قسم المشخصات الجزيئية

المحتويات

Academic Reference Standards for Doctorate Postgraduate Studies of Molecular Diagnostics and Therapeutics

(2015/2016)

Academic reference standards (ARS) for postgraduate studies, NAQAAE, March 2009

1-The graduate of Doctorate program of any specialty must:

1.1. Master basics and methodologies of scientific research.
1.2. Add to the knowledge in the specialization field.
1.3. Apply analytical and critical approach to the knowledge in specialty and related areas.
1.4. Merge and develop specialized knowledge with that of related subjects extrapolating bilateral ties in between.
1.5. Show deep consciousness of the ongoing specialty problems and theories.
1.6. Determine professional problems and find innovative solutions.
1.7. Master a wide range of professional skills in the specialty area.
1.8. Work towards the development of professional methods, and new tools.
1.9. Use appropriate technological means to serve professional practice.
1.10. Communicate effectively and lead work team in different professional contexts.
1.11. Make decisions according to available information.
1.12. Employ available and new resources efficiently and work on developing.
1.13. Be aware of the role in community development and environmental conservation.
1.14. Act in a manner reflecting the commitment to integrity, credibility and rules of the profession.
1.15. Be committed to continuous self-development and transfer knowledge and expertise to others.

2- General academic standards:

2.1. Knowledge & Understanding:

By the end of the study of Doctorate program of any specialty, the graduate must have fluent deep knowledge & understanding of:

2.1.1. Basic facts, theories and recent advances of the specialty and related subjects.
2.1.2. Basics, methodologies and scientific research ethics as its different tools.
2.1.3. Ethical and legal principles of professional practice.
2.1.4. Quality standards of professional practice.
2.1.5. Knowledge related to the professional practice impact on the environment development and conservation.

2.2. Intellectual skills:

By the end of the Doctorate program study in any specialty, the graduate must be able to:

2.2.1. Analyze, evaluate and deduce the information in the specialty fields.
2.2.2. Solve the specialized problems according to available data.
2.2.3. Conduct research studies that add to specialty knowledge.
2.2.4. Write and publish scientific articles.
2.2.5 Evaluate professional practice risks.
2.2.6. Plan to improve specialty performance.
2.2.7. Take decisions in various professional situations including dilemmas and controversial issues.
2.2.8. Add to the specialty field through creativity & innovation.
2.2.9. Manage discussions on basis of evidence and proofs.

2.3. Professional skills:

By the end of Doctorate program study in any specialty, the graduate must:

2.3.1. Master basic and advanced professional skills in the specialty field.
2.3.2. Write and appraise professional reports.
2.3.3. Evaluate and improve methods and tools used in the specialty.
2.3.4. Use technological tools to serve professional practice.
2.3.5. Plan for professional practice development and performance of others.

2.4. General & transferable skills:

By the end of the study of Doctorate program of any specialty, the graduate must:

2.4.1. Communicate effectively using different means.
2.4.2. Use information technology to improve professional practice.
2.4.3. Teach and evaluate others.
2.4.4. Perform self appraisal and seek continuous learning.
2.4.5. Use different resources to obtain information and knowledge.
2.4.6. Work in and lead a team.
2.4.7. Manage scientific meetings and time.

3- Program Academic Standards:

Derived from the Generic Academic Reference standards (ARS) for Doctorate Programs and approved from the Molecular Diagnostics and Therapeutics department and Institute Council

1- Graduate Attributes

1.1. Master basics and methodologies of scientific research and use of different tools
1.2. Add to the knowledge in the molecular diagnostics and therapeutics..
1.3. Apply analytical and critical approach to the knowledge in molecular diagnostics and therapeutics.
1.4. Demonstrate awareness of the onging problems and visions in molecular diagnostics and therapeutics field.
1.5. Identify and solve professional problems
1.6. Determine professional problems and find innovative solutions.
1.7. Master a appropriate scale of the professional skills and use of appropriate technological means to serve the professional practice.
1.8. Work towards the development of professional methods, and new tools.
1.9. Use appropriate technological means to serve professional practice.
1.10. Communicate effectively and lead work team.
1.11. Make decisions in different professional context.
1.12. use available resources efficiently to achieve the highest benefit and preservation.
1.13. Be aware of the role in community development and environmental conservation according to the global and regional changes

2- General academic standers

2.1 Knowledge & Understanding

By the end of the study of this program, the graduate must have sufficient knowledge and understanding of:

2.1.1 Basic facts, theories and recent advances of the molecular diagnostics and therapeutics and related subjects.
2.1.2 Basics and ethical issues of scientific research, methodologies and different tools.
2.1.3 Ethical and legal fundamentals (research writing – supervising – authorizing – applying) and their applications in the field of the molecular diagnostics and therapeutics and related subjects.
2.1.4 Quality standards of professional practice in the field of molecular diagnostics and therapeutics and related subjects.
2.1.5 Knowledge related to the professional practice impact on the environment development and conservation.

2.2 Intellectual Skills

By the end of the study of this program, the graduate must be able to:

2.2.1 Analyze, evaluate and deduce the information in the field of the molecular diagnostics and therapeutics.
2.2.2 Solve the specialized problems according to available data of molecular diagnostics and therapeutics and related subjects.
2.2.3 Conduct research studies that add knowledge to molecular diagnostics and therapeutics.
2.2.4 Write and publish scientific articles in the field of molecular diagnostics and therapeutics.
2.2.5 Evaluate professional practice risks in molecular diagnostics and therapeutics.
2.2.6 Plan to improve specialty performance in the field of molecular diagnostics and therapeutics.
2.2.7 Take decisions in various professional situations including dilemmas and controversial issues
2.2.8 Add to the specialty field through creativity & innovation.
2.2.9. Manage discussions on basis of evidence and proofs.

2.3. Professional skills

By the end of the study of this program, the graduate must be able to:

2.3.1 Master basic and advanced professional skills in the field of molecular diagnostics and therapeutics
2.3.2 Write and appraise professional reports about molecular diagnostics and therapeutics.
2.3.3 Evaluate and improve methods and tools used in the field of molecular diagnostics and therapeutics.
2.3.4 Use technological tools to serve professional practice.
2.3.5 Plan for professional practice development and performance of others.

3.4. General & Transferable skills

By the end of the study of this program, the graduate must be able to:

2.4.1 Communicate effectively using different means.
2.4.2. Use information technology to improve professional practice.
2.4.3. Teach and evaluate others.
2.4.4. Perform self-appraisal and seek continuous learning.
2.4.5. Use different resources to obtain information and knowledge.
2.4.6. Work in and lead a team.
2.4.7. Manage scientific meetings and time.

The matrix between ARS for NAQAAE and Program ARS

	ARS of NAQAAE	Program ARS
Knowledge & Understanding	1. Basic facts, theories and recent advances of the specialty and related subjects.	1. Basic facts, theories and recent advances of the molecular diagnostics and therapeutics and related subjects.
	2. Basics, methodologies and scientific research ethics as its different tools.	2. Basics, methodologies and scientific research ethics and its different tools
	3. Ethical and legal principles of professional practice.	3. Ethical and legal fundamentals (research writing – supervising – authorizing – applying) and their applications in the field of the molecular diagnostics and therapeutics and related subjects.
	4. Quality standards of professional practice..	4. Quality standards of professional practice in the field of molecular diagnostics and therapeutics and related subjects
	5. Knowledge related to the professional practice impact on the environment development and conservation.	5. Knowledge related to the professional practice impact on the environment development and conservation. .
Intellectual Skills	1. Analyze, evaluate and deduce the information in the specialty fields.	1. Analyze, evaluate and deduce the information in the field of the molecular diagnostics and therapeutics. 2. Solve the specialized problems according to available data of molecular diagnostics and therapeutics and related subjects.

	2. Solve the specialized problems according to available data.	2. Solve the specialized problems according to available data of molecular diagnostics and therapeutics and related subjects.
	3. Conduct research studies that add to specialty knowledge.	**3.** Integration of different information to solve professional problems in development of molecular diagnostics and therapeutics.
	4. Write and publish scientific articles.	4. Write and publish scientific articles in the field of molecular diagnostics and therapeutics.
	5 Evaluate professional practice risks.	5. Evaluate professional practice risks in molecular diagnostics and therapeutics.
	6. Plan to improve specialty performance.	6. Plan to improve specialty performance in the field of molecular diagnostics and therapeutics.
	7. Take decisions in various professional situations including dilemmas and controversial issues.	7. Take decisions in various professional situations including dilemmas and controversial issues
	8. Add to the specialty field through creativity & innovation.	8. Add to the specialty field through creativity & innovation.
	9. Manage discussions on basis of evidence and proofs.	9. Manage discussions on basis of evidence and proofs.
Professional Skills	1.Master basic and advanced professional skills in the specialty field. .	1. Master basic and advanced professional skills in the field of molecular diagnostics and therapeutics
	2.Write and appraise professional reports	2. Write and appraise professional reports about molecular diagnostics and therapeutics.
	3.valuate and improve methods	3. Evaluate and improve methods

	and tools used in the specialty.	and tools used in the field of molecular diagnostics and therapeutics
	4. Use technological tools to serve professional practice.	4. Use technological tools to serve professional practice.
	5. Plan for professional practice development and performance of others	5. Plan for professional practice development and performance of others
General and Transferable skills	1. Communicate effectively using different means.	1 Communicate effectively using different means.
	2. Use information technology to improve professional practice.	2. Use information technology to improve professional practice. .
	3. Teach and evaluate others.	3. Teach and evaluate others..
	4. Perform self appraisal and seek continuous learning.	4. Perform self appraisal and seek continuous learning.
	5. Use different resources to obtain information and knowledge)	5. Use different resources to obtain information and knowledge.
	6. Work in and lead a team.	6. Work in and lead a team.
	7. Manage scientific meetings and time	7. Manage scientific meetings and time

Molecular Diagnostics and Therapeutics
Doctorate
Program Specification
(2015/2016)

Doctorate Program Specification

(2015/2016)

A- Basic Information

1. **Program title: Doctorate in Molecular Diagnosis and Therapeutics**
2. **Program type:** **Single √**
3. **Department: Molecular Diagnostics and Therapeutics.**
4. **Program coordinator Dr. Manal Osama El-Hamshary**
5. **Program Approval Date: 20/10/2010**

B- Professional Information:

The scope of the program spans many interdisciplines including: advanced genetics and their applications in clinical practice; chemical, molecular, and cellular aspects of immunology, and cancer; physiology; human hematology and related diseases; molecular biology related techniques and molecular testing of some human diseases; biotechnology; molecular basis of therapeutics and drug resistance.

1- Program aims:

The program aims to broaden the knowledge and deep understanding of the student in the field of biological processes, the molecular basis of its pathologic states and related diseases, molecular and genetic diagnostic techniques. The elective courses will be chosen for each student according to his/her thesis in one of the following themes: chemical, molecular, and cellular aspects of immunology, hematology, advanced genetics, cancer, drug resistance mechanisms and molecular basis of therapeutics.

The final target of the program is to prepare a distinguished graduate capable of:

1.1. Applying the most recent techniques in the field of molecular diagnostics and therapeutics and developing skills to solve theoretical and practical problems related to diagnostics and molecular therapeutics using these recent technologies and innovative molecular methodologies.

1.2. Helping students to acquire the skills of writing and publishing research papers in molecular diagnostics and therapeutics journals and scientific conferences.

1.3. Developing the research and teamwork skills and setting research rules in the field of molecular diagnostics and therapeutics.

1.4. Enhancing the students understanding of research system (input – process-output) and be able to develop and manage new vision towards supervising scientific research projects in the field of molecular diagnostics and therapeutics.

