



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
**Academic Reference Standards for
Postgraduate Programs**



Academic Reference Standards (ARS)
for
**M Sc in Pharmaceutical Sciences
(Biochemistry)**

Department of Biochemistry

ARS

Academic Year: 2021/2022

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Quality Assurance Unit
Academic Reference Standards for
Postgraduate Programs



I. Attributes of the graduate:

The graduates of the Master Degree of Pharmaceutical Sciences (Biochemistry) should be capable of:

- Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Biochemistry.
- Mastering of advanced knowledge, professional research skills, attitudes and values in the field of Biochemistry and integrating with the relevant subjects in his/her professional practice.
- Recognizing the current issues in the field of biochemical analysis.
- Adopting the scientific thinking approaches in subjects relevant to Biochemical analysis.
- Identifying and solving problems in the field of Biochemistry
- Mastering adequate range of specialized professional skills and using appropriate technology to improve his/her professional practice.
- Communicating effectively and having ability to participate and lead team works.
- Taking appropriate professional and scientific decisions in light of the available information.
- Providing the ability to critically analyze the impact and outcomes of research results.
- Training in ethical and legal aspects of scientific research.
- Employing the available resources to achieve and preserve the maximum benefit.
- Exhibiting awareness of his/her role in the community development and preservation of environment in response to regional global changes.
- Reflecting commitment to integrity, credibility and rules of the pharmacy profession.
- Developing continuous self academic and professional learning.

II. General Standards

1. Knowledge and Understanding:

Upon successful completion of the Program, graduates should be able to:

- 1.1** Identify the theories and fundamentals of Biochemistry and other related fields.



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Academic Reference Standards for
Postgraduate Programs



- 1.2 Recognize the recent and advanced scientific developments in the field of Biochemistry.
- 1.3 Detect all basic and new techniques used in the field of Biochemical analysis.
- 1.4 Distinguish the value of ethics and legal issues of research and professional practice in Biochemistry.
- 1.5 Identify principles and fundamentals of quality in professional practice in the field Biochemical analysis.
- 1.6 Illustrate the mutual interaction between the pharmaceutical professional practice and the surrounding environment.

2. Intellectual Skills

Upon successful completion of the Program, graduates should be qualified to:

- 2.1 Analyze and evaluate information in the field of Biochemistry.
- 2.2 Deduce solutions for specialized problems in absence of some information.
- 2.3 Integrate information to solve professional problems.
- 2.4 Develop methodological scientific studies on certain research problems.
- 2.5 Assess risk assessment of professional practice Biochemistry.
- 2.6 Plan for development in pharmaceutical and Biochemistry.
- 2.7 Generate professional decision in response to various professional contexts.

3. Professional and Practical Skills

Upon completion of the program, graduates should be able to

- 3.1 Master basic and professional skills in Biochemistry and related fields.
- 3.2 Assess methods and techniques used in Biochemical analysis and drug quality control.
- 3.3 Write and evaluate professional research reports in Biochemistry.

4. General and transferable skills:

Upon completion of the program, graduates should be able to:

- 4.1 Communicate effectively by various methods
- 4.2 Utilize effectively information technology in professional practice development.
- 4.3 Perform self assessment, continuous learning and identifying personal educational needs.
- 4.4 Use different resources to acquire knowledge and information.
- 4.5 Anticipate needs and risks in the research fields.
- 4.6 Work in a team and lead others in various professional contexts.
- 4.7 Manage time effectively.
- 4.8 Interpret and evaluate data available from scientific research.



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Academic Reference Standards for
Postgraduate Programs



- 4.9 Show awareness of ethics and legal issues of research and professional practice
Biochemistry.

Date of course specification approval: 8/11/2021



**Program: Master in Pharmaceutical Sciences
(Biochemistry)**

Biochemistry Department

Program Specification

Academic Year: 2021/2022

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A-Basic Information

1	Faculty	Pharmacy
2	Program Title:	Master in Pharmaceutical Sciences (Biochemistry)
3	Program Type:	Single
4	Department (s):	Department of Biochemistry
5	Final award:	Master degree in (Biochemistry)
6	Coordinator:	Ass. Prof. Dr. Mohammed El Mesery
7	External Evaluator(s):	Prof. Dr. Sahar El Swefy
8	Date of Program Specification Approval:	Department council: 8/11/2021, Faculty council:

B-Professional Information

1-Program Aims

Upon successful completion of the program, graduates should demonstrate comprehensive knowledge, clear understanding and outstanding skills in pharmaceutical sciences and biochemistry.

