PROGRAMME SPECIFICATION
(Master degree in Basic Medical Sciences in Biochemistry)
Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Programme Title & Code	Postgraduate Master degree of Basic Medical Sciences in Biochemistry / BIC 500
(2) Final award/degree	MSc.
(3) Department (s)	Medical Biochemistry Department
(4) Coordinator	Members of credit committee
(5) External evaluator (s)	Prof.Dr/ Azza Ahmed Elbaramaw Faculty of Medicine,Benha University
(6) Date of approval by the Department`s council	29/4/2018
(7) Date of last approval of programme specification by Faculty council	

(B) Professional information

(1) Programme objectives:

1. To provide our candidate with a basic knowledge in different aspects of metabolism and metabolic interrelations.

2. To identify a basic knowledge about diversity of endocrine system and mechanism of hormonal action.
3. To provide our candidate with a basic knowledge about biological oxidation.
4. To provide our candidate with a basic knowledge about vitamins, minerals and enzymes.
5. To prepare our candidate with a basic knowledge about molecular biology & recombinant DNA.
6. To provide our candidate with a basic knowledge about the basic function of cell organelles & structure of biological membrane.
7. To provide our candidate with a basic knowledge about basic knowledge of Cell cycle & apoptosis.
8. To provide our candidate with a basic knowledge about immunochemistry and tissue chemistry
9. To provide our candidate with a basic knowledge about muscle chemistry &metabolism
10. To provide our candidate with a basic knowledge about free radical and antioxidants.
11. To provide our candidate with a basic knowledge about different blood components (plasma proteins, homeostasis & red and white blood cells).
12. To provide our candidate with a basic knowledge about immunity with its relation to health and disease or the role of cytokines in the immunity, inflammatory response& haematopoiesis (basic level I).
13. To provide our candidate with a basic knowledge about neurochemistry field and to understand the nature of important neuropsychatric disorders or the elements of respiration and acid-base regulation (basic level II).

(2) Intended Learning Outcomes (ILOs):

On successful completion of the programme, the candidate will be able to:

A- Knowledge and Understanding

AI.1	**Discuss carbohydrate chemistry & and different pathways of carbohydrate metabolism.**
AI.2	**Discuss Lipid chemistry & and different pathways of lipid metabolism.**
AI.3	**Discuss physical chemistry including types of chemical bonds, chemical reactions, buffers and solutions**.
AI.4	**Discuss protein chemistry & general protein metabolism**
AI.5	**Discuss individual amino acid metabolism including biosynthetic and catabolic pathways of essential and non-essential amino acids.**

AI.6	**Define principles of heme metabolism and different types of porphyria and hyperbillirubinemia**
AI.7	**Explain purine & pyrimidine chemistry & metabolism; including synthesis and degradation of purines and pyrimidines and their metabolic disorders.**
AI.8	**Explain metabolic interrelation & minerals; including enzyme changes and role of different organs in the feed-fast cycle**
AI.9	**Discuss mechanism of hormonal action including different types of hormone receptors and and how they affect the signaling pathways**
AI.10	**Discuss biological oxidation including electron transport chain and bioenergetics**
AI.11	**Discuss xenobioteic metabolism, toxic effects of xenobiotics and the phases of their metabolism**
AI.12	**Discuss vitamins; function and deficiency of fat- and water-soluble vitamins.**
AI.13	**Discuss enzymes, classification, mechanism of action and regulation of their activity.**
AI.14	**Discuss molecular biology including DNA organization, replication, transcription translation & recombinant DNA technology .**
AI.15	**Discuss basic function of Cell organelles & structure of biological membrane.**
AI.16	**Discuss phases and control of cell cycle & mechanism of apoptosis.**
AII.1	**Discuss water metabolism, pH & acid-base balance**
AII.2	**Discuss chemistry of carbohydrate, lipid & protein**
AII.3	**Discuss different pathways of carbohydrate & glycoprotein metabolism and their regulation.**
AII.4	**Discuss diabetes mellitus, its different types, metabolic changes and complications.**
AII.5	**Discuss different pathways of lipid metabolism, fatty liver & ecosanoids**
AII.6	**Discuss general protein metabolism and individual amino acid metabolism including biosynthetic and catabolic pathways of essential and non-essential amino acids.**
AII.7	**Explain purine & pyrimidine chemistry & metabolism; including synthesis and degradation of purines and pyrimidines and their metabolic disorders.**
AII.8	**Discuss porphyrine metabolism; synthesis, regulation and disorders.**