2- Intended learning outcomes (ILOs):

a. Knowledge and understanding:

By the end of this program, the graduate must be able to:

a-1 Understand in depth the basic facts & theories of advanced genetics and genomic imprinting and gene therapy, chemical and cellular immunology, detailed structure of antibodies, molecular pathology of human bone marrow and immune diseases, leukemia, hemostasis and thrombosis, biotechnology and genetic mechanisms of microbial pathogenesis.

a-2 Explain the mutual links between diagnostics (most recent techniques used in species diagnosis, DNA markers, molecular diagnosis of anemia, leukemia, lymphoma, molecular markers related to drug resistance) and molecular therapeutics and drug design using these molecular markers.

a-3 Know critically the molecular basis of: microbial pathogenesis, immune diseases, mechanisms of drug resistance and identifying molecular markers of a disease, the related response to therapies and using molecular targets and nucleic acids for therapeutic purposes.

a-4 Express the fundamentals of ethical and legal practice in the field of human genetics, human genetic diseases and gene therapy and its application in clinical practice.

a-5 Remolding the actual quality standards of the practical molecular testing of lymphoma and anemia, generating and applying DNA marker and species diagnostic protocols.

a-6 Explain basics and ethics of scientific research in molecular diagnostics and therapeutics at the molecular level.

a-7 Understand relevant scientific terminologies written in German language

a-8 Identify advanced computer models used in molecular diagnostics and therapeutics analysis.

b. Intellectual abilities:

By the end of this program, the graduate must be able to:

b-1 Innovate the suitable methods for designing new molecular therapeutics, gene therapy, nucleic acid targeted drug design and concurring the problem of drug resistance.

b-2 Evaluate molecular and biotechnological methods for the identification of molecular targets.

b-3 Interpret results of different methods of molecular testing and using DNA markers for: species diagnosis, diagnosis of genetic diseases, infectious diseases, anemia and lymphoma.

b-4 Determine different data and information needed to solve problems of scientific research in molecular genetics, molecular diagnosis, immunodiagnosis, and molecular therapeutics and design different approaches to solve the problems of genetic testing and disease predisposition.

b-5 Distinguish between the different aspects of molecular tools used for diagnostics and therapeutics.

b-6 Determine problems of scientific research in molecular genetics, molecular diagnosis, immunodiagnosis and molecular therapeutics.

b-7 Find solution to the risks imposed during molecular analysis of infectious, immunologic cancer, and multifactorial genetic diseases.

b-8 Evaluate professional decision taking in designing research in the field of molecular therapeutics and disease management.

c. Professional Skills:

By the end of this program, the graduate must be able to:

c-1 Write professionally scientific reports in the field of molecular diagnosis, genetic testing and molecular therapeutics.

c-2 Execute the basics and advanced professional skills applied in genetic testing and molecular trends of disease pathology, diagnosis and therapy.

c-3 Select different diagnostic and therapeutic strategies for disease management and drug design.

c-4 Prepare modern modules of research in molecular diagnostics and therapeutics.

c-5 Use professional technologies for serving research and practice.

d. General and transferable Skills:

By the end of this program, the graduate must be able to:

d-1 Work in a team and using all communication methods with public, colleagues and appropriate authorities.

d-2 Show management skills for using information technology to improve professional practice in internet and relative information.

d-3 Use different sources of information to obtain data for a given course topics.

d-4 Communicate with others & Manage time effectively.

d-5 Show self-learning abilities in situation comparable to his/ her level.

d-6 Use audio & video means for displaying information to learn independently and seek continuous learning in molecular diagnosis and therapeutics.

4.Program Academic standards:

The department council established the program ARS adopted by the ARS of NAQAAE and approved in the department council meeting in 9/2015

5. Bench marks: 1-ARS of NAQAAE
2- Program academic standers

6. Curriculum Structure and Contents:

a. Program duration: at least 3 years.

b. Program structure: No. of hours/units:

Lectures	27	Lab. /Exercise	18	Total	45
Compulsory	32	Optional	-	Elective	13

	No.	%
▪ **Basic sciences courses**	9	20
▪ **Specialized courses**		
▪ **Other sciences courses**	.	%
▪ **Practical/Field Training achieve dissertation (8hrs/week)**	No. 30	66.7

The time needed to

c. Program Levels (in credit-hours system): Not Applicable

d. Program courses:

a. Compulsory:

Code No.	Course Title	No. of Units	No. of hours/week			Year/Level	Semester
			Lect.	Ex.	App.		
	German language	3	3	-		1	2
A-81	Advanced Computer	3	2	-	2	2	1
	Research and research methodology	6	2	-	8	1	2
A-24	Biotechnology II	3	3	-	-	1	2
B7-45	Special Topics	3	3	-	-	2	1
B7- 46	Seminars	3	-	-	6	2	2
C-112	Protocols and applications of DNA markers	3	2	-	2	2	2
	Total	24	15	-	18		

b. Elective: Specialized courses (4 courses from the listed below courses)

No	Code No.	Course Title	No. of Units	No. of hours/week			Year/ Level	Semester
				Lect.	Ex.	App.		
1	B7-3	Antibodies III	3	3	-	-	1	1
2	B7-6	Chemical & cellular immunology	3	3	-	-	1	2
3	B7-10	Comparative hematology II	3	3	-	-	1	2
4	B7-12	Genetics and gene therapy	3	3	-	-	2	1
5	B7-13	Genetics and clinical practice	3	3	-	-	2	2
6	B7-14	Genomic imprinting	3	3	-	-	1	2
7	B7-15	Hemostasis and thrombosis	3	3	-	-	2	1

No	Code No.	Course Title	No. of Units	No. of hours/week			Year/ Level	Semester
				Lect.	Ex.	App.		
8	B7-19	Human genetics diseases	3	3	-	-	1	2
9	B7-21	Human genetics II	3	3	-	-	1	2
10	B7-25	Leukemia	3	3	-	-	1	2
11	B7-27	Lymphoma molecular diagnosis	3	3	-	-	2	2
12	B7-29	Molecular basis of therapeutics	3	3	-	-	1	2
13	B7-30	Molecular diagnosis of anemias	3	3	-	-	2	1
14	B7-34	Molecular genetics of drug resistance	3	3	-	-	2	1
15	B7-35	Molecular mechanisms in microbial pathogenesis	3	3	-	-	2	1
16	B7-37	Normal and Abnormal human bone marrow cytology	3	3	-	-	1	2
17	B7-38	Nucleic acid targeted drug design	3	3	-	-	2	1
18	B7-44	The molecular biology of immune diseases II	3	3	-	-	2	1
19	C-115	Species diagnostics protocol	3	2	-	2	2	1

c. PhD dissertation (at least two academic years)

All PhD-degree students should prepare a thesis in Molecular Diagnostics and Therapeutics. The department and the ethical committees must approve the protocol of the research. The thesis should include a review part and a research part. The thesis must be supervised by one or more senior faculty members of the Department of Molecular diagnostics and therapeutics and may include other specialties according to the nature of the research. Evaluation of the thesis should be approved by a committee of three professors, including one of the supervisors and two external professors.

7. Program admission requirements:

The applicant should have a Master's degree in the field of Molecular Diagnostics and Therapeutics from the Institute or any relevant specialty from an equivalent university institution.

8. Regulations for progression and program completion:

- Successful completion of the required courses (equivalent to at least 12 units 4 courses containing at least one practical course) in addition to compulsory courses: German language, advanced computer, Research and research, special topics and Seminars.
- Student success in any course is estimated as the following:

Excellent	From 90 to 100 degrees
Very Good	From 80 to less than 90 degrees
Good	From 70 to less than 80 degrees
Pass	From 60 to less than 70 degrees

- Successfully passes of both oral and written qualifying examinations.
- Approved completion of the research experiments.
- Approved scientific writing of Ph.D. dissertation.
- Successfully passes of dissertation open defense examination.

9. Assessment methods for Evaluating program Applicants:

No.	Method	Intended Learning Outcomes ' ILO's '
1	Semester Works(5^{th}&10^{th})	Measure Problems Solving Skills, Presentation Data, Discussion, and Work on team.
2	Midterm Exam (6^{th}) Week.	Measure Abilities on Concentration and understanding Scientific Points & Background.
3	Practical exam 13^{th} Week	Measure practical , application skills, and professional art skills
4	Oral Exam (14^{th}) Week.	Measure Analysis, Presentation and Discussion Skills.
5	Written (Final) Exam (15^{th}) Week.	Measure Remembering & Innovating Skills.
6	PhD dissertation	To assess the ability to write a review of literature, perform the needed practical steps and to present the results in tables and graphs. In addition, the skills of analysis of results and discussion with previous findings obtained by other authors are also assesed.

10. Program Evaluation methods:

No.	Evaluator	Tool	Sample
1	Senior students	Questionnaire	20
2	Alumni	Depth Meeting	5
3	Stakeholders (Employers)	Nucleus Meeting	5
4	External (Evaluators & Examiners)	Remarking Questionnaire & Nucleus Meeting	2
5	staff	Questionnaire	2

11. Evaluators

No.	Evaluator name	
1	**Prof Dr/ Neveen Abdelhafez**	**Professor of clinical pathology/Benha University**
2	**Prof Dr/ Nahed Saleh**	**Professor of clinical pathology/ University of Sadat City**

Program coordinator: Dr. Manal Osama El Hamshary

Head of Department council: Prof. Dr. Randa M Talaat

Matrix between Program ARS and ILO's

	Program ARS	ILO's
Knowledge & Understanding	Basic facts, theories and recent advances of the molecular diagnostics and therapeutics and related subjects. .	Understand in depth the basic facts & theories of advanced genetics and genomic imprinting and gene therapy, chemical and cellular immunology, detailed structure of antibodies, molecular pathology of human bone marrow and immune diseases, leukemia, hemostasis and thrombosis, biotechnology and genetic mechanisms of microbial pathogenesis.
	Basics and ethical issues of scientific research, methodologies and different tools.	Explain the mutual links between diagnostics (most recent techniques used in species diagnosis, DNA markers, molecular diagnosis of anemia, leukemia, lymphoma, molecular markers related to drug resistance) and molecular therapeutics and drug design using these molecular markers. -Know critically the molecular basis of: microbial pathogenesis, immune diseases, mechanisms of

		drug resistance and identifying molecular markers of a disease, the related response to therapies and using molecular targets and nucleic acids for therapeutic purpose
	Ethical and legal fundamentals (research writing – supervising – authorizing – applying) and their applications in the field of the molecular diagnostics and therapeutics and related subjects	Express the fundamentals of ethical and legal practice in the field of human genetics, human genetic diseases and gene therapy and its application in clinical practice - Explain basics and ethics of scientific research in molecular diagnostics and therapeutics at the molecular level - Understand relevant scientific terminologies written in German languag
	Quality standards of professional practice in the field of molecular diagnostics and therapeutics and related subjects	. Remolding the actual quality standards of the practical molecular testing of lymphoma and anemia, generating and applying DNA marker and species diagnostic protocols.
	Knowledge related to the professional practice impact on the environment development and conservation.	Identify advanced computer models used in molecular diagnostics and therapeutics analysis

Intellectual Skills:	Analyze, evaluate and deduce the information in the field of the molecular diagnostics and therapeutics	Evaluate molecular and biotechnological methods for the identification of molecular targets .
	Solve the specialized problems according to available data of molecular diagnostics and therapeutics and related subjects.	Find solution to the risks imposed during molecular analysis of infectious, immunologic cancer, and multifactorial genetic diseases.
	Conduct research studies that add knowledge to molecular diagnostics and therapeutics	Interpret results of different methods of molecular testing and using DNA markers for: species diagnosis, diagnosis of genetic diseases, infectious diseases, anemia and lymphoma.
	Evaluate professional practice risks in molecular diagnostics and therapeutics.	Determine different data and information needed to solve problems of scientific research in molecular genetics, molecular diagnosis, immunodiagnosis, and molecular therapeutics and design different approaches to solve the problems of genetic testing and disease predisposition
	Plan to improve specialty performance in the field of molecular diagnostics and therapeutics.	Distinguish between the different aspects of molecular tools used for diagnostics and therapeutics.
	Take decisions in various professional situations including dilemmas and controversial issues	Determine problems of scientific research in molecular genetics, molecular diagnosis, immunodiagnosis and molecular therapeutics
	Add to the specialty field through creativity & innovation.	Innovate the suitable methods for designing new molecular

		therapeutics, gene therapy, nucleic acid targeted drug design and concurring the problem of drug resistance.
	Manage discussions on basis of evidence and proofs	Evaluate professional decision taking in designing research in the field of molecular therapeutics and disease management
Professional Skills:	Master basic and advanced professional skills in the field of molecular diagnostics and therapeutics	Write professionally scientific reports in the field of molecular diagnosis, genetic testing and molecular therapeutics
	Write and appraise professional reports about molecular diagnostics and therapeutics	Execute the basics and advanced professional skills applied in genetic testing and molecular trends of disease pathology, diagnosis and therapy.
	Evaluate and improve methods and tools used in the field of molecular diagnostics and therapeutics	Select different diagnostic and therapeutic strategies for disease management and drug design .
	Use technological tools to serve professional practice.	Prepare modern modules of research in molecular diagnostics and therapeutics
	Plan for professional practice development and performance of others.	Use professional technologies for serving research and practice
General & Transferable skills	Communicate effectively using different means.	Communicate with others & Manage time effectively.
	Use information technology to improve professional practice.	Show management skills for using information technology to improve professional practice in internet and relative information

	Teach and evaluate others.	Practice independent learning and seek continuous learning
	Perform self-appraisal and seek continuous learning.	Show self-learning abilities in situation comparable to his/ her level -Practice independent learning and seek continuous learning
	Use different resources to obtain information and knowledge.	Use different sources of information to obtain data for a given course topics
	Work in and lead a team.	Work in a team and using all communication methods with public, colleagues and appropriate authorities
	Manage scientific meetings and time..	Manage time effectively.

