The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

Blood and lymphatic system

1	Course title	Blood and Lymphatic System
2	Course number	500371
3	Credit hours (theory, practical)	3, 1 (total 4)
	Contact hours (theory, practical)	
4	Prerequisites/corequisites	Co-requisite with immunology
5	Program title	Doctor of Medicine
6	Program code	
7	Awarding institution	
8	Faculty	Medicine
9	Department	
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	Anatomy, physiology, pathology, microbiology, biochemistry, pharmacology, internal medicine
14	Language of Instruction	English
15	Date of production/revision	2016/2017

16. Course Coordinator:

Dr. Tariq Aladily
Office Location: Hematology Lab, third floor, outpatient building, Jordan University Hospital
Office Hours: Sunday 12-2
Phone number: +962 6 5353666 - 2645
Email address: tnaladily@ju.edu.jo

17. Other instructors:

Name	Subject	Office number	Office hours	Phone #	Email address
Faraj Bustami	*Anatomy*	*118*	*2-4 Thursday*	*23429*	*fbustami@ju.edu.jo*
Salim Khraish	*Physiology*	*112*	*1-3 Sun, Tue*	*23474*	*salimkh@ju.edu.jo*
Nayef Karadsheh	*Biochemistry*	*308*	*10-12 Sun*	*23475*	*nsohk@yahoo.com*
Sameer Naji	*Microbiology*	*Adjunct*	*Adjunct*	*0799768949*	*Sameer_naji@hotmail.com*
Hikmat Abdul Razeq	*Problem based learning*	*Adjunct*	*Adjunct*	*0796433993*	*habdelrazeq@KHCC.JO*
Ahmad Mansour	*Pathology*	*Hem Lab,JUH*	*11-1 Sun*	*23500*	*Ah.mansour@ju.edu.jo*
Tariq Aladily	*Pathology*	*Hem Lab,JUH*	*10-12 Sun*	*23500*	*tnaladily@ju.edu.jo*
Munir Gharaibeh	*Pharmacology*	*307*	*11-12 Tue*	*23456*	*Mgharaib@ju.edu.jo*

Malik Zehlef	*Pharmacology*	*303*		*23455*	*m.zihlif@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, blood groups. The ultrastructure of normal and abnormal hemoglobin and their relation with function are also discussed. 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 number and functions; microorganisms related to blood cells, neoplastic conditions, disturbances of bleeding and coagulation diseases of the spleen and thymus; 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 physiologic, histologic and biochemical properties, then move to common pathologic conditions and pharmacologic drugs used in treatment.

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

1) identify composition of blood
2) Know anatomic characteristics of red blood cells, while blood cells and platelets
3) Know the origin of B and T lymphocytes
4) Identify major functional and anatomic differences between B and T lymphocytes
5) Know normal steps of hematopoiesis in bone marrow
6) Identify red and yellow components of bone marrow
7) Identify anatomic structures in lymph node, spleen and thymus
8) Know the normal anatomic distribution of white blood cells on lymph node, spleen and thymus
9) Know the normal count and percentage of white blood cells in blood and bone marrow
10) Know composition and function of blood: plasma, cells
11) Know name and function of plasma proteins
12) Know normal distribution of blood in adult at rest
13) Know normal RBC shape, size, count, function, life span
14) Know the normal hematocrit values
15) Know normal sites and regulation of erythropoiesis
16) Know normal WBC types, count, percentage, life span, myelogenesis
17) Know normal platelets function, count, production
18) Know normal steps of hemostasis
19) Know normal steps of coagulation cascade
20) Know blood groups: classification, minor types, mode of inheritance
21) Know Rh blood group, importance in transfusion
22) Understand normal distribution of blood groups among population
23) Understand compatibility, indications and complications of blood transfusion
24) Understand types of stored blood and its constituents, including WBCs
25) Know normal distribution of body fluids: intra and extracellular components and composition