AII.9	**Explain metabolic interrelation; including enzyme changes and role of different organs in the feed-fast cycle**
AII.10	**Discuss biological Transport, cell membrane and membrane diseases**
AII.11	**Discuss biochemistry of endocrine glands including synthesis of different types of hormones, secretion, transport and storage.**
AII.12	**Discuss mechanism of hormonal action including different types of hormone receptors and and the signaling pathways.**
AII.13	**Discuss immunochemistry and tissue chemistry including different types of extracellular matrix proteins and their disorders.**
AII.14	**Discuss vitamins & minerals; different types, functions and deficiency.**
AII.15	**Discuss enzymes, classification, mechanism of action and regulation of their activity.**
AII.16	**Describe muscle chemistry & metabolism; including muscle proteins, regulation of action and cytoskeleton.**
AII.17	**Discuss biological oxidation including electron transport chain and bioenergetics**
AII.18	**Discuss xenobioteic metabolism, toxic effects of xenobiotics and the phases of their metabolism**
AII.19	**Discuss free radical; sources, effects and antioxidants.**
AII.20	**Understand Blood (plasma proteins & homeostasis) including different functions of plasma proteins, phases of hemostasis and thrombosis and laboratory tests used for assessment.**
AII.21	**Discuss DNA structure, RNA synthesis, protein synthesis; regulation of gene expression and recombinant DNA technology.**
AII.22	**Describe oncology including oncogenes, their role in cancer development and tumor markers.**
AII.23	**Discuss general structure and major disorders of red and white blood cells.**
AII.24	**Discuss intraceller sorting & trafficking of proteins including the cytosolic and ER branches.**
AII.25	**Describe apoptosis including its pathways, types of caspases and its abnormalities in cancer cells.**
AIII.1	**Discuss basis of immunity with its relation to health and disease.**
AIV.1	**Discuss the role of cytokines in the immunity, inflammatory response& haematopoiesis.**
AV.1	**Discuss elements of respiration, acid-base regulation and its mechanism of**

	acid-base deregulation.
AVI.1	**Discuss neurochemistry field, nature of important neuropsychatric disorders, and basis for effective therapy.**

B- Intellectual skills :

BII.1	Interpret symptoms, signs and biochemical laboratory findings of some metabolic disorders.
BII.2	Point-out the etiology of metabolic disturbance in a given case study report.
BI.1, BII.3	Point-out the application of molecular biology in basic and clinical sciences.
BI.2, BII.4	Interpret symptoms, signs and biochemical laboratory findings of vitamins deficiency diseases
BI.3, BII.5	Interpret the clinical significance of determination of plasma levels of glucose, total proteins, sGOT, sGPT, bilirubin, albumin, cholesterol, TG, creatinine and uric acid
BI.4, BII.6	Diagnose the type of abnormality of pathological glucose tolerance curve
BIII.1, BIV.1, BV.1, BVI.1	Formulate a systematic approach for laboratory diagnosis of metabolic complications of diseases
BIII.2, BIV.2, BV.2, BVI.2	Make oral presentation and open discussions about scientific issues in a professional way.

