematopoiesis, and lymphatic organ histology to analyze clinical cases. (Case-based learning)	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A1
1	PHY1	Introduction (Blood composition, function, hematocrit, plasma, hematopoiesis)	Describe the composition and function of blood and list major plasma proteins and their main functions Describe the normal RBCs count, function, and life span. Understand common RBC parameters and how they can be used to distinguish between different causes of anemia.	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A2,A3



1	PHY2	Hematopoiesis, regulation	Describe the process of production of blood cells and its regulation with emphasis on the requirements for RBC maturation	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A2,A3
1	PHY3	Erythropoiesis 1	Identify the requirements for RBC maturation, and hemoglobin production	K	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A2,A3
1	PHY4	RBC parameters	Identify deficiencies complications Describe concepts of lab tests	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A2,A3
1	PHY5	Leukocytes	Identify the normal WBCs count with differential count. Describe characteristics, functions of each subtype. Describe steps of WBC recruitment and phagocytosis. Describe inflammation process and roles of involved leukocytes,	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A2,A3
1	PHY6	Immunity and allergy	Identify lymphocyte types and their distinct function in acquired immunity, describe preprocessing of lymphocytes, role of antibodies and complement system, tolerance of acquired immunity.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A2,A3
2	PHY7	Blood groups and Transfusion 1	Illustrate the basis of Blood groups, classification, mode of inheritance, and normal distribution of blood groups among population Demonstrate the importance of ABO and Rh blood groups matching in transfusion/ Rh in pregnancy Appraise the compatibility, indications and complications of blood transfusion	K	Face-to-face	In-class	Synchronous Lecturing	Written exam	28-A2,A3
2	PHY8	Blood groups and Transfusion 2	Demonstrate the importance of ABO and Rh blood groups matching in transfusion/ Rh in pregnancy Appraise the compatibility, indications and complications of blood transfusion	K	Face-to-face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A2,A3
2	PHY9	Hemostasis 1	Describe the mechanisms of homeostasis and coagulation pathways Identify the normal platelets count and understand their role in hemostasis.	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A2,A3
2	PHY10	Hemostasis 2 (+ lab theory)	Describe the body's normal anticoagulant processes and related regulatory mechanisms. Complications of deficiencies and lab tests	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A2,A3



2	PHYSIOL OGY LAB 1	Packed cell volume, Erythrocyte sedimentation rate and osmotic fragility test	Understand the concept of the lab test and to learn how it can be performed in the lab	S	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A2,A3
3	PHYSIOL OGY LAB 2	Differential Leukocyte count and reticulocyte count	Understand the concept of the lab test and to learn how it can be performed in the lab	S	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A2,A3
4	PHYSIOL OGY LAB 3	Blood types, bleeding time and clotting time	Understand the concept of the lab test and to learn how it can be performed in the lab	S	Face-to- face	In-class	Synchronous Lecturing	Written exam	28-A2,A3
1	BIOCHE M1	Introduction to Hemoglobin and Hemoglobinopathies	Review the structural features, functions, and genetics of hemoglobin with special focus on certain amino acids and their role in the structural transition of the protein in relation to its function	K	Face to face	In-class	Synchronous Lecturing	Written exam	28-A9, A10, A11
1	BIOCHE M2	Hemoglobinopathies 2	Discuss qualitative and quantitative hemoglobinopathies in relation to causes, prevalence, genetic mutations, functional structural alterations and diagnosis of the hemoglobin protein with a focus on the amino acids discussed in the first and second lectures with a focus on HbS, HbC, HbE, HbM, Hb Hammersmith, an Hb CS, methemoglobin, and alpha- and beta-thalassemias	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A9, A10, A11
2	BIOCHE M3	Metabolism of iron (Synthesis, storage, transport and genetic diseases)	Describe the distribution, absorption and transport of iron and their regulatory mechanisms in association with the responsible protein mediators, dysfunction, and diseases.	K S	Face to face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A9, A10, A11
2	BIOCHE M4	Biochemical view of Blood coagulation-1	Explain the biochemical and molecular steps of blood coagulation and clot dissolution through the intrinsic and extrinsic pathways in relation to platelets and endothelial cells	K S	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A9, A10, A11
2	BIOCHE M5	Biochemical view of Blood coagulation-2	Explain the biochemical and molecular steps of blood coagulation and clot dissolution through the intrinsic and extrinsic pathways in relation to platelets and endothelial cells	K S	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A9, A10, A11
1	PATH1	Polycythemia	Define anemia and polycythemia and Differentiate between absolute and relative polycythemia	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A4
2	PATH2	Anemia of blood loss	Classify anemia according to cause and morphology	K S	Face to face	In-class	Synchronous Lecturing	Written exam	28-A4