- 1.1 Mastering of advanced knowledge, professional research skills, attitudes and values in the field of Biochemistry and integrating with the relevant subjects in his/her professional practice.
- 1.2 Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Clinical Biochemistry.
- 1.3 Master practical research procedures according to the good laboratory practice (GLP) basics in chemistry labs and perform experiments with safety guidelines.
- 1.4 Mastering of all traditional and new techniques used in the field of management of diseases.
- 1.5 Applying the scientific thinking approaches and problem based learning in fields of Clinical biochemistry.
- 1.6 Formulating hypotheses based on current concepts in Clinical Biochemistry field.
- 1.7 Introduction to bioinformatics, structural bioinformatics and sequence alignments.
- 1.8 Designing and conducting research projects.
- 1.9 Analyze and interpret results and information acquired from primary literature sources.
- 1.10 Manipulate computer program, online database, software and other IT skills to get information and analyze the obtained research data.



1.11 Attaining communication skills, research ethics, time management, decision-making, and team-working.

2-Intended Learning Outcomes (ILOs)

a- Knowledge and Understanding:

By the end of this program the graduate should be able to:

A1	Explain the theories and fundamentals of instrumental analysis, statistics and biostatistics, physical chemistry and bioinformatics.
A2	Define the principles of body function in health and diseases states as well as the etiology, epidemiology, laboratory diagnosis, clinical features of different diseases and their pharmacotherapeutic approaches.
A3	Recognize the current problems, the recent and advanced scientific development in fields of Biochemical analysis.
A4	Utilize effectively all basic and recent techniques and technological tools used in the field of advanced biochemical research/analysis.
A5	Identify legal and ethical principles for conducting experiments using experimental animals and human volunteers.
A6	Define the principles and the basics of quality in professional practice in the fields of Clinical Biochemistry.
A7	Identify appropriate types of data needed to tackle a certain research problem.
A8	Understand the importance of DNA and protein sequencing and alignment in biology and drug discovery
A9	Understand the different approaches for sequence alignment and database similarity searching.
A10	Explain the basics of protein secondary and tertiary structure prediction
A11	Recognize fundamental and modern theories in biochemistry and other relevant subjects including clinical pathology, molecular biology, physical pharmacy and pharmacokinetics.
A12	Utilize scientific data presentation based on knowledge of biostatistics.
A13	Understand the concepts of the biosynthetic and metabolic pathways and their relation to a pathophysiology of diseases.
A14	Recognize recent research approaches in the medical, genetic and environmental fields.
A15	Identify the effect of research in the field of Clinical biochemistry, clinical pathology on community development.
A16	Utilize basic principles of quality assurance in biochemical research.
A17	Identify different diseases associated with metabolic disorders.
A18	Define the basic terms of oncology.
A19	Understand the potential effect of vitamins in treating cancers.

b- Intellectual Skills

By the end of this program the graduate should be able to:



B1	Analyze and evaluate the gained information in the field of instrumental analysis, biostatistics, physical chemistry, bioinformatics and drug development.
B2	Demonstrate logic and critical way of thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes.
B3	Demonstrate creativity and innovative scientific and professional approaches regarding Biochemistry.
B4	Utilize the available professional and scientific resources and research skills to solve problems.
B5	Assess professional and scientific risks in Biochemical analysis.
B6	Plan to improve performance and research in the field of Biochemistry.
B7	Interpret and validate the obtained research data.
B8	Recommend professional and scientific decisions based on proofs, evidences and available data.
B9	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs.
B10	Design and compute substitution scoring matrices
B11	Identify evolutionary relationships of proteins from their sequences
B12	Analyze and evaluate information in the fields of Clinical biochemistry and molecular biology.
B13	Solve problems in drug metabolism based on the accompanying circumstances and underlying reasons.
B14	Integrate different aspects of biochemical analysis, drug metabolism and pharmacokinetics to suggest solutions for research and professional problems.
B15	Design and conduct research studies.
B16	Professionally write scientific papers in the fields of Clinical biochemistry and molecular biology.
B17	Assess professional and scientific risks in practicing biochemical research.
B18	Suggest plans for enhancing performance in the field of Clinical biochemistry.

c- Professional and Practical Skills

By the end of this program the graduate should be able to:

C1	Collect, preserve, and store biological samples.
C2	Apply the practical research to analyze blood sample constituents and interpret abnormal Laboratory data
C3	Apply different statistical methods for data analysis and validation.
C4	Develop different research methodologies and good experimental and reporting skills in biochemical analysis, prophylaxis and management of different diseases.
C5	Manage safely and efficiently advanced technological research tools and equipment relevant to biochemical analysis research.



