



<b>Faculty:</b> Allied Medical Sciences
<b>Department:</b> Medical Laboratory Sciences (MLS)
<b>Program:</b> MSc
<b>Academic year:</b> 2022/2023 <b>Semester:</b> Second

## Course Plan

### First: Course Information

<b>Course No.</b> 0701705	<b>Course Title:</b> <i>Advanced Diagnostic Hematology</i>	<b>Credit Hours:</b> 3
<b>Prerequisite:</b> None	<b>Lectures Date &amp; Time:</b>	<b>Section 1:</b> Monday 4:30 pm – 7:30 pm <b>Section 2:</b> Saturday 9:00 am – 12:00 pm <b>Section 3:</b> Saturday 12:00 pm – 3:00 pm
<b>Type Of Course:</b>	<input type="checkbox"/> <i>Obligatory Faculty Requirement</i> <input type="checkbox"/> <i>Elective University Requirement</i> <input type="checkbox"/> <i>Obligatory University Requirement</i> <input type="checkbox"/> <i>Faculty Requirement</i> <input type="checkbox"/> <i>Course Elective Specialty Requirement</i> <input checked="" type="checkbox"/> <i>Obligatory Specialization requirement</i>	
<b>Type of Learning:</b>	<input type="checkbox"/> <i>Face-to-Face Learning</i> <input checked="" type="checkbox"/> <i>Blended Learning (2 Face-to-Face + 1 Asynchronous)</i> <input type="checkbox"/> <i>Online Learning (2 Synchronous+1 Asynchronous)</i>	

### Second: Instructor's Information

<b>Name:</b> Samir Awadallah	<b>Academic Rank:</b> Professor
<b>Office Number:</b> 355 D	<b>Telephone Ext:</b> 2201 <b>Email:</b> sawadallah@zu.edu.jo
<b>Office Hours:</b>	<b>Monday:</b> 10:00 am-2:00 pm <b>Wednesday:</b> 9:00 am-1:00 pm

### Third: Course Description

#### Advanced Diagnostic Hematology

The course is designed to give in-depth understanding of recent developments in the field of hematopathology. Emphasis is placed on hematological changes associated with disease states in the erythrocyte, leukocytes and coagulation systems. Learning strategies of this course will include clinical investigation of haematological and coagulation disorders through a combination of didactic lectures, case studies, critical paper reviews and presentations. Students will also be introduced to the new procedures and up-to-date technology applied in the diagnosis of hematological disorders including flow cytometry, cytochemistry and immunohistochemistry.

#### Fourth: Learning Source

<b>Main Reference:</b>	Clinical Hematology: Theory & Procedures	
<b>Author:</b> Mary Louise Turgeon	<b>Issue No.:</b> 5th edition	<b>Publication Year:</b> 2012
<b>Additional Sources &amp; Websites:</b>	<p><b>Textbooks:</b></p> <ul style="list-style-type: none"> <li>• Clinical Hematology Atlas, by Bernadette F. Rodak and Jacqueline H. Carr 4<sup>th</sup> edition, 2013</li> <li>• <i>Dacie and Lewis Practical Haematology</i>, by Barbara J Bain, 12<sup>th</sup> edition, 2017</li> </ul> <p><b>Journals</b></p> <ul style="list-style-type: none"> <li>• Thrombosis and Hemostasis</li> <li>• Blood</li> <li>• American Journal of Hematology</li> <li>• Hemoglobin</li> </ul> <p><b>Websites:</b>  <a href="https://www.hematology.org/education">https://www.hematology.org/education</a></p>	
<b>Teaching Type:</b>	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Laboratory <input type="checkbox"/> Workshop <input type="checkbox"/> MS Teams <input checked="" type="checkbox"/> Moodle	

#### Fifth: Learning Outcomes

Course Code*	Course Learning Outcomes (CLOs)	Connection To Program Learning Outcomes (PLOs)#
<b>Knowledge</b>		
K1	Acquire a detailed knowledge of recent developments in the procedures applied in the diagnosis of hematological disorders	P1,5,6
K2	Recognize standards and protocols related to pre-analytical, analytical, and post analytical aspects of sample collection and analysis.	P1,5,6
K3	Demonstrate full understanding of procedures and analytical techniques applied in investigating coagulation and bleeding disorders.	P1,2,3
K4	Demonstrate full understanding of physiological and biochemical changes associated with hematological and coagulation disorders or conditions presented and discussed in class.	P1,2
<b>Skills</b>		
S1	Identify and assess the effectiveness of individual tests, strategies and protocols in the investigation and screening of diseases and pathological conditions	P1,2,5,6
S2	Interpret complex and advanced test results related to erythrocytes disorders, hemoglobinopathies, and hemostasis disorders	P1,2
S3	Practice professional skills and scientific knowledge in quality management and quality assurance of clinical laboratory.	P3,5,6
S4	Apply essential set of skills needed to author technical reports, scientific manuscripts and monographs	P4,5,6

Competencies		
C1	Ability to apply proper procedures and standards related to pre-analytical, analytical, and post analytical aspects of sample collection and analysis	P2,3
C2	Confidence in correlating laboratory findings with physiological and biochemical changes associated with hematopathological conditions discussed in class.	P1,2,6
C3	Proficient in presenting and defending published research articles and/or data of case studies in front of students and faculty	P3,5,6
C4	Conducting literature search, reviewing, and criticizing published scientific articles	P4,5,6
C5	Demonstrate an awareness of the need for continuing education in terms of professional growth and development	P5,6

#P: Program PLOs, \*Codes for CLOs: K: knowledge; S: skills; C: competencies.

