



كلية الطب  
وحدة ضمان الجودة



Faculty of Medicine  
Quality Assurance Unit

*Medical Doctorate (M.D.) Degree Program  
and Courses Specifications for **MEDICAL  
BIOCHEMISTRY***

(According to currently applied laws)



*Medical Biochemistry Department  
Faculty of Medicine  
Assiut University  
2023-2022*

<b>Contents</b>	
<b>Item</b>	<b>Page</b>
<b>Program Specification For MD of Medical Biochemistry 2022-2023</b>	
<b><u>A. Basic Information</u></b>	<b>4</b>
<b><u>B. Professional Information</u></b>	
<ol style="list-style-type: none"> <li><b>1. Program aims</b></li> <li><b>2. Intended learning outcomes (ILOs) for the whole program</b></li> <li><b>3. Program academic standards</b></li> <li><b>4. Program external references</b></li> <li><b>5. Program structure and contents</b></li> <li><b>6. Courses contents (Annex 1)</b></li> <li><b>7. Admission requirements</b></li> <li><b>8. Progression and completion requirements</b></li> <li><b>9. Assessment methods and rules</b></li> <li><b>10. Program evaluation</b></li> <li><b>11. Declaration</b></li> </ol>	<b>5</b>
<b>- Annex 1, Courses/ specifications</b>	<b>19</b>
<b>1-Course 1 Medical Statistics</b>	<b>20</b>
<b>2- Course 2 Research Methodology</b>	<b>27</b>
<b>3- Course 3 Medicolegal Aspects and Ethics in Medical Practice and Scientific Research</b>	<b>35</b>
<b>4-Course 4 Basics of Medical Biochemistry</b>	<b>40</b>
<b>Second Part</b>	
<b>5-Course 5 Advanced Biochemistry</b>	<b>50</b>
<b><u>Unit 1 Clinical Chemistry</u></b>	
<b>Unit 1.1: Biochemistry of Diabetes</b>	
<b>Unit 1.2 :CNS biochemistry and diseases</b>	
<b>Unit 1.3 : Biomarkers as Cardiac biomarkers, tumour Markers, Platelet aggregations Biomarkers</b>	
<b>Unit 1.4 :Miscellaneous subjects including: Advanced Glycation , Nanotechnology, Neurotransmitters, Endothelial Dysfunctions, Cytokines and Chemokines, Pollutions, Nutrition</b>	
<b>Unit 1.5 :Case report</b>	

<b><u>Unit 2 Molecular Biology</u></b> <b>Unit 2.1 Genetic Basis of Diseases including:</b> <b>Apoptosis, Apoptotic genes, atherosclerosis and</b> <b>LDL modification</b> <b>Unit 2.2 Cancer Biology</b> <b><u>Unit 3. Integrated Metabolism: Including carbohydrate</u></b> <b>Minerals, Fat , Lipid , Enzymes, Vitamins</b> <b>2 Elective Courses</b>	
- Annex 2, Program external references	65
- Annex 3, Teaching methods	71
- Annex 4, Assessment methods	75
- Annex 5, Program evaluation tools	79
<b>- Annex 6 Program Correlations:</b> <b>III- Program ILOS versus courses ILOS</b> <b>IV-Graduate attributes versus ARS</b> <b>II-Program matrix</b> <b>postgraduates versus Program ARS</b> <b>I-National Academic reference standards(NARS) for</b>	81
- Annex 7, Additional information.	96



**Assiut University**  
**Faculty of Medicine**  
**Quality Assurance Unit (QAU)**



**كلية الطب**  
**وحدة ضمان الجودة**

## **M.D degree of medical biochemistry**

### **A. Basic Information**

- + Program Title: M.D, degree of Medical Biochemistry**
- + Nature of the program: Single.**
- + Responsible Department: Department of Medical Biochemistry**
- + Program Academic Director (Head of the Department):  
Prof. Amany Osama**
- + Coordinator (s):**
- + Principle coordinator: Assistant Professor:  
Khalid Mohammad Mahmoud Mohany**
- + Assistant coordinators(s): Dr. Sara Atta**
- + Internal evaluators: Prof. Soad M.Abd El-Ghany**  
**External evaluator: Prof. Mahmoud Zahran**
- + Date of Approval by the Faculty of Medicine Council of Assiut University:23-9-2014**
- + Date of most recent approval of program specification by the Faculty of Medicine Council of Assiut University:**27-11-2022****
- + Total number of courses: 5+ 2 elective courses**

## B. Professional Information

### 1- Program aims

1/1 The postgraduate student should be able to have the professional knowledge of the integrated basic medical biochemistry (structure, reaction and regulation), its practical applications and its implications in disease causations.

1/2 Graduated students should be able to independently be responsible for research, development or investigation work within different fields.

### 2-Intended learning outcomes (ILOs) *for the whole program*:

#### **2/1 Knowledge and understanding:**

- A. Demonstrate in-depth knowledge and understanding of theories, basics and updated biomedical clinical epidemiological and socio behavioral science relevant to Biochemistry as well as the evidence –based application of this knowledge to practice including patient care.
- B. Explain basics, methodology, tools and ethics of scientific medical, clinical research.
- C. Mention ethical, medico logical principles and bylaws relevant to his practice in the field of Biochemistry.
- D. Mention principles and measurements of quality assurance and quality improvement in medical education and in practice of the concerned Biochemistry.
- E. Mention public health and health policy issues relevant to this speciality and principles and methods of system –based improvement of related to his practice in the field of Biochemistry.

## **2/2 Intellectual outcomes**

- A. Apply the basic and clinically supportive sciences which are appropriate to Biochemistry related conditions / problem / topics.
- B. Demonstrate an investigatory and analytic thinking “problem – solving “approaches to relevant situations related to Biochemistry.
- C. Plan research projects.
- D. Write scientific paper.
- E. Participate in clinical or laboratory risk management activities as a part of clinical governance.
- F. Plan for quality improvement in the field of medical education and practice in Biochemistry.
- G. Create / innovate plans, systems, and other issues for improvement of performance in his practice.
- H. Present and defend his / her data in front of a panel of experts.
- I. Formulate management plans and alternative decisions in different situations in the field of Biochemistry.

## **2/3 Skills**

### **2/3/1 Practical skills (Patient Care)**

- A. Master practical skills relevant to Pathology for all common techniques and /or experiments.
- B. Master practical skills with non-routine, laboratory skills and techniques and under increasingly difficult circumstances, while demonstrating, appropriate and effective competency
- C. Master proficiency in performing available complex laboratory techniques and handling unexpected complications in biochemical practise.
- D. Gather essential and accurate information about practical/laboratory skills essential for biochemistry.
- E. Make informed decisions about diagnostic laboratory tests in biochemical conditions.
- F. Develop and carry out diagnostic and teaching plans for all biochemical related conditions / skills.
- G. Use information technology to support practical decisions and students education in biochemistry related practical situations.
- H. Provide health care or any relevant services aimed at preventing the biochemistry related health problems.
- I. Lead other professionals, including those from other disciplines, to provide practical/laboratory-focused care in Pathology related conditions.
- J. Write competently all forms of professional reports (lab reports, experiments reports,) including reports evaluating these charts and sheets.

### **2/3/2 General skills**

#### **Including:**

- Practice-based Learning and Improvement
- Interpersonal and Communication Skills
- Professionalism
- Systems-based Practice

## Practice-Based Learning and Improvement

- A. Demonstrate the competency of care provision to patients in the different area of Medical biochemistry.
- B. Appraise scientific evidence.
- C. Improve practical skills based on constant self-evaluation and life-long learning.
- D. Participate in clinical audit and research projects.
- E. Practice skills of evidence-based Medicine (EBM).
- F. Educate and evaluate students, residents and other health professionals.
- G. Design logbooks.
- H. Appraise evidence from scientific studies related to the patients' health problems.
- I. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies.
- J. Use information technology to manage information, access on-line medical information; for the important topics.

## Interpersonal and Communication Skills

- K- Master interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals, including:-
- Present a case.
  - Write a consultation note.
  - Inform patients of a diagnosis and therapeutic plan, Completing and maintaining comprehensive timely and legible medical records.
  - Teamwork skills.
- L- Create and sustain a therapeutic and ethically sound relationship with patients.
- M. Elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills.
- N. Work effectively with others as a member or leader of a health care team or other professional group.



## **Professionalism**

- O. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society.
- P. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
- Q. Demonstrate sensitivity and responsiveness to others' culture, age, gender, and disabilities.

## **Systems-Based Practice**

- R. Work effectively in academic and health care delivery settings and systems related to pathology including good administrative and time management.
- S. Practice cost-effective services provision and resource allocation that does not compromise quality.
- T. Advocate for quality patient care and assist patients in dealing with system complexities.
- U. Design, monitor and evaluate specification of under and post graduate courses and programs.
- V. Act as a chair man for scientific meetings including time management

### **3- Program Academic Reference Standards (ARS) (Annex 6-I)**

#### ***Academic standards for Medical Doctorate (MD) degree in Medical Biochemistry***

Assiut Faculty of Medicine developed MD degree programs' academic standards for different clinical specialties.

In preparing these standards, the National Academic Reference Standards for post graduate programs (NARS) were adopted. These standards set out the graduate attributes and academic characteristics that are expected to be achieved by the end of the program.