Matrix of the Targeted Knowledge and Skills of Molecular Diagnostics and Therapeutics Doctorate Program

No.	Course No.	Course title	Knowledge and understanding skills							
			a	**b**	**c**	**d**	**e**	**f**	**g**	**h**
1		German Language							X	
2	A-81	Advanced Computer								X
3		Research and Research Methodology						X		
4	A-24	Biotechnology II	X							
5	B7-45	Special Topics						X	X	X
6	B7-46	Seminars						X	X	X
7	C-112	Protocols and applications of DNA markers		X	X		X			
8	B7-3	Antibodies III	X							
9	B7-6	Chemical and cellular immunology	X							
10	B7-10	Comparative hematology II	X							
11	B7-12	Genetics and gene therapy	X			X				
12	B7-13	Genetics and clinical practice				X				
13	B7-14	Genomic imprinting	X							
14	B7-15	Hemostasis and thrombosis	X							
15	B7-19	Human genetic diseases				X				
16	B7-21	Human genetics II	X			X				
17	B7-25	Leukemia	X							
18	B7-27	Lymphoma molecular diagnosis	X	X			X			
19	B7-29	Molecular basis of therapeutics		X	X					
20	B7-30	Molecular diagnosis of anemias		X			X			
21	B7-34	Molecular genetics of drug resistance		X	X					
22	B7-35	Molecular mechanisms in microbial pathogenesis			X					
23	B7-37	Normal and abnormal human bone marrow cytology	X							
24	B7-38	Nucleic acid targeted drug design		X	X					
25	B7-44	The molecular biology of immune diseases II	X		X					
26	C-115	Species diagnostic protocols		X			X			
PhD dissertation								X	X	X

No.	Course No.	Course title	Intellectual skills							
			A	b	c	d	e	f	g	h
1		German Language								
2	A-81	Advanced Computer				X				
3		Research and Research Methodology				X				X
4	A-24	Biotechnology II		X						
5	B7-45	Special Topics				X		X		
6	B7-46	Seminars				X		X		
7	C-112	Protocols and applications of DNA markers		X	X	X	X	X		
8	B7-3	Antibodies III				X			X	
9	B7-6	Chemical and cellular immunology				X			X	
10	B7-10	Comparative hematology II				X		X		
11	B7-12	Genetics and gene therapy	X			X	X			
12	B7-13	Genetics and clinical practice			X	X			X	
13	B7-14	Genomic imprinting		X			X			
14	B7-15	Hemostasis and thrombosis				X				
15	B7-19	Human genetic diseases			X	X			X	
16	B7-21	Human genetics II						X		
17	B7-25	Leukemia			X	X			X	X
18	B7-27	Lymphoma molecular diagnosis		X	X	X	X	X	X	
19	B7-29	Molecular basis of therapeutics	X	X			X	X		
20	B7-30	Molecular diagnosis of anemia		X	X	X	X	X		
21	B7-34	Molecular genetics of drug resistance	X	X		X		X		X
22	B7-35	Molecular mechanisms in microbial pathogenesis		X	X		X			
23	B7-37	Normal and abnormal human bone marrow cytology		X		X				
24	B7-38	Nucleic acid targeted drug design	X	X			X			
25	B7-44	The molecular biology of immune diseases II			X		X	X	X	
26	C-112	Species diagnostic protocols		X	X	X	X		X	
PhD dissertation						X		X		

No.	Course No.	Course title	Professional and practical skills								
			a	b	c	d	e	_	_	_	_
1		German Language									
2	A-81	Advanced Computer					X				
3		Research and Research Methodology					X				
4	A-24	Biotechnology II			X		X				
5	B7-45	Special Topics	X	X							
6	B7-46	Seminars	X	X			X				
7	C-112	Protocols and applications of DNA markers	X	X	X						
8	B7-3	Antibodies III									
9	B7-6	Chemical and cellular immunology									
10	B7-10	Comparative hematology II									
11	B7-12	Genetics and gene therapy	X	X			X				
12	B7-13	Genetics and clinical practice	X	X			X				
13	B7-14	Genomic imprinting	X	X			X				
14	B7-15	Hemostasis and thrombosis									
15	B7-19	Human genetic diseases	X	X			X				
16	B7-21	Human genetics II	X								
17	B7-25	Leukemia		X	X		X				
18	B7-27	Lymphoma molecular diagnosis	X	X	X		X				
19	B7-29	Molecular basis of therapeutics	X	X							
20	B7-30	Molecular diagnosis of anemias	X	X	X		X				
21	B7-34	Molecular genetics of drug resistance	X								
22	B7-35	Molecular mechanisms in microbial pathogenesis		X							
23	B7-37	Normal and abnormal human bone marrow cytology		X							
24	B7-38	Nucleic acid targeted drug design	X	X							
25	B7-44	The molecular biology of immune diseases II		X							
26	C-115	Species diagnostic protocols	X	X			X				
PhD dissertation			X	X	X	X	X				

No.	Course No.	Course title	General and transferable skills					
			a	b	c	d	e	f
1		German Language						
2	A-81	Advanced Computer						
3		Research and Research Methodology						
4	A-24	Biotechnology II			X		X	X
5	B7-45	Special Topics			X		X	X
6	B7-46	Seminars	X	X	X	X	X	X
7	C-112	Protocols and applications of DNA markers	X	X	X	X	X	X
8	B7-3	Antibodies III			X		X	X
9	B7-6	Chemical and cellular immunology			X		X	X
10	B7-10	Comparative hematology II			X		X	X
11	B7-12	Genetics and gene therapy			X		X	X
12	B7-13	Genetics and clinical practice			X		X	X
13	B7-14	Genomic imprinting			X		X	X
14	B7-15	Hemostasis and thrombosis			X		X	X
15	B7-19	Human genetic diseases			X		X	X
16	B7-21	Human genetics II			X		X	X
17	B7-25	Leukemia			X		X	X
18	B7-27	Lymphoma molecular diagnosis			X		X	X
19	B7-29	Molecular basis of therapeutics			X		X	X
20	B7-30	Molecular diagnosis of anemia			X		X	X
21	B7-34	Molecular genetics of drug resistance			X		X	X
22	B7-35	Molecular mechanisms in microbial pathogenesis			X		X	X
23	B7-37	Normal and abnormal human bone marrow cytology			X		X	X
24	B7-38	Nucleic acid targeted drug design			X		X	X
25	B7-44	The molecular biology of immune diseases II			X		X	X
26	C-115	Species diagnostic protocols	X	X	X	X	X	X
PhD dissertation			X	X	X	X	X	X

Program coordinator: Dr. Manal Osama El Hamshary

Head of Department: Prof. Dr. Randa M Talaat

Courses Specifications

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

1. Course information:							
Course Code:	B7-3	**Course Title:**	Antibodies III				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

2. Course Aims	
	1- know the structure of immunoglobulins. 2-To understand the function of immunoglobulins 3-To correlate the heterogenecity of an immune response with different diseases

3. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
a. Knowledge and Understanding:	1-Summarize the role of different immunoglobulins 2-Explain the lattice theory 3-Clarify the difference between antibody affinity and diversity 4-Express what is meant by the heterogenecity of an immune reponse
b. Intellectual skills:	1-Distinguish between antibody affinity,avidity and diversity 2- Design the genetic basis of antibody diversity 3- Evaluate the binding forces 4- Suggest how lymphocytes produce antibodies
c. Professional Skills:	1- Practice how monoclonal antibodies are produced 2- Use anti-CD3 in monoclonal antibody 3- Practice the use of monoclonal antibodies 4- Calculate the activation of B-lymphocytes
d. General and Transferable Skills	1- Use information communication technology to improve his/her professional practice in internet and relative information of nucleic acids and drug design. 2- Practice self-appraisal and determines his/her learning needs.

	3- Use different sources of information to obtain data for a given nucleic acid drug targeted design course topics. 4-Use educational technology displaying devices for explain important modern techniques of presentation in. 5- Manage time effectively & work in teams. 6- Show leadership & admintration skills in situation comparable to his level.

	4. Course Contents:
No.	**Topic**
1	Heterogenecity of immune response
2	Lattice theory
3	Genetic basis of antibody diversity
4	Cross reactivity
5	Antibody affinity and avidity
6	Binding forces,and how lymphocyte produce antibodies
7	Discussion and poster presentation

5. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

6. Teaching and Learning Methods (for students with special needs)	**Not applied**

7. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam

	* Oral Exam * Written (Final) Exam
b. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
c. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

8. List of References:	
a. Notes	Course notes
b. Essential Books (Text Books)	Basic and clinical immunology Daniel P Stites, sixth edition
c. Suggested Books	Basic immunology, third edition .Abul K.Abbas
1- Periodicals, Web Sites, … etc ...	-

Course coordinator: Dr. Randa Mohamed Talaat

Head of the department council: Prof. Dr. Randa Mohamed Talaat

Course Matrix

Week No.	Topics	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Heterogenecity of immune response	2	3	1	1
3, 4	Lattice theory	4	1	2	2
5, 6	Genetic basis of antibody diversity	1	-	1, 3	2
7, 8	Cross reactivity	-	4	4	1, 2
9, 10	Antibody affinity and avidity	4	2	1	1
11, 12	Binding forces and how lymphocytes produce antibodies	3	4	2, 3	1
13, 14	Discussion and poster presentation	-	-	-	4, 5, 6

Course coordinator: Dr. Randa Mohamed Talaat

Head of the department council: Prof. Dr. Randa Mohamed Talaat

Department: Molecular Diagnostics and Therapeutics

Course Specifications

1. Course information:							
Course Code:	B7-6	**Course Title:**	**Chemical and cellular immunology**				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular diagnosis and therapeutics**						

2. Course Aims	
	1-Explaining what is cellular immunity 2-.Explaining what is primary and secondary immune response. 3- .Summarizing the principle and usages of flow cytometry and polymerase chain reaction (PCR)

Intended Learning Outcomes of Course (ILO's)	
a. Knowledge and Understanding:	1- Cells and organs of the immune system 2-Innate vs adaptive immunity 3- T and B cell development, activation and differentiation 4- MHC antigen ,processing and differentiation
b. Intellectual skills:	1- How to assess T-cell activation and proliferation 2- classify differences between humoral and cellular immunity 3- Understand the different pathways of complement 4- Evaluate the role of Chemokines, and cytokines
c. Professional Skills:	1-Test how to understand role of interferon in health and disease 2- Structure and function of antigen and antibody 3- Estimate the clinical significance of cytokines and interleukins 4- Estimate the clinical significance of antigen-antibody reactions
d. General and Transferable Skills	1-Work in team 2- Use internet 3- Comminucate with others 4- Show administrative skills .

