COURSE DESCRIPTIONS

Faculty	Pharmacy				
Department	Medical Laboratory Sciences			**NQF level**	6
Course Title	Diagnostic Hematopathology	**Code**	**902365**	**Prerequisite**	**902265**
Credit Hours	3	**Theory**	2	**Practical**	1
Course Leader	**SokiynaAbabneh, M.Sc**	**email**	s.ababneh@jadara.edu.jo		
Lecturers	**SokiynaAbabneh, M.Sc**	**emails**	s.ababneh@jadara.edu.jo		
Lecture time		**Classroom**			
Semester	First 2021-2022	**Production**	2019	**Updated**	2020
Awards				**Attendance**	Fulltime

ShortDescription

This course provides students with a vista of the common hematological abnormalities and malignancies of white blood cells (benign and malignancies) and lymph nodes, and hematological abnormalities of red blood cells and platelets, with a major emphasis on the etiology, pathogenicity, and clinical features. The course will also include a detailed description covering the laboratory diagnostic approaches of erythrocytic and leukocytic disorders examination flow and the interpretation of routine hematological assay results, as well as specialized assays. In addition, the course will cover the morphological abnormalities that require microscopic examination of stained blood smears, and traditional and special-stained bone marrow smears. Quality control and quality assurance measures will be included to ensure precise and accurate diagnosis of diseases.

The course will also cover hemostatic disorders including quantitative and qualitative disorders of platelets as well as coagulopathies. Routine and special laboratory tests for the differential diagnosis and follow- up of these disorders will be extensively described, including the morphological abnormalities that require microscopic examination through details of stained blood films and the correlation with other routine tests.

Course Objectives

- To understand the basic concepts and terminologyin hematopathology
- To understand the principle of classifying erythrocytesdisorders and benign and malignant leukocytes disorders.
- To understand the etiology, pathogenesis, clinical presentation and prognosis of erythrocyte disorders and leukocytesmalignancies
- To correlate clinical aspects of the disease with the diagnostic and prognostic issues
- To understand the methods and application of hematologicaltests in the diagnosis of hematological malignancies anddisorders including routine examination and specialized technical approaches
- To introduce hemostatic disorders including platelets disease and coagulopathies in regard to etiology, pathogenesis, clinical features as well as the routine and specialized diagnosticapproaches
- To be able to interpret the laboratory findings and to correlate them to diagnostic aspects of hematological malignancies and disorders including routine CBC, blood film analysis, special assays, and coagulation tests, todisease conditions.

Learning Outcomes
A. Knowledge - Theoretical Understanding
a1. Outline different types of anemia, leukemia , lymphoma, multiple myeloma, myeloproliferative disorders ,myelodysplastic syndromes ,hemostatic disorders, their causes and diagnosis.
B. Knowledge - Practical Application
a2.make use of the different methods used in diagnostic hematology and their applications in scientific research and medical analysis.
C. Skills – Generic Problem Solving and Analytical Skills
b1. Analyze the scientific procedures for solving problems in identifying and studying different topics related to hematopathology through analyzing course example and answer questions.
D. Skills – Communication, ICT, and Numeracy
b2. prove the ability to communicate information and arguments effectively using written and oral skills.
E. Competence: Autonomy, Responsibility, and Context
c1. Adapt the knowledge from this course into larger context of how to apply modern laboratory procedures and techniques in diagnostic hematology into medical laboratory field , diagnosis of diseases, and hematopathology research. **c2.** discuss the principles of hematological tests and their interpretation in the diagnosis of erythrocytesdisorders, malignant disorders and hemostatic disorders including routine examination and specialized technical approach.
Teaching and Learning Methods
Lectures will be given according to the specified time and location as assigned on the academic schedule (see course information above). Lectures will be administrated using power-point presentations and will be provided to the students through JU e-learning website. Textbook is obligatory and required by the students. **Teaching duration**: According to the academic calendar provided at JU website.
Assessment Methods
• **Midterm exam 30%** • **Quiz 10%** • **Case study 10%** • **Final exam 50%**

Course Contents					
Week	**Hours**	**CLOs**	**Topics**	**Teaching & Learning Methods**	**Assessment Methods**
1.	3	a1,c2	• Erythrocytes disorders: classificationsystems • Introduction toanemia • **Disorders of Iron kinetics and metabolism(I):** Iron deficiency anemia	Power point presentation & textbook (chapter 19 &20)& handout	Mid term exam
2.	3	a1,c2,	• **Disorders of Iron kinetics and metabolism(II):**	Power point presentation	Mid term