These standards were approved by the faculty council on 3/2010. These standards were revised and approved without changes by the Faculty Council on 23-9-2014. These standards were recently revised and reapproved without changes by the Faculty Council on 27-11-2022

#### 4- Program External References (Annex 2)

1. ACGME (Accreditation Council for Graduate Medical Education).

2. **Birmingham University – England- UK**

[www.birmingham.ac.uk](http://www.birmingham.ac.uk)

#### 5- Program Structure

**Total number of credit hours: = 270**

**Master degree: 180 credit point**

**Didactic #: 37 (30.8%), practical 83 (69.2%), total 120 CP Thesis (80) and researches (40): 120 CP (50%)**

**First part**

**Didactic 10 (100%), practical 0 (0 %), total 10 CP**

**Second part**

**Didactic 24, (22.4 %), practical 83 (77.6 %), total 107 CP**

**Elective courses: 3 credit points**

**#Didactic (lectures, seminars, tutorial)**

**According the currently applied bylaws:**

Total courses: 120 credit point

Compulsory courses: 117 credit point (97.5%)

Elective courses: 3 credit point (2.5%)

	<b>Credit points</b>	<b>% from total</b>
▪ Basic science courses	10	4.1%
▪ Humanity and social courses	3	1.2%
▪ Speciality courses	107	44.6%
▪ Others ( Computer, ...)		
▪ Field training	83	34.8%
Thesis	80	33.4%
2 published researches	40	16.7%
Master degree	180	

## **Program Time Table**

### **Program Time Table**

#### **A-Duration of program 4 years divided into**

##### **○ Part 1**

Program-related basic science courses

- Medical statistic

- Research methodology

- Medicolegal Aspects and Ethics in Medical Practice and Scientific Research

Students are allowed to sit the exams of these courses after 6 months from applying to the M D degree.

Students are allowed to sit the exams of the remaining basic science courses after 12 months from applying to the MD degree.

Thesis and 2 published researches

For the M D thesis;

MD thesis subject should be officially registered within 1 year from application to the MD degree,

Discussion and acceptance of the thesis should not be set before 24 months from registering the M D subject;

It could be discussed and accepted either before or after passing the second part of examination

Two elective courses can be set during either the 1<sup>st</sup> or 2<sup>nd</sup> parts.

The students pass if they get 50% from the written exams and 60% from oral exams, 60% from clinical/practical exams of each course and 60% of summation of the written exams, oral and clinical/practical exams of each course

Total degrees 1700 marks.

500 marks for first part

1200 for second part

Written exam 40% - 70%.

Clinical/practical and oral exams 30% - 60%.

## Curriculum Structure: (Courses):

✚ Levels and courses of the program:

Courses and student work load list	Course Code	Core Credit points		
		didactic #	training	total
<b>First Part</b>				
<b>Basic science courses (10 CP)</b>				
Course 1: Medical Statistics	FAC309A	1		1
Course 2: Research Methodology	FAC309B	1		1
Course 3: Medicolegal Aspects & Ethics in Medical Practice and Scientific Research	FAC310C	1		1
Course 4 Biochemistry 1: Basics of Medical Biochemistry	MBC304A	7		7
<b>Elective courses*</b>		3 CP		
- Elective course 1				
- Elective course 2				
Thesis		80 CP		
<b>Published researches**</b>		40 CP		
Second Part		Speciality courses 24 CP Speciality Practical Work (log Book) 83 CP		
Speciality Courses Course 5: <b>Advanced Biochemistry</b>	MBC304B	24		24
Speciality Practical Work (83 CP) <b>Advanced Biochemistry</b>	MBC304B		83	83
Total of second part		<b>24</b>	<b>83</b>	<b>107</b>

### #Didactic (lectures, seminars, tutorial)

\* Elective courses can be taken during either the 1<sup>st</sup> or 2<sup>nd</sup> parts.

### **Student work load calculation:**

Work load hours are scheduled depending on the type of activities and targeted competences and skills in different courses

### **Elective Courses#:**

- Advanced medical statistics.
- Evidence based medicine.
- Advanced infection control.
- Quality assurance of medical education.
- Quality assurance of clinical practice.
- -Hospital management

# Two of the above mentioned courses are prerequisites for fulfillment of the degree.

### **3. Thesis / Researches:**

40 CP are appointed to the completion and acceptance of the thesis.

\*\* Another 40 points are appointed to acceptance or publication of one research from the thesis in international indexed medical journals or publication of 2 researches from the thesis in local specialized medical journals.

## 6. Courses Contents (Annex 1)

*The competency based objectives for each course/module/rotation are specified in conjunction with teaching/training methods, requirements for achieving these objectives and assessment methods.*

See Annex 1 for detailed specifications for each course/ module  
Annex 6 II: Program Matrix

## 7-Admission requirements

### 7-Admission requirements

✚ **Admission Requirements (prerequisites) if any :**

✚ **Admission Requirements (prerequisites) if any :**

I. **General Requirements:**

- **Master degree in the speciality.**

II. **Specific Requirements:**

- **Fluent in English (study language)**

### VACATIONS AND STUDY LEAVE

The current departmental policy is to give working candidate 2 week leave prior to first/ second part exams.

### FEES:

As regulated by the postgraduate studies rules and approved by the faculty vice dean of post graduate studies and the faculty and university councils.

## 8-Progression and completion requirements

✚ Examinations of the first part (Medical statistic, Research methodology and Medicolegal Aspects and Ethics in Medical Practice and Scientific Research) could be set at 6 months from registering to the MD degree.

- + Students are allowed to sit the exams of the remaining essential courses of the first part after 12 months from applying to the MD degree.
- + Examination of the second part cannot be set before 4 years from registering to the degree.
- + Discussion of the MD thesis could be set after 2 years from officially registering the MD subject, either before or after setting the second part exams.
- + The minimum duration of the program is 4 years.

**The students are offered the degree when:**

1. Passing the exams of all basic science, elective and speciality courses of this program as regulated by the post graduates approved rules by the faculty council.
2. Completing all scheduled CP and log book (minimum 80%).
3. Discussion and acceptance of the MD thesis.
4. Acceptance or publication of one research from the thesis in international indexed medical journals or publication of 2 researches from the thesis in local specialized medical journals.

**9-Program assessment methods and rules (Annex IV)**

Method	ILOs measured
Written examinations: Structured essay questions Objective questions MCQ Problem solving	K & I
Practical : OSPE	K ,I, P &G skills
Structured oral	K ,I &G skills
Logbook assessment	All
Research assignment	I &G skills

## Weighting of assessments:

Courses		Degrees			
First Part	Course code	Written Exam	Oral and/or Practical I Exam		Total
Basic science courses:					
Medical Statistics	FAC309A	35	15		50
Research Methodology	FAC309B	35	15		50
Medico-legal aspect	FAC310C	35	15		50
Basics of Medical Biochemistry	MBC304A	175	80	95	350
<b>Second Part</b>					
Course 5: <b>Advanced Biochemistry</b>	Course code	Written	oral	Practical	Total
Speciality Course	MBC304B	800	300	100	
Paper 1		160			
Paper 2		160			
Paper 3		160			
Paper 4		160			
Paper 5		160			
<b>Total</b>		<b>800</b>	<b>300</b>	<b>100</b>	<b>1200</b>

\* 25% of the oral exam for assessment of logbook

**\* 25% of the oral exam for assessment of logbook**

**500 marks for first part**



## 1200 for second part

Written exam 66.67% (800 marks).

Clinical/practical and oral exams 33.33 % (400 marks)

### Examination system:

#### ➤ First part:

- Written exam 2 hours in Medical Statistics and Research Methodology + oral examination
- Written exam 1 hours in Medicolegal Aspects and Ethics in Medical Practice and Scientific Research + oral examination
- Written exam 3 hours in Biochemistry 1 + oral & Practical examination

#### ➤ Second part:

- Written exam 5 paper (3 hours each) in course 5 + oral & Practical examination

#### ➤ Elective courses

- Written exam one paper 1 hour in Elective course 1 + Oral & Practical exam
- Written exam one paper 1 hour in Elective course 2 + Oral & Practical exam

## 10-Program evaluation

By whom	method	Sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits questionnaires	#
Senior students	questionnaires	#
Alumni	questionnaires	#

**#Annex 5 contains evaluation templates and reports**

## 11-Declaration

**We certify that all of the information required to deliver this program is contained in the above specification and will be implemented.**

**All course specifications for this program are in place.**

Contributor	Name	Signature	Date
<b>Program Principle Coordinator:</b>	<b>Assistant prof. Khalid M. Mohany</b>		2022
<b>Head of the Responsible Department (Program Academic Director):</b>	<b>Prof. Amany Osama</b>		2022

# Annex 1, Specifications for Courses / Modules

## Annex 1: specifications for courses/ modules

### First Part

#### Course 1: Medical statistics

***Name of department: Public Health and Community Medicine***

***Faculty of medicine***

***Assiut University***

***2022-2023***

#### 1. Course data

- + Course Title: Medical statistics
- + Course code: FAC309A
- + Specialty: offered to all clinical and academic specialties
- + Number of credit points: 1 credit point
- + Department (s) delivering the course: Pubic Health and Community Medicine
- + Coordinator (s):
  - Course coordinator: Prof. Farag Mohammed Moftah
  - Assistant coordinator (s):  
Prof. Medhat Araby Khalil Saleh
- + Date last reviewed: January -2022
- + Requirements (pre-requisites) if any:
  - Completed Master degree in any of the academic or clinical departments of Medicine.