	3. Course Contents:
Week No.	**Topics**

1	Cells and organs of the immune system.
2	Innate vs adaptive immunity
3	Antigen, antibody structure and function of antigen-antibody reactions. Tand B cell development, activation and differentiation
4	MHC, antigen processing, presentation, T-cell receptor. How to assess T-cell activation and proliferation
5	Complement. Classical, alternative, and lectin pathways
6	Cytokines. Different cytokines and chemokines, interleukins and their role in immune system
7	Interferons, and their role in health and disease in immune system

4. Teaching and Learning Methods	
	1-Lectures 2-Power point presentations 3-Internet search and assignments 4-Paper presentation 5-Group discussion

5. Teaching and Learning Methods (for students with special needs)	**Not applicable**

6. Student Assessment:	
a. Assessment Methods:	*Semester works, *Midterm exam, *Oral exam**,** *Written (Final) exam**.**
b. Assessment Schedule	* (5^{th}&10^{th} weeks)**,** * (6^{th}) Week**,** * (14^{th}) Week, * (15^{th}) Week.
c. Weighting of Assessments	10 degrees ratios 10%, 10 degrees ratios 10%, 20 degrees ratios 20 %, 60 degrees ratios 60% Total 100 degrees ratios 100%

7. List of References:	
a. Notes	Basic immunology Third edition Abul K.Abbas
b. Essential Books (Text Books)	Basic and clinical immunology Daniel P Stites, sixth edition
c. Suggested books	Basic immunology, third edition .Abul K. Abbas
d. Periodicals, Web Sites, … etc ...	

Course coordinator : **Dr. Randa Mohamed Talaat**

Head of the department council: **Prof. Dr. Randa Mohamed Talaat**

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Cells and organs of the immune system	1	-	-	1
3, 4	Innate vs adaptive immunity	2	2	-	2
5, 6	Antigen, antibody structure, and function of antigen-antibody reactions Tand B cell development, activation and differentiation	3	-	2	2
7, 8	MHC antigen, processing, preservation. T-cell receptor. How to assess T-cell activation and proliferation	4	-	-	3
9, 10	Complement, classical, alternative and lectin pathways	-	3	-	1
11, 12	Cytokines. Different cytokines and chemokines, interleukins and their role in immune system	-	4	3	2
13, 14	Interferon, their role in health and disease in immune system	-	-	1, 4	3

Course coordinator : Dr.Randa Mohaned Talaat
Head of the department council: Prof. Dr. Randa Mohamed Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

8. Course information:							
Course Code:	B7-10	**Course Title:**	Comparative haematology II				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

9. Course Aims	
	1-discuss and understand what is meant by anemia. 2-Different types of leukaemia. and other benign leucocytic disorders 3-Haemoglobinopathies ; thalassemias and hemaolytic anemia 4-Disorders of blood coagulation and its control mechanisms

10. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
e. Knowledge and Understanding:	1- Summarize the different types of anaemia 2- Explain what is meant by leukaemia and its types 3- Clarify differences between haemoglobinapathies and thalassemia 4- Explain the disorders of erythrocyte metabolism, haemoglobin electrophoresis
f. Intellectual skills:	1- Distinguish between different types of acute leukaemias, chronic lymphocytic leukaemia, and chronic myeloid leulaemia 2- Suggest what is meant by disorders of erythrocyte metabolism 3- Innovate how to deal with haemoglobinopathies and thalassemias 4- Determine problems concerning disorders of erythrocyte membrane cytoskeleton ,coagulation pathway

g. Professional Skills:	1- Test different types of anaemias,iron deficiency,aplastic anaemias 2- Diagnose cases of haemoglobinopathies and thalassemias 3- Prepare how to diagnose disorders of erythrocyte-metabolism 4- Estimate the disorders of erythrocyte membrane cytoskeleton
h. General and Transferable Skills	1- Use information communication technology to improve his/her professional practice in internet and relative information of nucleic acids and drug design. 2- Practice self-appraisal and determines his/her learning needs. 3- Use different sources of information to obtain data for a given nucleic acid drug targeted design course topics. 4-Use educational technology displaying devices for explain important modern techniques of presentation in. 5- Manage time effectively & work in teams. 6- Show leadership & admintration skills in situation comparable to his level.

	11. Course Contents:
No.	**Topics**
1	Different types of anaemias. Causes and clinical picture of deficiency anaemia, aplastic anaemias and anemia of chronic disorders
2	Disorders of erythrocyte metabolism
3	Thalassemias. Haemoglobinopathies. How is haemoglobin electrophoresis performed
4	Blood hemostasis & its physiologic controls & coagulopathies
5	What is meant by leukaemia (etiology ; types ; diagnosis ; management)
6	Myeloprolefrative disorders & myelodysplasia
7	Discussion and poster presentation

12. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

13. Teaching and Learning Methods (for students with special needs)	Not applied

14. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam * Oral Exam * Written (Final) Exam
b. Assessment Schedule	* (5^{th} &10^{th} weeks), * (6^{th}) Week, * (14^{th}) Week, * (15^{th}) Week.
c. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

15. List of References:	
e. Notes	Course notes
f. Essential Books (Text Books)	-Essential Haematology, by Victor Hoffbrand and Paul Moss (2011)

g. Suggested Books	-Comparative clinical haematology, by R.K. & L.B. Jeffcott. (editors) Archer (1977)
1- Periodicals, Web Sites, … etc ...	-

Course coordinator: Dr. Randa Mohamed Talaat
Head of the department council: Prof. Dr. Randa Mohamed Talaat Date: 14/6/2011

Course matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Different types of anaemias. Causes and clinical picture of deficiency anaemia, aplastic anaemias and anemia of chronic disorders	1	-	1	1
3, 4	Disorders of erythrocyte metabolism	2	1	3, 4	2
5, 6	Thalassemias. Haemoglobinopathies. How is haemoglobin electrophoresis performed	2	-	2	2
7, 8	Blood hemostasis & its physiologic controls & coagulopathies	4	2	2	3
9, 10	What is meant by leukaemia (etiology ; types ; diagnosis ; management)	3	3, 4	2	4
11, 12	Myeloprolefrative disorders & myelodysplasia	4	2	2	2

13, 14	Discussion and poster presentation	-	-	-	4, 5, 6

Course coordinator Dr. Randa Mohamed Talaat
Head of department council: Prof. Dr. Randa Mohamed Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

16. Course information:							
Course Code:	B7-12	**Course Title:**	Genetics and Gene Therapy				
No. units	3	**Lec.**	2	**App.**	-	**Level**	Doctorate
Department	**N.A (General course)**						

17. Course Aims	
	The course provides an overview of the concepts, strategies and different methods used for gene therapy according to the nature of the disease.

18. Intended Learning Outcomes of Course (ILO's)	
i. Knowledge and Understanding:	1- Summarize concept, different strategies and different methods used in gene therapy. 2- Clarify the proper strategy of gene therapy to be used according to the nature of the disease. 3- Explain how stem cells can be used for gene therapy.
j. Intellectual skills:	1- Find solutions for treating some genetic diseases according to the causative genetic defect. 2- Suggest new strategies for treatment of some resistant malignancies.
k. Professional Skills	1- Estimate the advantages and disadvantages of the different vector systems used for treating certain diseases. 2- Select the most suitable strategy and method to be used.
l. General and Transferable Skills	1- Use displaying devices to conduct presentations in the course topics. 2- Manage time effectively & work in teams. 3- Use information communication technology to improve his/her professional practice in internet and

	relative information of human cell biology.

	19. Course Contents:
No.	**Topics**
1	1- Overview of the concept and strategies of gene therapy
2	2- Gene therapy candidate diseases
3	3- Delivery of therapeutic genes using viral vectors
4	4- Delivery of therapeutic genes using non-viral vectors
5	5- Gene augmentation therapy
6	6- Gene silencing therapy
7	7- Cell Therapy and stem cells

20. Teaching and Learning Methods	
	Lectures **Class activities** **Discussion** **Presentation** **Reports**

21. Teaching and Learning Methods (for students with special needs)	**Not applied**

22. Student Assessment:	
d. Assessment Methods:	- work on team

	- Midterm - Oral - Written
e. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week -Written (Final) Exam (15th) Week.
f. Weighting of Assessments	-10 10% -10 10% -20 20% -60 60% Total=100 100%

23. List of References:	
h. Notes	-
i. Essential Books (Text Books)	• **Human Genetics by Vogle part 26** • **The Cell:** A Molecular Approach, Fourth Edition by Cooper and Hausman • **Molecular Therapeutics**
j. Suggested Books	-
k. Periodicals, Web Sites, … etc ...	

Course coordinator :Dr. Usama Fouad Shaalan

Head of the department council: : Prof. Dr. Randa M. Talaat

Course Matrix

Course Contents	Week No.	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1-Overview of the concept and strategies of gene therapy	**1&2**	**1**	**-**	**-**	**-**
2-Gene therapy candidate diseases	**3&4**	**2**	**1,2**	**-**	**1,2,3**
3-Delivery of therapeutic genes using viral vectors	**5&6**	**1**	**-**	**1**	**-**
4-Delivery of therapeutic genes using non-viral vectors	**7&8**	**1**	**-**	**1**	**-**
5-Gene augmentation therapy	**9&10**	**1,2**	**1,2**	**2**	**1,2,3**
6-Gene silencing therapy	**11&12**	**1,2**	**1,2**	**2**	**1,2,3**
7-Cell Therapy and stem cells	**13&14**	**3**	**2**	**2**	**1,2,3**

Course Coordinator: Dr.Usama Fouad Shalaan
Head of the Department Council: Prof. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

24. Course information:							
Course Code:	B7-13	**Course Title:**	Genetics and clinical practice				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

25. Course Aims	
	1- Enable student to know the basic concepts and principles of genetics. 2- Familiarize students with the genetic diseases are covered in the lecture component. 3- Help student to understand the laboratory techniques used to diagnosis the genetic disorders. 4- Enable student to realize the genetic approaches

26. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
m. Knowledge and Understanding:	1- Explain Chromosome, genome structure and functions. 2- Name Chromosome abnormalities: how they arise, risks of occurrence and their detection 3- Explain Prenatal tests and screening for genetic defects 4-Summarize Non-traditional inheritance: mosaicism, microdeletion syndromes, uniparental disomy, genome imprinting, trinucleotide repeats, mitochondrial disorders 5- Summarize The events in sexual development and some genetic abnormalities 6- Explain Several common single gene disorders, their cause, diagnosis, and recurrence risks 7- Summarize How and where new mutations arise and the possible consequences: somatic and germinal 8- Summarize of Common multifactorial traits and recurrence

	risks 9- Explain Common teratogens and the embryopathies they produce 10- Express The use of DNA fingerprinting in identification of individuals 11- Divide The current status of prenatal testing, newborn screening, carrier testing, genetic counseling 12- Remodel pedigree and analyze it.
n. Intellectual skills:	1- Distinguish how single gene anomalies and chromosome aberrations of number and structure now known in humans (along with their meiotic basis), affect the incidence of birth defects, and are the probable casual effects in many cancers. 2- Determine Evidences how polygenic (multifactorial) genetics contributes to the inheritance and determination of more complicated human traits 3- Design Link Between our current knowledge in molecular genetics to appreciate and explain the structure of genes. 4- Suggest selective forces in evolution, and current day residuals, to explaining how genetic diseases have obtained their frequencies in various populations
o. Professional Skills:	1- Select the different types of genetic screening programs currently in use, describe the purpose of each, and explain how each is affecting the frequency of abnormal genes and genotypes screened 2- Estimate our current knowledge of principles of inborn errors of metabolism and their molecular basis, (As it will be discussed in isolated course of IBM) 3- Prepare discussion of population genetics factors which cause changes in gene frequencies, and thus determine the basis of evolutionary change. 4- Select the principles of human genetics by applying them to counseling, screening, ethics, law, and evaluating their social implications.
p. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	27. Course Contents:
No.	**Topic**

1	1- THE STRUCTURE AND FUNCTION OF GENES
2	2- GENOTYPE-PHENOTYPE CORRELATIONS IN GENETIC DISEASE
3	3- ETHICAL ISSUES IN GENETIC TESTING
4	4- Patterns of Inheritance(introduction)
5	5- AUTOSOMAL DOMINANT INHERITANCE
6	6-MOLECULAR DIAGNOSIS OF GNETIC DISORDERS
7	7- AUTOSOMAL RECESSIVE INHERITANCE

28. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

29. Teaching and Learning Methods (for students with special needs)	**Not applied**

30. Student Assessment:	
g. Assessment Methods:	
h. Assessment Schedule	-Semester Works (5^{th}&10^{th}) -Midterm Exam (6^{th}) Week -Oral Exam (14^{th}) Week - Written (Final) Exam (15^{th}) Week.
i. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

31. List of References:	
l. Notes	Course notes
m. Essential Books (Text Books)	Nelson Text book of pediatrics
n. Suggested Books	For far text book of pediatrics
2- Periodicals, Web Sites, … etc ...	Pediatrics clinic of North America

Course coordinator :Dr. Usama Fouad Shalaan

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1, 2	Introduction to microbial infections & immune defenses against pathogens	1,2	1	2	1,2
3, 4	Microbial agents and diseases	5	3		1,2
5, 6	Microbial disease mechanisms	3,4,5,7	2,3,4,6,8	1,3	1,2
7, 8	Molecular mechanisms of microbial infections	4,5	2,3,4,6	1,3	1,2
9, 10	Molecular pathogenesis of microbial infections	3,4,5	2,3,4,6,8		1,2
11, 12	Molecular mechanisms of bacterial, viral and fungal medical infections	3,4,5,7,8	2,3,4,6,8		1,2
13, 14	Molecular mechanisms of bacterial, viral and fungal animal infections	3,5,6,7,8	2,3,4,5,6,8		1,2

Course coordinator: Dr. Usama Fouad Shaalan
Head of department council: Prof. Dr. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

1. Course information:							
Course Code:	**B7- 14**	**Course Title:**	**Genomic Imprinting**				
No. units	3	**Lect.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

2. Course Aims	
	■ The course presents an introduction to genomic imprinting and the epigenetic mechanisms involved in the regulation and differential gene expression through DNA methylation and gives examples of some diseases resulting from defects in these processes.

