

Republic of Yemen
Ministry of Higher Education & Scientific Research
21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIED
SCIENCES



Faculty of Laboratory medicine.

Department of Hematology
Course Specification of Advanced Genetics of Hematology
Course No. (03.13. 321)
2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
Dr\ Nawal Al- Henhena	Dr\ Nabil Alowiri	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 Genetics of Hematology			
2	Course Code & Number:	03.13. 321			
3	Credit Hours:	Theory Hours			Credit Hours
		Lecture	Exercise	Practical	
		2	0	2	3
4	Study Level/ Semester at which this Course is offered:	1 st Level / 2 nd 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			

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II. Course Description:

This course is designed to provide advanced knowledge and understanding of the molecular genetic basis of hematological disorders. Students will learn about the latest research and advancements in the field of molecular genetic hematology, including the identification and characterization of genetic mutations that contribute to the development and progression of hematological disorders.

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course Intended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: <i>Upon successful completion of the course, students will be able to:</i>		
a1	Understand the molecular genetic basis of hematological disorders, including the identification and characterization of genetic mutations that contribute to the development and progression of hematological disorders	A1
B. Intellectual Skills: <i>Upon successful completion of the course, students will be able to:</i>		
b1	Analyze the interplay between genetic and environmental factors in the pathogenesis of hematological disorders.	B1
C. Professional and Practical Skills: <i>Upon successful completion of the course, students will be able to:</i>		
c1	Evaluated research plan based on the latest research and advancements in the field	C1
D. Transferable Skills: <i>Upon successful completion of the course, students will be able to:</i>		
d1	Communicate effectively about hematological disorders to patients, colleagues, and the public	D1

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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 molecular genetic basis of hematological disorders, including the identification and characterization of genetic mutations that contribute to the development and progression of hematological 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	Analyze the interplay between genetic and environmental factors in the pathogenesis of hematological 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	Evaluated research plan based on the latest research and advancements in the field	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 hematological disorders to patients, colleagues, and the public	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 Molecular Genetic Hematology:	Basic concepts and definitions, history of molecular genetic hematology, and overview of the course.	2	4	a1,b1,c3,d1
2	The Genetics of Hematological Disorders	<ul style="list-style-type: none"> ○ Mendelian inheritance ○ Chromosomal disorders 	1	2	a1,b1,c3,d1
3	Hematopoiesis and Hematopoietic Stem Cells:	Mechanisms of hematopoiesis, regulation of hematopoietic stem cells, and their role in the development of hematological disorders.	2	4	a1,b1,c3,d1
4	Genetic Basis of Hematological Disorders:	Role of genetic mutations in the development and progression of hematological disorders, including anemias, leukemias, lymphomas, and myeloproliferative disorders.	1	2	a1,b1,c3,d1
5	Inherited Hematological Disorders:	Molecular basis of inherited hematological disorders, including thalassemia, sickle cell anemia, and hemophilia.	2	4	a1,b1,c3,d1
6	Acquired Hematological Disorders:	Molecular basis of acquired hematological disorders, including myelodysplastic syndromes and	2	4	a1,b1,c3,d1

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		myeloproliferative neoplasms.			
7	Epigenetics and Hematological Disorders:	Role of epigenetic modifications in the development and progression of hematological disorders.	1	2	a1,b1,c3,d1
8	Hematological Oncogenomics:	Applications of genomics and transcriptomics in the study of hematological disorders, including identification of new therapeutic targets and development of personalized medicine.	1	2	a1,b1,c3,d1
9	Hematological Immunology:	Role of the immune system in the pathogenesis of hematological disorders, including autoimmune hemolytic anemia and immune thrombocytopenia.	1	2	a1,b1,c3,d1
10	Stem Cell Transplantation:	Role of stem cell transplantation in the treatment of hematological disorders, including allogeneic and autologous stem cell transplantation.	1	2	a1,b1,c3,d1
11	Research and Developments in Molecular Genetic Hematology:	Current research and developments in the field of molecular genetic hematology, including new tools, technologies, and approaches.	1	2	a1,b1,c3,d1
12	Final exam		1	2	a1,b1,c3,d1
Number of Weeks /and Units Per Semester			16	32	

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V. Teaching Strategies of the Course:

1-	Lectures
2-	Practical session
3-	Self-learning
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,a2,b1,c3,d1
3	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,c3,d1

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4	Practical exam	12	20	20%	a1,a2,b1,c3,d1
5	Final Exam	14	60	60%	a1,a2,b1,c3,d1
Total					

Learning Resources:
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).
1- Required Textbook(s) (maximum two).
Clinical Biochemistry: An Integrated Approach, 7th Edition by William M. Brown and David A. Marks Clinical Chemistry: A Laboratory Handbook, 7th Edition by John W. Baynes and Michael J. Dominiczak
2- Essential References.
Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th Edition by Burt Hirschhorn and Robert A. McPherson Devlin's Textbook of Biochemistry with Clinical Correlations: Martin D. Snider John Wiley & Sons, Incorporated, Oct 9, 2024 - 1448 pages
Web
1- http://www.biology.arizona.edu/biochemistry/biochemistry.html
2- GENERAL BIOCHEMISTRY: http://web.indstate.edu:80/thcme/mwking/
3- MEDICAL BIOCHEMISTRY http://www.kumc.edu/research/medicine/biochemistry/bioc800/opening.html
4- https://pubmed.ncbi.nlm.nih.gov/

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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.
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

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