## 2. Course Aims

Enable graduate students to use statistical principles to improve their professional work and develop the concept of critical interpretation of data

## 3. Intended learning outcomes (ILOs): To be able to use statistical principals to manage data

### A knowledge and understanding

ILOS	Methods of teaching/ learning	Methods of Evaluation
A. List the types of variables	Lecture and discussion	Written examination
B. Identify the methods of data collection	Lecture and discussion	Written examination
C. Describe the different sampling strategies	Lecture and discussion	Written examination
D. Identify types of tabular and graphic presentation of data	Lecture and discussion	Written examination
E. Identify measures of central tendency and dispersion	Lecture and discussion	Written examination
F. Identify the characters of normal distribution curve.	Lecture and discussion	Written examination
G. Detect the difference between parametric and non-parametric tests	Lecture and discussion	Written examination
H. Identify the concepts of correlation and regression	Lecture and discussion	Written examination

## B. intellectual

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Describe the normal curves.	Lecture & Discussions	Written examination
B. Describe and summarize data	Lecture & Discussions	Written examination
C. Select the proper test of significance	Lecture & Discussions	Written examination
D. Interpret the proper test of significance	Lecture & Discussions	Written examination
E. Describe the difference between parametric and non-parametric tests	Lecture & Discussions	Written examination

## C. Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design data entry files.	Tutorial on SPSS	Assignments SPSS exam
B. Validate data entry.	Tutorial on SPSS	Assignments SPSS exam
C. Manage data files.	Tutorial on SPSS	Assignments SPSS exam
D. Construct tables and graphs.	Tutorial on SPSS	Assignments SPSS exam
E. Calculate measures of central tendency and dispersion.	Tutorial on SPSS	Assignments SPSS exam
F. Select, apply and interpret the proper test of significance.	Tutorial on SPSS	Assignments SPSS exam

## D general skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Appraise scientific evidence	Discussions	Research assignment
B. Use information technology to manage information, access on-line medical information; for the important topics.	tutorial	Research and audits' assignment

**4. Course contents (topic s/modules/rotation  
Course Matrix**

**Time Schedule: First Part**

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
	A	B	C	D
Introduction	A-F	A-D	-	A&B
Tables and graphics	D	A-D	-	A&B
Sampling	C	-	-	A&B
Methodology of data collection	B	-	-	A&B
Type of variables	A	-	-	A&B
Proportion test& Chi-square test	E,F	C&D	-	A&B
Student T test& Paired T test	E,F	C&D	F	A&B
ANOVA test	E,F	C&D	F	A&B
Non parametric tests	E,F	C&D	F	A&B
Discrimination analysis factor analysis	E,F	C&D	-	A&B
SPSS Introduction	A-F	A-D	-	A&B
Data entry and cleaning of data	A	A-D	A-C	A&B
Transforming of variables	A	A&B	A-C	A&B
Descriptive statistics	D	A-D	D&E	A&B
Graphic presentation	D	A&B	D	A&B
Chi square and interpretation of results	E,F	C&D	F	A&B
Correlation Regression	E,F	C&D	F	A&B
Multiple and logistic Regression	E,F	C&D	F	A&B



## 5. Course Methods of teaching/learning

1. Lectures
2. Assignments
3. Discussions
4. Exercises
5. Tutorial on SPSS v.16

## 6. Course assessment methods:

### i. Assessment tools:

1. Attendance and active participation
2. Assignment
3. Practical SPSS examination
4. Written exam

ii. **Time schedule:** After 6 months from applying to the M D degree.

iii. **Marks:** 50 (35 for written exam and 15 for practical exam).

## 7. List of references

### i. Lectures notes

Department lecture notes

### ii. Essential books

- Medical Statistics: Book by Ramakrishna HK 2016
- Janet Peacock and Philip Peacock. Oxford Handbook of Medical Statistics (second edition.) Publisher: Oxford University Press, Print Publication Date: Nov 2010 Print ISBN-13: 9780199551286, Published online: Jun 2011. DOI: 10.1093/med/9780199551286.001.0001
- Leslie E. Daly MSc, PhD, Hon MFPHM,, Geoffrey J. Bourke MA, MD, FRCPI, FFPHM, FFPHMI, Interpretation and Uses of Medical Statistics, Fifth Edition, First published:1 January 2000, Print ISBN:9780632047635 |Online ISBN:9780470696750 |DOI:10.1002/9780470696750
- Marcello Pagano, Kimberlee Gauvreau: Principles of Biostatistics second edition published in 2000 by Brooks/Cole and then Cengage Learning. CRC Press, Feb 19, 2018 - Mathematics - 584 pages.

### **iii- Recommended books**

- Ji-Qian Fang (Sun Yat-Sen University, China) Handbook of Medical Statistics: <https://doi.org/10.1142/10259> | September 2017. Pages: 852
- Robert H. Riffenburgh: Statistics in Medicine 4th Edition (2020). Evidence Based Medicine How to practice and teach EBM.
- Discovering Statistics Using IBM SPSS Book by Andy Field, 2013.

### **iii. Periodicals, Web sites, etc**

iv. **Periodicals , etc** Statistics in Medicine - Wiley Online Library

v. **Web sites** <https://www.phc.ox.ac.uk/research/medical-statistics>

## **8. Signatures**

<b>Course Coordinator:</b> - Farag Mohammed Moftah	<b>Head of the Department:</b> - Prof. Eman Morsy Mohamed
<b>Date:</b> 10-1-2022	<b>Date:</b> 10-1-2022
<b>Associated Coordinator:</b> Prof. Medhat Araby Khalil Saleh	
<b>Date:</b> 10-1-2022	

## Course 2: Research Methodology

**Name of department:** *Public Health and Community Medicine Faculty of medicine*  
*Assiut University*  
*2021-2022*

### 1. Course data

-  **Course Title:** Research methodology
-  **Course code:** FAC309B
-  **Specialty:** Offered to all clinical and academic specialties
-  **Number of credit points:** 1 credit point
-  **Department (s) delivering the course:** Department of public health
-  **Coordinator (s):**
  - **Course coordinator:** Prof. Mahmoud Attia
  - Assistant coordinator (s):** Prof. Ekram Mohamed
    - Prof. Medhat Araby Khalil
-  **Date last reviewed:** January 2022
-  **Requirements (prerequisites) if any:**
  - **Completed Master degree in any of the academic or clinical departments of Medicine.**

## 2. Course Aims

To provide graduate students with the skills of:

- planning and implementing sound research
- writing a scientific research proposal

## 3. Intended learning outcomes (ILOs)

### A knowledge and understanding

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Explain differences between different study designs.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments Practical exam
B. Identify sources and types of bias in research.	Lecture and discussion Practical sessions	Written exam Log book assignments Practical exam
C. Identify methods of data collection.	Lecture and discussion Practical sessions	Written exam Log book assignments
D. Select and design valid measurement tools for research.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments Practical exam
E. Explain ethical issues in conducting research on human subjects.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments
F. List the steps involved in proposal writing.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments Practical exam
G. Identify a research problem within a conceptual framework.	Lecture Discussion	Written exam Log book assignments

		Practical exam
H. Use the web sources to do a literature search	Practical tutorial on web	Log book assignment
I. Describe the rules of authorship in scientific writing.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments
J. Select the appropriate study design for the research question.	Lecture Practical sessions	Written exam Practical exam
K. Minimize bias in designing research.	Lecture	Written exam
L. Screening & theoretical background	Lectures	Written exam Practical exam
M. Mention the basic ethics for conducting a research and medicolegal principles relevant to data confidentiality.	lectures seminar	Written exam Practical exam

## B. intellectual

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A- Apply basic science & knowledge for appraising scientific literature.	Discussions & seminars	Written exam Practical exam
B- Design research and present study data, in seminars.	lecture seminar	log book assignments
C- Design suitable epidemiological study.	lecture seminar	log book assignments
D- Design strategies for resolving ethical concerns in research, law, and regulations.	lecture Workshops	Written exam log book assignments
E- Apply coherently synthesize ideas and integrate lateral and vertical thinking.	lecture Workshops	log book assignments
F- Evaluate screening tests and interpreting their uses in different population.	lecture	Written exam Practical exam

### C. Practical skills

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A- Conduct epidemiological studies, screening and surveys.	lectures seminar	written exam log book assignments
B- Identify steps required in fielding the study.	Lecture	Assignments Written exam
C- Managing data collection team.	lectures seminar	log book assignments
D- Identify steps required for calculation sensitivity, specificity, positive predictive value, negative predictive value, accuracy of a screening test.	Lecture Practical sessions	Assignments Written exam Practical exam
E- Be able to define and apply the epidemiologic criteria of causality and be able to distinguish between a measure of association and evidence of causality.	Lecture Practical sessions	Assignments Written exam Practical exam
F- Synthesize information from multiple sources for research writing and the ability to perform paper critique .	Lecture Practical sessions	Assignments Written exam Practical exam
G- Identify bias and confounding in epidemiological study designs, their types and ways to control them in various types of biases.	Lecture Practical sessions	Assignments Written exam Practical exam

**D General skills**  
**Practice-Based Learning and Improvement**

<b>ILOs</b>	<b>Methods of teaching/ learning</b>	<b>Methods of Evaluation</b>
A- Scientific paper and proposal writing skills: be able to write an introduction, objectives and the methodological section.	Tutorial	Written examination
B- Learn authorship ethical rules.	Tutorial	Written examination
C- Perform practice-based improvement activities using a systematic methodology (audit, logbook, critical appraisal)	- Lectures - Practical sessions - Discussion - Readings	critical appraisal
D- Appraise evidence from scientific studies(journal club)	- Lectures - Practical sessions - Discussion - Readings	critical appraisal
E- Conduct epidemiological studies, screening and surveys.	- Lectures - Practical sessions - Discussion - Readings	attendance and participation
F- Facilitate training of junior students and other health care professionals in different screening activities.	Field work Participation in projects	attendance and participation

## Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
G- Maintain ethically sound relationship with community members.	- Lectures - Practical sessions - Discussion - Readings	Written exams
H- Provide information using effective nonverbal, explanatory, questioning, and writing skills.	- Lectures - Practical sessions - Discussion - Readings	Written exams Practical exams
I- Present results of researches in seminars.	- Lectures - Practical sessions - Discussion - Readings	Log book assignments

## Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
J- Demonstrate respect, compassion, and integrity to the needs of society.	- Lectures - Discussion - Readings	Written exams
K- Manage potential conflicts of interest encountered by practitioners, researchers, and organizations.	- Lectures - Discussion - Readings	Written exams
L- Design strategies for resolving ethical concerns in research, law, and regulations.	Lectures - Discussion - Readings	Written exams Practical exams
M- Demonstrate ways to control for confounding in the analysis phase of a study	Lectures - Discussion - Readings	Written exams Practical exams
N- Demonstrate a commitment to ethical principles including confidentiality of participants' information and informed consent.	Lectures - Discussion - Readings	Written exams
O- Assess ethical considerations in developing communications and promotional initiatives.	- Lectures - Discussion - Readings	Written exams



## 4. Course contents (topic s/modules/rotation Course Matrix

### Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
	A	B	C	D
Over view on research conduction and research ethics	A&E	A-D	A-C	C-G, I,L&M-O
How to write a research proposal	F,I	E	F	A-C&H
Observational study design	A& D	B & C	D	E & F
Experimental study design	A& D	B & C	B	E & F
Evaluation of diagnostic tests (Screening )	L	A	B& E	F
Systematic reviews and meta analysis	G, H & M	E& F	F	C, D
Confounding, bias & effect modification	B & K	D	E & G	M

## 5. Course Methods of teaching/learning:

1. Lectures
2. Assignments
3. Discussion
4. Exercises

## 6. Course assessment methods:

### i. Assessment tools:

1. Attendance and participation
2. Log book assignments
3. Written examination
4. Practical examination

ii. **Time schedule:** After 6 months from applying to the M D degree.

iii. Marks: 50 (35 for written exam and 15 for practical exam).