C- Professional/practical skills:

CI.1	Identify laboratory reagents and instruments used in biochemistry laboratory
CI.2	Perform manual and automatic colorimetric estimation of some blood parametars (serum levels of glucose, total proteins, albumin, bilirubin, GPT, GOT, alkaline phosphatase, cholesterol, TG, creatinine and uric acid).
CI.3	Perform urine analysis (Identify the physiological variations of physical and chemical characters of normal urine and performing chemical tests to detect abnormal constituents of urine).
CI.4	Perform chemical DNA extraction.
CI.5	Perform agarose gel electrophoresis .
CI.6	Estimate the risks of handling and use of chemical agents on community and environment as a part of their ethical heritage and consequently implement the standard guidelines of chemist and environmental safety.

CI.7	Perform different aspects of the physical chemistry
CII.1	Perform DNA extraction by spin column.
CII.2	Perform molecular biology techniques: electrophoresis and conventional PCR.
CII.3	Identify gene polymorphisms by restriction endonucleases.
CII.4	Measure some parameters by ELISA.

D- Communication & Transferable skills

D1	To be able to work effectively in a group in lab or during preparation of seminars
D2	To respect the role of staff and co-staff members regardless of degree or occupation.
D3	To be able to use computer and IT.
D4	Demonstrate key skills in the retrieval, preparation, analysis and interpretation of information from different sources.

(3) Academic standards:

Academic standards for the programme are attached in Appendix I. in which. External reference points/Benchmarks are use

A table of comparison between ARS, NARS, Program ILos is attached in Appendix II.

3.a- External reference points/benchmarks are selected to confirm the appropriateness of the objectives, ILOs and structure of assessment of the programme:

The biochemistry department select the MRs biochemistry graduate programme, school of medicine, University of Michigan as an external reference point approved by the Department' council on 29/7/2010 and by the Faculty council on 17/8/2010 .

https://www.lsa.umich.edu/UMICH/chem/Home/Undergraduate/Advising/Biochemistry%20worksheet.pdf.

3.b- Comparison of the specification to the selected external reference/ benchmark:

- At least 75% programme aims of the Benchmark elective course are covered by the current compulsory programme.
- Assessment methods and schedules are different than the benchmark , they follow the post graduate bylaws in ARE.

(4) Curriculum structure and contents:

4.a- Duration of the programme : 4 semesters

4.b- programme structure:

Candidates should fulfill a (total 45 credit hours).

●4.b.1: Number of teaching hours:
First part: (8 credit hours), Second part: (15 credit hours) & logbook: 60 contact hours (2credit hours) Practical course: (10 credit hours) Thesis: 300 contact hours (3 hours twice weekly for 48 weeks).

●4.b.2: Teaching hours/week:
Lectures: **6** hr. Seminars: **2** hr. Laboratory: **7** hr. Total: **15** hours/week

●4.b.3: Number of contact hours for Basic science (Teached in the first part) = 8 Credit hours represents 15% of total hours.

●4.b.4: Number of contact hours for Specialized science (Teached in the second part) = 15 Credit hours represents 33.3% of total hours.

●4.b.5: Number of contact hours for Logbook activities, skill to be performed and thesis work = 4hrs weekly for 30 months= 360 hours represents 27% of total hours.
•4.b.6: Number of contact hours for laboratory =300 hours represents 22.3% of total hours.

(5) Programme courses /ILOs matrix:

	Medical Biochemistry & Molecular Biology (Basic level I)	Advanced Medical Biochemistr Molecular Biology (Basic level II)	Elective course (1st pa immunology or cytok	Elective course (2nd pa neurochemistry or respiration)
AI.1	√			
AI.2	√			
AI.3	√			
AI.4	√			
AI.5	√			
AI.6	√			
AI.7	√			
AI.8	√			
AI.9	√			
AI.10	√			
AI.11	√			

AI.12	√			
AI.13	√			
AI.14	√			
AI.15	√			
AI.16	√			
AII.1		√		
AII.2		√		
AII.3		√		
AII.4		√		
AII.5		√		
AII.6		√		
AII.7		√		
AII.8		√		
AII.9		√		
AII.10		√		
AII.11		√		
AII.12		√		
AII.13		√		
AII.14		√		
AII.15		√		
AII.16		√		
AII.17		√		
AII.18		√		
AII.19		√		
AII.20		√		
AII.21		√		
AII.22		√		
AII.23		√		
AII.24		√		
AII.25		√		
AIII.1			√	
AIV.1			√	
AV.1				√
AVI.1				√

