

## Module (Course Syllabus) Catalogue 2023-2024

College/ Institute	Erbil Health and Medical Technical College		
Department	MLT		
Module Name	Hematology		
Module Code	HEM303		
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input checked="" type="checkbox"/>	
	High Diploma	Master	PhD <input type="checkbox"/>
Semester	Third		
Qualification	PhD		
Scientific Title	Assist. Prof.		
ECTS (Credits)	5		
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/>	Assist. <input type="checkbox"/>
Weekly hours	2 Hrs		
Weekly hours (Theory)	( 2Hrs)hr Class	( )TotalhrsWorkload	
Weekly hours (Practical)	( 2hrs )hrClass	( )TotalhrsWorkload	
Number of Weeks	14		
Lecturer (Theory)	Assist.Prof.Dr. Goran Qader Othman		
E-Mail & Mobile NO.			
Lecturer (Practical)	Hero Omar Hamad		
E-Mail & Mobile NO.	Hero.omar@epu.edu.iq		
Websites			

# Course Book

<p><b>Course Description</b></p>	<p>Hematology is one of the most important branch in the field of MLT. It is regarded as one of the major sections in any hospitals labs. In this course, the students will learn the fundamentals about hematology basics and tools related to the blood tests. The main idea of giving hematopathology is to make our students familiar with the elements exist within the blood especially the blood cells. The first lectures will provide students what is important about blood cell production and structure and function of RBC, then followed by some lectures about WBC structure, Classification and functions. Illustrating the main disease related to blood, such as anemia, leukemia...etc are also included in the later lectures.</p> <p>It involves treating diseases that affect the production of blood and its components, such as blood cells, hemoglobin, blood proteins, bone marrow, platelets, blood vessels, spleen, and the mechanism of coagulation. Such diseases might include hemophilia, blood clots, other bleeding disorders and blood cancers such as leukemia, multiple myeloma, and lymphoma. The laboratory work that goes into the study of blood is frequently performed by a medical technologist or medical laboratory scientist. Many hematologists work as hematologist-oncologists, also providing medical treatment for all types of cancer</p>
<p><b>Course objectives</b></p>	<p>The objectives for practical classes of this course are to introduce the students to the field of hematology and engage the students in small laboratory experiments that they can accomplish in a small group. This program can utilize the concepts and skills learned to foster their career.</p>
<p><b>Student's obligation</b></p>	<ol style="list-style-type: none"> <li>1- Attendance at each laboratory is mandatory at Soran technical Institute campus, while attending MOODLE is mandatory for theory classes.</li> <li>2- Excessive absences can reduce a student's grade or deny credit for the course</li> <li>3- The students are required to set for 2 exams paper for theoretical part and 2 other exams papers for practical classes.</li> <li>4- Students are required to submit 2 assignments (one assignment) in each term.</li> <li>5- The monthly home work is one of the important duties to the students during the year. They are required to submit minimum 5 reports.</li> <li>6- Quizzes will be held during the theory and practical classes, in every 3 class's one test.</li> </ol>
<p><b>Required Learning Materials</b></p>	<p>Students are required to apply MOODLE program as the platform of electronic study. They need to use Laptop or mobile version. They need to use university G-suite account for accessing the course materials and assignments.</p>

Evaluation	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
	Paper Review				
	Assignments	Homework	5%		
		Class Activity	2%		
		Report	10%		
		Seminar			
		Essay			
		Project			
	Quiz		8%		
	Lab. report		10%		
	Midterm Exam		25%		
	Final Exam		40%		
	Total		100%		
Specific learning outcome:	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the components of human blood and characteristics, functions, and abnormalities and disease states of each.</li> <li>2. Demonstrate proficiency in the skills necessary to perform blood cell counts, and evaluation of blood elements within stated limits of accuracy.</li> <li>3. Demonstrate compliance with OSHA safety regulations for blood –borne pathogens.</li> <li>4. Determine suitability of hematology specimens and dispose of them in the appropriate biohazard containers.</li> </ol>				
Course References:	<ul style="list-style-type: none"> <li>• Essential hematology</li> <li>• Atlas of pathology hematology</li> <li>• Hoffbrand post graduated hematology</li> </ul>				
Course topics (Theory)			Week	Learning Outcome	
Introduction to Hematology and Hematopathology			1		
Composition of Blood			2		
Hematopoiesis, Sites of blood production and Bone marrow microenvironment			3		
Hematopoiesis, The process, Regulation of Hematopoiesis			4		
Erythropoiesis process and its regulation			5		
RBC Structure and function: 1			6		

