XI. *Course Policies:*	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughti	Dr\Gamil Taher Abdul Mughti	- Associate Prof. Dr. Ebtesam Al-Zabedi

Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of Hematology

Course Specification of Advanced Hematology IV (Hematological Malignancies)

Course No. (03.13.314)

2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Ahmed	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:

1	**Course Title:**	Advanced Hematology IV (Hematological Malignancies)			
2	**Course Code & Number:**	03.13.314			
3	**Credit Hours:**	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 2nd Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree Medical Diagnostic Hematology			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**				
13	**Date of Approval:**	2022-2023			

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

II. Course Description:

This course provides an in-depth look at the diagnosis and management of advanced hematologic malignancies. Topics covered include the pathophysiology, clinical presentation, diagnosis, and treatment of acute leukemia, chronic leukemia, lymphoma, myeloma, and other hematologic malignancies. Students will also learn about the role of supportive care in the management of hematologic malignancies.

III. Alignment Course Intended Learning Outcomes with program outcomes

	III. Course Intended Learning Outcomes (CILOs)	Referenced PILOs
A. Knowledge and Understanding: *Upon successful completion of the course, students will be able to:*		
a1	Understand the classification, causes, pathophysiology, clinical features, laboratory diagnosis and treatment of hematologic malignancie	**A1**
B. Intellectual Skills: *Upon successful completion of the course, students will be able to:*		
b1	Interpret the clinical and laboratory information to understand and classify different types of hematologic malignancie	**A1**
C. Professional and Practical Skills: *Upon successful completion of the course, students will be able to:*		
c1	Evaluate the latest research in the hematologic malignancie	**C1**
D. Transferable Skills: *Upon successful completion of the course, students will be able to:*		
d1	Communicate effectively about the diagnosis and management of hemostasis and thrombosis with patients, families, and other healthcare professionals	**D1**

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Understand the classification, causes, pathophysiology, clinical features, laboratory diagnosis and teatment of hematologic malignancie	Lecture	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Interpret the clinical and laboratory information to understand and classify different types of hematologic malignancie	Lecture	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Evaluate the latest research in the hematologic malignancie	Lecture Discussion Presentation	Exam Discussion Presentation
(D Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Communicate effectively about the diagnosis and management of hemostasis and thrombosis with patients, families, and other healthcare professionals	Lecture Discussion Presentation	Exam Discussion Presentation

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al Zabedi

Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Overview of Hematological Malignancies:.	An introduction to the different types of hematological malignancies, including acute and chronic leukemias, lymphomas, and multiple myeloma	2	4	a1,b1,c1,d1
2	Pathophysiology of Hematological Malignancies:	A detailed examination of the genetic and molecular mechanisms underlying the development and progression of hematological malignancies.	3	6	a1,b1,c1,d1
3	Diagnosis of Hematological Malignancies:	A review of the clinical presentation, diagnostic evaluation, and staging of hematological malignancies, including bone marrow biopsy, flow cytometry, cytogenetics, and imaging studies.	1	2	a1,b1,c1,d1
4	Treatment of Acute Leukemias:	An examination of the current treatment approaches for acute myeloid leukemia and acute lymphoblastic leukemia, including chemotherapy, stem cell transplantation, and targeted therapies.	3	6	a1,b1,c1,d1
5	Treatment of Chronic Leukemias:	A discussion of the treatment options for chronic myeloid leukemia and chronic lymphocytic leukemia, including tyrosine kinase inhibitors, monoclonal antibodies, and stem cell transplantation.	2	4	a1,b1,c1,d1
6	Treatment of Lymphomas:	An overview of the treatment strategies for Hodgkin lymphoma and non-Hodgkin lymphoma, including chemotherapy, radiation therapy, immunotherapy, and stem cell transplantation.	2	4 4	a1,a2,b1,c3,d1

