

**Program SPECIFICATION FOR****Doctor of Philosophy Degree in Applied Medical Chemistry****Code: 1702800****University:** Alexandria**Faculty:** Medical Research Institute**Program Specification****A- Basic information****1- Program title:** **Doctor of Philosophy Degree in Applied Medical Chemistry****2- Program type:** single double multiple **3- Department(s) :** Applied Medical Chemistry**4- Co-ordinator :****5- External evaluator(s):** **Prof. Saad Abdel Fattah Abu-Noeman**

Professor of Medical Biochemistry,

Medical Biochemistry Department

Faculty of Medicine

Tanat University

6- Last date of program specification approval: 8/1/2017**B- Professional Information****1- Program aims:****By the end of the program the student should:**

1. Propose and carry out research, technical and supervisory positions in scientific laboratories in academic, government and the healthcare field.
2. Provide updated data and researches concerned with metabolic and chronic diseases, their molecular causes, as well as laboratory investigations of those diseases
3. Apply basic and advanced bioanalytical methods relevant to medical biochemistry
4. Have an adequate knowledge and skills in research methodology that enable them to design experiments, analyze data, and review literature critically
5. Carry out academic and professional self development and be capable of continuous learning
6. Acquire the ability to use transferable skills in oral presentations, report writing, and the use of information technology
7. Communicate effectively and the ability to lead work teams



8. Have the ability to decision in professional contexts
- 9- Describe the basic ethical principles relevant medical biochemistry

2- Intended learning outcomes (ILOS)

a- knowledge and understanding:

- a1- Discuss the digestion and absorption of both micro- and macronutrients and the metabolic interrelationships, metabolic fuel, integration between different organs
- a2- List perfectly the updates related to different metabolic disorders
- a3- Describe the advances in molecular biology and biochemical aspects of tumour proliferation and progression as well as cancer prevention
- a4- Discuss sufficient knowledge of molecular biochemistry
- a5- Recall the principles and applications of genetic engineering
- a6- Describe the principles and different biochemical applications of the chromatographic and molecular biology techniques in the field of medical biochemistry
- a7- Mention ethics and scientific principles of research methodology

b- Intellectual skills:

- b1- Assess the nutritional values of macro and micronutrients and their metabolic interrelationship, metabolic fuel and integration between different organs
- b2- Analyze biochemical and molecular bases human metabolic diseases
- b3- Assess the principles of cancer molecular biology and cancer prevention
- b4- Evaluate the importance of molecular biochemistry and genetic engineering
- b5- Analyze the data of chromatographic and molecular biology techniques
- b6- Analyze information in the field of specialization to solve professional problems
- b7- Construct research projects

c- Professional and practical skills:

- c1- Manage and run bioanalytical and clinical laboratories
- c2- Gain experience in sample extraction and dealing with problems affecting obtaining good chromatographic separation by HPLC or GC
- c3- Apply different types of nucleic acids extraction and gain experience in PCR instrument programming and use
- c4- Perform basic competencies in a range of practical biochemical techniques including data collection, analysis and interpretation
- c5- Practice safely in a laboratory environment



- c6- Write competently and evaluate all forms of professional reports related to medical biochemistry
- c7- Interpret data with appropriate statistical tests.
- c8- Apply different types of computer programs

d- General and transferable skills:

- d1- Work independently or in a team
- d2- Communicate orally, in writing or electronically
- d3- Plan, manage time and make a decision
- d4- Solve problems

3- Academic standards

3a. External references for standards (Benchmarks)

Generic Academic Reference Standards of the National Authority for Quality Assurance and Accreditation of Education (NAQAAE)

Date of Academic Reference standards (ARS) approval by Institute Council: 12/2/2014

3b. Comparison of provision to selected external references

Comparison between Generic Academic Standard of NAQAAE and ARS of Ph.D. of Applied Medical Chemistry