## 7. List of references

### i. Lectures notes

- Department lecture notes

### ii. Essential books

- Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th Edition by John W. Creswell SAGE Publications, Inc; 4th edition (January 1, 2014)
- Research methodology: A step – by – step Guide for Beginners. Ranjit Kumar, 2020. Second edition <https://books.google.com.eg/books?>
- Medical Research Essentials Rania Esteitie, McGraw Hill Professional, third edition, Feb 5, 2014 - Medical - 104 pages
- Research Methodology in the Medical and Biological Sciences Petter Laake, Haakon Breien Benestad, Bjorn R. Reino Olsen, 4th edition , Academic Press, Nov 5, 2007 - Science - 512 pages

### iv. Recommended books

- Research Methods in Education 7th Edition, by Louis Cohen, Lawrence Manion, Keith Morrison Publisher: Routledge; (April 22, 2011) [www.routledge.com/textbooks/cohen7e](http://www.routledge.com/textbooks/cohen7e).
- Research Methodology: A Practical and Scientific Approach Vinayak Bairagi, Mousami V. Munot · 2019, Research Methodology: A Practical and Scientific Approach - Google Books
- Based Medicine How to practice and teach EBM. David Sachett, Sharon E. Straus, W. Scott Richardson , William Rosenberg R. Brain Haynes
- Dissertation workshop open courseware JHSPH

## 8. Signatures

<b>Course Coordinator:</b> Prof. Mahmoud Attia	<b>Head of the Department:</b> Prof. Eman Morsy Mohamed
<b>Date:</b> 10-1-2022	<b>Date:</b> 10-1-2022

## **Course 3: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research**

***Name of department: Forensic medicine and clinical toxicology***  
***Faculty of medicine***  
***Assiut University***

### **1. Course data**

- + Course Title: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research**
- + Course code: FAC310C**
- + Speciality: All Academic Departments (1<sup>st</sup> part).**
- + Number of credit points: 1 credit point**
- + Department (s) delivering the course: Forensic Medicine and Clinical Toxicology**
- + Coordinator (s):**
  - **Course coordinator:** Prof. Ghada Omran
  - **Assistant coordinator (s).** Prof. Zaghoul Thabet
  
- + Date last reviewed: 17/4/2022.**
  
- + Requirements (prerequisites) if any :**
  - **Completed Master degree.**

## 2. Course Aims

To describe the basic ethical and medicolegal principles and bylaws relevant to practice in the field of academic specialties

## 3. Intended learning outcomes (ILOs):

### A. knowledge and understanding

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Mention medical ethics.	Lecture and discussion	Oral &Written exam
B. Explain ethics in research.(human and animal)	Lecture and discussion	Oral &Written exam
C. Mention medical laws.	Lecture and discussion	Oral &Written exam
D. List causes of medical responsibilities.	Lecture and discussion	Oral &Written exam

### B. intellectual

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A-Design and present case , seminars in common problem In medical responsibilities, medical ethics and ethics in research-	Lecture and discussion	Oral &Written exam

### C. Practical skills

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Write medical and legal reports.	Discussion	Discussion
B. Identify ethics in research.	Discussion	Discussion
C. Identify medical laws.	Discussion	Discussion
D. Identify medical responsibilities.	Discussion	Discussion

### D. General skills

#### Practice-Based Learning and Improvement

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Make timely and legible medical records	Lecture and discussion	Global rating logbook
B. Acquire the teamwork skills	Lecture and discussion	Global rating logbook

#### 4. Course contents (topic s/modules/rotation Course Matrix

##### Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
	A	B	C	D
1. Medical ethics	A,C,D	A	A,C,D	A,B
2. Ethics in research	B,C,D	A	B, ,C,D	A,B

#### 5. Course Methods of teaching/learning:

1. Lectures.
2. Discussions.
3. Exercises.

#### 6. Course assessment methods:

##### i. Assessment tools:

1. Written examination.
2. Attendance and active participation.
3. Oral examination.

**ii. Time schedule:** After 6 months from applying to the M D degree.

**iii. Marks:** 50 (35 for written exam and 15 for oral exam).

#### 7. List of references

##### i. Lectures notes

- Course notes.
- Staff members print out of lectures and/or CD copies.

##### ii. Essential books

- Bernard Knight and Pekka Saukko (2015: Knight Forensic Pathology. Hodder Arnold press

- Goldfrank, Lewis R.; Howland, Mary Ann; Hoffman, Robert S.; Nelson, Ewis S.; Lewin, Neal A (2019): Goldfrank's Toxicologic Emergencies, 11<sup>th</sup> ed. McGraw Hill / Medical.
  - Medical Ethics Manual. World medical association. Third edition 2015.
  - Medical ethics and law. Dominic Wilkinson, 3<sup>rd</sup> edition 2019.

### iii. Recommended books

- Biswas Gautam (2021): Review of Forensic Medicine & Toxicology. 5<sup>th</sup> ed. Jaypee Brothers Medical Pub.

### iv. Journal and web site

- Journals of all Egyptian Universities of Forensic Medicine and Clinical Toxicology.
- All International Journals of Forensic Medicine and Clinical Toxicology which available in the university network at [www.sciencedirect.com](http://www.sciencedirect.com). As :
  - Forensic Science International Journal.
  - Toxicology Letter.

### v. others

## 8. Signatures

<p><b>- Course Coordinator:</b> <b>Prof. Ghada Omran</b></p>	<p><b>- Head of the Department:</b> <b>Prof. Randa Hussein Abdelhady</b></p>
<p><b>Date: 17-4-2022</b></p>	<p><b>Date: 17-4-2022</b></p>

## Course 4 Basics of medical Biochemistry

*Department of Biochemistry*  
*Faculty of medicine*  
*Assiut University*  
*2022-2023*

### 1. Course data

**Course Title: Basics of medical Biochemistry**

+ **Course code: MBC304A**

**Speciality: *Biochemistry***

**Department (s) delivering the course: Department of *Biochemistry* 1**

+ **Number of credit points: Didactic 7 point (100 %)**

+ **Coordinator (s):**

- **Course coordinator: Dr . Khalid M. Mohany**
- **Assistant coordinator(s): All members are sharing**

+ **Date last Reviewed: September 2022**

+ **Requirements (prerequisites) if any :**

**According to regulatory roles**

+ **Requirements from the students to achieve course ILOs are clarified in the joining log book.**



## 2. Course Aims

To acquire sufficient knowledge in Medical Biochemistry.

2. To prepare highly trained biochemists in appropriate laboratory fields and biomedical investigations.

2. To introduce candidates to the basics of scientific medical research and its ethics to provide an educational environment that encourages creativity and research both fundamental and applied.

3. To enable the candidates to develop basic concepts and principles of human biochemistry.

## 3. Course intending learning outcomes (ILOs):

### A-Knowledge and understanding

ILOs	Methods of teaching/ Learning	<i>Methods of Evaluation</i>
<p>A. Grasp properly the different physicochemical considerations of physiologic relevance</p> <p>B. Illustrate the classification and physiological significance of different types of carbohydrate</p> <p>C. Identify :</p> <ul style="list-style-type: none"> <li>• Biochemical properties, classification and physiologic significance of different types of lipid.</li> <li>• Laboratory reagents and instruments used in biochemistry laboratory Colorimetric estimation of some blood parameters (serum</li> </ul>	<p>Didactic (lectures, seminars, tutorial)</p> <p>-Journal club,</p> <p>-Critically appraised topic,</p>	<p>Portfolios</p> <p>Procedure/stains</p> <p>Log book</p> <p>Oral exam</p> <p>Written exam</p>

<p>levels of glucose, total proteins, albumin, bilirubin, GPT, GOT, alkaline phosphatase, cholesterol, TG, creatinine and uric acid)</p> <ul style="list-style-type: none"> <li>• Physiological variations of physical and chemical characters of normal urine and performing chemical tests to detect abnormal constituents of urine</li> </ul> <p>D. State the different types of amino acids, how they are polymerize into various versatile types of proteins with their genetic and metabolic relevance.</p> <p>E. Cite the structure and different types of different monomers that form nucleic acid</p> <p>F. Define the structure, function and metabolic pathways of carbohydrates, lipids, proteins, nucleotides and their micro-molecules and their regulatory mechanisms.</p> <p>G. Point out the related metabolic disorders and their clinical prints on biochemical and molecular basis</p> <p>H. Point out the functions of hormones and micronutrients, their biochemical, clinical and laboratory importance and deficiency manifestations of each</p>		
---	--	--

## B. Intellectual outcomes

ILOs	Methods of teaching/ Learning	Methods of Evaluation
A. Apply the basic Biochemistry supportive sciences which are appropriate to Advanced Biochemistry related problems.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination - Log book
B. .Demonstrate an investigatory and analytic thinking (problem solving) approaches to conditions relevance to application of chemoprophylaxis in medicine		
C. Design and present audits, cases, seminars in common problems related to biochemical study.		