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
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		A discussion of the treatment		4	a1,b1,c1,d1
7	Treatment of Multiple Myeloma:	options for multiple myeloma, including chemotherapy, immunomodulatory drugs, proteasome inhibitors, and stem cell transplantation.	2		
8	Supportive Care:	An examination of the supportive care measures used to manage the complications of hematological malignancies and their treatment, including infection prophylaxis, transfusion support, and symptom management.	2	4	a1,b1,c1,d1
9	Emerging Therapies:	A review of the emerging treatment approaches for hematological malignancies, including immunotherapy, targeted therapies, and gene therapy.	2	4	a1,b1,c1,d1
10	Case Studies:	Application of the principles learned in the course to real-life cases, including diagnosis and treatment plans.	2	4	a1,b1,c1,d1
7	Final exam		1	2	a1,b1,c1,d1
Number of Weeks /and Units Per Semester			16	32	

- Acute leukemia

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	**Group discussion**
	Case study analysis

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

VI. Assessment Methods of the Course:	
No	**Assignment**
1	**Written Exams (Essays) and Quizzes**
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
2	**Activity**	Throughout the semester	10	10%	a1,b1,c1,d1
3	Practical Report	Throughout the semester	10	10 %	a1,b1,c1,d1
4	**Practical exam**	12	20	20%	a1,b1,c1,d1
5	**Final Exam**	14	60	60%	a1,b1,c1,d1
Total					

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

X. Learning Resources:	
Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).	
1- Required Textbook(s) (maximum two).	
1-	Basic Principles and Practice , 2017 by Ronald Hoffman et al.
2-	Williams Hematology ,2010 ,by Kenneth Kaushansky et al.
2- Essential References.	
1-	Clinical Hematology, Theory and Procedures by Mary Louise Turgeon 2018 .
2-	Clinical Principles and Applications by Bernadette F. Rodak and George A. Fritsma.
3- Electronic Materials and Web Sites *etc*.	
1-	The American Society of Hematology website www.hematology.org
2-	The National Institutes of Health, National Heart, Lung, and Blood Institute Website www.nhlbi.nih.gov
3-	The World Health Organization website (www.who.int)
4-	The Centers for Disease Control and Prevention website (www.cdc.gov)
5	Medscape Hematology (www.medscape.com/hematology)
6	Blood Journal (www.bloodjournal.org)

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ehtesam Al-Zabedi

XI. *Course Policies:*	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
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Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of Hematology

Course Specification of **Advanced Hematology III (Hemostasis and Thrombosis)**

Course No. (03.13.313)

2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:					
1	**Course Title:**	Advanced Hematology III (Hemostasis and Thrombosis)			
2	**Course Code & Number:**	(03.13.313)			
3	**Credit Hours:**	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 1st Semester			
5	**Pre –Requisite (if any):**	Advanced Hematology I, II			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree Medical Diagnostic Hematology			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**				
13	**Date of Approval:**	2022-2023			

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

II. Course Description:
This course provides an in-depth look at the pathophysiology, diagnosis, and management of hemostasis and thrombosis. Topics covered include the coagulation cascade, platelet function, fibrinolysis, and the role of genetics and acquired factors in hemostasis disorders. Students will also learn about the prevention and treatment of venous thromboembolism (VTE), arterial thromboembolism (ATE), and disseminated intravascular coagulation (DIC).

III. Alignment Course Intended Learning Outcomes with program outcomes

	III. Course Intended Learning Outcomes (CILOs)	Referenced PILOs
A. Knowledge and Understanding: **Upon successful completion of the course, students will be able to:**		
a1	Understand the different types, causes, pathophysiology, signs, symptoms, laboratory diagnosis and treatment of coagulation disorders	A1
B. Intellectual Skills: **Upon successful completion of the course, students will be able to:**		
b1	Interpret the clinical and laboratory information to understand and classify different types coagulation disorders	B1
C. Professional and Practical Skills: **Upon successful completion of the course, students will be able to:**		
c1	Evaluate the latest research in the field of coagulation disorders disorders	C1
D. Transferable Skills: **Upon successful completion of the course, students will be able to:**		
d1	Communicate effectively about the diagnosis and management of hemostasis and thrombosis with patients, families, and other healthcare professionals	D1