26) Know total body fluid and relationship with age and gender
27) Know structure and property of haemoglobin and myoglobin
28) Know relationship between structure and function
29) Know role of haemoglobin in O2 and CO2 transportation
30) Understand Bohr effect
31) Understand O2 dissociation curve: normal and abnormal patterns
32) Know mechanism of action of allosteric effectors
33) Identify structure of abnormal hemoglobins: sickle, thalassemia and methemoglobin
34) Know functional changes of abnormal hemoglobins
35) Understand metabolism of heme and iron
36) Know pathogenesis of propheria
37) Know causes of jaundice
38) Know the remaining metabolic functions of mature RBCs
39) Know the importance of normal life span
40) Identify malaria species: types, life cycle, symptoms
41) Know morphology of malaria parasites
42) Identify Babesia species: types, life cycle, symptoms
43) Know morphology of babesia parasites
44) Learn structure, characteristics and epidemiology of EBV
45) Know diseases associated with EBV
46) Know diagnosis and treatment of infectious mononucleosis
47) Know properties and types of paramyxoviruse
48) Learn about Human diseases caused by parvovirus B19
49) Know diagnosis and treatment of parvovirus B19
50) Know human lymphotropic virus-1: structure, epidemiology and hematologic diseases caused by
51) Know human Herpes Virus-8: structure, epidemiology and hematologic diseases caused by
52) Understand definition of anemia
53) Know parameters of hemogram test and normal ranges in adults
54) Know classification of anemia according to morphology and etiology
55) Know general features and causes of intra and extravascular haemolytic anemias
56) Know general features and causes of anemia secondary to decreased erythropoiesis
57) Know about anemia of acute and chronic blood loss: causes, morphology
58) Know about hereditary spherocytosis: epidemiology, morphologic features
59) Know about glucose-6-phosohate dehydrogenase deficiency: epidemiology, morphologic and clinical features
60) Know about Paroxysmal nocturnal hemoglobinuria: epidemiology, causes, diagnosis, clinical features
61) Know about autoimmune hemolytic anemia: types, causes, morphologic features
62) Know about thalassemia: epidemiology, types, morphologic and clinical features, diagnosis
63) Know about sickle cell anemia and trait: epidemiology, types, morphologic and clinical features, diagnosis
64) Know about microangiopathic haemolytic anemia: causes, morphologic features
65) Know about Iron deficiency anemia: causes, morphologic features
66) Know about megaloblastic anemia: causes, morphologic features
67) Know about aplastic anemia: causes, morphologic features
68) Know about anemia of chronic disease: causes, pathogenesis, morphologic features
69) Know about anemias associated with chronic renal failure, chronic liver disease and hypothyroidism
70) Know about primary and secondary Polycythemia
71) Know definition, types and causes of leukopenia
72) Know definition, types and benign causes of leukocytosis and lymph adenitis
73) Know about myeloproliferative neoplasms: types, causes, morphologic features

74) Know about myelodysplastic syndromes: epidemiology, types, morphologic features
75) Know about acute myeloid leukemia: types, morphologic features
76) Know the types and causes of lymphoma and plasma cell myeloma, and morphologic features
77) Know about splenomegaly; definition and causes
78) Know about thymoma; types and morphology
79) Know treatment methods of iron deficiency anemia and megaloblastic anemia
80) Identify drugs used in thromboembolic diseases
81) Understand oral anti-coagulant drugs
82) Know therapy of bleeding tendency
83) Learn about antimalaria drugs
84) Know hematopoietic growth factors
85) Learn about chemotherapy used in hematologic malignancies; regimens and types
86) Understand common targeted therapies used in treatment of hematologic malignancies
87) Know definition, causes and complications of thrombocytopenia and thrombocytosis
88) Know bleeding and thrombotic diseases
89) Know signs and symptoms related to hematologic diseases in general
90) Know variation of specificity and severity of symptoms
91) Know major points in taking history, physical exam and laboratory investigation from patients with hematologic diseases
92) Discuss examples of numerous clinical cases

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Anatomy	1,2	F. Bustami	1-9	Written & practical exams	1
Physiology	1-4	S. Khraisha	10-26	W + P	2, 3
Biochemistry	1-4	N. Karadsheh	27-39	W	4
Microbiology	4	S. Naji	40-51	W + P	5, 6
Pathology	4-8	A. Mansour T. Aladily	52-70 71-78	W + P	7
Pharmacology	7, 8	M. Gharaibeh M. Zihlif	79-84 85-86	W	8
Clinical	1, 8	H. Abdel Raziq	87-92	W	9

21. Teaching Methods and Assignments:

Identification of ILOs in advance
Focusing of key ideas
Discussion during the lecture
Answering questions post lectures
Questioning ILOs in exams

22. Evaluation Methods and Course Requirements:

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

Written (70%) & practical (20%) exams

23. Course Policies:

A- Full attendance is granted 10 marks at the end of the course.
B- Make up exams are held for students who did not attend regular exams if they present acceptable reasons to relevant committee.
C- A complementary exam is held next to the course for eligible students according to faculty regulation.
C- Health and safety procedures: we call the student emergency clinic or civil defense office for emergency cases
D- Students who do misconducts such as cheating, plagiarism, misbehavior are reported to the dean office for an interrogation committee
E- Grading policy:
40% final exam, 30% midterm exam, 20% practical exam, 10% attendance
F- Potentially available university services that support achievement in the course online virtual slides, gross specimens exhibit

24. Required equipment:

none

25. References:

1) Color Textbook of Histology, 3rd edition, Gartner and Hiatt.
2) Guyton and Hall Textbook of medical physiology, 13th edition, Hall.
3) Ganong's review of medical physiology, 25th edition. Barrett, Barman, Boitano, Brooks.
4) Biochemistry (Lippincott illustrated reviews series) 6th edition, Farrier.
5) Basic clinical parasitology. F. A. Neva & H.W. Brown. Prentice Hall International Editions.
6) Sherries Medical Microbiology, 6th edition, Ryan, Ray, Ahmad, Drew.
7) Robbins & Cotran Pathologic Basis of Disease, 9th edition, Kumar, Abbas, Aster.
8) Basic and Clinical Pharmacology, 13th edition, Katzung, Trevor.
9) Essential Haematology, 6th edition, Hoffbrand, Moss.

26. Additional information:

Name of Course Coordinator: *Tariq Aladily* 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