RBC Structure and function: 2	7	
Extravascular Destruction of RBC	8	
Intravascular Destruction of RBC	9	
RBC metabolism	10	
Hemoglobin: Introduction	11	
Hemoglobin synthesis and metabolism	12	
<b>Practical Topics</b>	<b>Week</b>	<b>Learning Outcome</b>
Anticoagulants	1	
Collection of blood from capillary -Blood film	2	
- Differential leukocyte count	3	
Collection of blood from veins	4	
Estimation of erythrocyte sedimentation rate (ESR)	5	
Packed cell volume	6	
Hemoglobin estimation	7	
Total erythrocyte count	8	
Total leukocyte count	9	
Total platelets count	10	
Red blood cell indices (MCV, MCH, MCHC and RDW) -Normal and abnormal shapes of RBCs	11	
Automated Haematology analyzer (coulter counter)	12	

## Questions Example Design

Examples of Examining Questions:

Theoretical Exam.

1. Compositional: In this type of exam the questions usually starts with Explain how, What are the reasons for...?, Why...?, How....?Examples:

Q: 1) What is the difference between hematology and hematopathology?

Answer: Hematology: The study of the nature, function and diseases of the blood and bloodforming organs.

Hematopathology: The division of pathology that is specialized in blood cell diseases and diseases of the blood forming organs.

2. Trueorfalsetypeofexams:Inthistypeofexam as shortsentence aboutaspecificsubjectwill providedas below, and then students will comment on the trueness or falseness of this particularsentence.

Examples:

Q1: The familiar red fluid in the body that contains white and red blood cells, platelets, proteins, and other elements. Answer: True

3. Multiple choices: In this type of exam there will be a number of phrases next or below a statement,students will match the correct phrase.Examples provided as below.

Q1) Aspects of study of Hematology are all except:

1. Origin & development of the various component of the blood.
2. Structure of the various components of the blood.
3. Function of blood components.
4. Origin of fetal development.\_

Q3) Select the most appropriate words to full the blanks:

Q) Blood transfers all belowexcept.....4 ..... 1. Gases, nutrients, waste products. 2.Processed molecules 3. Regulatory molecules 4. Nervous stimuli

### Practical

Written part

Q1/ What is the main solution used in each of these tests: (8 Marks)

1. Haemoglobin estimation (cyanmethemoglobin method).
2. Total RBC count.
3. DLC.
4. Reticulocyte count.

Q2/ Calculate and insert the missing parameters in the following table: (8 Marks)

Are the overall results normal? Answer Yes or No in the box:

RBC million/mm <sup>3</sup>	Hb gm/ dl	Hct %	MCV fl	MCH pg	MCHC g/dl	Normal
5.34	20.8	61.1				
3.92	12.9	37.2				
4.28	13.6		92.8			
4.56	11.7	35.5				

Q3/ Give the blood picture of: (7 Marks)

1. Iron deficiency anaemia.
2. G6PDD.
3. Hereditary spherocytosis.
4. Sickle cell hemoglobinopathies.

## **Extra notes:**

In this course theoretical part we will focus in some subjects such as; Hematological tests in general especially the important ones. In Assignments: Every lecture there is 10 min free for student to preview a seminar about a subject chosen by the lecturer previously planned and the purpose of this is to encourage the student to study as work team and encourage them to pass their fears on facing others for the future and consider as an activity for the students. 2- The best seminars will take into consideration and students will be rewarded.

## **External Evaluator**