

Course Syllabus of Hematology I

Faculty: Medicine and Health Sciences

Department: Health science

Program: Bachelor in Medical laboratory

I. General information about the course instructor :

Name	Dr. Abdulrazzaq Othman Alagbare	Office Hours(3 Hours Weekly)					
Location & phone number	Sanaa 777182124	Sat	Sun	Mon	Tue	Wed	Thu
Email	Alagbariz@yahoo.com	1		1		1	

II. General information about the course :

	Course Title:	Hematology1				
1.	Course Code and Number :	BML242				
2.	Credit Hours	Lecture	Seminar/Tutorial	Practical	Training	Total
		2		1		3
3.	Study Level and Semester:	2nd year /1st semester				
4.	Pre-requisites :	BHS140				
5.	Co-requisites:	None				
6.	Program in which the course is offered	Bachelor in Medical laboratory				
7.	Teaching Language:	English				
8.	Study System :	Semester based				
9.	Prepared by :	Dr. Abdulrazzaq Othman Alagbare				

III. Course Description :

This course aim to provide the student in the medical laboratory with the knowledge about the blood tissue developing , the hematopoietic organs , The essential substances for erythrocytes production and hemoglobin synthesis, the metabolic pathways of the RBC, from the fetal life up to adult age, and the blood cells function, The student will develop competency in hematological techniques conducted in pathology laboratories, including blood collection procedures, complete blood count concerned with diseases that affect the blood, such as anemia's, and hemoglobinopathies. The teaching strategies will include lectures, self-learning and assignment. The students will be evaluated through report, written exam and practical exam

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د. مجاهد نصار

الموصف:
د. عبد الرزاق الاخيرى

IV. Course Aims: This course is aimed to:

1. Recognize the hematopoietic organs, blood cells formation, developing , regulation and function,
2. Identify and describe classic morphologic characteristics at each stage of maturation for the erythrocyte, neutrophil, monocyte, lymphocyte, and thrombocyte
3. Recognize the RBC requirement for developing, hemoglobin synthesis. and synthesis of each hemoglobin types in all human life etc
4. Understand the anemia classification ,causes, mechanism and clinical picture
5. Explain and apply of anemia laboratory investigation and lab. Findings, blood cells morphology (Normal)and abnormal and evaluate their importance in diagnosis of anemia

V. Course Intended Learning Outcomes (CILOs) :

After completion of this course student should be able to:

1. **Name** the fetal hematopoietic organs in each trimester, the main hematopoietic organs in adult
2. **Outline** the hemoglobin synthesis, types of polypeptide chains, how and when developed each type of Hb
3. **Present** the types , mechanism ,causes and clinical pictures of anemia's and classification of acquired and inherited anemia
4. **Analyze** blood smears and inspect by microscope , to be familiar with the morphology and shape of each type of blood cells,
5. **Inspect** CBC, blood smears, and the other routine lab. tests
6. **Create** different diagnostic procedures, for each anemia, chemistry tests, bone marrow study, flow cytometry result, molecular genetic study etc.
7. **Prepare** the most important reagents for blood counting ,testing and collecting the CBC specimen.
8. **Perform** CBC, blood film smear, Reticulocyt-count and lab. tests which needed for each type of anemia.
9. **Develop** skills how to use ,maintain and compare between automation and manual methods of work.
10. Cooperate with supervisors and colleagues in biology lab and show the appropriate responsibility, self-confidence and behaviors.

VI. Course Contents

First: Theoretical Aspect:

No.	Course Topics/Units	Sub-topics	Week	Contact Hours
1	Introduction of the Blood and Haemopoiesis 1	<ul style="list-style-type: none"> • Definition • Site of haemopoiesis 		