Generic Academic Standards	ARS of Ph.D. of Applied Medical Chemistry
A1- Basic facts, theories, of the specialty and related subjects/fields	a1- Discuss established basic and molecular knowledge of medical biochemistry and related sciences a2- Recognize established basic and molecular knowledge of cancer biology a3- List the basic and advanced techniques applied in the field of medical biochemistry
A2- Mutual relation between professional practice and effects on environment	a4- Describe the principals of different basic and advanced techniques related to the field of medical biochemistry a5- Recall the different types of molecular biomarkers and tumour markers and their clinical applications
A3- Recent advances in the field of practice	a6- Recognize recent advances in the field of molecular medical biochemistry
A4- Details of ethical & legal practice	a7- Recognize ethical and legal principles relevant to practice medical biochemistry
A5- Quality standards of the practice	a8- Understand principles of quality assurance related to practice medical biochemistry



A6- Design, conduction & publishing of scientific research	a9- Design, conduction and publishing of scientific research through thesis
A7- Ethical considerations in different types of scientific research	a10- Ethical considerations in different types of scientific research through thesis
B1- Analyze, deduce, extrapolate & evaluation of information	b1- Demonstrate laboratory skills relevant to medical biochemistry b2- Evaluate the value of different bioanalytical techniques b3- Analyze on the basic concept of molecular medical biochemistry
B2- Solve the majority of problems in the specialty according to the available data (complete or incomplete)	b4- Distinguish the elements of the scientific problems through data analysis and evaluation (even in the absence of some data) of similar conditions related to medical biochemistry
B3- Conduct research studies that add to the existing specialty knowledge	b5- Conduct research studies that add to the existing specialty knowledge through thesis and assignment
B4- Publish scientific articles/papers (in indexed journals)	b6- Publish scientific articles/papers (in indexed journals) through thesis
B5- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice	b7- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice through student questionnaire
B6- Take decisions in various professional situations (including dilemmas & controversial issues)	b8- Prepare alternative decisions in different situations in the field of medical biochemistry
B7- Add to the specialty field through creativity & innovation	b9- Add to the specialty field through creativity & innovation through thesis
B8- Manage discussions on basis of evidence and proofs	b10- Take decisions in various situations of different issues covering the field of medical biochemistry on the basis of evidence and proofs
C1- Competent in all basic and all required advanced professional skills (to be determined according to the specialty board/ department)	c1- Perform different biochemical analysis and improve methods and tools used
C2- Write and appraise reports	c2- Write and comment on reports related to medical biochemistry



C3- Evaluate and improve methods and tools used in specialty	c3- Evaluate <i>and improve</i> methods and tools used in medical biochemistry through student questionnaire
C4- Use technology to advance practice	c4- Use technology to advance practice in medical biochemistry
C5- Plan professional development courses to improve practice and enhance performance of juniors	C5- Evaluate <i>and improve</i> methods and tools used in medical biochemistry through student questionnaire
D1- Communicate effectively using all methods	d1-- Develop skills in communication using all methods
D2- Use information technology to improve his/her professional practice	d2- Use different sources of information to obtain data relevant to medical biochemistry and/or related sciences to improve professional practice in the field of medical biochemistry
D3- Teach and evaluate others	d3- Apply skills of teaching and evaluating others
D4- Perform self appraisal & seek continuous learning	d4- Develop skills in self appraisal & seek continuous learning
D5- Use different sources of information to obtain data	d2- Use different sources of information to obtain data relevant to medical biochemistry and/or related sciences to improve professional practice in the field of medical biochemistry
D6- Work in teams as well as a member in larger teams	d5- Work independently or in a team d6- Manage time and work to deadline d7- Learn skills for interaction
D7- Manage scientific meetings and appropriately utilize time	d6- Manage time and work to deadlines

4- Curriculum structure and contents

4.a program duration: **5 years**

4.b program structure :