			List general symptoms of anemia and laboratory indicators for testing anemia Discuss the epidemiology, pathogenesis and morphologic features of the different types of anemia						
2	PATH3	Anemia of low production	Classify anemia according to cause and morphology List general symptoms of anemia and laboratory indicators for testing anemia Discuss the epidemiology, pathogenesis and morphologic features of the different types of anemia	K S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
2	PATH4	Hemolytic anemia	Classify anemia according to cause and morphology List general symptoms of anemia and laboratory indicators for testing anemia Discuss the epidemiology, pathogenesis and morphologic features of the different types of anemia	K S	Face to face	In-class	Synchronous Lecturing	Written exam	28-A4
3	PATH5	Hemoglobinopathies	Outline the genetic diseases of hemoglobin (thalassemia syndromes and structural hemoglobin variants)	K S	Face to face	In-class	Synchronous Lecturing	Written exam	28-A4
3	PATH6	Neoplastic diseases of WBCs-1	Classify lymphoid and myeloid neoplasms Discuss general features of Hodgkin and non-Hodgkin lymphoma, plasma cell myeloma, acute and chronic lymphoid leukemias	K S	Face to face	In-class	Synchronous Lecturing	Written exam	28-A4
3	PATH7	Bleeding disorders	Classify bleeding disorders and list the general features of diseases of platelets, coagulation and blood vessels	S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
3	PATH8	Non-neoplastic WBC disorders	Indicate main causes of leukopenia and reactive leukocytosis, reactive lymphadenitis	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
3	PATH9	Neoplastic proliferation of WBCs-2	Classify myeloid neoplasms and list the general features of myeloproliferative neoplasms, myelodysplastic syndrome and acute myeloid leukemia	S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
4	PATH10	Neoplastic proliferation of WBCs-3	Classify myeloid neoplasms and list the general features of myeloproliferative neoplasms, myelodysplastic syndrome and acute myeloid leukemia	S	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
4	PATH11	DISCUSSION	Problem based learning	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A4
2	PHARMA 1	Iron deficiency anemia	Classify iron preparations used in the treatment of iron deficiency anemia; explain the mechanisms of absorption, distribution, and utilization of therapeutic iron; compare	K	Face to face	In-class	Synchronous Lecturing	Written exam	28-A5



			oral and parenteral iron preparations regarding indications, efficacy, and safety; identify common adverse effects, contraindications, and clinically important drug interactions of iron therapy; select appropriate iron replacement strategies based on clinical scenarios						
3	PHARMA 2	Vitamin B12 deficiency anemia	Describe the pharmacological properties and physiological roles of vitamin B12; explain the absorption, transport, and metabolism of vitamin B12; compare oral and parenteral vitamin B12 formulations and their clinical indications; identify adverse effects and precautions associated with vitamin B12 replacement; select appropriate replacement regimens for patients with dietary deficiency, pernicious anemia, or malabsorption	K	Face to face	In-class	Synchronous Lecturing	Written exam	28-A5
3	PHARMA 3	Folic acid deficiency anemia + hematopoietic growth factors	Explain the mechanism of action and therapeutic role of folic acid in megaloblastic anemia; identify the indications, limitations, and precautions of folic acid supplementation, including the risk of masking vitamin B12 deficiency; Classify hematopoietic growth factors, including erythropoiesis-stimulating agents, granulocyte colony-stimulating factors, and thrombopoietin receptor agonists; Explain the mechanisms of action and major clinical indications of hematopoietic growth factors; recognize important adverse effects and safety considerations associated with hematopoietic growth factor therapy	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A5
4	PHARMA 4	Anticoagulants I	Classify anticoagulant drugs according to their mechanisms of action; explain the mechanisms of action of unfractionated heparin and low-molecular-weight heparins; Compare the pharmacokinetics, clinical indications, and routes of administration of heparin preparations; describe the laboratory monitoring requirements of heparin therapy; identify major adverse effects, including bleeding and heparin-induced thrombocytopenia, and explain their management principles	K	Face to face	In-class	Synchronous Lecturing	Written exam	28-A5
4	PHARMA 5	Anticoagulants II	Explain the mechanism of action, pharmacokinetics, and clinical uses of warfarin; classify direct oral anticoagulants according to their molecular targets; compare warfarin and direct oral anticoagulants regarding indications, monitoring, interactions, and safety; Identify major contraindications,	K	Face to face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A5