## Sixth: Course Structure

### Teaching and learning Methods and strategies

The teaching and learning methods are mixture of lectures, problem-solving, case discussions, and oral presentations. While the format of lectures is conventional; informal interaction is encouraged. Case discussions relevant to selected topics, will be covered in the teaching sessions and will involve extensive student participation. Assignments require students to present and review journal articles. Skills and ability to present journal articles are developed through class discussion.

The table below illustrate topics to be covered in this course with corresponding ILOs

Week/Date	Topic	ILOs	Teaching Procedure	Teaching Method	Reading Material
1 (4/3-6/3)	<b>Introduction:</b> Discussing course syllabus and plan		Face-to-face	Discussion	Course syllabus
2 (11/3-13/3)	<b>Hematopoiesis:</b> Origin and development of blood cells <b>Blended session:</b> Maturation characteristics of blood cells	K1,3 C1 S3	Face-to-face Asynchronous	Lectures (PPT) Group discussion Assignments	Chapter 4 Pages 73-87
3 (18/3-20/3)	<b>Erythropoiesis:</b> Maturation and development of erythrocytes <b>Blended Session:</b> Retics Calculations	K1,3 C1 S3	Face-to-face Asynchronous	Lectures (PPT) Group discussion Assignments	Chapter 5 Pages 89-121
4 25/3-27/3	<b>Erythropoiesis:</b> Hemoglobin synthesis, Iron metabolism and metabolic pathways of erythrocytes ( <i>Case study presentations</i> ) <b>Blended Session:</b> Erythrocyte Morphology and Inclusions	K1,2,4 C1	Face-to-face Asynchronous	Lectures (PPT) Case study discussion Assignment Quiz 1	Chapter 6 (pages 126-137)
5 1/4-3/4	<b>Hemolytic Anemia: Part 1</b> ( <i>Case study presentations</i> ) <b>Blended Session:</b> Lab Methods	K4 S2 C2	Face-to-face Asynchronous	Lectures (PPT) Case study discussion Assignment	Chapter 12 (pages 192-207) Dacie Practical hematology
6 8/4-10/4	<b>Hemolytic Anemia: Part 2</b> ( <i>Case study presentations</i> ) <b>Blended Session:</b> Case study (HPP)	K4 S2 C2	Face-to-face Asynchronous	Lectures (PPT) Case study discussion Literature Assignment	Chapter 12 (pages 192-207) Dacie Practical

7 15/4-17/4	<b>Hemoglobinopathies: Part 1</b> (Sickle Cell Disease) <i>Case study presentations</i> <b>Blended Session:</b> Hb Electrophoresis	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Literature Assignment	Chapter 13 (Pages 210-233)
8 22/4-24/4	(عيد الفطر)				
9 29/4-1/5	(عيد العمال 1/5) Midterm exam, Monday 29/4/2023)				
10 6/5-8/5	<b>Hemoglobinopathies: Part 2</b> (Thalassemia) <i>Case study presentations</i> <b>Blended Session:</b> Hb SC Disease Case	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Literature Assignment	Chapter 13 (Pages 210-233)
11 13/5-15/5	<b>Hemostasis and Thrombosis: Part 1</b> <b>Blended Session:</b> Coagulation Cascade -Review	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Quiz 2	Chapter 23 (Pages 399-430)
12 20/5-22/5	<b>Hemostasis and Thrombosis: Part 2</b> <b>Blended Session:</b> Case study	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Assignment	Chapter 23 (Pages 399-430)
13 27/5-29/5	<b>Disorders of Hemostasis and Thrombosis Part 1:</b> Vascular, platelets and clotting factors disorders <b>Blended Session:</b> <i>Case study</i>	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Assignment	Chapter 24 (Pages 431-450)
14 3/6-5/6	<b>Disorders of Hemostasis and Thrombosis Part 2:</b> The state of hypercoagulability <b>Blended Session:</b> <i>case study</i>	K4 S2 C2	Face-to-face  Asynchronous	Lectures (PPT) Case study discussion Assignment Quiz 3	Chapter 24 (Pages 450-458)
15 11/6-22/6	<b>Final Exams</b>				

**Seventh: Assessment methods**


Summative assessment is through a combination of written examinations, class participation and discussion, marked assignments, and oral presentations in front of class.

Methods	Online Learning	Blended Learning	Face-To-Face Learning	Measurable Course (ILOs)
First Exam	0	0	0	
Second Exam	0	0	0	
Mid-term Exam	0	30	0	K1-5; S1-3; C1-2
Quizzes/homework/participation	0	30	0	All

Oral Presentations	0	0	0	S4, C3,4,5
Final Exam	0	40	0	All

### **Eighth: Course Policies**

- All course policies are applied to all teaching patterns (online, blended, and face-to-face Learning) as follows:
  - a. Punctuality.
  - b. Participation and interaction.
  - c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approved by:	Name	Date	Signature
Head of Department	Dr.Kawther Amawi	5/3/2023	
Faculty Dean	Dr.Hashem Abu Harirah	5/3/2023	