## C. Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform The followings: <ul style="list-style-type: none"> <li>• Chemical tests for the identification of different types of carbohydrates and proteins.</li> <li>• Laboratory investigations and establishment of different biochemical enzymes</li> <li>• Laboratory investigations and establishment of different biochemical enzymes, hormones and other biochemical indices</li> <li>• Chemical tests for the identification of different types of carbohydrates and proteins.</li> </ul>	- seminar -Direct observation of the practical work	log book - Objective structure -Check list

## D. General Skills

### Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
<p>A. Present a thorough background of structural biochemistry, molecular biology and metabolism.</p> <ul style="list-style-type: none"> <li>• The first semester provides the underpinning of quantitative biochemistry, i.e., stoichiometry, acids, bases, thermodynamics and kinetics.</li> <li>• This is followed by a consideration of the structure and properties of amino acids and proteins. Fundamentals of catalysis and enzyme properties and mechanisms follow the development of protein structure.</li> </ul>	<p>Log book and supervision Written &amp; oral communication Journal clubs Discussions in seminars Scientific meetings participate in seminars</p>	<p>Log book Portfolios Procedure/case presentation</p>

### Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Maintain ethically sound relationship with other members of the health care team.	Observation & supervision	Simulation Record review (report)
C. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
D. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
E. Work effectively with others as a member or leader of a team in Infection control unit.		
F. Write a report about type of organism and antimicrobial sensitivity results.		

### Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
G. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation & supervision Didactic Didactic (lectures, seminars, tutorial Educational prescription	Objective structured practical examination 2.Student survey
H. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
I. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

### Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
J. Work effectively in relevant health care delivery settings and systems as diagnosis of different metabolic diseases.	Observation & supervision Didactic Didactic (lectures, seminars, tutorial Educational prescription	1-student survey 2.portfolios
K. Practice cost-effective health care and resource allocation that does not compromise quality of care (if applied) in performing special techniques as special stains and cultures.		
L. Assist patients in dealing with system complexities.		

**4. Course contents (topic s/modules/rotation  
Course Matrix**

**Time Schedule: First Part**

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
	A	B	C	D
<ul style="list-style-type: none"> <li>• Grasp properly the different physicochemical considerations of physiologic relevance</li> <li>• Classification and physiological significance of different types of carbohydrate</li> <li>• Biochemical properties, classification and physiologic significance of different types of lipid.</li> <li>• Laboratory reagents and instruments used in biochemistry laboratory Colorimetric estimation of some blood parameters (serum levels of glucose, total proteins, albumin, bilirubin, GPT, GOT, alkaline phosphatase, cholesterol, TG, creatinine and uric acid)</li> <li>• Physiological variations of physical and chemical</li> </ul>	A-H	A-C	A	A-L

<p>characters of normal urine and performing chemical tests to detect abnormal constituents of urine</p> <ul style="list-style-type: none"> <li>• Different types of amino acids, how they are polymerize into various versatile types of proteins with their genetic and metabolic relevance.</li> <li>• Structure and different types of different monomers that form nucleic acid</li> <li>• Structure, function and metabolic pathways of carbohydrates, lipids, proteins, nucleotides and their micro-molecules and their regulatory mechanisms.</li> <li>• Metabolic disorders and their clinical prints on biochemical and molecular basis</li> <li>• Functions of hormones and micronutrients, their biochemical, clinical and laboratory importance and deficiency manifestations of each</li> </ul>				
<ul style="list-style-type: none"> <li>• Chemical tests for the identification of</li> </ul>	F, H	A-C	A	A-L

<p>different types of carbohydrates and proteins.</p> <ul style="list-style-type: none"> <li>• Laboratory investigations and establishment of different biochemical enzymes</li> <li>• Laboratory investigations and establishment of different biochemical enzymes, hormones and other biochemical indices</li> </ul>				
--	--	--	--	--

**5. Course methods of teaching/learning:**

1. Didactic (lectures, seminars, tutorial)
2. Observation and supervision
3. Written & oral communication
4. Senior staff experience
5. Case study

**6. Course methods of teaching/learning: for students with poor achievements**

Extra didactic (lectures, seminars, tutorial)



## 7. Course assessment methods:

### i. Assessment tools:

1. Written , oral Practical examination
2. Log book

ii. **Time schedule:** After 12 months from applying to the M D degree.

iii. **Marks:** 350

## 8. List of references

### i. Lectures notes

### ii. Essential books.

1. Harper Illustrated Biochemistry; PK Murray et al,2021.
2. Biochemistry; J. Berg, et al, 2023.
3. Mark Basic Medical Biochemistry; a clinical Approach;  
C Smith et al, 2023.
4. Medical Biochemistry; JW Baynes and MH Dominiczek,2019
5. Principles of Biochemistry; AL. Lehninger et al,2023.
7. Principles of Physical Biochemistry; KE van Holde2006.
11. Tietz Fundamentals of Clinical Chemistry; Burtis et al 2023.

## 9. Signatures

<b>Course Coordinator: Dr Khalid M. Mohany</b>	<b>Head of the Department: Prof. Amany Osama</b>
<b>Date: 2022-2023</b>	<b>Date: 2022-2023</b>

## Course 5: Advanced Biochemistry

*Faculty of medicine*  
*Assiut University*  
**2022-2023**

### 1. Course data

**Course Title: Advanced Biochemistry**

**Course code: MBC304B**

**✚ Speciality: Medical Biochemistry**

**Number of cp: Didactic 24. (11%) practical 83 (89%). Total 107cp.**

**✚ Department (s) delivering the course: Medical Biochemistry**

**✚ Coordinator (s):**

- **Course coordinator: Dr . Khalid M. Mohany**
- **Assistant coordinator(s): Sara Atta**

**✚ Date last reviewed: 2022**

**✚ Requirements (prerequisites) if any :**

**✚ Chemicals and reagents.**

**✚ Molecular biology and cloning core laboratory facilities.**

**✚ Funding for research cost.**

**✚ Tissue culture core laboratory facilities.**

**✚ Requirements from the students to achieve course ILOs are clarified in the joining log book.**

## 2. Course Aims

**By the end of the course the students should be able to:**

- Provide consultant opinion in Advanced Biochemistry.
- Acquire Professional experience of the diagnostic techniques required to become technically competent in practical work, and to master the underlying analytical and clinical principles.
- Provide the indepth knowledge for Clinical Chemistry, Molecular Biology, Integrated Metabolism, Enzyme structure and reaction mechanisms Regulation mechanisms and biomedical importance Biomedical importance and disease implication
- Integrate clinical information and laboratory investigations into diagnosis.
- Acquire experience of research and development projects
- Write an accurate report that gives clinicians the information needed for management.

### 3. Course intending learning outcomes (ILOs):

#### A-Knowledge and understanding

ILOs	Methods of teaching/ learning	Methods of Evaluation
<p>A. Describe different clinical conditions and diseases related to</p> <p><u>Unit 1: Clinical Biochemistry</u>            Unit 1.1: Biochemistry of Diabetes            Unit 1.2 :CNS biochemistry and diseases            Unit 1.3: Biomarkers as Cardiac biomarkers, tumour Markers, Platelet aggregations Biomarkers            Unit 1.4:Miscellaneous subjects including: Advanced Glycation , Nanotechnology, Neurotransmitters, Endothelial Dysfunctions, Cytokines and Chemokines, Pollutions, Nutrition            Unit 1.5:Case report  <u>Unit 2 Molecular Biology</u>            Unit 2.1 Genetic Basis of Diseases including: Apoptosis, Apoptotic genes, atherosclerosis and LDL modification            Unit 2.2 Cancer Biology  <u>Unit 3. Integrated Metabolism:</u> Including carbohydrate Minerals, Fat , protein, Lipid , Enzymes, Vitamins</p>	<p>1-Lectures            2-Self-learning from the computer and internet sources            3- Laboratory practical training</p>	<p><i>1-Tutorial sessions</i>  <i>2-Assigned seminar delivery</i></p>
<p>B. Mention the details of different diagnostic tools of diseases related to Advanced Biochemistry</p>	<p>1-Lectures            2-Self-learning from the computer and internet sources            3- Laboratory practical training</p>	<p><i>1-Tutorial sessions</i>  <i>2-Assigned seminar delivery</i></p>
<p>B. State update and evidence based Knowledge</p>	<p>1-Lectures</p>	<p><i>1-Tutorial</i></p>

related to Advanced Biochemistry	2-Self-learning from the computer and internet sources	<i>sessions</i> <i>2-Assigned seminar delivery</i>
C. Memorize the facts and principles of the other relevant basic and clinically supportive sciences related to speciality including: general consideration, enzyme structure and reaction mechanisms, regulation mechanisms and biomedical importance, biomedical importance and disease implication	1-Lectures 2-Self-learning from the computer and internet sources	<i>1-Tutorial sessions</i> <i>2-Assigned seminar delivery</i>
D. Mention the basic ethical and medico legal principles relevant to Carbohydrate, Fat, Protein, Nucleotides and Mineral metabolism		<i>1-Tutorial sessions</i> <i>2-Assigned seminar delivery</i>
E. Explain the basics of quality assurance to ensure good professional skills in his field.		
F. Mention the ethical and scientific principles of medical research		

### B-Intellectual outcomes

	<b>Methods of teaching/ learning</b>	<b>Methods of Evaluation</b>
A. Design / present case , seminars in common problem related to Carbohydrate, Fat, Protein, Nucleotides and Mineral metabolism	1-Lectures 2-Self-learning from the computer and internet sources 3- Laboratory practical training	1-Tutorial sessions 2- Assigned seminar delivery
B. Apply the basic and clinically supportive sciences which are appropriate to the speciality		

related conditions / problem / topics.		
C. Demonstrate an investigatory and analytic thinking “problem – solving “approaches to clinical situation related to general consideration, enzyme structure and reaction mechanisms, regulation mechanisms and biomedical importance, biomedical importance and disease implication	1-Lectures 2-Self-learning from the computer and internet sources 3- Laboratory practical training	1-Tutorial sessions 2- Assigned seminar delivery
D. Conduct or share in research projects.		
E. Write scientific papers.		
F. Participate in the management of risky conditions related to speciality.		
G. Plan for quality improvement in the field of medical education and professional practice in speciality.		
H. Create / innovate plans, systems, and other issues for improvement of performance in his practice.		
I. Present and defend his / her data in front of a panel of experts		

### C-Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Take history, examine and clinically diagnose different conditions related to general consideration, enzyme structure and reaction mechanisms, regulation mechanisms and biomedical importance, biomedical importance and disease implication	1-Lectures 2-Self-learning from the computer and internet sources	1-Tutorial sessions 2- Assigned seminar delivery

	3- Laboratory practical training	
B. Order the following non invasive/invasive diagnostic procedures Laboratory practical training		
C. Interpret the following non invasive/invasive diagnostic procedures Blood analysis-PCR		
D. Perform the following non invasive/invasive diagnostic procedures Chemical analysis of blood components basic experiments in related basic sciences to be utilized in the research work: ELIZA ,HPLC, PCR experiments advanced lab skills essential to the course: Advanced topics of ALL Master degree		
E. Use instruments and devices in evaluation of intermediary metabolism.		
F. Develop patient management plans for the following problems related to intermediary metabolism (anabolic and catabolic).	1-Lectures 2-Self-learning from the computer and internet sources 3-Laboratory practical	1-Tutorial sessions 2- Assigned seminar delivery

	training	
G. Develop and carry out patient management plans for the following problems related to intermediary metabolism (anabolic and catabolic).		
H. Counsel and educate patients and their family about to intermediary metabolism (anabolic and catabolic).		
I. Use information technology to support patient care decisions and patient education for to intermediary metabolism (anabolic and catabolic) related conditions.	1-Lectures 2-Self-learning from the computer and internet sources 3-Laboratory practical training	1-Tutorial sessions 2- Assigned seminar delivery
J. Provide health care services aimed at preventing the following conditions related to intermediary metabolism (anabolic and catabolic)		
K. Work with health care professionals, including those from other disciplines, to provide patient-focused care.		



## D-General Skills

### Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology in the common problems (plan and conduct audit cycles)	Observation Post graduate teaching participate in multi-header microscope seminars	Log book and practical exam
B. Locate, appraises, and assimilates evidence from scientific studies related to health problems.	seminars, tutorial -Journal club, -Critically appraised topic	Log book
C. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies	seminars, tutorial -Journal club, -Critically appraised topic	Log book
D. Use information technology to manage information, access on-line medical information; and support their own education	Senior staff experience	Log Book
E. Lead the learning of students and other health care professionals.	Observation Post graduate teaching Senior staff experience	Log book

## Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Create and sustain a therapeutic and ethically sound relationship with patients	Senior staff experience	Log book
G. Perform the following oral communications: - communicate with other members of the department, other departments and other members of the multidisciplinary team - communicate in writing, through letters and reports  - Act as consultants to clinical colleagues on the interpretation and relevance of laboratory findings, with particular regard to their significance in the management of the patient.	-Routine work - Senior staff experience	Log book
H. Fill the following reports: Produce accurate reports with clear conclusions and other written correspondence.	Routine work Senior staff experience	Log book
I. Work effectively with others as a member or leader of a health care team e.g. Multidisciplinary team meetings	Routine work Senior staff experience	Log book

## Professionalism

ILOs	Methods of teaching/ Learning	Methods of Evaluation
J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	Routine work Senior staff experience	1. Objective structured Practical examination 2. Patient survey
K. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.	Routine work Senior staff experience	1. 360o global rating
L. Demonstrate sensitivity and responsiveness to others' culture, age, gender, and disabilities	Routine work Senior staff experience	Log book

## Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Work effectively in different health care delivery settings and systems.	Routine work Senior staff experience	1. 360o global rating
N. Practice cost-effective health care and resource allocation that does not compromise quality of care	Routine work Senior staff experience	1. Check list evaluation of live or recorded performance
O. Advocate for quality patient care and assist patients in dealing with system complexities		1. 360o global rating 2. Patient survey
P. Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance	Routine work Senior staff experience	

**4. Course contents (topic s/modules/rotation  
Course Matrix**

**Time Schedule: Second part**

Topic	Covered ILOs			
	Knowle dge	Intellectual	Practical skill	General Skills
<u>Unit 1: Clinical Biochemistry</u>	A-F	A-L	A-L	A-P
Unit 1.1: Biochemistry of Diabetes	A-F	A-L	A-L	A-P
Unit 1.2 :CNS biochemistry and diseases	A-F	A-L	A-L	A-P
Unit 1.3 : Biomarkers as Cardiac biomarkers, tumour Markers, Platelet aggregations Biomarkers	A-F	A-L	A-L	A-P
Unit 1.4 :Miscellaneous subjects including: Advanced Glycation , Nanotechnology, Neurotransmitters, Endothelial Dysfunctions, Cytokines and Chemokines, Pollutions, Nutrition	A-F	A-L	A-L	A-P
Unit 1.5 :Case report	A-F	A-L	A-L	A-P
<u>Unit 2 Molecular Biology</u>	A-F	A-L	A-L	A-P
Unit 2.1 Genetic Basis of Diseases including: Apoptosis, Apoptotic genes, atherosclerosis and LDL modification	A-F	A-L	A-L	A-P
Unit 2.2 Cancer Biology	A-F	A-L	A-L	A-P
<u>Unit 3. Integrated Metabolism:</u> Including carbohydrate Minerals,	A-F	A-L	A-L	A-P

Fat , protein, Lipid , Enzymes, Vitamins				
---	--	--	--	--

### **5. Course Methods of teaching/learning:**

1. Lectures
2. Tutorial sessions
3. Assignments for self-learning from the computer and internet sources
4. Laboratory practical training
5. Assigned nation- wide workshop attendances
6. Assigned seminar delivery and attendance

### **6. Course Methods of teaching/learning: for students with poor achievements**

1. Lectures
2. Tutorial sessions
3. Assignments for self-learning from the computer and internet sources
4. Laboratory practical training
5. Assigned nation- wide workshop attendances
6. Assigned seminar delivery and attendance

### **7. Course assessment methods:**

i. Assessment tools: Oral exam

Written exam

Practical exam

Student log book

Thesis preparation and defense

ii. Time schedule: at the end of second part.

iii. Marks: 1200

## 8. List of references

### **i. Lectures notes**

lecture note and CDs

### **ii. Essential books.**

#### **1. Lectures notes**

#### **ii. ii. Essential books.**

1. Harper Illustrated Biochemistry; PK Murray et al,2021.

2. Biochemistry; J. Berg, et al, 2023.

3. Mark Basic Medical Biochemistry; a clinical Approach;  
C Smith et al, 2023.

4. Medical Biochemistry; JW Baynes and MH Dominiczek,2019

5. Principles of Biochemistry; AL. Lehninger et al,2023.

7. Principles of Physical Biochemistry; KE van Holde2006.

11. Tietz Fundamentals of Clinical Chemistry; Burtis et al 2023.

#### **iii. Recommended books**

1. Human Molecular Genetics 2; T. Strachan and AP. Read2005.

2. Modern genetic Analysis; AJF. Griffiths et al2014.

3. Clinical Chemistry; A Laboratory Perspective; W. Arneson,  
and J. Brickell2006.

4. Enzyme Biocatalysis; Principles and Applications; A.  
Illanes2011.

5. Methods in Molecular Biology; JM. Walker2004.

6. Methods in Enzymology; JN. Abelson and MI. Simon2012.

7. Molecular Biology and Genomics; C. Mulhardt2003.

8. Bioinformatics- A Practical Approach; SQ. Ye2005.

9. Molecular Cloning; JM. Sambrook et al2013.

10. Harrison's Principles of Internal Medicine; DL Kasper et  
al2002.

11. Statistics for Biology; ON. Bishop1988.

**iv. Periodicals, Web sites, ... etc**

- <http://www.ncbi.nlm.gov/>
- <http://www.vlib.org/>
- <http://www.arjournals.annualreviews.org/toc/biochem/76/1>

**v. Others :**

**9. Signatures**

Course Coordinator: Dr Mona A.H. El-Baz	Head of the Department: Prof. Abdelraheim M.A. Meki
Date: Sept 2022	Date: Sept 2022



# Annex 2, Program External References

## **ANNEX 2**

# **Program Academic Reference Standards (ARS)**

### **1. Graduate (after residence training and master degree years of study) must:**

- 1-** Have the capability to be a scholar, understanding and applying basics, methods and tools of scientific research and medical audit in the chosen field of medicine.
- 2-** Appraise and utilise scientific knowledge to continuously update and improve clinical practice in related speciality.
- 3-** Acquire sufficient medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care in the field of speciality.
- 4-** Dealing with common problems and health promotion using updated information in the field of speciality.
- 5-** Identify and share to solve health problems in his speciality.
- 6-** Acquire all competencies –including the use of recent technologies- that enable him to provide safe, scientific, and ethical care including update use of new technology in the speciality field.
- 7-** Demonstrate interpersonal and communication skills that ensure effective information exchange with other health professions, the scientific community, junior students and the public.
- 8-** Function as supervisor, and trainer in relation to colleagues, medical students and other health professions.
- 9-** Acquire decision making capabilities in different situations related to his field of practice.
- 10-** Show responsiveness to the larger context of the related health care system, including e.g. the organisation of health care, partnership with health care providers and managers, practice of cost-effective health care, health economics, and resource allocations.

**11-** Be aware of public health and health policy issues and share in system-based improvement of his practice and related health care.

**12-** Show appropriate attitudes and professionalism.

**13-** Demonstrate skills of lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages in the speciality or one of its subspecialties.

## ***2- Competency based Standards for medical doctorate***

### **2.1- Knowledge and understanding**

***By the end of the program, the graduate should demonstrate satisfactory knowledge and understanding of:***

**2-1-A-** Established basic, biomedical, clinical, epidemiological and behavioral sciences related to the speciality.

**2-1-B-** The relation between practice in the speciality and the welfare of society.

**2-1-C-** Up to date and recent developments in common problems related to the field of speciality.

**2-1-D-** Ethical and medicolegal principles relevant to practice in the speciality field.

**2-1-E** -Quality assurance principles.

**2-1-F-** Ethical and scientific basics of medical research.

### **2.2- Intellectual skills:**

**By the end of the program, the graduate should be able to demonstrate the following:**

**2-2-A-** Correlation of different relevant sciences in the problem solving and management of common problems of the speciality.

**2-2-B-** Problem solving skills based on data analysis and evaluation (even in the absence of some) for common situations related to speciality.

**2.2- C-** Demonstrating systematic approach in studying common themes or problems relevant to the speciality field.

**2-2-D-** Making alternative decisions in different situations in the field of the speciality.

### **2.3- Clinical skills**

**By the end of the program, the graduate should be able to**

**2-3-A** - Provide practical and or laboratory services that can help patient care, solving health problems and better understanding of the normal structure and function.

**2-3-B**- Demonstrate practical / laboratory skills relevant to that speciality.

**2-3- C**- Write and comment on reports for situations related to the field of speciality.

### **2.4- General skills**

**By the end of the program, the graduate should be able to;**

#### ****Competency-based outcomes for practice-based learning and improvement****

**2-4-A**- Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own practice, appraisal and assimilation of scientific evidence, improvements in provided services and risk management.

**2-4-B**- Use all information sources and technology to improve his practice.

**2-4-C**- Demonstrate skills of teaching and evaluating others.

#### *****Competency-based objectives for interpersonal and communication Skills*****

**2-4-D**- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, lab technical staff and other health professionals.

 ***Competency-based objectives for Professionalism***

**2-4-E-** Demonstrate professionalism behaviors, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

 ***Competency-based objectives for Systems-based Practice***

**2-4-F-** Demonstrate an awareness of and responsiveness to the larger context and system of health care and academic services and the ability to effectively use system resources to provide care that is of optimal value.

**2-4-G-** Demonstrate skills of effective time management.

**2-4-H-** Demonstrate skills of self and continuous learning.

# Annex 3, Methods of teaching/learning

**Annex 2, Methods of teaching/learning**

	Patient care	Medical knowledge	Practice-based learning/Improvement	Interpersonal and communication skills	Professionalism	Systems-based practice
Didactic (lectures, seminars, tutorial )	X	X		X	X	X
journal club,	X	X	X			
Educational prescription	X	X	X	X	X	X
Present a case (true or simulated) in a grand round	X	X	X	X	X	
Observation and supervision	X		X	X	X	X
conferences		X	X	X		X
Written assignments	X	X	X	X	X	X
Oral assignments	X	X	X	X	X	X



### **Teaching methods for knowledge**

- ❖ Didactic (lectures, seminars, tutorial )
- ❖ journal club
- ❖ Critically appraised topic
- ❖ Educational prescription (a structured technique for following up on clinical questions that arise during rounds and other venues).
- ❖ Present a case (true or simulated) in a grand round
- ❖ Others

### **Teaching methods for patient care**

- ❖ Observation and supervision /Completed tasks procedure/case logs
- ❖ On-the-job” training without structured teaching is not sufficient for this skill (checklists).
- ❖ Simulation is increasingly used as an effective method for skill/ teamwork training.

### *Teaching methods for other skills*

- ❖ Written communication (e.g., orders, progress note, transfer note, discharge summary, operative reports, and diagnostic reports).
  
- ❖ Oral communication (e.g., presentations, transfer of care, interactions with patients, families, colleagues, members of the health care team) and/or non verbal skills (e.g., listening, team skills)
  
- ❖ Professionalism, including medical ethics, may be included as a theme throughout the program curriculum that includes both didactic and experiential components (e.g., may be integrated into already existing small group discussions of vignettes or case studies and role plays, computer-based modules) and may be modeled by the faculty in clinical practice and discussed with the resident as issues arise during their clinical practice.

# Annex 4, Assessment methods

**Assessment methods for MD students.**

Method	Practical skills	K	Intellectual	General skills			
	Patient care	K	I	Practice-based learning/Improvement	Interpersonal and communication skills	Professionalism	Systems-based practice
Record review	X	X	X		X	X	X
Checklist	X				X		
Global rating	X	X	X	X	X	X	X
Simulations	X	X	X	X	X	X	
Portfolios	X	X	X	X	X		
Standardized oral examination	X	X	X	X	X		X
Written examination	X	X	X	X			X
Procedure/case log	X	X					

#### **Annex 4, Glossary of MD students assessment methods**

- ❖ Record Review – Abstraction of information from patient records, such as medications or tests ordered and comparison of findings against accepted patient care standards.
- ❖ Chart Stimulated Recall – Uses the MD doctor’s patient records in an oral examination to assess clinical decision-making.
- ❖ Mini clinical evaluation: Evaluation of Live/Recorded Performance (single event) – A single resident interaction with a patient is evaluated using a checklist. The encounter may be videotaped for later evaluation.
- ❖ Standardized Patients (SP) – Simulated patients are trained to respond in a manner similar to real patients. The standardized patient can be trained to rate MD doctor’s performance on checklists and provide feedback for history taking, physical examination, and communication skills. Physicians may also rate the MD doctor’s performance.
- ❖ Objective Structured Clinical Examination (OSCE) – A series of stations with standardized tasks for the MD doctors to perform. Standardized patients and other assessment methods often are combined in an OSCE. An observer or the standardized patient may evaluate the MD doctors.
- ❖ Procedure or Case Logs – MD doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
- ❖ PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by MD doctors.
  
- ❖ Case /problems – assess use of knowledge in diagnosing or treating patients or evaluate procedural skills.
- ❖ Models: are simulations using mannequins or various anatomic structures to assess procedural skills and interpret

clinical findings. Both are useful to assess practice performance and provide constructive feedback.

- ❖ 360 Global Rating Evaluations – MD doctors, faculty, nurses, clerks, and other clinical staff evaluate MD doctors from different perspectives using similar rating forms.
- ❖ Portfolios – A portfolio is a set of project reports that are prepared by the MD doctors to document projects completed during the MD study years. For each type of project standards of performance are set. Example projects are summarizing the research literature for selecting a treatment option, implementing a quality improvement program, revising a medical student clerkship elective, and creating a computer program to track patient care and outcomes.
- ❖ Examination MCQ – A standardized examination using multiple-choice questions (MCQ). The in-training examination and written board examinations are examples.
- ❖ Examination Oral – Uses structured realistic cases and patient case protocols in an oral examination to assess clinical decision-making.
- ❖ Procedure or Case Logs – MD doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
- ❖ PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by MD doctors.

# Annex 5, Program evaluation tools

By whom	Method	sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits questionnaires	#
Senior students	questionnaires	#
Alumni	questionnaires	#



# Annex 6, Program Correlations:

## I-General Academic Reference Standards (GARS) for postgraduates versus Program ARS

### *1- Graduate attributes*

Faculty ARS	NAQAAE General ARS for postgraduate programs
1- Demonstrate competency and mastery of basics, methods and tools of scientific research and medical audit in the chosen field of medicine.	1- إتقان أساسيات و منهجيات البحث العلمي
2- Have continuous ability to add knowledge new developments to Medical biochemistry through research and publication.	2- العمل المستمر علي الإضافة للمعارف في مجال التخصص
3- Appraise and utilise scientific knowledge to continuously update and improve practical skills	3- تطبيق المنهج التحليلي والناقد للمعارف في مجال التخصص و المجالات ذات العلاقة
4- Acquire excellent level of medical knowledge in the basic biomedical, related clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in practical skills and scientific research.	4- دمج المعارف المتخصصة مع المعارف ذات العلاقة مستتبطينا و مطورا للعلاقات البينية بينها
5- Function as a leader of a team to provide appropriate, effective and compassionate reaction when dealing with problems related to Medical biochemistry.	5- إظهار وعيا عميقا بالمشاكل الجارية و النظريات الحديثة في مجال التخصص
7- Acquire an in depth understanding of common areas of Medical biochemistry, from basic practice and related clinical care to application, and possession of skills to manage independently all problems in these areas.	
6- Identify and create solutions for health problems related to Medical	6- تحديد المشكلات المهنية و إيجاد حلولاً مبتكرة لحلها

biochemistry.	
<p>5- Function as a leader of a team to provide appropriate, effective and compassionate reaction when dealing with problems related to Medical biochemistry.</p> <p>7- Acquire an in depth understanding of common areas of Medical biochemistry, from basic practice and related clinical care to application, and possession of skills to manage independently all problems in these areas.</p>	<p>7- إتقان نطاقا واسعا من المهارات المهنية في مجال التخصص</p>
<b>Faculty ARS</b>	<b>NAQAAE General ARS for postgraduate programs</b>
<p>8- Share in updating and improving practical practice in Medical biochemistry.</p> <p>9- Function as teacher in relation to colleagues, medical students and other health professions.</p>	<p>8- التوجه نحو تطوير طرق و أدوات و أساليب جديدة للمزاولة المهنية</p>

<b>NAQAAE General ARS for postgraduate programs</b>	<b>Faculty ARS</b>
8- التوجه نحو تطوير طرق و أدوات و أساليب جديدة للمزاولة المهنية	16- Share in updating and improving practical practice in Medical biochemistry. 9- Function as teacher in relation to colleagues, medical students and other health professions.
9- استخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسته المهنية	15- Use recent technologies to improve his practice in Medical biochemistry.
10- التواصل بفاعلية و قيادة فريق عمل في سياقات مهنية مختلفة	8- Demonstrate leadership competencies including interpersonal and communication skills that ensure effective information exchange with other health professions, the scientific community and the public. 5- Function as a leader of a team to provide appropriate, effective and compassionate reaction when dealing with problems related to Medical biochemistry.
11- اتخاذ القرار في ظل المعلومات المتاحة	10- Master decision making capabilities in different situations related to Medical biochemistry.
12- توظيف الموارد المتاحة بكفاءة و تنميتها والعمل على إيجاد موارد جديدة	11- Show leadership responsiveness to the larger context of the related health care system, including the organisation, partnership with health care providers and managers, and resource allocations.
13- الوعي بدوره في تنمية المجتمع و الحفاظ على البيئة	12- Demonstrate in depth awareness of public health and related health policy issues including independent ability to improve health care, and identify and carryout system-based improvement of care.

<p>14-التصرف بما يعكس الالتزام بالنزاهة و المصادقية و قواعد المهنة</p>	<p>13- Show model attitudes and professionalism.</p>
<p>15-الالتزام بالتنمية الذاتية المستمرة و نقل علمه و خبراته للآخرين</p>	<p>14- Demonstrate commitment for lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages and in Medical biochemistry or one of its subspecialties.</p> <p>15- Use recent technologies to improve his practice in Medical biochemistry.</p>

**Comparison between ARS ILOS for medical doctorate (basic)**

<b>(ARS)</b>	<b>(ILOs)</b>
<p><b><u>2-1- Knowledge and understanding</u></b></p> <p><b>2-1-A-</b> Established, updated and evidence-based theories, basics and developments of speciality and relevant sciences.</p>	<p><b><u>2-1- Knowledge and understanding</u></b></p> <p><b>2-1-A-</b> Demonstrate in-depth knowledge and understanding of theories, basics and updated biomedical, clinical epidemiological and socio behavioral science relevant to his Medical biochemistry as well as the evidence – based application of this knowledge to practice including patient care.</p>
<p><b>2-1-B</b> Basic, methods and ethics of medical research.</p>	<p><b>2-1-B-</b> Explain basics, methodology, tools and ethics of scientific medical, clinical research.</p>
<p><b>2-1-C-</b> Ethical and medicological principles of medical practice related to speciality field.</p>	<p><b>2-1-C-</b> Mention ethical, medico logical principles and bylaws relevant to his practice in Medical biochemistry.</p>
<p><b>2-1-D-</b> Principles and measurements of quality in the speciality field.</p>	<p><b>2-1-D-</b> Mention principles and measurements of quality assurance and quality improvement in medical education and in practice of Medical biochemistry.</p>
<p><b>2-1-E-</b>Principles and efforts for maintaining and improvements of public health.</p>	<p><b>2-1-E-</b> Mention public health and health policy issues relevant to Medical biochemistry and principles and methods of system –based improvement of related to his practice in Medical biochemistry.</p>

continuous <b>(ARS)</b>	continuous <b>(ILOs)</b>
<b><u>2-2- Intellectual skills:</u></b> <b>2-2-A-</b> Application of basic and other relevant science to solve Medical biochemistry related problems.	<b><u>2-2- Intellectual skills:</u></b> <b>2-2-A-</b> Apply the basic and clinically supportive sciences which are appropriate to Medical biochemistry related conditions / problem / topics.
<b>2-2-B-</b> Problem solving based on available data.	<b>2-2-B-</b> Demonstrate an investigatory and analytic thinking “problem – solving “approaches to relevant situations related to Medical biochemistry.
<b>2-2-C-</b> Involvement in research studies related to Medical biochemistry.	<b>2-2-C-</b> Plain research projects.
<b>2-2-D</b> Writing scientific papers	<b>2-2-D-</b> Write scientific paper.
<b>2-2-E-</b> Risk evaluation in the related clinical practice.	<b>2-2-E-</b> Participate in clinical or laboratory risk management activities as a part of clinical governance.
<b>2-2-F-</b> Planning for performance improvement in Medical biochemistry.	<b>2-2-F-</b> Plan for quality improvement in the field of medical education and practice in Medical biochemistry.
<b>2-2-G-</b> Creation and innovation in the Medical biochemistry.	<b>2-2-G-</b> Create / innovate plans, systems, and other issues for improvement of performance in Medical biochemistry.
<b>2-2-H-</b> Evidence – based discussion.	<b>2-2-H-</b> Present and defend his / her data in front of a panel of experts.
<b>2-2-I-</b> Decision making in different situations related to Medical biochemistry fields.	<b>2-2-I-</b> Formulate management plans and alternative decisions in different situations in the field of Medical biochemistry.

continuous <b>(ARS)</b>	continuous <b>(ILOs)</b>
<p><b><u>2-3- Clinical skills:</u></b></p> <p><b>2-3-A-</b> provide extensive level of practical and or laboratory services that can help patient care ,solving health problems and better understanding of the normal structure and function extensive level means in depth understanding from basic science to evidence – based clinical application and possession of skills to manage independently all problems in his field of practice.</p> <p><b>2-3-B-</b> Master practical/laboratory skills relevant to Medical biochemistry.</p>	<p><b><u>2/3/1/Practical skills (Patient care :)</u></b></p> <p><b>2-3-1-A-</b> Master practical skills relevant to Medical biochemistry for all common techniques and /or experiments.</p> <p><b>2-3-1-B-</b> Master practical skills with non-routine, laboratory skills and techniques and under increasingly difficult circumstances, while demonstrating, appropriate and effective competency.</p> <p><b>2-3-1-C-</b> Master proficiency in performing available complex laboratory techniques and handling unexpected complications.</p> <p><b>2-3-1-D-</b> Gather essential and accurate information about practical/laboratory skills of the Medical biochemistry related conditions.</p> <p><b>2-3-1-E-</b> Make informed decisions about diagnostic laboratory tests for the Medical biochemistry related conditions.</p> <p><b>2-3-1-F-</b> Develop and carry out diagnostic and teaching plans for Medical biochemistry related conditions / skills.</p>



	<p><b>2-3-1-G-</b> Use information technology to support practical decisions and students education in all Medical biochemistry related practical situations.</p> <p><b>2-3-1-H-</b> Provide health care or any relevant services aimed at preventing the Medical biochemistry related health problems (if applied).</p> <p><b>2-3-1-I-</b> Lead other professionals, including those from other disciplines, to provide practical/laboratory-focused care in Microbiology &amp; Immunology related conditions.</p>
<p><b>2-3-C-</b> Write and evaluate reports for situations related to Medical biochemistry.</p>	<p><b>2-3-1-J-</b> Write competently all forms of professional reports related to Medical biochemistry (lab reports, experiments reports, ) including reports evaluating these charts and sheets.</p>

## II-Program matrix

### Knowledge and Understanding

Course	Program covered ILOs				
	2/1/A	2/1/B	2/1/C	2/1/D	2/1/E
Course 1: Medical Statistics		✓		✓	
Course 2: Research methodology		✓			
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research			✓		
Course 4: Biochemistry 1	✓				
course 5 : Biochemistry 2	✓				

## Intellectual

Course	Program covered ILOs								
	2/2/	2/2/	2/2/	2/2/	2/2/	2/2/	2/2/	2/2/	2/2/
	A	B	C	D	E	F	G	H	I
Course 1: Medical Statistics			✓	✓					
Course 2: Research methodology			✓	✓					
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research		✓		✓			✓		
Course 4: Biochemistry 1	✓	✓							
course 5 : Biochemistry 2	✓	✓							

### Practical Skills (Patient Care)

Course	Program covered ILOs									
	2/3 /1/ A	2/3/ 1/B	2/3/ 1/C	2/3/ 1/D	2/3/1 /E	2/3/1 /F	2/3/1 /G	2/3/1 /H	2/3/ 1/I	2/3/ 1/J
Course 1: Medical Statistics			✓				✓			✓
Course 2: Research methodology					✓					✓
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research		✓							✓	
Course 4: Biochemistry 1	✓									
course 5 : Biochemistry 2				✓						

## General Skills

Course	Program covered ILOs							
	2/3/ 2/A	2/3/2/ B	2/3/2/C	2/3/2/D	2/3/2/ E	2/3/2/ F	2/3/2/G	2/3/2/ H
Course 1: Medical Statistics		✓					✓	
Course 2: Research methodology					✓			✓
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research			✓		✓		✓	
Course 4: Biochemistry 1								
course 5 : Biochemistry 2				✓			✓	

## General Skills

Course	Program covered ILOs						
	2/3/2/J	2/3/2/K	2/3/2/L	2/3/2/M	2/3/2/N	2/3/2/O	2/3/2/P
Course 1: Medical Statistics	✓				✓		
Course 2: Research methodology			✓				✓
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research			✓	✓			
Course 4: Biochemistry 1	✓	✓				✓	
course 5 : Biochemistry 2	✓						

## General Skills

Course	Program covered ILOs					
	2/3/2 /Q	2/3/2 /R	2/3/2 /S	2/3/2 /T	2/3/2 /U	2/3/2 /V
Course 1: Medical Statistics	✓				✓	
Course 2: Research methodology		✓			✓	
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research		✓			✓	
Course 4: Biochemistry 1		✓				
course 5 : Biochemistry 2		✓			✓	

Annex 7,  
Additional information:



**Department information:**

Provide candidate with basic knowledge in modern biochemistry and molecular biology necessary for understanding of life sciences at the molecular level.

**Opportunities within the department:**

Education: the teaching mission is to provide the best possible training in Medical biochemistry areas.

Undergraduate studies: we offer many courses that cater to undergraduates from seminars to advanced classes