			adverse effects, and clinically significant drug interactions of oral anticoagulants; describe anticoagulant reversal strategies and select appropriate agents in common clinical scenarios						
4	PHARMA 6	Thrombolytic agents and antiplatelet drugs	Classify thrombolytic and antiplatelet drugs according to their mechanisms of action; explain the pharmacological mechanisms of fibrinolytic agents, including alteplase and tenecteplase; identify the major clinical indications, contraindications, and complications of thrombolytic therapy; compare the mechanisms of action and clinical applications of aspirin, P2Y ₁₂ inhibitors, and glycoprotein IIb/IIIa inhibitors; recognize important adverse effects and drug interactions associated with antiplatelet therapy; differentiate the therapeutic roles of anticoagulants, antiplatelet agents, and thrombolytics in common thrombotic disorders	K	Face to face	In-class	Synchronous Lecturing	Written exam/ Online activities and assignments	28-A5
4	PHARMA 7	Antimalarial drugs	Classify antimalarial drugs according to their mechanisms of action and stages of the parasite life cycle targeted; Explain the mechanisms of action of major antimalarial agents, including artemisinin derivatives, chloroquine, and primaquine; Identify the major therapeutic indications of antimalarial drugs in uncomplicated and severe malaria; Describe clinically important adverse effects, contraindications, and precautions, including glucose-6-phosphate dehydrogenase deficiency; Explain the principles of antimalarial drug resistance and the rationale for combination therapy	K	Blended	Moodle	Asynchronous Lecturing	Written exam	28-A5
4	PHARMA 8	Antiviral drugs affecting the hematolymphatic system	Classify antiviral drugs relevant to hematolymphatic disorders according to their viral targets and mechanisms of action; explain the mechanisms of action of major antiretroviral drug classes used in HIV treatment; describe the mechanisms and clinical applications of selected antiviral agents used against EBV-associated conditions and cytomegalovirus infections; Identify important hematological adverse effects of antiviral drugs, including bone marrow suppression and cytopenias; explain the principles of combination antiviral therapy, resistance prevention, and clinically significant drug interactions	K	Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A5



4	PHARMA 9	Drugs for Leukemias and Lymphomas	Classify major antineoplastic agents used in leukemias and lymphomas according to their mechanisms of action; explain the mechanisms of action of selected conventional chemotherapeutic agents, including alkylating agents, antimetabolites, and microtubule inhibitors; describe the therapeutic roles of selected targeted therapies, including tyrosine kinase inhibitors and monoclonal antibodies; identify major dose-limiting toxicities and adverse effects of commonly used agents, particularly myelosuppression and organ toxicity; relate the pharmacological mechanisms of selected drugs to their clinical applications in common hematological malignancies; Explain the rationale for combination chemotherapy and supportive pharmacological treatment		Blended	Moodle	Asynchronous Lecturing	Written exam/ Online activities and assignments	28-A5
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25. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Descriptors**	Period (Week)	Platform
Midterm exam	40	Histology, physiology, biochemistry	1.1/ 1.2/1.3/ 1.4/ 2.1/ 2.2/ 2.3/ 2.4/ 1.5/ 1.6/ 1.7/ 1.8/ 2.5/ 2.6/ 2.7/ 2.8/ 1.9/ 1.10/ 2.9/ 2.10/ 2.11/ 1.11/ 1.12/ 1.13/ 2.12/ 2.13/2.14	K S	End of second week	Exam builder
Online assignments, activities and discipline	3	All blended topics	1.3/ 1.4/ 1.7/ 1.8/ 1.13/ 2.3/ 2.4/ 2.7/ 2.8/ 2.11/ 3.3/ 3.4/ 3.5/ 3.6/ 3.9/ 3.10/ 4.2/ 4.3/ 4.5/ 4.6/ 4.7/ 4.8/ 4.9	K S C	1 st - 4 th week	Moodle
Practical	14	Histology, Physiology	2.15/ 3.15/ 3.13/ 3.14/ 4.10	C	End of fourth week	Exam builder
Final exam	43	Pathology, pharmacology, microbiology, clinical	3.1/ 3.2/ 3.3/ 3.4/ 3.5/ 3.6/ 3.7/ 3.8/ 4.1/ 4.2/ 4.3/ 4.4/ 4.5/ 4.6/ 4.7/ 4.8/ 4.9	K S C	End of fourth week	Exam builder
** K: Knowledge, S: Skills, C: Competency						