	Medical Biochemistry & Molecular Biology (Basic le	**Advanced M Biochemistry Molecular B (Basic level II)**	**Elective course (1st part, immunology or cytokines)**	**Elective course (2nd part, neurochemistry or respiration)**

BII.1		√		
BII.2		√		
BI.1, BII.3	√	√		
BI.2, BII.4	√	√		
BI.3, BII.5	√	√		
BI.4, BII.6	√	√		
BIII.1, BIV.1, BV.1, BVI.1			√	√
BIII.2, BIV.2, BV.2, BVI.2			√	√

	Medical Biochemistry & Molecular Biology (Basic le	**Advanced Biochemistry Molecular (Basic level II)**	**Elective course (1st part, immunology or cytokines)**	**Elective course (2nd part, neurochemistry or respiration)**
CI.1	√			
CI.2	√			
CI.3	√			
CI.4	√			
CI.5	√			
CI.6	√			
CI.7	√			
CII.1		√		
CII.2		√		
CII.3		√		
CII.4		√		

	Medical Biochemistry & Molecular Biology (Basic le	**Advanced Biochemistry Molecular (Basic level II)**	**Elective course (1st part, immunology or cytokines)**	**Elective course (2nd part, neurochemistry or respiration)**

D1	√	√		
D2	√	√		
D3	√	√		
D4	√			

	Object 1	**Object 2**	**Object 3**	**Object 4**	**Object 5**	**Object 6**	**Object 7**	**Object 8**	**Object 9**	**Object 10**	**Object 11**	**Object 12**
AI.1	√											
AI.2	√											
AI.3	√											
AI.4	√											
AI.5	√											
AI.6											√	
AI.7	√											
AI.8	√											
AI.9		√										
AI.10			√									
AI.11	√											
AI.12				√								
AI.13				√								
AI.14					√							
AI.15						√						
AI.16							√					
AII.1	√											
AII.2	√											
AII.3	√											
AII.4	√											
AII.5	√											
AII.6	√											
AII.7	√											
AII.8											√	
AII.9	√											
AII.10						√						
AII.11		√										
AII.12		√										
AII.13								√				
AII.14				√								

AII.15				√								
AII.16									√			
AII.17			√									
AII.18	√											
AII.19										√		
AII.20											√	
AII.21					√							
AII.22					√							
AII.23											√	
AII.24							√					
AII.25						√						
AIII.1												√
AIV.1												√
AV.1												
AVI.1												

	Object 1	Object 2	Object 3	Object 4	Object 5	Object 6	Object 7	Object 8	Object 9	Object 10	Object 11	Object 12
BII.1	√											
BII.2	√											
BI.1, BII.3					√							
BI.2, BII.4				√								
BI.3, BII.5	√											
BI.4, BII.6	√											
BIII.1, BIV.1, BV.1, BVI.1	√											√
BIII.2, BIV.2, BV.2, BVI.2												√

	Object 1	Object 2	Object 3	Object 4	Object 5	Object 6	Object 7	Object 8	Object 9	Object 10	Object 11	Object 12	O
CI.1													
CI.2													

CI.3													
CI.4					√								
CI.5					√								
CI.6													
CI.7													
CII.1					√								
CII.2		√											
CII.3					√								
CII.4													

- **First part**

  a- Compulsory courses: (48 weeks over a period of 12 months)
  b- Elective courses: (15 weeks over a period of 4 months)

