The University of Jordan

Accreditation & Quality Assurance Center

Course Syllabus

Course Name:

Blood and the Lymphoreticular System

1	**Course title**	**Blood and the Lymphoreticular System**
2	**Course number**	**500371**
3	**Credit hours (theory, practical)**	**3 Theory, 1 Practical**
	Contact hours (theory, practical)	**51 Lectures and 5 Labs**
4	**Prerequisites/corequisites**	**Immunology**
5	**Program title**	**Medical Doctor**
6	**Program code**	**05**
7	**Awarding institution**	**The University of Jordan**
8	**Faculty**	**Medicine**
9	**Department**	**Anatomy, Physiology, Pathology, Microbiology, Pharmacology, and Internal medicine.**
10	**Level of course**	**Bachelor**
11	**Year of study and semester (s)**	**Third year/ first semester**
12	**Final Qualification**	**MD degree**
13	**Other department (s) involved in teaching the course**	**Shown above**
14	**Language of Instruction**	**English**
15	**Date of production/revision**	**2022/2023**

16. Course Coordinator:

Prof. Dr. Heba Kalbouneh
School of Medicine
1st floor
Office number 148
Tel: 065355000/23480
Email: heba.kalbouneh@ju.edu.jo, heba.kalbouneh@gmail.com
Office hours: **Tuesdays 12.00pm-2.00pm and Wednesdays 11.00am- 1.00pm**

17. Other instructors:

	INSTRUCTOR	*Office number*	*office hours*	*phone number*	*email address*
1	**Prof. Dr. Salim Khraisha**	112		**23474**	salimkh@ju.edu.jo
2	**Prof. Dr. Mamoun Ahram**		Sundays to Wednesdays 14.00-16.00pm	**23481**	m.ahram@ju.edu.jo
3	**Dr. Tariq Aladily**	Hemato Lab/ JUH	Thursdays 12.00-13.00pm	**23500**	tnaladily@ju.edu.jo
4	**Dr. Nader Araidah**				naderalaridah@gmail.com
5	**Prof. Dr. Yacoub Irshaid**	302	Daily 9-9:45	**23430**	y.irshaid@ju.edu.jo
6	**Dr. Feras Farajeh**	Hemato-oncology / JUH		**23434**	ferasmf@hotmail.com
7	**Dr. Tamara Al-Qudah**	Physio lab	Thursdays 9.00am-12.00pm		tamara.alqudah@ju.edu.jo

18. Course Description:

This course covers the study of cellular elements of lymph, blood and the histology of both central and peripheral lymphatic systems, including bone marrow, thymus, spleen and lymph nodes. It also covers the production of blood cells, the functionality of blood cells, pro and anti-coagulation factors, and blood groups. The ultrastructure of normal and abnormal hemoglobin and its relation with function is also discussed. The course discusses the diseases that affect blood and lymphatic system including disturbances of red blood cells, various types of anemia; disturbances of white blood cells including their numbers and functions; microorganisms related to blood cells, neoplastic conditions, disturbances of bleeding and coagulation diseases of the spleen; and therapeutics of blood and lymphatic diseases. The course also covers the clinical aspects including signs and symptoms, history taking and physical examination.

19. Course aims and outcomes:

A- Aims:

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

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to:

A. Histology

1. Know the microscopic characteristics of erythrocytes, leukocytes and thrombocytes
2. Identify the major cellular and functional differences between B and T lymphocytes
3. Know the major steps of hematopoiesis and the major microscopic features for each stage
4. Identify red and yellow components of bone marrow
5. Describe the general microscopic structure of lymph node, spleen, tonsils, MALT and thymus
6. Know the normal microscopic distribution of leukocytes in lymph node, spleen and thymus
7. Describe the T cell development in thymus
8. Know the anatomic distribution of major lymph nodes
9. Know the basic anatomy of spleen and thymus

B. Physiology

1. Describe the composition and function of blood: plasma, cells
2. Know major plasma proteins and their main functions
3. Describe the normal distribution of blood in adult at rest
4. Describe the normal RBCs count, function, and life span and the normal hematocrit values
5. Identify the normal sites and regulation of erythropoiesis
6. Identify the normal WBCs count, percentage and life span
7. Identify the normal platelets function, count, and production
8. Describe the steps of homeostasis and coagulation cascade
9. Know the basis of Blood groups, classification, minor types, mode of inheritance, and normal distribution of blood groups among population
10. Describe the importance of Rh blood group in transfusion
11. Understand the compatibility, indications and complications of blood transfusion
12. Describe the normal distribution of body fluids: intra and extracellular components and composition

C. Biochemistry

1. Describe the structure-function relationship of hemoglobin
2. Recognize transition of expression of hemoglobin variants during development
3. Understand genetics of hemoglobin
4. Describe the allosteric effectors of hemoglobin and their structural effect in relation to O2 dissociation curve
5. Classify and differentiate hemoglobinopathies (quantitative and qualitative) and their molecular causes and functional and clinical consequences
6. Understand the metabolic pathways of erythrocytes, their functional significance, and related pathological conditions
7. Understand the mechanisms of iron absorption, transport, and storage at the biochemical and molecular levels and iron-related disorders
8. Understand the metabolism of heme (biosyntheisis and catabolism) and related pathologies (porphyria and jaundice)
9. Understand the biochemical process of coagulation and its regulation