3. Intended Learning Outcomes of Course (ILO's)	**By the end of this course, the student should be able to:**
a. Knowledge and Understanding	1- Summarize the process of DNA methylation, the structure of chromatin and its role in the regulation of gene expression, defferential gene expression and many diseases caused by imprinted genes. 2- Clarify different mechanisms of genomic imprinting and its role in cellular processes. 3- Explain different mechanisms of non-mendalian inheritance of imprinted genes.
b. Intellectual skills	1- Distinguish between different mechanisms of non mendelian inheritance of some diseases related to imprinted genes epigenetic mechanisms 2- Link between gene expression regulation mechanisms and imprinting.
c. Professional Skills	1- Prepare scientific reports and research papers in the area of genomic imprinting.
d. General and Transferable Skills	1- Use different sources of information to obtain data for the Genomic Imprinting course topics. 2- Use displaying devices to conduct presentations in the course topics. 3- Manage time effectively & work in teams.

4. Course Contents:	
No.	**Topic**
1	Overview of regulation and differential gene expression.
2	Chromatin structure, Epigenetic mechanisms of gene regulation
3	Genomic imprinting: definition and mechanism
4	Inheritance of imprinted genes
5	Genomic imprinting: parental dependent gene expression and uniparental disomy
6	Diseases associated with imprinting: Inherited Tumors
7	Diseases associated with imprinting: Genetic diseases

5. Teaching and Learning Methods	
	Lectures. Class activities Discussions Presentations Reports

6. Teaching and Learning Methods (for students with special needs)	**Not applicable**

7. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam * Oral Exam * Written (Final) Exam

b. Assessment Schedule	* (5th &10th weeks), * (6th) Week, * (14th) Week, * (15th) Week.		
c. Weighting of Assessments	10 degrees	ratios	10 %
	10 degrees	ratios	10 %
	20 degrees	ratios	20 %
	60 degrees	ratios	60 %
	Total 100 degrees	ratios	100 %

8. List of References:	
a. Notes	• Course Notes
b. Essential Books (Text Books)	• Human Genetics by Vogel and Motulsky's (2010) Chapter 5, 9, 15,
c. Suggested Books	-
d. Periodicals, Web Sites, … etc.	www.geneimprint.com/site/what-is-imprinting http://genomebiology.com/2002/3/2/reviews/1003

Course coordinator :Dr. Manal Osama El Hamshary

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

No.	Course topic	Knowledge and understanding a	Intellectual abilities b	Practical skills c	General and transferable skills d
1	Overview of regulation and differential gene expression.	1	-	-	-
2	Chromatin structure, Epigenetic mechanisms of gene regulation	1	2	-	-
3	Genomic imprinting: definition and mechanism	2	-	-	-
4	Inheritance of imprinted genes	3	1	-	-
5	Genomic imprinting: parental dependent gene expression and uniparental disomy	3	1	1	-
6	Diseases associated with imprinting: Inherited Tumors	2,3	-	1	1,2,3
7	Diseases associated with imprinting: Genetic diseases	2,3	-	1	1,2,3

Course coordinator :Dr. Manal Osama El-Hamshary

Head of the department council: Prof. Dr. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

32. Course information:							
Course Code:	B7-15	**Course Title:**	**Haemostasis and thrombosis**				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

33. Course Aims	
	1Summarize and understand the normal blood hemostasis 2Understand the role of blood platelets in hemostasis 3-Discuss the intrinsic and extrinsic coagulation pathways 4-understand the physiologic control of hemostasis and fibrinolysis

34. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
q. Knowledge and Understanding:	1- Summarize the picture of a normal blood picture 2- Explain the bleeding time,clotting time,coagulation time 3-Clarify difference between the intrinsic and extrinsic coagulation pathways 4-Explain the prothrombin time and concentrtion
r. Intellectual skills:	1-Design the strategy for treating a case of dissiminated intravascular coagulopathy 2-Distinguish between the bleeding factors,clotting factors, and coagulation factors 3-Determine problems caused by fibrinogen or factor 1 4-Evaluate the importance of prothrombin time and concentration
s. Professional Skills:	1-Test the picture of a normal blood film 2- Estimate the role of fibrinogen degradation products 3-Diagnose case of dissiminated intravascular coagulopathy 4-Test the role of extrinsic and intrinsic factors in coagulation pathway

t. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	35. Course Contents:
No.	**Topics**
1	Description of a normal blood film, and analyses ,the normal ranges of each component
2	How to state the role blood platelets in hemostasis
3	what is meant by fibrinolysis and its role in hemostasis
4	Mid-term exam. Description of lab work in diagnosis of coagulopathies
5	Description of the relation of disorders in haemostasis and its relation systemic diseases
6	What are the natural anticoagulants and its role
7	Revision

36. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

37. Teaching and Learning Methods (for students with special needs)	**Not applied**

38. Student Assessment:	
j. Assessment Methods:	
k. Assessment Schedule	-Semester Works (5^{th}&10^{th}) -Midterm Exam (6^{th}) Week -Oral Exam (14^{th}) Week - Written (Final) Exam (15^{th}) Week.

l. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

39. List of References:	
o. Notes	Course notes
p. Essential Books (Text Books)	Nelson Text book of pediatrics
q. Suggested Books	For far text book of pediatrics
3- Periodicals, Web Sites, … etc ...	Pediatrics clinic of North America

Course coordinator :Dr. Randa Mohamed Talaat

Head of the department council: Prof. Dr. Randa Mohamed Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Description of a normal blood film, and analyses ,the normal ranges of each component	1	-	1	1
3, 4	How to state the role blood platelets in hemostasis	2	3	2	2
5, 6	what is meant by fibrinolysis and its role in hemostasis	-	1	3	2
7, 8	Description of lab work in diagnosis of coagulopathies	2, 4	4	-	2
9, 10	Description of the relation of disorders in haemostasis and its relation systemic diseases	-	4	-	2
11, 12	What are the natural anticoagulants and its role	3	-	4	1
13, 14	Revision	-	-	-	1, 2

Course coordinator Dr. Randa Mohamed Talaat
Head of department council: Prof. Dr. Randa Mohamed Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

40. Course information:							
Course Code:	B7-19	**Course Title:**	Human Genetic Diseases				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**N.A (General course)**						

41. Course Aims	
	The course broadly aims to develop knowledge of human genetic inheritance and different genetic diseases inorder to prepare the student to perform genetic counseling, pedigree analysis so as to select the most suitable genetic test to confirm the clinical diagnosis.

42. Intended Learning Outcomes of Course (ILO's)	
u. Knowledge and Understanding:	1- Express different modes of inheritance, genetic counseling and pedigree analysis. 2- Summarize the types of chromosomal pathologies giving examples for diagnostic tests. 3- Clarify the genetic causes of monogenic and multifactorial diseases
v. Intellectual skills:	1- Link between phynotypic features and the chromosomal abnormality or defective gene(s) involved. 2- Evaluate the risk of disease in future generations. 3- Find the appropriate genetic test to confirm the disease.
w. Professional Skills	1- Prepare a pedigree analysis from patient detailed history 2- Estimate the risk of transmission of the disease. 3- Select the suitable genetic test to confirm the disease and to perform genetic counseling.

x. General and Transferable Skills	1- Communicate effectively using all methods with public, colleagues and appropriate authorities. 2- Use information communication technology to improve his/her professional practice in internet and relative information of human cell biology. 3- Practice self-appraisal and determines his/her learning needs. 4- Use different sources of information to obtain data for a given human cell biology course topics. 5- Use educational technology displaying devices for explain important frames in human cell biology. 6- Manage time effectively & work in teams.

	43. Course Contents:
No.	**Topics**
1	Inheritance, Pedigree analysis and genetic counseling
2	Chromosomes pathology in postnatal diagnostics
3	Diseases caused by Numerical chromosomal abnormalities
4	Diseases caused by Structural chromosomal abnormalities
5	Diseases caused by Sex chromosomes aneuploidy
6	Diseases caused by chromosomal microdeletions
7	Monogenic diseases and multifactorial diseases

44. Teaching and Learning Methods	
	Lectures **Class activities** **Discussion** **Presentation** **Reports**

45. Teaching and Learning Methods (for students with special needs)	**Not applied**

46. Student Assessment:	

m. Assessment Methods:	- work on team - Midterm - Oral - Written
n. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week -Written (Final) Exam (15th) Week.
o. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

47. List of References:	
r. Notes	-
s. Essential Books (Text Books)	**Human Genetics By Vogle**
t. Suggested Books	-
u. Periodicals, Web Sites, … etc ...	

Course coordinator :Dr. Usama Fouad Shaalan

Head of the department council: : Prof. Dr. Randa M. Talaat

Course Matrix

Course Contents	Week No.	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
Inheritance, Pedigree analysis and genetic counseling	1&2	1	2	1,2	-
Chromosomes pathology in postnatal diagnostics	3&4	-	1,3	1,2,3	-
Diseases caused by Numerical chromosomal abnormalities	5&6	2	1	1,2,3	1,2,3,4,5,6
Diseases caused by Structural chromosomal abnormalities	7&8	2	1	1,2,3	1,2,3,4,5,6
Diseases caused by Sex chromosomes aneuploidy	9&10	2	1	1,2,3	1,2,3,4,5,6
Diseases caused by chromosomal microdeletions	11&12	2	1	1,2,3	1,2,3,4,5,6
Monogenic diseases and multifactorial diseases	13&14	1,3	1,3	1,2,3	-

Course Coordinator: Dr. Usama Fouad Shalaan
Head of The Department Council: Prof. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

48. Course information:							
Course Code:	B7-21	**Course Title:**	Human Genetics II				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**N.A (General course)**						

49. Course Aims	
	The course aims to develop and broaden the knowledge of the student about human genetic diseases, the human genome variations and its implications in the field of clinical genetics, genetic testing and personalized medicine.

50. Intended Learning Outcomes of Course (ILO's)	
y. Knowledge and Understanding:	1- Summarize the human genome organization and its variations and their applications. 2- Clarify the role of DNA technology in the fields of medical genetics 3- Explain the advances of genomics and post genomics
z. Intellectual skills:	1- Evaluate the role of DNA technology in the new era of human genetics
aa. Practical and Professional Skills	1- Prepare scientific reports and research papers in the area of Genomics, human genetics and post genomic era.
bb. General and Transferable Skills	1 Communicate effectively using all methods with public, colleagues and appropriate authorities. 2- Use information communication technology to improve his/her professional practice in internet. 3- Practice self-appraisal and determines his/her learning

	needs. 4- Use different sources of information to obtain data for a given human genetics course topics. 5- Use educational technology displaying devices to explain important frames in human genetics. 6- Manage time effectively & work in teams.

	51. Course Contents:
No.	**Topics**
1	Human genome sequence organisation and genome variation
2	Human genome project, hapmap, snps, prsonalized medicine
3	DNA technology in medical genetics:
4	a- Sequencing
5	b- Array based
6	From genes to Genomics to proteomics
7	Post genomic era

52. Teaching and Learning Methods	
	Lectures **Class activities** **Discussion** **Presentation** **Reports**

53. Teaching and Learning Methods (for students with special needs)	**Not applied**

54. Student Assessment:	
p. Assessment Methods:	- work on team - Midterm - Oral - Written

q. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week -Written (Final) Exam (15th) Week.
r. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

55. List of References:	
v. Notes	-
w. Essential Books (Text Books)	**Human Genetics by Vogle**
x. Suggested Books	-
y. Periodicals, Web Sites, … etc ...	

Course coordinator :Dr. Usama Foad Shaalan
Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Course Contents	Week No.	Knowledge and Understanding a	Intellectual skills b	Professional Skills of course c	General and Transferable Skills d
Human genome sequence organisation and genome variation	1&2	1	1	-	-
Human genome project, hapmap, snps, prsonalized medicine	3&4	1,2	1	-	-
Overview of DNA technology in medical genetics:	5&6	2	1	1	1,2,3,4,5,6
a- Sequencing	7&8	3	1	1	1,2,3,4,5,6
b- Array based	9&10	3	1	1	1,2,3,4,5,6
From genes to Genomics to proteomics	11&12	3	1	1	1,2,3,4,5,6
Post genomic era	13&14	3	1	1	1,2,3,4,5,6

Course Coordinator: Dr.Usama Fouad Shalaan
Head of the Department Council: Prof. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

56. Course information:							
Course Code:	B7-25	**Course Title:**	**LEUKEMIA**				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

57. Course Aims	
	1- Help student to know the types and classifications of leukemia 2- Enable student to understand etiology ; pathogenesis and managements of acute leukemia . 3- Enable student to understand etiology ; pathogenesis and managements of chronic leukemia . 4- Enable student to know the application of the new molecular methods for diagnosis and follow up of treatment of leukemia

58. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
cc. Knowledge and Understanding:	1- Divide different types leukemia 2- Summarize Bone marrow failure 3- Mention the impact of molecular technology in leukemia Diagnosis 4- Explain the most important clinical conditions and outline the diagnosis and treatment 5- Summarize and discuss the main disease categories that may affect the body as well as the basic mechanisms underlying these disorders (etiology, pathogenesis and natural history). 6- Determine the fate & complications of each particular disease and outline the general management procedures. 7- Explain medical terms of different types of leukemia process 8- Clarify difference different stages of leukemia progress
dd. Intellectual skills:	1- Distinguish laboratory diagnosis of leukemia 2- Design molecular reports 3- Evaluate according to evidence the causal relationship of different types of blood malignancy

	4- Determine the sign & symptoms of diseases based on the underlying changes responsible for symptomatology and physical changes in the patients, thereby enabling the candidate recognize patients with threatening conditions. 5- Distinguish professional manner a laboratory report
ee.Professional Skills:	١-Diagnose and fully describe the laboratory and clinical picture of leukemia based on different stages 2- Estimate the most appropriate cost effective of management and diagnostic procedures ٣- Select the necessary techniques for sample reception & processing 4- Prepare the specimen received.
ff. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	59. Course Contents:
No.	**Topic**
1	Bone Marrow & Blood Formation
2	Myeloid Leukemia (types ; classifications and clinical pictures)
3	Managements of Myeloid leukemia patients (Diagnosis; treatment and prevention)
4	Mid term Exam , Lymphoblastic Leukemia (types ; classifications and clinical pictures
5	Managements of Lymphatic leukemia patients ; treatment and prevention
6	Lymphoma (types classifications ; clinical pictures and lab diagnosis)
7	Seminars and group discussion

60. Teaching and Learning Methods	

	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

61. Teaching and Learning Methods (for students with special needs)	**Not applied**

62. Student Assessment:	
s. Assessment Methods:	
t. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
u. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

63. List of References:	
z. Notes	Course notes shaalan's text book of pediatrics (For Free) Obtained copy from the institute library
aa. Essential Books (Text Books)	Nelson Text book of pediatrics
bb. Suggested Books	For far text book of pediatrics
4- Periodicals, Web Sites, … etc ...	Pediatrics clinic of North America

Course coordinator :Dr Usama Fouad Shaalan
Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	a/-Knowledge and Understanding	b/- Intellectual skills	c/- Professional Skills	d/-General and Transferable Skills
1	Bone Marrow & Blood Formation	1, 2	-	1	1
2	Myeloid Leukemia (types ; classifications and clinical pictures)	1	3	2	2
3	Managements of Myeloid leukemia patients (Diagnosis; treatment and prevention)	5	1	3	2
4	Mid term Exam Lymphoblastic Leukemia (types ; classifications and clinical pictures	4	4	2	2
5	Managements of Lymphatic leukemia patients ; treatment and prevention	7, 3	4	-	2
6	Lymphoma (types classifications ; clinical pictures and lab diagnosis)	8	5	4	1
7	Seminars and group discussion	6	-	3	1, 2

Course coordinator :Dr Usama Fouad Shaalan

Head of the department council: Prof. Dr.Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

64. Course information:							
Course Code:	B7-27	**Course Title:**	**Lymphoma molecular diagnosis**				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

65. Course Aims	
	1- Help student to know all about Lymphoma. 2- Enable student to understand the type of Lymphomas. 3- Familiarize student with diagnosis method and treatment of lymphomas.

66. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
gg. Knowledge and Understanding:	1- Divide different types lymphoma 2- Summarize Bone marrow failure 3- Mention the impact of molecular technology in lymphoma Diagnosis 4- Explain the most important clinical conditions and outline the diagnosis and treatment 5- Summarize and discuss the main disease categories that may affect the body as well as the basic mechanisms underlying these disorders (etiology, pathogenesis and natural history). 6- Determine the fate & complications of each particular disease and outline the general management procedures. 7- Explain medical terms of different types of lymphoma process 8- Clarify difference different stages of lymphoma progress
hh. Intellectual skills:	1- Distinguish laboratory diagnosis of lymphoma 2- Design molecular reports 3- Evaluate according to evidence the causal relationship of different types of blood malignancy 4- Determine the sign & symptoms of diseases based on the

	underlying changes responsible for symptomatology and physical changes in the patients, thereby enabling the candidate recognize patients with threatening conditions. 5- Distinguish professional manner a laboratory report
ii. Professional Skills:	١-Diagnose and fully describe the laboratory and clinical picture of lymphoma based on different stages 2 -Estimate the most appropriate cost effective of management and diagnostic procedures ٣- Select the necessary techniques for sample reception & processing 4- Prepare the specimen received.
jj. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	67. Course Contents:
No.	**Topics**
1	Molecular Diagnosis
2	Prevalence
3	Kiel classification
4	REAL classification
5	WHO classification
6	Mature B cell neoplasms
7	Mature T cell and natural killer (NK) cell neoplasms

68. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

69. Teaching and Learning Methods (for	**Not applied**

students with special needs)	

70. Student Assessment:	
v. Assessment Methods:	
w. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
x. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

71. List of References:	
cc. Notes	Course notes shaalan's text book of pediatrics (For Free) Obtained copy from the institute library
dd. Essential Books (Text Books)	Nelson Text book of pediatrics
ee. Suggested Books	For far text book of pediatrics
5- Periodicals, Web Sites, … etc ...	Pediatrics clinic of North America

Course coordinator :Dr. Usama Fouad Shaalan

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Molecular Diagnosis	1	-	1	1
3, 4	Prevalence	2, 3	3	2	2
5, 6	Kiel classification	5	1	3	2
7, 8	REAL classification	4	4	2	2
9, 10	WHO classification	7	4	-	2
11, 12	Mature B cell neoplasms	8	5	4	1
13, 14	Mature T cell and natural killer (NK) cell neoplasms	6	-	3	1, 2

Course coordinator :Dr. Usama Fouad Shaalan

Head of the department council: Prof. Dr.Randa M. Talaat

Course Specifications

1. Course information:							
Course Code:	**B7- 29**	**Course Title:**	**Molecular Basis of Therapeutics**				
No. units	3	**Lect.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

2. Course Aims	
	■ Developing a broad spectrum of knowledge related to molecular therapeutics used in certain diseases. ■ Identifying new molecular markers and using various technologies to design molecular therapeutics.

3. Intended Learning Outcomes of Course (ILO's)	
a. Knowledge and Understanding	1- Summarize the molecular basis of therapeutics and different strategies used in the production of molecular therapeutics and vaccines. 2- Clarify the difference between using nucleic acids for diagnosis and as therapeutics. 3- Explain the advantages of using molecular therapeutics to replace conventional therapies. 4- Express the role of nucleic acids and stem cells in recent advances of therapies.
b. Intellectual skills	1- Suggest new applications of nucleic acids in molecular therapeutics. 2- Design methods for recombinant vaccines and recombinant proteins. 3- Distinguish between different types of regulatory RNA and application in therapy . 4- Find solutions to overcome hazards related to gene therapy.
c. Professional Skills	1- Select the suitable and relevant strategies to treat certain diseases on the molecular level. 2- Prepare modern modules of reports in the area of molecular therapeutics and stem cell therapy. 3- Prepare project proposals in the field of molecular therapeutics.
d. General and Transferable Skills	1- Use different sources of information to obtain data for the course topics. 2- Use displaying devices to conduct presentations in the course topics. 3- Manage time effectively & work in teams.

4. Course Contents:	
No.	**Topic**
1	**Introduction and overview on molecular diagnostics, molecular therapeutics.**
2	**Use of nucleic acids as a diagnostic and as a therapeutic tool: gene therapy applications according to the genetic basis of a disease. Chapter 9**
3	**Vaccines versus DNA vaccines**
4	**Molecular therapeutics in cancer chapters 2,3**
5	**RNA interference basics and therapeutics chapter 6**
6	**Human stem cell therapy chapter 8**
7	**Molecular therapeutics in infectious diseases; chapter 12, neurodegenerative diseases; chapters 10, 11 and Antiaging; chapter 5**

5. Teaching and Learning Methods	
	Lectures. Class activities Discussions Presentations Reports

6. Teaching and Learning Methods (for students with special needs)	Not applicable

7. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam * Oral Exam * Written (Final) Exam
b. Assessment Schedule	* (5^{th} &10^{th} weeks), * (6^{th}) Week,

	* (14th) Week, * (15th) Week.		
c. Weighting of Assessments	10 degrees	ratios	10 %
	10 degrees	ratios	10 %
	20 degrees	ratios	20 %
	60 degrees	ratios	60 %
	Total 100 degrees	ratios	100%

8. List of References:	
a. Notes	----------
b. Essential Books (Text Books)	• Molecular and Cellular Therapeutics by David Whitehouse and Ralph Rapley (2012) chapters (2,3,4,5,6,8,9,10,11,12) • Molecular Medicine fourth edition by Roland J Trent (2012) chapters (7, 8)
c. Suggested Books	•
d. Periodicals, Web Sites, … etc.	----------

Course coordinator: Dr. Manal Osama El Hamshary
Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

No.	Course topic	Knowledge and understanding a	Intellectual abilities b	Professional skills c	General and transferable skills d
1	**Introduction and overview on molecular diagnostics and molecular therapeutics**	1	-	-	-
2	**Use of nucleic acids as a diagnostic and as a therapeutic tool: gene therapy applications according to the genetic basis of a disease.**	2	-	1	-
3	**Vaccines versus DNA vaccines**	1,2	2,4	1	-
4	**Molecular therapeutics in cancer chapters 2,3**	3	1,4	1,2,3	1,2,3
5	**RNA interference basics and therapeutics chapter 6**	2	3	3	-
6	**Human stem cell therapy chapter 8**	3,4	-	2	-
7	**Molecular therapeutics in infectious diseases; chapter 12, neurodegenerative diseases; chapters 10, 11 and Antiaging; chapter 5**	3,4	1	1,2,3	1,2,3