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

Semester	Core Courses	Elective Courses
	No. of hours	No. of hours
First semester	7 (3 + 2^a + 2^b)	6
Second semester	4	
Third semester	3	3
Fourth semester	1	

a: Medical Statistics**b: Computer**

4.b.ii- No. of credit Lectures Practical Total

Compulsory Elective Optional

4.b.iii- No. of credit hours of basic science courses No. %

4.b.iv- No. of credit hours of courses of social sciences and humanities. No. %

4.b.v- No. of credit hours of specialized courses No. %

4.b.vi- No. of credit hours of other courses No. %

4.b.vii- Practical/Field Training Yes No

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

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

5- Program Courses**5.1- Compulsory (add no. of hours)**

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1702801	Applied Medical Chemistry IV	2	----	2
1702802	Applied Medical Chemistry V	2	----	2
1702803	Cancer Chemistry III	2	----	2
1702804	Molecular Biochemistry II	2	----	2



1702805	Molecular Biochemistry III	1	----	1
1702806	Laboratory Techniques III	----	2	1
1702807	Laboratory Techniques IV	----	2	1
1721822	Medical Statistics	1	2	2
1721823	Computer	1	2	2

5.2- Elective I (add no. of hours)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
1704820	Pharmacology	3	2	2
1705820	Hematology	3	2	2
1706820	Bacteriology	3	2	2
1707820	Parasitology	3	2	2
1708820	Immunology	3	2	2
1703820	Physiology	3	2	2
1709820	Histology and Cell Biology	3	2	2
1710820	Pathology	3	2	2

5.3- Elective II (add no. of hours)

Code No.	Course Title	No. of credit hours	No. of hours /week	
			Lecture	Practical
	Non	----	----	----

5.4- Optional – (none)**6- Program admission requirements**

Postgraduate students with a M.Sc. of Applied Medical Chemistry or an equivalent degree of Faculties of Science, Pharmacy, Medicine or High Studies Institute

7- Regulations for progression and program completion

For the progression and completion of the program to obtain the degree of Doctor



of Philosophy in Applied Medical Chemistry, the student must complete 12 credit hours with CGPA of at least C+ and submit a thesis validity report.

8- Evaluation of program intended learning outcomes

Evaluator	tool	Sample
1- Senior students	Interview	At least 50 %
2- Alumni	Interview	Representative sample
3- Stakeholders (Employers)	Interview	Representative sample
4- External Evaluator(S) External Examiner (s)	Report	Prof. Saad Abdel Fattah Abu-Noeman Professor of Medical Biochemistry, Medical Biochemistry Department Faculty of Medicine Tanat University
5- Other		

Program coordinator:

Name: Mohamed A. Abdel Mohsen

Signature Date: 6/9/2017

Department Head:

Name: Dr/ Moahmed Ahmed Abdel-Mohsen

Signature:

Date of Department Council Approval: 6/9/2017

Attach these Matrixes:

****Program Aims vs ILOs matrix***

**** Courses vs Program ILOs matrix***

**Program Aims vs.ILOS Matrix****Knowledge and Understanding**

	a1	a2	a3	a4	a5	a6	a7
1. Propose and carry out research, technical and supervisory positions in scientific laboratories in academic, government and the healthcare field.							
2. Provide updated data and researches concerned with metabolic and chronic diseases, their molecular causes, as well as laboratory investigations of those diseases		X	X	X	X		
3. Apply basic and advanced bioanalytical methods relevant to medical biochemistry						X	
4. Have an adequate knowledge and skills in research methodology that enable them to design experiments, analyze data, and review literature critically						X	
5. Carry out academic and professional self development and be capable of continuous learning							X
6. Acquire the ability to use transferable skills in oral presentations, report writing, and the use of information technology							
7. Communicate effectively and the ability to lead work teams							
8. Have the ability to decision in professional contexts							
9- Describe the basic ethical principles relevant medical biochemistry							X