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zubedi

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Understand** the different types, causes, pathophysiology, signs, symptoms, laboratory diagnosis and teatment of coagulation disorders	Lecture	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	**Interpret** the clinical and laboratory information to understand and classify different types coagulation disorders.	Lecture	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Evaluate** the latest research in the field of coagulation disorders disorders	Lecture Discussion Presentation	Exam Discussion Presentation
(D Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	**Communicate** effectively about the diagnosis and management of hemostasis and thrombosis with patients, families, and other healthcare professionals	Lecture Discussion Presentation	Exam Discussion Presentation

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Overview of Hemostasis:	A review of the normal physiological processes involved in hemostasis, including platelet activation, coagulation cascade, fibrinolysis, and endothelial function.	2	4	a1,b1,c1,d1
2	Coagulation cascade, fibrinolysis, and endothelial function.	coagulation cascade, fibrinolysis, and endothelial function.	2	4	
3	Bleeding Disorders:	A detailed examination of the pathophysiology, clinical presentation, and diagnostic evaluation of bleeding disorders, including von Willebrand disease, hemophilia, and platelet function disorders.	2	4	a1,b1,c1,d1
4	Thrombotic Disorders:	A detailed examination of the pathophysiology, clinical presentation, and diagnostic evaluation of thrombotic disorders, including deep vein thrombosis, pulmonary embolism, arterial thrombosis, and thrombotic microangiopathies.	2	4	a1,b1,c1,d1
5	Anticoagulant Therapy	A discussion of the pharmacology, indications, and monitoring of anticoagulant medications, including heparin, warfarin, direct oral anticoagulants, and antiplatelet agents.	1	2	a1,b1,c1,d1
6		An overview of the pharmacology and indications for thrombolytic agents in the treatment of acute thrombotic events.	1	2	a1,b1,c1,d1
7	Laboratory Evaluation of Hemostasis and	An introduction to the laboratory techniques used to evaluate	2	4	a1,b1,c1,d1

	Thrombosis:	hemostasis and thrombosis,			
		including bleeding time, clotting time, platelet function testing, coagulation factor assays, and genetic testing.			
8	Thrombophilia:	A discussion of the genetic and acquired risk factors for thrombosis, including factor V Leiden, prothrombin gene mutation, and antiphospholipid syndrome.	1	2	a1,b1,c1,d1
9	Hemostasis and Thrombosis in Special Populations:	A review of the unique considerations for hemostasis and thrombosis in pregnancy, pediatrics, and elderly populations.	1	2	a1,b1,c1,d1
10	Thrombosis Prevention Strategies:	A discussion of the strategies for preventing thrombotic events, including prophylaxis in surgical and medical settings, and lifestyle modifications.	1	2	a1,b1,c1,d1
11	Final exam		1	2	a1,b1,c1,d1
Number of Weeks /and Units Per Semester			16	32	

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	Group discussion
	Case study analysis

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

VI. Assessment Methods of the Course:	
No	**Assignment**
1	Written Exams (Essays) and Quizzes
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
2	Activity	Throughout the semester	10	10%	a1,b1,c1,d1
3	Practical Report	Throughout the semester	10	10 %	a1,b1,c1,d1
4	Practical exam	12	20	20%	a1,b1,c1,d1
5	Final Exam	14	60	60%	a1,b1,c1,d1
Total					

X. Learning Resources:	
· Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).	
1- Required Textbook(s) (maximum two).	
1-	Basic Principles and Practice , 2017 by Ronald Hoffman et al.
2-	Williams Hematology ,2010 ,by Kenneth Kaushansky et al.
2- Essential References.	
1-	Clinical Hematology, Theory and Procedures by Mary Louise Turgeon 2018 .
2-	Clinical Principles and Applications by Bernadette F. Rodak and George A. Fritsma.
3- Electronic Materials and Web Sites *etc*.	
1-	The American Society of Hematology website www.hematology.org
2-	The National Institutes of Health, National Heart, Lung, and Blood Institute Website www.nhlbi.nih.gov
3-	The World Health Organization website (www.who.int)
4-	The Centers for Disease Control and Prevention website (www.cdc.gov)
5	Medscape Hematology (www.medscape.com/hematology)
6	Blood Journal (www.bloodjournal.org)