Course Title	Course Code	Total teaching hours			Programme ILOs covered (REFERRING TO MATRIX)
		Lectures	aboratory		
Medical Biochemistry& molecular biology **(Basic level I)**	**BIC 504**	**6**	**2**	**8**	**AI (1, 2, 3, 4, 7,8,9,10,11,12,13,14,15,,15,16) B I(1,2,3, 4) C I(1, 2, 3,4, 5,6,7) D I(1, 2, 3,4)**
Elective course (**immunology or cytokines**	**BIC 504 BI or BIC 504 CY**	**2**		**2**	**AIII.1, A IV.1 B III 1,2- B IV 1,2 D III 1,2,3,4,5 – D IV 1,2,3,4,5**

- **Second part**

  a- Compulsory courses: (72 weeks over a period of 18 months)
  b- Elective courses: (15 weeks over a period of 4 months)

Course Title	Course Code	Total teaching hours			Programme ILOs covered (REFERRING TO MATRIX)
		Lectures	Laboratory		
Medical Biochemistry &Molecular Biology **(Basic level II)**	**BIC504**	**13**	**8**	**21**	**A II (1:25) B II (1, 2, 3, 4, 5,6) C II (1, 2, 3, 4) D II (1, 2, 3)**

Elective course **(neurochemistry or respiration)**	**BIC 504 NC or BIC 504 CR**	**2**		**2**	**A V.1, A VI.1 B V.1,2 –B VI.1,2 D V.1:5 –D VI..1:5**

(6) programme admission requirements:

●General requirements:

By laws regulating post graduate Studies.

●Specific requirements :

N/A

(7) Regulations for progression and programme completion:

- **First part**

1- Attendance Criteria:

Minimally accepted attendance in each course is 75%.

2-Log book for attending conferences-thesis discussions-seminars-Workshops-attending scientific lectures-essays-self learning to assess knowledge and understanding and intellectual skills should be fulfilled and signed by Head of the department

3-Assessment tool

Tools	Marks	Percentage of the total mark
Medical Biochemistry & Molecular Biology (Basic level I)		
Written exam	144	40%
MCQ exam	36	10%
Oral exam:OSCE in 5 stations	60	16.6%
Practical exam OSP In 5 stations	60	16.6%
Elective course		
Written exam	48	13.3%
MCQ exam	12	3.3%
Total	**360**	

- **Second part**

1-Attendance Criteria:

Minimally accepted attendance in is 75%.

2-Log book for attending conferences-thesis discussions-seminars-

Workshops-attending scientific lectures-essays-self learning to assess knowledge and understanding and intellectual skills should be fulfilled and signed by Head of the department.

3-Assessment tool

Tools	Marks	Percentage of the total mark
Advanced Medical Biochemistry & Molecular Biology (Basic level II		
Written exam	240	36.9%
MCQ exam	60	9.2%
Oral exam:OSCE in 5 stations	150	23%
Practical exam:OSPE In 5 stations	150	23%
Elective course		
Written exam	40	6.2%
MCQ exam	10	1.5%
Total	**650**	

- **Classification of Final Result for the MSc**

To qualify for the award of the MSc with distinction, candidates must achieve an overall average mark of a 75% or more, with a mark of at least 75% being achieved in each course. To qualify for the award of the MSc, candidates must pass at least 60% of the final exam.

(8) Evaluation of Programme's intended learning outcomes (ILOs):

Evaluator	Tools*	Sample size
Internal evaluators : 1- * **Dr/** Lamiaa Elmetwally Elabbasy 2-Prof. Ayman El-Baz (Head of the Department)	Observation Questionnaire Workshops Group discussion	
External Evaluator**:** ***** Prof. Dr/ Azza Ahmed Elbaramawy Faculty of Medicine, Benha University	Questionnaire Communication Email	
Senior student **:** **None**		
Alumni: **None**		
Stakeholder: **None**		

We certify that all information required to deliver this programme is contained in the above specification and will be implemented. All course specification for this programmeare in place.	
Programme coordinator: Name: Dr/ Lamiaa Elmetwally Elabbasy	Signature & date:
Dean: Name: Prof Dr/ El-Said Abd-el-Hady	Signature & date:
Executive director of the quality assurance unit: Name: Prof. / Nesreen Salah	Signature & date: