The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	**Hematology I**
2	Course number	**0308362**
3	• **Credit hours (theory, practical)**	**3 (2 theory, 1practical)**
	• **Contact hours (theory, practical)**	**1 theory, 3 practical / week**
4	Prerequisites/co requisites	
5	Program title	**Clinical Laboratory Sciences**
6	Program code	
7	Awarding institution	
8	Faculty	**Science**
9	Department	**Clinical Laboratory Sciences**
10	Level of course	
11	Year of study and semester (s)	**Summer Semester 2017/2018**
12	Final Qualification	**BSc**
13	Other department (s) involved in teaching the course	
14	Language of Instruction	**English**
15	Date of production/revision	**27.05.2018**

16. Course Coordinator:

Dr Ruba Abed
Consultant Hematopathologist

- **Office numbers: N/A, Part Time lecturer.**
- **Office hours: Lecture Time**
- **Phone numbers: 22243**
- **E-mail: r.abed@ju.edu.jo**

17. Other instructors:

Imad Jawabreh
Practical Hematology

- **Office: Bio 207**
- **Office hours: 11-12 Sun, Tue, Thu**
- **Phone numbers: 0798513464**
- **E-mail: e.jawabreh@ju.edu.jo**

18. Course Description:

Hematology is the study of blood cells in normal and abnormal conditions. Students will be instructed in the theory and practical application of hematology procedures, blood cell maturation sequences, and normal and abnormal morphology with associated disease.

19. Course aims and outcomes:

To be able to; identify, know, describe and apply

- The terms hematopoiesis and extramedullary hematopoiesis.
- The major anatomical sites of the hematopoietic system progressing from embryonic to adulthood.
- The sites and cells found in primary and secondary lymphoid tissue.
- Contrast the features of erythropoiesis, granulopoiesis, lymphopoieses, and megakaryopoieses.
- Growth factors and association of each factor with target cells.
- The cells in developmental order in maturation sequence of erythrocytes, thrombocytes, and the five leukocyte types.
- The cytoplasmic features of color, granulation, shape, quantity, vacuolization, and inclusions to cell maturity.
- The sites of erythropoiesis from the early embryonic stage of development until fully established in adults.
- The basic substances necessary for proper erythropoiesis.
- The normal condition that stimulates the production of erythropoietin.
- The maturational times for the various erythrocyte developmental phases.
- The events that occur during reticulocyte maturation.
- The terms secondary polycythemia and relative polycythemia.
- The morphological characteristics of defective erythrocyte maturation and megaloblastic maturation with normal developmental features.
- The general characteristics, including the physical properties, of the erythrocyte membrane.
- The chemical composition and configuration of normal adult hemoglobin molecule.
- The factors that regulate the synthesis of globin in hemoglobin production.
- The overall impact of intravascular destruction in normal erythrocyte physiology.
- The terms anisocytosis, poikilocytosis.
- The source of the cellular elements of the blood.
- The major categories of the cellular elements of the circulating blood.
- The components of a complete blood count (CBC).
- The abbreviations: RBC, WBC, Hgb, Hct, and retic.
- Define each of the erythrocyte indices: mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC).
- Apply the appropriate formulas and calculate the MCV, MCH, and MCHC when give the erythrocyte values.
- Classify RBC morphology based on erythrocyte indices.
- Compare the morphological appearances of reticulocytes stained with Wright stain and a supravital stain, such as new methylene blue.
- Define the laboratory measurements that define anemia.
- Define the term functional anemia.
- Name underlying disorders that can contribute to anemia.
- Explain the relationship of anemia as it relates to normal erythrocyte kinetics.
- State the causes of the clinical signs and symptoms of anemia.
- Describe the usual complaints of an anemic patient.
- Describe the organization of anemias according to erythrocyte size and explain the limitations of such a system.
- Give examples of macrocytic anemias and pathological megaloblastic anemias.

- Explain the characteristics of categories of anemias using a pathological basis.
- The supplementary assays that may be of assistance in establishing a specific anemia diagnosis.
- Compare absolute iron deficiency with functional iron deficiency.
- Conditions that can contribute to iron deficiency anemia IDA.
- The physiology of iron metabolism, including the iron needs of children and normal dietary sources.
- Laboratory findings of IDA.
- Define terms: transferrin, hemosiderin, ferritin, total iron-binding capacity (TIBC).
- Describe DNA synthesis differs in nonmegaloblastic macrocytosis from megaloblastosis.
- Define the term megaloblastic anemia.
- Explain the cellular maturation abnormalities in the bone marrow in megaloblastic anemias.
- The epidemiology of pernicious anemia. The etiology and pathophysiology, including the immune nature, of pernicious anemia.
- The clinical signs and symptoms of pernicious anemia.
- The usual management of and therapy for pernicious anemia.
- The physiology of folic acid deficiency.
- The body's requirements for folate and the physiological role of folate.
- The clinical signs and symptoms of folic acid deficiency.
- The laboratory assays used to confirm folic acid deficiency and state the results associated with folic acid deficiency.
- Define the term hemolytic anemia.
- Categories of intrinsic versus extrinsic hemolytic anemia.
- Inherited Vs acquired hemolytic disorders.
- Various types of autoimmune hemolytic anemia (AIHA).
- The characteristics of cold agglutinin disease. The components and percentage of normal adult hemoglobin.
- Compare the disease state and trait condition of a hemoglobinopathy.
- General characteristics and clinical findings in the various types of thalassemias.
- Describe the etiology of Sickle Cell Disease (SCD).
- Describe other Hemoglobinopathies.

20. Topic Outline and Schedule:

1. Introduction to Hematology
2. Hemopoiesis
3. Erythropoiesis and general aspects of anemia
4. Hypochromic anemias
5. Macrocytic anemias
6. CBC; General overview
7. **Mid Term Exam**
8. Hemolytic anemias
9. Genetic disorders of hemoglobin
10. Peripheral blood film
11. **Final Exam**

21. Teaching Methods and Assignments:

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

- **2/ 1h,20 min lectures/ week**
- **3 h lab/ week**

22. Evaluation Methods and Course Requirements:

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

- **1h Mid Term Exam + 2h Final Exam**
- **10 lab Quizzes**
- **2 lab practical exams**

23. Course Policies:

A- **Attendance policies:**

Attendance of lectures and lab sessions is obligatory

B- **Absences from exams and not handing in assignments on time:**

Not accepted

C- **Health and safety procedures:**

Strict and are followed up

D- **Honesty policy regarding cheating, plagiarism, misbehavior:**

Very strong.

E- **Grading policy:**

70% theory , 30% practical

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

Accepted,

24. Required equipment:

25. References:

References:

1. HOFFBRAND'S ESSENTIAL HAEMATOLOGY, SEVENTH EDITION 2016, WILEY Blackwell
2. Henry's, Clinical Diagnosis and Management by Laboratory Methods, 23rd 2017.
3. Stiene-Martin, E.ANN,et al. Clinical Hematology, Principles, Procedures and Correlations. Lippincott-Raven

Publishers, Second Edition 1998.

Recommended Websites:

- www.hematology.org
- https://emedicine.medscape.com/hematology
- https://www.med-ed.virginia.edu/courses/hema/
- https://www.mastersinnursing.com/hematology-blood-health

26. Additional information:

Name of Course Coordinator: Dr Ruba Abed **Signature:** Dr Ruba Abed

Date: 27.05.2018

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

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

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

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

Copy to:

Head of Department
Assistant Dean for Quality Assurance
Course File