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

XI. *Course Policies:*	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
. Dr Fuad Balkam	- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of Hematology

Course Specification of Advanced Hematology II (Red Blood Cell Disorders)

Course No. (03.13.312)

2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	. Dr Fuad Balkam	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:					
1	**Course Title:**	Advanced Hematology II (Red Blood Cell Disorders)			
2	**Course Code & Number:**	03.13.312			
3	**Credit Hours:**	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 1st Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree Medical Diagnostic Hematology			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**				
13	**Date of Approval:**	2022-2023			

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	. Dr Fuad Balkam	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

II. Course Description:
This course provides an in-depth look at the pathophysiology, diagnosis, and management of advanced red blood cell disorders. Topics covered include:Anemias, Sickle cell disease, Thalassemia, Hemoglobinopathies and Acquired red blood cell disorders

III. Alignment Course Intended Learning Outcomes with program outcomes		
III. Course Intended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: **Upon successful completion of the course, students will be able to:**		
a1	Understand the different types, causes, pathophysiology, clinical features, laboratory diagnosis and treatment of anemia.	A1
B. Intellectual Skills: **Upon successful completion of the course, students will be able to:**		
b1	Interpret the clinical and laboratory information to understand and classify different types of anemia.	B1
C. Professional and Practical Skills: **Upon successful completion of the course, students will be able to:**		
c1	Evaluate the latest research in the field of red blood cell disorders	C1
D. Transferable Skills: **Upon successful completion of the course, students will be able to:**		
d1		D1

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	. Dr Fuad Balkam	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Understand** the different types, causes, pathophysiology, clinical features, laboratory diagnosis and teatment of anemia. of anaemia	Lecture	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	**Interpret** the clinical and laboratory information to understand and classify different types of anemia.	Lecture	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Evaluate** the latest research in the field of red blood cell disorders	Lecture Discussion Presentation	Exam Discussion Presentation
(D Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1		Lecture Discussion Presentation	Exam Discussion Presentation

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Ameri	. Dr Fuad Balkam	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	1. Introduction to Red Blood Cell Disorders:.	An overview of the different types of red blood cell disorders, including anemias, hemoglobinopathies, and red blood cell membrane disorders	1	2	a1,b1,c1
2	2. Red Blood Cell Production and Destruction:	The process of red blood cell production and breakdown, including the role of erythropoietin, the bone marrow, and the spleen.	1	2	a1,b1,c1
3	3. Anemia:	A detailed look at the causes, symptoms, and treatment of anemia, including iron deficiency anemia, hemolytic anemia, and aplastic anemia.	2	4	a1,b1,c1
4	Hemoglobinopathies	A discussion of the genetic mutations that can cause abnormal hemoglobin production, including sickle cell anemia and thalassemia.	2	4	a1,b1,c1
5	Red Blood Cell Membrane Disorders	An examination of the genetic mutations that can affect the structure and function of red blood cell membranes, including hereditary spherocytosis and	2	4	a1,b1,c1

		elliptocytosis.			
6	Red Blood Cell Enzyme Deficiencies:	A look at the genetic mutations that can affect the enzymes involved in red blood cell metabolism, including glucose-6-phosphate dehydrogenase deficiency.	1	2	a1,b1,c1
7	7. Red Blood Cell Transfusion:	An overview of the indications for red blood cell transfusion, the types of blood products available, and the risks and benefits of transfusion.	1	2	a1,b1,c1
8	8. Hemolytic Disease of the Newborn:	A discussion of the causes, prevention, and treatment of hemolytic disease of the newborn, including Rh incompatibility and ABO incompatibility.	1	2	a1,b1,c1
9	9. Other Red Blood Cell Disorders:	A brief overview of less common red blood cell disorders, including paroxysmal nocturnal hemoglobinuria and cold agglutinin disease.	1	2	a1,b1,c1
10	Case Studies:	Application of the principles learned in the course to real-life cases, including diagnosis and treatment plans.	2	4	a1,b1,c1
12	Final exam		1	2	a1,b1,c1
Number of Weeks /and Units Per Semester			16	**32**	