		a2	Anemia of chronic inflammation. Sideroblastic anemia. • **Anemia of defective DNA synthesis andmetabolism:** Megaloblastic anemia.	&textbook (chapter 20 &21)	exam
3.	3	a1,c2, a2	• **Disorders of Iron kinetics and metabolism(III):** Porphyria. Iron overload. • **Anemia of bone marrowfailure:** Aplastic Anemia • **Anemia of excessive erythrocytes destructionI:** Introduction to hemolytic anemia	Power point presentation & textbook (chapter 20 &22 &23)	Mid term exam
4.	3	a1,c2, a2, b1,b2	• **Disorders of Hemesynthesis (Hemoglobinpathies)I** Thalassemia • **Disorders of Hemesynthesis (Hemoglobinpathies)II** Thalassemia (cont.)	Power point presentation & textbook (chapter 28)	Mid term exam
5.	3	a1,c2, a2,b1, c1,b2	• **Disorders of Hemesynthesis (Hemoglobinpathies)III:** Sickle cell disease • **Anemia of excessive erythrocytes destructionII:** Erythrocyte membrane defects	Power point presentation & textbook (chapter 27&24)& handout	Mid term exam & quiz
6.	3	a1, a2, c2,b1, ,b2,c1	• **Anemia of excessive erythrocytes destructionIII:** Enzymopathies • **Anemia of excessive erythrocytes destructionIV** Immune mediated hemolytic anemia	Power point presentation & textbook (chapter 25)	Mid term exam & quiz
7.	3	a1,a2, b1,b2, ,c1 c2	• Review to leukocytes and disordersclassification • **Leukemia (I)**: Etiology, pathogensis and clinicalfeatures • **Leukemia (II)**: Acuteleukemia • Myeloid and Erythroidmaturation • **Midterm exam**	Power point presentation &handout & textbook (chapter 29)& handout	Final exam
8.	3	a1,c2, a2	• **Leukemia (III)**: Acuteleukemia • **Leukemia (IV)**: Chronic LymphoidLeukemia	Power point presentation & textbook (chapter	Final Exam

				35 & 36)&handout	
9.	3	a1,c2, a2,b1, c1,b2	• **Myeloproiferative Disorders MPD (I):** Chronic myeloid leukemia. Polycythemia Vera. • **Myeloproiferative Disorders MPD (II):** IdiopathicMyelofibrosis Essential thrombocythemia.	Power point presentation & textbook (chapter 33)	Final Exam
10.	3	a1,c2, a2,b1, ,b2,c1	• **Myelodysplastic syndromes MDS (I)**: Introduction and myelodysplasticevidences • **Myelodysplastic syndromes MDS(II)**	Power point presentation & textbook (chapter 34)	Final Exam
11.	3	a1,c2, a2,b1, ,b2,c1	• **Lymphomas** • **Plasma cells disorders:** MultipleMyeloma	Power point presentation & handout	Final Exam
12.	3	a1,c2, a2	• **Platelets disorders (I)**: Quantitativedisorders	Power point presentation & textbook (chapter 40)	Final Exam
13.	3	a1,c2, a2, b1,b2, c1	• **Platelets disorders (II)**: Qualititativedisorders	Power point presentation & textbook (chapter 41)	Final Exam
14.	3	a1,c2, a2,b1, b2,c1	• **Coagulaopathies (I)**: Hypercoagulabilitydisorders	Power point presentation & textbook (chapter 39)	Final Exam
15.	3	a1,c2, a2, b1,b2, c1	• **Coagulaopathies (II)**: Hypocoagulabilitydisorders • Coagulation tests • Quality control and quality assurance.	Power point presentation & handout & textbook (chapter 38)& handout	Final Exam
16.	3	a1,a2, b1,b2, c1,c2	• Revision • **Final exam**		

Infrastructure	
Textbook	Hematology: Clinical principles and applications. Bernadette F. Rodak, George A. Fritsma and Kathryn Doig. Publisher: Saunders Elsevier 2016 5th edition ISBN:9780-323-23906-6

References	• https://evolve.elsevier.com • Lecture handouts • NCBI Database (https//:www.ncbi.nlm.nih.gov/): includes many updated textbooks that are available online FREE. • Internet: there are many websites that provide valuable updated data related to hematopathology including research paper, books, animation, etc. you can find more of these websites by searching in the internet using a suitable searching key. Many websites will be posted on E-learning during the semester. • Hematology Atlas
Required reading	Textbook is obligatory and required by the students
Electronic materials	Provided to the students through JU e-learning website.
Other	In addition to the above, the students will be provided with handouts by the lecturer.

Course Assessment Plan								
Assessment Method		**Grade**	**CLOs**					
			a1	**a2**	**b1**	**b2**	**c1**	**c2**
First(Midterm)		30%	10	4	4	4	4	4
Second (if applicable)								
Final Exam		50%	10	2	6	6	11	15
Coursework								
43Coursework assessment methods	Assignments							
	Case study	10%	2	4	1			3
	Discussion and interaction							
	Group work activities							
	Labtests and assignments							
	Presentations							
	Quizzes	10%				1	9	
Total		100%	22	10	11	11	24	22

Plagiarism

Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code).

Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.