D. Pathology

1. Know definition of anemia and polycythemia
2. Know general symptoms of anemia and laboratory indicators for testing anemia
3. Know the classification of anemia according to cause and morphology
4. Discuss the epidemiology, pathogenesis and morphologic features of iron deficiency anemia, anemia of chronic disease, megaloblastic anemia, aplastic anemia, paroxysmal nocturnal hemoglobinuria, myelopthisic anemia, thalassemia, sickle cell anemia, G6PD deficiency, hereditary spherocytosis, immune mediated anemia, anemia of mechanical destruction
5. Discriminate hereditary from acquired anemias
6. Identify which anemia has acute versus chronic course
7. Know pathologic features of anemia of blood loss
8. Know difference between absolute and relative polycythemia
9. Know classification of bleeding disorders and general features of diseases of platelets, coagulation and blood vessels
10. Know main causes of leukopenia and reactive leukocytosis, reactive lymphadenitis
11. Know classification of lymphoid and myeloid neoplasms
12. Discuss general features of Hodgkin and non-Hodgkin lymphoma, plasma cell myeloma, acute and chronic lymphoid leukemias
13. Know classification of myeloid neoplasms and general features of myeloproliferative neoplasms, myelodysplastic syndrome and acute myeloid leukemia

E. Pharmacology:

1. Know the drugs used in thromboembolic diseases
2. Know the Oral anti-coagulant drugs and the therapy of bleeding tendency
3. Know the Antimalaria drugs
4. Describe Hematopoietic growth factors
5. Know regimens and types of chemotherapy used in hematologic malignancies
6. Know common targeted therapies used in treatment of hematologic malignancies

F. Microbiology:

1. Identify Malaria species: types, life cycle, symptoms
2. Understand the morphology of malaria parasites
3. Identify Babesia species: types, life cycle, symptoms
4. Understand the morphology of babesia parasites
5. Understand the structure, characteristics and epidemiology of EBV
6. Identify diseases associated with EBV
7. Describe the diagnosis and treatment of infectious mononucleosis
8. Describe the human diseases caused by parvovirus B19
9. Identify the human lymphotropic virus-1: structure, epidemiology and hematologic diseases caused by
10. Identify the human Herpes Virus-8: structure, epidemiology and hematologic diseases caused by

G. Clinical:

1- Describe the general signs and symptoms related to hematologic diseases
2- Understand the major points in taking history, physical exam and laboratory investigations from patients with hematologic diseases
3- Identify examples of some clinical cases

20. Topic Outline and Schedule:

Topic	Week No.	Instructor	Achieved ILOs	Evaluation methods	References
Histology	1, 2	Dr. Heba Kalbouneh	A1-A9	Written and practical exam	A1
Physiology	1, 2, 3, 4	Prof. Dr. Salim Khraisha	B1-B13	Written and practical exam	A2, A3
Biochemistry	1, 2, 3, 4	Prof. Dr. Mamoun Ahram	C1-C13	Written exam	A4
Pathology	1, 2, 3, 4	Dr. Tariq Aladily	D1-D13	Written and practical exam	A5
Pharmacology	1, 2, 3, 4	Prof. Dr. Yacoub Irshaid	E1-E6	Written exam	A6
Microbiology	3, 4	Dr. Nader Araidah	F1-F10	Written exam	A7, A8
Clinical (PBL)	1, 4	Dr. Feras Farajeh	G1-G3	Written exam	____

21. Teaching Methods and Assignments:

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

- ✓ **Class room Lectures**
- ✓ **Online educational material (Electronic Videos and Animations)**
- ✓ **Online Challenges and Quizzes**
- ✓ **Lab sessions**

22. Evaluation Methods and Course Requirements:

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

Midterm (40%)
Final practical (20%)
Final theory (40%)

23.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/ .

24. Required equipment:

- ✓ Data show for power point presentation.
- ✓ Histology lab: Light Microscopes.
- ✓ Physiology Lab

25. 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 by John E. Hall, 13th edition.
3. Ganong's review of medical physiology, 25th edition. Barrett, Barman, Boitano, Brooks.
4. Lippincott illustrated reviews series, 6th edition, Farrier.
5. Robbins & Cotran Pathologic Basis of Disease, 9th edition, Kumar, Abbas, Aster.
6. Basic and Clinical Pharmacology, 13th edition, Katzung, Trevor.
7. Basic clinical parasitology. F. A. Neva & H.W. Brown. Prentice Hall, International Editions.
8. Sherries Medical Microbiology, 6th edition, Ryan, Ray, Ahmad, Drew.

B- Recommended books, materials, and media:

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

26. Additional information:

First and second examination marks will be announced by the faculty to the students. Final marks will be given to the students through the registration after being approved by the faculty council.

Name of Course Coordinator: ----------Signature: ---------- Date: ----------

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File