Course coordinator : **Dr. Manal Osama El Hamshary**

Head of the department council: **Prof. Dr. Randa M. Talaat**

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

72. Course information:							
Course Code:	B7-30	**Course Title:**	Molecular diagnosis of anemias				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

73. Course Aims	
	1- Enable student to understand the clinical feature of anemia 2- make student oriented with the etiology, pathogenesis and manifestation of anemia 3- Help student to know the differential diagnosis and treatment of anemia

74. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
kk. Knowledge and Understanding:	1- Divide different types anemia 2- Summarize Bone marrow failure 3- Mention the impact of molecular technology in anemia Diagnosis 4- Explain the most important clinical conditions and outline the diagnosis and treatment a/5- Summarize and discuss the main disease categories that may affect the body as well as the basic mechanisms underlying these disorders (etiology, pathogenesis and natural history). 6- Determine the fate & complications of each particular disease and outline the general management procedures. 7- Explain medical terms of different types of leukemia process 8- Clarify difference different stages of anemia progress
ll. Intellectual skills:	1- Distinguish laboratory diagnosis of anemia 2- Design molecular reports 3- Evaluate according to evidence the causal relationship of different types of anemia 4- Determine the sign & symptoms of diseases based on the underlying changes responsible for symptomatology and physical changes in the patients, thereby enabling the

	candidate recognize patients with threatening conditions. 5- Distinguish professional manner a laboratory report
mm. Professional Skills:	١-Diagnose and fully describe the laboratory and clinical picture of anemia based on different stages ٢-Estimate the most appropriate cost effective of management and diagnostic procedures ٣- Select the necessary techniques for sample reception & processing 4- Prepare the specimen received.
nn. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	75. Course Contents:
Week No.	**76. Course Contents:**
	Topics
1,2	Describe the normal maturation sequence of each hematopoietic element and show how they differ from each other morphologically
3,4	Classify hereditary types of anemia and discuss its main types
5,6	Discuss the red cell membrane and enzymes congenital disorders
7,8	Mid term Exam Discuss erythropoiesis and describe types and pathogenesis of thalassemia
9,10	CBC and interpretation of different types of anemia
11,12	Discuss the principles and interpretations of the Molecular tests used to evaluate erythrocyte production, Hb synthesis, and its O2 carrying capacity
13,14	Seminars and discussion

77. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

78. Teaching and Learning Methods (for students with special needs)	**Not applied**

79. Student Assessment:	
y. Assessment Methods:	
z. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
aa. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

80. List of References:	
ff. Notes	Course notes shaalan's text book of pediatrics (For Free) Obtained copy from the institute library
gg. Essential Books (Text Books)	Nelson Text book of pediatrics
hh. Suggested Books	For far text book of pediatrics
6- Periodicals, Web Sites, … etc ...	Pediatrics clinic of North America

Course coordinator :Dr. Usama Fouad Shaalan

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Describe the normal maturation sequence of each hematopoietic element and show how they differ from each other morphologically	1	-	1	1
3, 4	Classify hereditary types of anemia and discuss its main types	2, 3	3	2	2
5, 6	Discuss the red cell membrane and enzymes congenital disorders .	5	1	3	2
7, 8	Discuss erythropoiesis and describe types and pathogenesis of thalassemia	4	4	2	2
9, 10	CBC and interpretation of different types of anemia	7	4	-	2
11, 12	Discuss the principles and interpretations of the Molecular tests used to evaluate erythrocyte production, Hb synthesis, and its O2 carrying capacity.	8	5	4	1
13, 14	Seminars and discussion	6	-	3	-

Course coordinator: Dr. Usama Fouad Shaalan
Head of the department council: Prof. Dr. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

1. Course information:							
Course Code:	**B7- 34**	**Course Title:**	**Molecular Genetics of Drug Resistance**				
No. units	3	**Lect.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

2. Course Aims	
	▪ The course will develop a broad spectrum of knowledge related to molecular basis of drug resistance, membrane transport and the role of the genetic makeup of the host and the causative organism in this resistance. ▪ The course will enable the student to comprehend the concept of individualized therapy.

3. Intended Learning Outcomes of Course (ILO's)	
a. Knowledge and Understanding	1- Express the basis of membrane transport and selectivity 2- Summarize the phenomenon of drug resistance and its genetic basis. 3- Explain concepts of drug resistance in many disease examples.
b. Intellectual skills	5- Evaluate and conduct studies in the field of drug resistance. 6- Innovate existing strategies in individualized therapy. 7- Find solutions for drug resistance problems.
c. Professional Skills	1- Prepare reports in the area of molecular basis of drug resistance. 2- Estimate the influence of the genetic makeup of an organism on its response to therapeutics.
d. General and Transferable Skills	1- Use different sources of information to obtain data for the nucleic acid drug targeted design course topics. 2- Use displaying devices to conduct presentations in the course topics. 3- Manage time effectively & work in teams.

4. Course Contents:	
No.	**Topic**
1	Membrane transport and ABC system and MDR.
2	Introduction to phenomenon of drug resistance and its genetic basis.
3	Drug resistance of chemotherapeutics.
4	Introduction to drug resistance in: bacterial and viral infections.
5	Drug resistance in: bacterial strains
6	Viral genotypes and response to viral therapy
7	Drug resistance in mycobacterium tuberculosis

5. Teaching and Learning Methods	
	Lectures. Class activities Discussions Presentations Reports

6. Teaching and Learning Methods (for students with special needs)	**Not applicable**

7. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam * Oral Exam * Written (Final) Exam
b. Assessment Schedule	* (5^{th} &10^{th} weeks), * (6^{th}) Week,

	* (13th) Week, * (14th) Week, * (15th) Week.		
c. Weighting of Assessments	10 degrees	ratios	10 %
	10 degrees	ratios	10 %
	20 degrees	ratios	20 %
	60 degrees	ratios	60 %
	Total 100 degrees	ratios	100%

8. List of References:	
a. Notes	----------
b. Essential Books (Text Books)	• Molecular Genetics of Drug Resistance by John D. Hayes and Roland Wolf. • The Cell: A molecular approach by Cooper. • Reversal of Multidrug resistance in Cancer by John A. Kellen.
c. Suggested Books	• Molecular Therapeutics 21st Century Medicine by Pamela Greenwell and Michelle McCulley.
d. Periodicals, Web Sites, … etc.	• Medscape Pharmacicts.com • Ingentaconnect.com • http://members.tripod.com/~Dr_Venky/med2.html • www.actionbioscience.org/biotech/margawati.html

Course coordinator :Dr. Manal osama El Hamshary

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

No.	Course topic	Knowledge and understanding a	Intellectual abilities b	Professional and practical skills c	General and transferable skills d
1	Membrane transport and ABC system and MDR.	1	-	-	-
2	Introduction to phenomenon of drug resistance and its genetic basis.	2	-	-	-
3	Drug resistance in: tumors.	3	1,3,3	1,2	-
4	Drug resistance in: bacterial and viral infections.	3	1	1	-
5	Drug resistance in: bacterial strains	3	1,2,3	1,2	1,2,3
6	Viral genotypes and response to viral therapy	3	1,2,3	1,2	1,2,3
7	Drug resistance in mycobacterium tuberculosis	3	1,2,3	1,2	1,2,3

Course Coordinator: Dr. Manal Osama El hamshary
Head of the Department Council: Prof. DR. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

81. Course information:							
Course Code:	B7-35	**Course Title:**	Molecular mechanisms in microbial pathogenesis				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

82. Course Aims	
	1- Enable student to understand the various mechanisms involved in pathogenesis of microbial infections. 2- Familiarize students with various ways in which microbial infection may result in cell and tissue injury. 3- Enable students to be oriented with immune response to pathogens. 4- Help students to know the main cellular and molecular sequences of bacterial, viral, fungal and yeast infections.

83. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
oo. Knowledge and Understanding:	1- Explain Koch's postulates of microbial infection. 2- Express the immune response to microbial pathogens. 3- Explain the role of Gram-positive bacteria in disease state. 4- Summarize potential outcome of infection with Gram-negative bacteria. 5- Explain molecular mechanisms in pathogenesis of microbial infections. 6- Clarify difference between various mechanisms involved in pathogenesis of microbial infections. 7- Summarize the pathogenesis of infection with various species of pathogenic bacteria and viruses. 8- Divide the molecular events in pathogenesis of some

	pathogenic fungi and yeasts.
pp. Intellectual skills:	1- Distinguish different patterns of host-pathogen interactions. 2- Determine molecular mechanisms in microbial pathogenesis. 3- Evaluate virulence determinants of pathogenic bacteria. 4- Suggest physiochemical forces required for bacterial adhesion. 5- Distinguish different steps of virus replication. 6- Find the relationship between type of infecting bacteria and the process of invasion of host cells. 7- Distinguish various mechanisms involved in pathogenesis of bacterial, viral and fungal infections.
qq. Professional Skills:	1- Propose molecular mechanisms in microbial pathogenesis. 2- Estimate immune response to microbial pathogens. 3- Test theories for molecular pathogenesis of microbial infections.
rr. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	84. Course Contents:
No.	**Topic**
1	Introduction to microbial infections & immune defenses against pathogens
2	Microbial agents and diseases
3	Microbial disease mechanisms
4	Molecular mechanisms of microbial infections
5	Molecular pathogenesis of microbial infections
6	Molecular mechanisms of bacterial and viral infections
7	Molecular mechanisms of fungal and yeast infections

85. Teaching and Learning Methods	

	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

86. Teaching and Learning Methods (for students with special needs)	**Not applied**

87. Student Assessment:	
bb. Assessment Methods:	
cc. Assessment Schedule	-Semester Works (5^{th}&10^{th}) -Midterm Exam (6^{th}) Week -Oral Exam (14^{th}) Week - Written (Final) Exam (15^{th}) Week.
dd. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

88. List of References:	
ii. Notes	Course notes
jj. Essential Books (Text Books)	- Mechanisms of Microbial diseases. 2 nd Edition. Moselio Schaechter, Gerald Medhoff and Barry I. Esinstein. 1993. Williams and Wilkins. Baltimore. Hong Kong. London. Munich. Phildelphia. Sydney.
kk. Suggested Books	- Molecular mechanisms of bacterial virulence. (1994). Edited by C.I. Kado and J.H. Crosa. Kluwer academic press. - Hepatitis B virus: Molecular mechanisms in disease and novel strategies for therapy. (1998). Edited by R. Koshy and W.H. Caselmann. Imperial college press.

7- Periodicals, Web Sites, … etc ...	**a-**

Course coordinator :Prof. Dr. Gamal Soliman Radwan

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1, 2	Introduction to microbial infections & immune defenses against pathogens	1,2	1	2	1,2
3, 4	Microbial agents and diseases	5	3		1,2
5, 6	Microbial disease mechanisms	3,4,5,7	2,3,4,5,6,7	1,3	1,2
7, 8	Molecular mechanisms of microbial infections	4,5	2,3,4,5,7	1,3	1,2
9, 10	Molecular pathogenesis of microbial infections	3,4,5	2,3,4,6,7		1,2
11, 12	Molecular mechanisms of bacterial and viral infections	3,4,5,7	2,3,4,5,6,7		1,2
13, 14	Molecular mechanisms of fungal and yeast infections	3,5,6,8	2,4,5,6,7		1,2

Course coordinator: Dr. Gamal Soliman Radwan
Head of department council: Prof. Dr. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

89. Course information:							
Course Code:	B7-37	**Course Title:**	Normal and abnormal human bone marrow cytology				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

90. Course Aims	
	1- Help student to have a broad spectrum of knowledge related to molecular genetic mechanisms. 2- Enable student to know about drug resistance, role of mutations in natural selection, and concepts used in the reversal of drug resistance.

91. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
ss. Knowledge and Understanding:	1- Summarize the normal structure and function of bone marrow 2- Express the methods for evaluating the bone marrow biopsy 3- Explain the genetic marker of human bone marrow transplantation 4- Clarify difference between human bone marrow cytology and cytogenetics
tt. Intellectual skills:	1- Suggest the methods for evaluating the bone marrow biopsy 2- Design the genetic marker of human bone marrow transplantation 3- Distinguish histology of bone marrow from human bone marrow cytology 4- Evaluate cytogenetics in diagnosis of diseases
uu. Professional Skills:	1- Prepare how to interpret a report of bone marrow biopsy 2- Estimate the genetic marker of human bone marrow

	transplantation 3- Select the methods for evaluating the bone marrow cytology 4- Test cytogenetics in diagnosis of diseases
vv. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	92. Course Contents:
No.	**Topics**
1	Normal structure and function of bone marrow
2	Histology of bone marrow
3	Methods for evaluating bone marrow biopsy
4	Name the genetic marker of human bone marrow transplantation
5	Human bone marrow cytology
6	Cytogenetics and its applications in diagnosis of diseases
7	Discussion and poster presentation

93. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

94. Teaching and Learning Methods (for students with special needs)	**Not applied**

95. Student Assessment:	
ee. Assessment Methods:	

ff. Assessment Schedule	- Semester Works (5th&10th) -Midterm Exam (6th) Week - Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
gg. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% - 60 60% Total=100 100%

96. List of References:	
ll. Notes	Course notes
mm. Essential Books (Text Books)	Basic and clinical immunology Daniel P Stites,sixth edition
nn. Suggested Books	Basic immunology,third edition .Abul K.Abbas
8- Periodicals, Web Sites, … etc ...	-

Course coordinator :Dr. Randa Mohamed Talaat

Head of the department council: Prof. Dr. Randa Mohamed Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	Normal structure and function of bone marrow	1	-	1	1
3, 4	Histology of bone marrow	2, 3	3	2	2
5, 6	Methods for evaluating bone marrow biopsy	2	1	3	2
7, 8	Name the genetic marker of human bone marrow transplant	4	4	2	2
9, 10	Human bone marrow cytology	1	4	-	2
11, 12	Cytogenetics	3	3	4	1
13, 14	Discussion and poster presentation		-		2, 3

Course coordinator: Dr. Randa Mohamed Talaat
Head of department council: Prof. Dr. Randa Mohamed Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

97. Course information:							
Course Code:	B7-38	**Course Title:**	Nucleic Acid Targeted Drug Design				
No. units	3	**Lec.**	3	**App.**	-	**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

98. Course Aims	
	This course summarizes the concepts of nucleic acid interactions, nucleic acid analogues and their applications. The student will obtain an introduction about nucleic acid binding molecules, mode of binding and the use of nucleic acids as drugs and drug targets.

99. Intended Learning Outcomes of Course (ILO's)	
ww. Knowledge and Understanding:	1- Express nucleic acids analogues and their applications. 2- Summarize nucleic acids interactions and processes. 3- Distinguish nucleic acids as drug target and as a therapeutic tool.
xx. Intellectual skills:	1- Suggest applications for nucleic acids as a diagnostic tool 2- Innovate methods of using nucleic acid analogues. 3- Explain sequence specificity and drug interactions.
yy. Professional Skills:	1-Prepare scientific reports and research papers in the area of nucleic acid targeted drug design.
d. General and Transferable Skills	1- Use different sources of information to obtain data for the nucleic acid drug targeted design course topics. 2- Use displaying devices to conduct presentations in the course topics. 3- Manage time effectively & work in teams.

	100. Course Contents:
No.	**Topic**
1	Introduction to nucleic acids
2	Nucleic acids and their interactions
3	Nucleic acids analogues and their applications
4	Drugs That Interact with Nucleic acids
5	Molecular therapeutics and molecular targets
6	Sequence specificity and drug design
7	Applications

101. Teaching and Learning Methods	
	Lectures **Class activities** **Discussion** **Presentation** **Reports**

102. Teaching and Learning Methods (for students with special needs)	Not applicable

7. Student Assessment:	
a. Assessment Methods:	* Semester Works * Midterm Exam * Oral Exam

	* Written (Final) Exam
b. Assessment Schedule	* (5th &10th weeks), * (6th) Week, * (14th) Week, * (15th) Week.
c. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

103. List of References:	
oo. Notes	**Course notes**
pp. Essential Books (Text Books)	**-**
qq. Suggested Books	**-**
9- Periodicals, Web Sites, … etc ...	**http://themedicalbiochemistrypage.org**

Course coordinator :Dr. Manal osama El Hamshary
Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Course Contents	Week No.	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
Introduction to nucleic acids and their interactions	1&2	1	-	-	-
Nucleic acids and their interactions	3&4	2	-	-	-
Nucleic acids analogues and their applications	5&6	1	2	-	-
Nucleic acids as therapeutics, Drugs That Interact with Nucleic acids	7&8	2	3	1	1,2,3
Molecular therapeutics and molecular targets	9&10	3	2	1	1,2,3
Sequence specificity and drug design	11&12	2	1,3	-	-
Applications	13&14	-	1	1	1,2,3

Course coordinator : **Dr. Manal Osama El Hamshary**

Head of the department council: **Prof. Dr. Randa M. Talaat**

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

104. Course information:							
Course Code:	B7-44	**Course Title:**	**The molecular biology of Immune disease-2**				
No. units	3	**Lec.**	3	**App.**		**Level**	Doctorate
Department	**Molecular Diagnostics and Therapeutics**						

105. Course Aims	
	1- Help student to understand the nomenclature and genetic organization of the HLA system 2- Help student to review class1 and class2 antigens 3- Enable students to understand the biological significance of the complement system 4- Make student oriented with the genetic factor in auto immune diseases

106. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
zz.Knowledge and Understanding:	1- SummarizeThe molecular biology of the cause of autoimmune disease 2- Express the structure and function of antigens 3- Explain the value of autoepitopes 4- Remodel the genetic and environmental effects in autommunity
aaa. Intellectual skills:	1- Suggest the molecular biology of autoimmunity 2- Design the molecular analysis of the cause 3- Evaluate and identify autoepitopes 4- Find solutions and analysis of structural and functional aspects of antigens
bbb. Professional Skills of	1- Test the identification of autoepitopes

course:	2- Select the molecular characterization of autoantigens 3- Estimate how to analyze the structural and functional aspects of antigens 4- Prepare for novel diagnostic assays
ccc. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	107. Course Contents:
No.	**Topic**
1	The molecular biology of auto-immune diseases
2	Molecular analysis of the cause of autoimmune disease
3	Identification of autoepitopes on proteins
4	Analysis of structural and functional aspects of antigens
5	Analysis of expression and cell biology of antigens
6	Development of novel diagnostic assays
7	Discussion and poster presentation.Exam

108. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Internet search and assignments. - Paper presentations and group discussions.

109. Teaching and Learning Methods (for students with special needs)	**Not applied**

110. Student Assessment:	

hh. Assessment Methods:	
ii. Assessment Schedule	-Semester Works (5th&10th) -Midterm Exam (6th) Week -Oral Exam (14th) Week - Written (Final) Exam (15th) Week.
jj. Weighting of Assessments	Degrees % -10 10% -10 10% -20 20% -60 60% Total=100 100%

111. List of References:	
rr. Notes	Course notes
ss. Essential Books (Text Books)	Basic and clinical immunology Daniel P Stites,sixth edition
tt. Suggested Books	Basic immunology,third edition .Abul K.Abbas
10- Periodicals, Web Sites, … etc ...	-

Course coordinator :Dr Randa Mohamed Talaat

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional Skills c	General and Transferable Skills d
1,2	The molecular biology of auto-immune diseases	1	-	1	1
3, 4	Molecular analysis of the cause of autoimmune disease	2, 3	3	2	2
5, 6	Identification of autoepitopes on proteins	2	1	3	2
7, 8	Analysis of structural and functional aspects of antigens	4	4	2	2
9, 10	Analysis of expression and cell biology of antigens	1	4	-	2
11, 12	Development of novel diagnostic assays	3	3	c/4	1
13, 14	Discussion and poster presentation. Exam	-	-	-	1, 2

Course coordinator: Dr. Randa M. Talaat
Head of department council: Prof. Dr. Randa M. Talaat

Department: **Molecular Diagnostics and Therapeutics**

Course Specifications

112. Course information:							
Course Code:	C-115	**Course Title:**	**Species Diagnostic Protocols**				
No. units	3	**Lec.**	2	**App.**	2	**Level**	Doctorate
Department	**N.A. (Applied course)**						

113. Course Aims	
	■ Applying the principles of molecular biology techniques in molecular characterization and diagnosis of different species. ■ Designing protocols for molecular characterization. ■ Explain the role of the genetic makeup of an organism in identifying markers for diagnosis and characterization. ■ Developing a broad spectrum of knowledge related to molecular basis of testing and molecular diagnosis and nucleic acid handling from different sources.

114. Intended Learning Outcomes of Course (ILO's)	**By the end of course, student should be able to:**
ddd. Knowledge and Understanding:	1- Explain principles of conventional techniques in of characterization and diagnosis of different species. 2- Express principles of molecular techniques for characterization and diagnosis of different species 3- Clarify difference among different laboratory diagnostic protocols to be used for detection of bacteria and viruses.
eee. Intellectual skills:	1- Determine common problems in the use of appropriate conventional and molecular diagnostic methods. 2- Evaluate the advantages and disadvantages of conventional diagnostic methods for pathogenic bacteria. 3- Distinguish different laboratory diagnostic approaches to be used for detection of viruses. 4 Select suitable analytical procedure to be used in diagnosis.
fff. Professional and Practical	1- Estimate biosafety considerations in diagnostic labs.

skills:	2- Apply different laboratory diagnostic approaches to be used for detection of microbial species
ggg. General and Transferable Skills	1- Practice self-appraisal and seek continuous learning. 2- Use different scientific data resources (text books, journals, periodicals and internet web sites) to gain scientific knowledge and data.

	115. Course Contents:
No.	**Topic**
1	Introduction to species diagnostic techniques and protocols
2	Conventional diagnostic techniques and procedures for bacterial species
3	Molecular diagnostic protocols for bacterial species
4	Conventional diagnostic techniques and procedures for viruses
5	Molecular diagnostic protocols for viruses
6	Laboratory sessions: biosafety in diagnostic labs- Conventional microbial investigations
7	Laboratory sessions: lab molecular diagnostic methods for microbial species

116. Teaching and Learning Methods	
	- Lectures. - Power point presentations. - Laboratory sessions. - Internet search and assignments. - Paper presentations and group discussions.

117. Teaching and Learning Methods (for students with special needs)	**Not applied**

118. Student Assessment:	
kk. Assessment Methods:	
ll. Assessment Schedule	- Semester Works (5^{th}&10^{th}) - Midterm Exam (6^{th}) Week - Practical Exam (14^{th}) Week - Oral Exam (14^{th}) Week - Written (Final) Exam (15^{th}) Week.

mm. Weighting of Assessments	Degrees % -10 10% -10 10% -10 10% -10 10% -60 60% Total=100 100%

119. List of References:	
uu. Notes	Course notes
vv. Essential Books (Text Books)	- Molecular Diagnostics techniques and applications for the clinical laboratory. Edited by Grody, Nakamura, Kiechle and Strom. AP, 2010. - Molecular diagnostics. G.P. Patrinos and W. Ansorge. 2005. Elsevier Academic Press.
ww. Suggested Books	- -
11- Periodicals, Web Sites, … etc ...	**b-**

Course coordinator: Dr. Manal Osama El-Hamshary

Head of the department council: Prof. Dr. Randa M. Talaat

Course Matrix

Week No.	Topic	Knowledge and Understanding a	Intellectual skills b	Professional and Pactical Skills c	General and Transferable Skills d
1, 2	Introduction to species diagnostic techniques and protocols	1,2	1	-	1,2
3, 4	Conventional diagnostic techniques and procedures for bacterial species	1,3	1,2,4	-	1,2
5, 6	Molecular diagnostic protocols for bacterial species	2,3	1,2 ,4	-	1,2
7, 8	Conventional diagnostic techniques and procedures for viruses	1 ,3	1,2,3,4	-	1,2
9, 10	Molecular diagnostic protocols for viruses	2,3	1,3,4	-	1,2
11, 12	Laboratory sessions: biosafety in diagnostic labs- Conventional microbial investigations	1,3	1,2,3,4	1,2	1,2
13, 14	Laboratory sessions: lab molecular diagnostic methods for microbial species	2.3	1,2,3,4	1,2	1,2

Course coordinator: Dr. Manal Osama El-Hamshary

Head of department council: Prof. Dr. Randa M. Talaat