Program specification for Master in Laboratory and Clinical Hematological Researches

Code:1705700

University: Alexandria **Faculty:** Medical Research Institute

Program Specification

A- Basic information

1- Program title: Master in Laboratory and Clinical Hematological Researches

2- Program type: single [√] **double** [ ] **multiple** [ ]

3- Department(s): Hematology

4- Coordinator: Prof Dr: Maha EL Gammal

5- External evaluator(s):

6- Last date of program specification approval: 7-3-2019

B- Professional Information

1- Program aims:

By the end of the program the students should

1-List and recognize the basic knowledge of hematopoiesis and haemostasis.
2- Investigate a case of anemia and hemostasis.
3-Discuss the basic steps in immunophenotyping and molecular techniques
4- Identify basic cytogenetics knowledge and molecular biology steps and different molecular techniques.
5 –Recognize basic knowledge in immunology and interpret disordered function of the immune system
6- State different lines of treatment of anemia and recognize the causes of drug resistance
7- Recall the pharmacokinetics of specific drug groups which are antimicrobial, antineoplastic, iron therapy, antifungal drugs and immunotherapy and their indications.
8- Recognize the blood group system and HLA system.
9- List the indications for transfusion in certain situations.
10- Differentiate between different benign leucocytic disorders and diagnose lysosomal storage disorders.
11-Recognize and interpret the diagnostic approach for different types of anemias.
12- List the indications of Stem cell transplantation in hematological diseases.
13- Identify causes of splenomegaly and hypersplenism.
14- Interpret bone marrow aspirate and biopsy and causes of bone marrow infiltration.
15- Recognize the diagnostic approach for different types of acute and chronic leukemias.

16- Investigate cases of chronic lymphoproliferative and myeloproliferative neoplasms.
17- Discuss findings in Plasma cell dyscrasias and histocytic disorders.
18- Use systematic approaches to design and conduct scientific research and communicate efficiently and lead work teams.

2- Intended learning outcomes (ILOS)

a- knowledge and understanding:

a1- Identify cell structure, production, function and fate of hematopoietic cells
a2- List basic knowledge in hemostasis and fibrinolysis
a3 - Recognize the importance of basic hematological laboratory techniques in samples collection and preparation
a4- Discuss principles of cytogenetics and basic molecular biology steps
a5- Recall the basic aspects of immunology. List different types of cytokines, complement and MHC.
a6- List the pharmacokinetics of antimicrobials, antineoplastic drug, iron therapy, blood components, antifungal drugs and immunotherapy and recognize the uses of cytokines, growth factors and immunosuppressive agents in hematology
a7- Identify the basic knowledge of blood group system and HLA system and blood donation
a8- Recall the indications of cytapheretic, plasmapheresis, blood components and complications of transfusion
a9- List the diagnostic approach for lysosomal storage disorders and benign leucocytic disorders
a10- List the management of different types of anemias and causes of iron overload. Identify causes of splenomegaly and hypersplenism
a11- List the investigations used for acute and chronic leukemia and chronic lymphoproliferative and chronic myeloproliferative disorders and indications for BMT
a12-List the signs and symptoms and management of hematological malignancies, the recent advances in the field of hematology and the details of ethical and legal practice and quality standards of the practice through thesis.

b- Intellectual skills:

b1- Assess the role of basic cell biology to pathogenesis of hematological diseases
b2- Evaluate the abnormalities in complete blood count and differentiate between different coagulation techniques
b3- Differentiate between different molecular techniques
b4- Evaluate the role of adoptive immune response and the basic steps in clinical transplantation, tumor immunology and hypersensitivity.
b5- Interpret the uses of antiplatelets, antithrombotic and immunotherapy in hematological diseases
b6- Interpret the steps of transfusion in different situations.
b7- Interpret tests for bleeding disorders and thrombophilia, conduct research studies that add to hematology and publish scientific articles and papers and plan for professional improvement.
b8- Differentiate between the laboratory diagnosis of different types of leukemias and lymphomas
b9- Evaluate the prognosis and outcome of treatment of patients with hematological malignancies.
b10 Write a thesis protocol using a scientific and systematic approach to a research problem

c- Professional and practical skills:

c1- Interpret the results of complete blood count and do reticulocytic count
c2- Perform mononuclear separation using Ficoll hypaque

c3- Perform forward and reverse typing and Rh.
c4- Use technology to advance practice.
c5- Assess different findings in anemic and bleeding/thrombotic patients
c6- Make use of bone marrow aspirate and biopsy in diagnosing different hematological neoplasms
c7- Perform proper clinical examination and create a diagnostic paradigm for hematological neoplasms

d- General and transferable skills:

d1- Develop skills in communication using all methods.
d2-- Use information technology to improve professional practice and use different sources of information to obtain data.
d3- Develop skills in self-appraisal and seek continuous learning.
d4- Develop team work skills, work as team leader as well as a member in larger teams.
d5- Manage scientific meeting and appropriately utilize time.

3- Academic standards

3a - External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE)
Adopted at MRI council 12/2/2014 and re –adopted at 15/1/2023
Last date of Academic References standards (ARS) approval by institute 15/1/23: Council

3b -Comparison of provision to selected external references

Comparison between Generic Academic Standards of NAQAAE and ARS of Master in Laboratory and Clinical Hematological Researches

Generic Academic Standards	ARS of Master in Laboratory and Clinical Hematological Researches
A1-Basic facts, theories, of the specialty and related subjects/ fields	A1- List basic knowledge in hemostasis and fibrinolysis A2-Recognize the importance of basic hematological laboratory techniques A3-Discuss principles of cytogenetics and basic molecular biology steps A4- Recall the basic aspects of immunology A5-- Identify the basic knowledge of blood group system and HLA system and blood donation
A2- Mutual relation between professional practice and effects on environment	A6- Recall different benign and malignant hematological disorders and tests needed to diagnose them. A7- Describe the importance of pharmacokinetics of specific drug groups.
A3- Main scientific advances in the field of practice	A12--List the signs and symptoms and management of hematological malignancies, the recent advances in the

	field of hematology and the details of ethical and legal practice and quality standards of the practice through thesis.
A4- Fundamentals of ethical & legal practice A5 -Quality standards of the practice	A12-List the signs and symptoms and management of hematological malignancies, the recent advances in the field of hematology and the details of ethical and legal practice and quality standards of the practice through thesis
A6- Basics and ethics of scientific research	A12-List the signs and symptoms and management of hematological malignancies, the recent advances in the field of hematology and the details of ethical and legal practice and quality standards of the practice through thesis
B1- Interpret, analyze & evaluate the information to solve problems	B1-Evaluate the abnormalities in complete blood count b2-Interpret the uses of antiplatelets ,antithrombotic and immunotherapy in hematological diseases b3- Interpret the steps of transfusion in different situations **.** b4- Interpret tests for bleeding disorders and thrombophilia b5-Interpret basic cell biology to pathogenesis of hematological diseases
B2- Solve some problems that do not conform to classic data (incomplete data)	B6-Differentiate between different molecular techniques
B3- Integrate different information to solve professional problems	B7- Interpret tests for bleeding disorders and thrombophilia, conduct research studies that add to hematology and publish scientific articles and papers and plan for professional improvement
B4- Conduct a scientific research &/Or write scientific systematic approach to a research problem (hypothesis)	b10 Write a thesis protocol using a scientific and systematic approach to a research problem
B5- Evaluate risks imposed during professional practice	B9-Evaluate the prognosis and outcome of treatment of patients with hematological malignancies
B6- Plan for professional improvement	B7- Interpret tests for bleeding disorders and thrombophilia, conduct research studies that add to hematology and publish scientific articles and papers and plan for professional improvement
B7- Take professional decisions in wide range of professional situations	B8-Differentiate between the laboratory diagnosis of different types of leukemias and lymphomas
C1- Competent in all basic and all required advanced professional skills (	**c1**- Perform different hematological tests

to be determined according to the specialty board/ department)	
C2- Write and appraise reports	**c2**- Write and appraise reports of complete blood picture
C3-Evaluate methods and tools used in specialty	C3-Evaluate *and improve* methods and tools used in specialty Through student questionnaire
D1-Communicate effectively using all methods	D1- Develop skills in communication using all methods
D2- Use information technology to improve his/her professional practice	D2- Use information technology to improve professional practice and use different sources of information to obtain data professional practice
D3- Practice self appraisal and determines his learning needs	D3- Develop skills in self appraisal and seek continuous learning
D4-Share in determination of standards for evaluation of others	D3- Develop skills in self appraisal and seek continuous learning
D5- Use different sources of information to obtain data	D2- Use information technology to improve professional practice and use different sources of information to obtain data
D6- Work in teams	D4 Work as team leader as well as a member in larger teams
D7- Manage time effectively	D5- Manage scientific meeting and appropriately utilize time.
D8- Work as team leader in situations comparable to his work level	D4-Work as team leader as well as a member in larger teams
D9- Learn independently and seek continuous learning	D3 Develop skills in self-appraisal and seek continuous learning

4- Curriculum structure and contents

4.a program duration: 4 years

4.b program structure :

4.b.i- No. of hours per week in each year/semester:

Semester	**Core courses**	**Elective courses**
	No. of hours	**No. of hours**
First semester	**5CH**	**2 CH**
Second semester	**4 CH**	

Third semester	**5 CH**	
Fourth semester	**6 CH**	**2 CH**
Fifth semester	**6 CH**	

4.b.ii- No. of credit hours

Lectures	**18**	**Practical**	**12**	**Thesis**	**8**	**Total**	**38**
		Compulsory	**26**	**Elective**	**4**	**Optional**	**0**

4.b.iii- No. of credit hours of specialized courses **No.** **26** **%** **87**

4.b.iv- No. of credit hours of other courses **No.** **4** **%** **13**

4.b.v- Program levels (in credit-hours system)

Student is required to pass at least 12 credit hours with CGPA not less than C+ before submitting a thesis proposal.

5- Program Courses

5.1- Compulsory (26 CH)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1705709	Hematological cell Biology	2	2	
1705711	Hematological Immunology	1	1	
1705712	Hematological molecular biology and cytogenetics.	3	2	2
1705713	Transfusion medicine	3	2	2
1705714	Pharmacology of hematological drugs	2	2	
1705715	Basic laboratory techniques	3	1	4
1705716	Benign Laboratory Haematopathology	3	1	4

1705717	Malignant Laboratory Haematopathology	3	1	4
1705718	Clinical Benign Haematology	3	2	2
1705719	Clinical malignant Haematology	3	2	2
	Total	26	16	20

5.2- Elective I (4 Credit Hours)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1715721	**Clinical internal medicine**	**2**	**1**	**2**
1721720	**Medical statistics**	**2**	**1**	**2**

5.3- Elective II

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1706720	**Bacteriology**	**2**	**1**	**2**
1710720	**Pathology**	**2**	**1**	**2**
1717720	**Chemical pathology**	**2**	**1**	**2**

5.4- Optional – (none)

6- Program admission requirements

- The student applying for master degree should have had a master degree with at least a grade of C or an equivalent degree in M.B.Ch.B of Medicine.

7- Teaching and learning methods

Lectures, practical, problem solving, case study, self-directed learning

8- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of **Master in Laboratory and Clinical Hematological Researches**

- Complete……30……. credit hours with CGPA of at least C+ through courses.

- Complete 8 credit hours through thesis
- Submit a thesis validity report by an examination committee approved by the department council and their members include at least two external examiners.
- The master degree is awarded to the student who passes the scientific debate of the thesis after successfully passing all the required courses to obtain a degree as well as passing the comprehensive exam if any, upon the suggestion of the department's board and approval of the Institute's Council

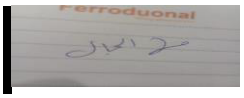
9- Evaluation of Students enrolled in the program.

Tool evaluation	**Intended learning outcomes being assessed**
Written	ILOs a &b
Practical	ILOs c
Oral	ILOs a ,b &d
Semester Work	ILOs a, b & d

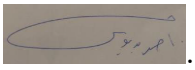
Evaluation of the Program

Evaluator	**Tool**	**Sample**
1- Senior students	Questionnaire	50 %
2- Alumni	Questionnaire	Representative sample
3- Stakeholders (Employers)	Meeting	Representative sample
4- External Evaluator(S)	Report	
5- Other		

Program coordinator :

Name: Prof Dr Maha el Gammal. Signature 

Head of the Department:

Name: Prof Dr Ahmed Bedewy Signature:  .

Date of Department Council Approval: 31/10/2023

Matrix for ILOs and aims

ILOS / Aims	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5
1	X	X																																
2																			X	X										X				
3-			X																												X			
4				X																														
5					X																													
6										X																					X			
7						X																										X		
8							X																											
9																		X																
10									X																									
11																											x							
12											X																							
13										X																								
14																												X						
15																				X														
16																				X														
17																				X									X					
18																						X												X

Courses vs Program ILOs matrix

Title of the course	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5
Hematological cell Biology	X	X											X																	X				
Hematological Immunology					X											X																		
Hematological molecular biology and cytogenetics				X											X									X							X			
Transfusion medicine							X	X										X							X							X		
Pharmacology of hematological drugs						X											X																	
Basic laboratory techniques			X											X									X			X							X	
Benign Laboratory Haematopathology									X										X									X						
Malignant Laboratory Haematopathology											X									X														
Clinical Benign Haematology										X																	X							
Clinical malignant Haematology												X									X								X					X
Thesis																						X												

Matrix for programme ILOs and ARS of Master in Laboratory and Clinical Hematological Researches