Intellectual Skills

	b1	b2	b3	b4	b5	b6	b7
1. Propose and carry out research, technical and supervisory positions in scientific laboratories in academic, government and the healthcare field.							X
2. Provide updated data and researches concerned with metabolic and chronic diseases, their molecular causes, as well as laboratory investigations of those diseases	X	X	X				
3. Apply basic and advanced bioanalytical methods relevant to medical biochemistry				X			
4. Have an adequate knowledge and skills in research methodology that enable them to design experiments, analyze data, and review literature critically					X		
5. Carry out academic and professional self development and be capable of continuous learning							
6. Acquire the ability to use transferable skills in oral presentations, report writing, and the use of information technology						X	
7. Communicate effectively and the ability to lead work teams							
8. Have the ability to decision in professional contexts						X	
9- Describe the basic ethical principles relevant medical biochemistry							



Professional and Practical Skills

	c1	c2	c3	c4	c5	c6	c7	c8
1. Propose and carry out research, technical and supervisory positions in scientific laboratories in academic, government and the healthcare field	X			X				
2. Provide updated data and researches concerned with metabolic and chronic diseases, their molecular causes, as well as laboratory investigations of those diseases								
3. Apply basic and advanced bioanalytical methods relevant to medical biochemistry		X	X	X	X			
4. Have an adequate knowledge and skills in research methodology that enable them to design experiments, analyze data, and review literature critically				X		X		
5. Carry out academic and professional self development and be capable of continuous learning				X	X	X		
6. Acquire the ability to use transferable skills in oral presentations, report writing, and the use of information technology						X	X	X
7. Communicate effectively and the ability to lead work teams								
8. Have the ability to decision in professional contexts				X				
9- Describe the basic ethical principles relevant medical biochemistry								



General and Transferable Skills

	d1	d2	d3	d4
1. Propose and carry out research, technical and supervisory positions in scientific laboratories in academic, government and the healthcare field.				X
2. Provide updated data and researches concerned with metabolic and chronic diseases, their molecular causes, as well as laboratory investigations of those diseases				
3. Apply basic and advanced bioanalytical methods relevant to medical biochemistry				
4. Have an adequate knowledge and skills in research methodology that enable them to design experiments, analyze data, and review literature critically				
5. Carry out academic and professional self development and be capable of continuous learning				
6. Acquire the ability to use transferable skills in oral presentations, report writing, and the use of information technology				
7. Communicate effectively and the ability to lead work teams	X	X		
8. Have the ability to decision in professional contexts			X	X
9- Describe the basic ethical principles relevant medical biochemistry				

**Courses vs.ILOS Matrix****Knowledge and Understanding**

	a1	a2	a3	a4	a5	a6	a7
Applied Medical Chemistry IV	X						
Applied Medical Chemistry V		X					
Cancer Chemistry III			X				
Molecular Biochemistry II				X			
Molecular Biochemistry III					X		
Laboratory Techniques III						X	
Laboratory Techniques IV						X	
Thesis							X

Intellectual Skills

	b1	b2	b3	b4	b5	b6	b7
Applied Medical Chemistry IV	X						
Applied Medical Chemistry V		X					
Cancer Chemistry III			X				
Molecular Biochemistry II				X			
Molecular Biochemistry III				X			
Laboratory Techniques III					X		
Laboratory Techniques IV					X		
Thesis						X	X



Professional and Practical Skills

	c1	c2	c3	c4	c5	c6	c7	c8
Applied Medical Chemistry IV								
Applied Medical Chemistry V								
Cancer Chemistry III								
Molecular Biochemistry II								
Molecular Biochemistry III								
Laboratory Techniques III	X	X		X	X	X		
Laboratory Techniques IV	X		X	X	X	X		
Thesis	X			X	X	X	X	X