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	. Dr Fuad Balkam	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	**Group discussion**
	Case study analysis

VI. Assessment Methods of the Course:	
No	**Assignment**
1	**Written Exams (Essays) and Quizzes**
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
2	Activity	Throughout the semester	10	10%	a1,b1,c1
3	Practical Report	Throughout the semester	10	10 %	a1,b1,c1
4	Practical exam	12	20	20%	a1,b1,c1
5	Final Exam	14	60	60%	a1,b1,c1
Total					

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X. Learning Resources:	
Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).	
1- Required Textbook(s) (maximum two).	
1-	Basic Principles and Practice , 2017 by Ronald Hoffman et al.
2-	Williams Hematology ,2010 ,by Kenneth Kaushansky et al.
2- Essential References.	
1-	Clinical Hematology, Theory and Procedures by Mary Louise Turgeon 2018 .
2-	Clinical Principles and Applications by Bernadette F. Rodak and George A. Fritsma.
3- Electronic Materials and Web Sites *etc.*	
1-	The American Society of Hematology website www.hematology.org
2-	The National Institutes of Health, National Heart, Lung, and Blood Institute Website www.nhlbi.nih.gov
3-	The World Health Organization website (www.who.int)
4-	The Centers for Disease Control and Prevention website (www.cdc.gov)
5	Medscape Hematology (www.medscape.com/hematology)
6	Blood Journal (www.bloodjournal.org)

XI. *Course Policies:*	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose

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	the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
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7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of Hematology

Course Specification of **Advanced Hematology I Stem Cells and Hemopoiesis**

Course No. (03.13.311)

2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:					
1	**Course Title:**	Advanced Hematology I Stem Cells and Hemopoiesis			
2	**Course Code & Number:**	03,13,311			
3	**Credit Hours:**	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 1st Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree Medical Diagnostic Hematology			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**				
13	**Date of Approval:**	2022-2023			

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Abdulrahman Amer	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

II. Course Description:
This course will provide an in-depth look at the biology of stem cells and hematopoiesis. Topics will include the biology of stem cells, the differentiation of stem cells into blood cells, the regulation of hematopoiesis, and the role of stem cells in disease.

III. Alignment Course Intended Learning Outcomes with program outcomes		
III. Course Intended Learning Outcomes (CILOs)		**Referenced PILOs**
A. Knowledge and Understanding: **Upon successful completion of the course, students will be able to:**		
a1	Understand the basic biology of stem cells	A1
B. Intellectual Skills: **Upon successful completion of the course, students will be able to:**		
b1	Explain the regulation of hematopoiesis	B1
C. Professional and Practical Skills: **Upon successful completion of the course, students will be able to:**		
c1	• Evaluate the ethical issues surrounding stem cell research	C1
c2		
D. Transferable Skills: **Upon successful completion of the course, students will be able to:**		
d1		D1

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- Explain the role of stem cells in diseases such as leukemia and lymphoma
- Apply the principles of stem cell research to their own research or clinical practice

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Understand the basic biology of stem cells	Lecture	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Explain the regulation of hematopoiesis	Lecture	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	• Evaluate the ethical issues surrounding stem cell research	Lecture Discussion Presentation	Exam Discussion Presentation
(D Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Communicate effectively about stem cells	Lecture Discussion Presentation	Exam Discussion Presentation

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Course Content:					
A – Theoretical Aspect:					
Order	**Units/Topics List**	**Sub Topics List**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	Introduction to Stem Cells	What are stem cells? Types of stem cells The properties of stem cells	2	4	a1,b1,c1,d1
2	Hematopoiesis	The development of blood cells Hematopoiesis The different types of blood cells The development of blood cells from stem cells	2	4	a1,b1,c1,d1
3	Regulation of Hematopoiesis	The regulation of hematopoiesis The factors that regulate hematopoiesis The role of cytokines in hematopoiesis	2	4	a1,b1,c1,d1
4	Stem Cells in Disease	Diseases of stem cells and hematopoiesis Aplastic anemia Leukemia Myelodysplastic syndromes	2	4	a1,b1,c1,d1
5	Midterm Exam		1	2	a1,b1,c1,d1
6	Laboratory Exercise:	Isolation and Culture of Hematopoietic Stem Cells	1	2	a1,b1,c1,d1
7	Student Presentations		1	2	a1,b1,c1,d1
8	Graft-Versus-Host Disease (GVHD)		1	2	a1,b1,c1,d1
9	Gene Therapy and Stem Cells		2	4	a1,b1,c1,d1
10	Clinical Applications of HSCs in Hematology		1	2	a1,b1,c1,d1
11	Ethical and Regulatory Issues in Stem Cell Research and Clinical Applications		1	2	a1,b1,c1,d1
12	Final Exam				a1,b1,c1,d1

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
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Number of Weeks /and Units Per Semester	12	32	

B - Practical Aspect: (if any)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	Introduction to diagnostic techniques of tumors	3	6	a1,a2,b1,c3,d1
2	Diagnostic test for heart and liver diseases	3	6	a1,a2,b1,c3,d1
3	ELISA techniques	2	4	a1,a2,b1,c3,d1
Number of Weeks /and Units Per Semester				

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	Group discussion
	Case study analysis

VI. Assessment Methods of the Course:	
No	**Assignment**
1	Written Exams (Essays) and Quizzes
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
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VII. Assignments:					
No.	**Assignments**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned CILOs (symbols)**
1	Activity	Throughout the semester	10	10%	a1,a2,b1,c3,d1
2	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,c3,d1
3	Practical exam	12	20	20%	a1,a2,b1,c3,d1
5	Final Exam	14	60	60%	a1,a2,b1,c3,d1
Total					

Learning Resources:

- Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

- 1-Hematopoiesis: A Cellular and Molecular Approach by John E. Dick
- 2-Stem Cell Biology by Alexander R.P. de Sousa

2- Essential References.

Stem Cells and Regenerative Medicine by Anthony Atala and James J. Yoo

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XI. Course Policies:	
1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
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Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory Medicine.

Department of Hematology

Course Specification of **Medical laboratory training**

Course No. ()

2022 /2023

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr. Ebtesam Al-Zabedi	Dr. Nawal Al-Honhena	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

Practical WBCs disorder

I. Course Identification and General Information:

1	**Course Title:**	Medical laboratort training.rtf			
2	**Course Code & Number:**				
3	**Credit Hours:**	**Theory Hours**			
		Lecture	**Exercise**	Practical	**Credit Hours**
		0	0	4	1
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 2nd Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree Medical laboratory training			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**	Dr. Gamil taher			
13	**Date of Approval:**	2023			

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr. Ebtesam Al-Zabedi	Dr. Nawal Al-Henhena	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtesam Al-Zabedi

NO.	Tasks/ Experiments	Sub title	Number of Weeks	Contact hours
1	Introduction to laboratory diagnosis for WBCs disorder	Classification of WBCs disorder and its Indication from CBCs and blood film	1	2
2	Normal leucopoiesis stages	microscopic pictures	1	2
3	Peripheral blood smear morphology for benign change		1	2
4	Peripheral blood smear morphology for malignant myeloid change		1	2
5	Peripheral blood smear morphology for malignant lymphoid change		1	2
6	Reactive lymphocyte change with lymphoma change on peripheral blood smear		1	2
7	cytochemical stains		1	2
8	Bone marrow smear technique and fixation		1	2
9	Bone marrow examination	Smear, fixation, microscopic analysis and report form	1	2
10	Immunophenotyping classification and examination		1	2

Practical RBCs disorder

NO.	Tasks/ Experiments	Sub title	Number of Weeks	Contact hours
1	Introduction to Laboratory diagnosis for RBCs disorder		1	2
2	Manual CBC and peripheral blood film fixation and staining		1	2
3	Hematology stain	Type of Stain, composition, preparation and used	1	2
4	CBC Automation	CBC automation principle, artificial result error from CBC	1	2
11	Flowcytometry		1	2
12	Gene expression/mutation analysis		1	2
13	Chromosome study and cytogenetic analysis		1	2
Number of Weeks /and Units Per Semester				

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		and it's correction technique and blood film indications		
5	Normal erythropoiesis stages	microscopic pictures and WBCs correction	1	2
6	Blood film report	Anisocytosis, poikilocytosis, abnormal RBC Shape and inclusion	3	6
7	Retic count		1	2
8	Special Chemical test in hematology	Iron, TIPC, transferrin, ferritin, G6PD, vit B12, folate .. etc.	2	2
9	Special hematology test	Osmotic fragility, sickling, solubility, ham test .. ect.	2	2
10	Electrophoresis		1	2
11	Bone marrow examination and report		1	2
12	Quality Assurance in general hematology	Safety practice Pre analytic, analytic, and post analytic error source Reliability check for CBC and	1	2

		other hematology result		
Number of Weeks /and Units Per Semester				

Practical blood bank				
NO.	**Tasks/ Experiments**	**Sub title**	**Number of Weeks**	**Contact hours**
1	Introduction to blood bank practical	Reagent, equipment and different principle of serology reaction	1	2
2	RBCs washing and cell suspension preparation		1	2
3	Blood grouping	Slide and tube (foreword and reverse)	1	2
4	Blood sub group	Detection and reagent used	1	2
5	Weak D positive techniques		1	2
6	ABO blood group Discrepancy	Detection and problem solving	1	2
7	Comb's test	DAT, IAT	1	2
8	Ab titration		1	2
9	Ab screening and identification		2	4
١٠	Ab elusion techniques		1	2
١١	Pre transfusion tests and Crossmatching		1	2
١٢	Blood component preparation and preservation	Component and PRP preparation	1	2
١٣	Advance technique in blood bank	Apheresis, automation .. etc.	1	2
١٤	Quality Assurance and infection prevention control in blood bank		1	2
Number of Weeks /and Units Per Semester				

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Practical hemostasis/coagulation				
NO.	**Tasks/ Experiments**	**Sub title**	**Number of Weeks**	**Contact**

				hours
1	Introduction to laboratory homeostasis/coagulation study tests		1	2
2	Screening test Primary homeostasis	A. Plt count: 1- Manually 2- automation with plt indices and it's indication 3- semi-quantity by peripheral smear B. Plt function screen test for: 1. bleeding time 2. screen for plt aggregation	1	2
3	Bone marrow analysis for plt and megakaryocyte disorder		1	2
4	Plt function test	1. Tests for General functions (adhesion, activation, and aggregation) 2. Test for specific abnormality	2	4
5	Secondary homeostasis screening test	Clotting time, PT, aPTT, TT, Reptile's test .. etc.	1	2
6	Mixing study		1	2
7	Factor assay		1	2
8	Von Willebrand disease classification and diagnostic tests		1	2
10	Advance techniques for homeostasis study	Flowcytometry (immunophenotyping) and genetic related test	1	2
١١	Quality assurance in homeostasis/coagulation lab		1	2
Number of Weeks /and Units Per Semester				

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V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self-leaning
4-	**Group research**

VI. Assessment Methods of the Course:

No	Assignment	
1	**Written Exams (Short Essays) and Quizzes**	
2	Written Exams(MCQ)	
3	Structured Oral Exams	
4	Objective Structured Practical Exams (OSPE)	
5	Student presentation	

XI. *Course Policies:*	
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7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

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