Programme ARS	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	C4	C5	C6	C7
A1		X																											
A2			X																										
A3				X																									
A4					X																								
A5							X	X																					
A6	X								X	X	X	X																	
A7						X																							
A8												X																	
B1														X															
B2																	X												
B3																		X											
B4														X					X										
B5													X																
B6															X														
B7																X													
B8																				X									
B9																					X								
B10																						X							
C1																							X	X	X		X	X	x
C2																							X						
C3																													
C4																										X			

Programme ARS	d1	d2	d3	d4	D5
d1	X				
d2		X			
d3			X		
d4				X	
D5					x

Teaching methods versus Courses

	Course code 1705709	Course code 1705710	Course code 1705712	Course code 1705713	Course code 1705714	Course code 1705715	Course code 1705716	Course code 1705717	Course code 1705718	Course code 1705719
Lecture	X	X	X	X	X	X	X	X	X	x
Practical/Clinical			practical	practical		practical	practical	practical	Clinical	Clinical
Brainstorming										
Discussion Groups										
Problem Solving									X	X
Case Study									X	x
Training Workshops										
Self-Directed Learning	X	X	X	X	X	X	X	X	X	x
e-learning										
Project										

Attributes versus aims

Generic Graduate Attributes of NAQAAE	Graduate Attributes of Master of Science in Master in Laboratory and Clinical Hematological Researches **By the end of this program, Graduate of Master of Science in Master in Laboratory and Clinical Hematological Researches, *should be able to***	Programme aims
Apply the basics and methodologies of scientific research and using its various tools proficiently.	Apply the basics and methodologies of immunology and interpret disordered function of the immune system and List and the basic knowledge of hematopoiesis and haemostasis	Recognize basic knowledge in immunology and interpret disordered function of the immune system and List and the basic knowledge of hematopoiesis and haemostasis
Use the analytical methods in the field of specialty	Use investigations to diagnose a case of anemia and hemostasis. Discuss the basic steps in immunophenotyping and molecular techniques	Investigate a case of anemia and hemostasis. Discuss the basic steps in immunophenotyping and molecular techniques
Apply specialized knowledge in the field of specialty and integrate it with relevant knowledge in his professional practice.	Apply basic cytogenetics knowledge and molecular biology steps and different molecular techniques	Identify basic cytogenetics knowledge and molecular biology steps and different molecular techniques
Demonstrate awareness of current problems and modern visions in the field of specialty	Demonstrate different lines of treatment of anemia and recognize the causes of drug resistance. - Identify causes of splenomegaly and hypersplenism.	State different lines of treatment of anemia and recognize the causes of drug resistance. - Identify causes of splenomegaly and hypersplenism.
Identify professional problems in the field of specialty and propose solutions to them.	Identify professional problems in diagnosing different types of anemias	Recognize and interpret the diagnostic approach for different types of anemias
Master an appropriate of professional skills in the field of including use of technology.	Master an appropriate of professional skills in Interpret bone marrow aspirate and biopsy	Interpret bone marrow aspirate and biopsy and causes of bone marrow infiltration
Communicate efficiently and lead work teams.	Communicate efficiently and lead work teams	Use systematic approaches to design and conduct scientific research and Communicate efficiently and lead work teams.
Take Decision in different professional contexts.	Decision in how to use specific drug groups	Recall the pharmacokinetics of specific drug groups which are antimicrobial, antineoplastic ,iron therapy, antifungal drugs and immunotherapy and their indications
Employ the available resources to achieve the highest benefit and maintain them.	Employ the available resources to investigate cases of chronic lymphoproliferative and myeloproliferative neoplasms Employ the available resources to investigate cases of chronic lymphoproliferative and myeloproliferative neoplasms	Employ the available resources to investigate cases of chronic lymphoproliferative and myeloproliferative neoplasms

Show awareness of his/her role in community development and environmental preservation in light of global and regional changes.	Show awareness in the diagnosis of different types of acute and chronic leukemias	- Recognize the diagnostic approach for different types of acute and chronic leukemias
Act in a manner that reflects a commitment to integrity, credibility, professionality, and accountability.	Identify the indications for transfusion in certain situations and t the indications of Stem cell transplantation in hematological diseases .Recognize the blood group system and HLA system	List the indications for transfusion in certain situations and t the indications of Stem cell transplantation in hematological diseases. Recognize the blood group system and HLA system
Realize the need for self-development and engaging in continuous learning.	Realize the need for continuous learning in Hematology and updating his knowledge to investigate and differentiate between different hematological diseases.	Discuss findings in Plasma cell dyscrasias and histocytic disorders and differentiate between benign leucocytic disorders and diagnose lysosomal storage