26. Course Requirements:

- Classroom Lectures
- Internet connection
- Online educational material using Moodle (Electronic Videos and Activities)
- Histology and physiology Lab sessions



27. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Classroom Lectures
- Interactive Videos and Animations
- Online activities and assignments
- Laboratory sessions
- Discussion sessions and forums
- Game- based learning

28. Course Policies:

A- Attendance policies:

Attendance will be monitored by the course coordinator. Attendance policies will be announced at the beginning of the course.

B- Absences from exams and handing in assignments on time:

Will be managed according to the University of Jordan regulations. Refer to <http://registration.ju.edu.jo/Documents/daleel.pdf>

C- Health and safety procedures:

Faculty Members and students must at all times, conform to Health and Safety rules and procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this course and also integrity in your behavior in and out of the classroom. Students violate this policy would be subjected to disciplinary action according to University of Jordan disciplinary policies

E- Grading policy:

Grade-point average, Rules are preset by the Faculty and Department Councils

F- Available university services that support achievement in the course:

Availability of comfortable lecture halls, data show, internet service and E learning website <https://elearning.ju.edu.jo/>

28. References:

A- Required book (s), assigned reading and audio-visuals:

1. Junqueira's Basic Histology, Text and Atlas by Anthony L. Mescher, 15th edition.
2. Guyton and Hall Textbook of Medical Physiology (Guyton Physiology) by John E. Hall, 14th edition.
3. Lauralee Sherwood. Human Physiology: From Cells to Systems (9th Edition).



4. Robbins & Cotran Pathologic Basis of Disease, 11th edition, Kumar, Abbas, Aster.
5. Basic and Clinical Pharmacology, 13th edition, Katzung, Trevor.
6. Basic clinical parasitology. F. A. Neva & H.W. Brown. Prentice Hall, International Editions.
7. Sherries Medical Microbiology, 6th edition, Ryan, Ray, Ahmad, Drew.
8. Ferrier, Denise R. (2017). Lippincott Illustrated Reviews: Biochemistry (7th edition). Philadelphia, PA: Wolters Kluwer Health.
9. Rodwell, Victor W, Bender, David A, Botham, Kathleen M, Kennelly, Peter J, Weil, Anthony P. (2018). Harper's Illustrated Biochemistry (31st).
10. Lieberman, M., & Marks, A. D. (2023). Basic medical biochemistry (6th ed.), Baltimore, MD: Lippincott Williams & Wilkins

B- Recommended books, materials, and media:

Web based resources: <http://www.histologyguide.org/index.html>

29. Additional information: NA

Name of the Course Coordinator:

Signature:

Date:

Dr. Malik Sallam

10 October 2026

Name of the Head of Department

Signature:

Date:

Prof. Dr. Abdelkader Battah

Name of the Head of Quality Assurance
Committee/School of Medicine

Signature:

Date:

Dr. Hana Taha

Name of the Dean/School of Medicine

Signature:

Date:

Prof. Dr. Hussam H. AlHawari