General and Transferable Skills

	d1	d2	d3	d4
Applied Medical Chemistry IV				
Applied Medical Chemistry V				
Cancer Chemistry III				
Molecular Biochemistry II				
Molecular Biochemistry III				
Laboratory Techniques III	X			X
Laboratory Techniques IV	X			X
Thesis	X	X	X	X

**ARS vs. ILOs Matrix****Knowledge and Understanding**

ARS of Ph.D. of Applied Medical Chemistry	a1	a2	a3	a4	a5	a6	a7
a1- Discuss established basic and molecular knowledge of medical biochemistry and related sciences	X	X		X	X		
a2- Recognize established basic and molecular knowledge of cancer biology			X		X		
a3- List the basic and advanced techniques applied in the field of medical biochemistry							
a4- Describe the principals of different basic and advanced techniques related to the field of medical biochemistry						X	
a5- Recall the different types of molecular biomarkers and tumor markers and their clinical applications			X				
a6- Recognize recent advances in the field of molecular medical biochemistry				X	X		
a7- Recognize ethical and legal principles relevant to practice medical biochemistry							X
a8- Understand principles of quality assurance related to practice medical biochemistry				X	X		
a9- Design, conduction and publishing of scientific research through thesis							X
a10- Ethical considerations in different types of scientific research through thesis							X



Intellectual Skills

ARS of Ph.D. of Applied Medical Chemistry	b1	b2	b3	b4	b5	b6	b7
b1- Demonstrate laboratory skills relevant to medical biochemistry					X		
b2- Evaluate the value of different bioanalytical techniques					X		
b3- Analyze on the basic concept of molecular medical biochemistry	X	X	X	X			
b4- Distinguish the elements of the scientific problems through data analysis and evaluation (even in the absence of some data) of similar conditions related to medical biochemistry				X	X		
b5- Conduct research studies that add to the existing specialty knowledge through thesis and assignment							X
b6- Publish scientific articles/papers (in indexed journals) through thesis							X
b7- Plan and implement (or supervise implementation of) enhancement & Improvement approaches to practice through student questionnaire							X
b8- Prepare alternative decisions in different situations in the field of medical biochemistry						X	
b9- Add to the specialty field through creativity & innovation through thesis							X
b10- Take decisions in various situations of different issues covering the field of medical biochemistry on the basis of evidence and proofs				X	X	X	

**Professional and Practical Skills**

ARS of Ph.D. of Applied Medical Chemistry	c1	c2	c3	c4	c5	c6	c7	c8
c1- Perform different biochemical analysis and improve methods and tools used	X	X	X	X				
c2- Write and comment on reports related to medical biochemistry					X	X	X	X
c3- Evaluate <i>and improve</i> methods and tools used in medical biochemistry through student questionnaire	X	X	X	X				
c4- Use technology to advance practice in medical biochemistry	X	X	X	X				X
c5- Evaluate <i>and improve</i> methods and tools used in medical biochemistry through student questionnaire	X	X	X	X				

General and transferable Skills

ARS of Ph.D. of Applied Medical Chemistry	d1	d2	d3	d4
d1-- Develop skills in communication using all methods	X	X		
d2- Use different sources of information to obtain data relevant to medical biochemistry and/or related sciences to improve professional practice in the field of medical biochemistry		X		
d3- Apply skills of teaching and evaluating others	X			
d4- Develop skills in self appraisal & seek continuous learning			X	
d5- Work independently or in a team	X			
d6- Manage time and work to deadline			X	X
d7- Learn skills for interaction	X			X



Teaching and Learning Methods vs. Courses Matrix

	801	802	803	804	805	806	807
Lecture	X	X	X	X	X	X	X
Practical						X	X
Brainstorming						X	X
Discussion Groups	X	X	X	X	X	X	X
Problem Solving						X	X
Case Study							
Field Training							
Role playing							
Training Workshops							
Self-Directed Learning							
e-learning							
Project	X	X	X	X	X	X	X