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		<p>during Fetal life</p> <ul style="list-style-type: none"> The main Hematopoietic organs in adult life 1-Bone marrow structure, 2-Thymus,3-The secondary heamatopoietic organ (RES) 		
2	Haemopoiesis 2	<ul style="list-style-type: none"> Erythropoiesis Leukopoiesis Thrombocytes Production 	2 nd	2
3	Composition of erythrocytes and haemoglobin	<ul style="list-style-type: none"> Structure and function of Hemoglobin Synthesis of Hemoglobin (Hb) Myoglobin Oxygen transportation Functions of hemoglobin Normal Hemoglobin pigments Pathological Hemoglobin pigments RBC after death 	3 rd	2
4	Red blood cell membrane development and function	<p>Red cell membrane structure</p> <p>Cytoskeleton Importance</p> <p>Deformability and elasticity</p> <p>Metabolic pathways</p> <ol style="list-style-type: none"> The Embden-Meyerhof pathway The hexose monophosphate shunt <p>The methemoglobin reductase pathway</p>	4 th	2
5	The essential substances for erythrocytes production	<ul style="list-style-type: none"> 1-Iron, 2-Vitamin B12 , 3-Folic acid 	5 th	2
6	The oxygen carrying capacity of hemoglobin	<p>The erythrocyte cycle life</p> <p>Oxygen saturation (sO_2),</p> <p>Haemoglobin's affinity for oxygen</p> <p>The oxygen-hemoglobin dissociation curve (ODC)</p> <ul style="list-style-type: none"> Blood Serve as a Carrier of Oxygen 	6 th	2
7	Midterm Exam		7 th	2

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8	Introduction to anemia and	Anemia classification and Investigation Tests	8 th	2
9	Microcytic anemia	Iron deficiency anemia Causes, diagnosis	9 th , 10 th	4
10	Normocytic anemia	1-Anemia of chronic disorders (ACD) 2-Aplastic anemia (AA) Red cell aplasia 3-Sideroblastic anemia (SA)	11 th	2
11	Aplastic anaemia 4-Iron overload-hemosiderosis Hereditary and Hemochromatosis (HH)	Types, mechanism, diagnosis and investigations	12 th	2
12	B12 and folic metabolism and megaloblastic anaemia	<ul style="list-style-type: none"> Megaloblastic anemia Pernicious anemia Non Megaloblastic anemia 	13 th	2
13	Introduction to hemolytic anemia (H.A.)	<ul style="list-style-type: none"> Types, mechanism, diagnosis and investigations 	14 th	2
14	Final exam		15 th	2
Total number of weeks and hours			15	30

Second: Practical/Tutorial/Clinical Aspects

No.	Practical/Tutorial/Clinical topics	No. of Weeks	Contact Hours
1	Normal cells Morphology, Drawing and observing the cells of RBC, Granular and non- granular morphology	2 nd	2
2	Preparation and uses of: EDTA, Citrate sodium, Brilliant Cresyl Blue (Reticulocytes stain), Reagent in the hematology (Drabkin, etc) Preparation of WBC solution count Giemsa	3 rd	2
3	Types of specimen New born and specimen for CBC (site collection, quantity) Infant and specimen for CBC Adult and specimen for CBC CBC- compartment, methods etc CBC content, CBC-	4 th	2

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د. عبد الرزاق الاغبري

	Evaluation, RBC electronic parameters		
4	Blood collection form different ages (infant, child, adult) Estimation of the haemoglobin concentration , Sahli Haemocytometer	5 th	2
5	Red Blood Cells counting , Heamtocrit (Ht,Hct)/Packing Cells Volume (PCV) and Measurement technique	6 th	2
6	Heamoglobin (Hb) Curve Preparation Blood film preparation Staining thin blood films by Giemsa stain (May-Grünwald-Giemsa Stain)	7 th	2
7	Red Blood Cells Morphology Normal red cell <u>Morphological abnormalities and variants</u>	8 th	2
8	Microcytic anemia (RBC morphology) report writing	9 th	2
9	Macrocytic anemia (RBC morphology) report writing	10 th	2
10	Chemistry analysis for Iron tests	11 th	2
11	Reticulocytes count	12 th	2
12	Measurement of the erythrocyte sedimentation rate Calculation RBC indices MCV, MCH, MCHC, RDW	13 th	2
13	Final practical exam	14 th	2
Total number of weeks and hours		13	26

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