C6	Outline and illustrate the calculations of the heat of the reaction, neutralization, combustion of a chemical reaction.
C7	Carry out scientific research and contribute to the knowledge in the field of Biochemistry.
C8	Write accurately, evaluate professional reports and publish scientific research papers in scientific journals and conferences.
C9	Write thesis in a scientific and precise way.
C10	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance.
C11	Perform sequence alignment using different algorithms
C12	Write and evaluate biochemical reports

d. General and Transferable Skills

By the end of this program the graduate should be able to:

D1	Communicate clearly by verbal and written means.
D2	Manipulate computer program, online database, software and other Information Technology (IT) to get information and analyze the obtained research data.
D3	Practice self- assessment and learning needed for continuous professional development.
D4	Utilize different available information resources relevant to Biochemistry.
D5	Promote critical thinking, problem-solving and decision-making capabilities.
D6	Deal with obstacles and problems.
D7	Work effectively in a team and offer expertise and advice to others
D8	Develop creativity and time management abilities.
D9	Evaluate and criticize scientific work, literature and research data.
D10	Adopt ethical, legal, professional responsibilities and safety guidelines.
D11	Develop presentation skills, give seminars and defend thesis in public.
D12	Practice independent research on different tools for bioinformatics.
D13	Engage in useful scientific discussions
D14	Work in a team and acquire team leadership skills.
D15	Efficient time management.

3-Academic Reference Standards(ARS):

Approved by both the department and faculty councils

Department Council Approval Date: 14/12 /2021,

Faculty Council Approval Date: 14/12 /2021



3a- Academic References Standards: (Attached)

3b-Comparison of provision to External References

Achievement of academic reference standards via program Intended Learning Outcomes.

ILOs	ARS	Program
1. Knowledge and Understanding	1.1	A1, A2, A3
	1.2	A4, A5 ,A6
	1.3	A7, A8 A9
	1.4	A10,A11, A1
	1.5	A13,A14
	1.6	A15, A16
2. Intellectual Skills	2.1	B1, B2, B3, B4
	2.2	B5, B6, B7
	2.3	B8, B9
	2.4	B10, B11, B12
	2.5	B13, B14, B15
	2.6	B16, B17
	2.7	B18
3. Professional and Practical Skills	3.1	C7 ,C8, C9, C10
	3.2	C1, C2, C3, C4,C5 ,C6
	3.3	C11, C12, C13, C14
4. General and Transferable Skills	4.1	D1, D2
	4.2	D3, D4
	4.3	D5,D6
	4.4	D7
	4.5	D8,D9
	4.6	D10
	4.7	D11
	4.8	D12
	4.9	D13

4-Curriculum Structure and Contents

4A. Program duration: 18 months from the date of registration -5 years.

4B. Program structure:

a- The program consists of 46 credit hours of study (16 credit hours of courses and 30 credit hours for thesis).



b. The program includes 16 credit hours graduate courses. These courses include 8 credit hours of general required courses of the faculty requirement, in addition to 8 credit hours of special required (6 credit hours) and special elective (2 credit hours) courses. The courses will possess the code [200] according to Faculty By-Law.

c. A scientific research thesis of 30 credit hours represent a main component of the program. It is achieved in a subject assigned by the supervision committee, endorsed by the Department Council, the committee of graduate studies & research and the Faculty Council.

d. The student should publish at least one scientific research paper in scientific journals before the public defense of the Thesis.

4c. Program Components

1- Courses according to the By-law

Code number	Name of the course	Type	Credit Hours	Semester
(GCM-201)	<i>Instrumental Analysis</i>	General/Compulsory	2	Fall
(GCM-202)	<i>Statistics and biostatistics</i>	General/Compulsory	2	Fall
(GCM-203)	<i>Physical chemistry</i>	General/Compulsory	1	Fall
(GCM-204)	<i>Bioinformatics</i>	General/Compulsory	1	Fall
(GCM-205)	<i>Research Methodology & Ethics</i>	General/Compulsory	1	Fall
(GCM-206)	<i>Scientific writing and Seminar</i>	General/Compulsory	1	Fall
(PBM-201)	Advanced Biochemistry	Special/Compulsory	2	Spring
(PBM-202)	Clinical Biochemistry	Special/Compulsory	2	Spring
(PBM-203)	Advanced Molecular Biology	Special/Compulsory	2	Spring
(PBM-204)	Oncology and Tumor Markers	Special/elective	2	Spring
(PBM-205)	Biochemistry Laboratory Techniques	Special/elective	2	Spring
Total (Courses)			16	
	Thesis		30	



Total			46	
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2- Achievement of Program Intended Learning Outcomes via the courses

Course	C.H/ week	Program ILOs (by No.)			
		K.U*	IS**	P.P.S***	G.T.S****
General Courses (8C.H.)					
<i>Instrumental Analysis (GCM-201)</i>	2	A1, A4	B1, B2	C4,C5	D1, D3, D5
<i>Statistics and biostatistics (GCM-202)</i>	2	A1, A12	B1, B2, B7	C3	D1, D2, D3, D5
<i>Physical chemistry (GCM-203)</i>	1	A1	B1, B2, B13	C6	D1, D3, D5
<i>Bioinformatics (GCM-204)</i>	1	A1, A8, A9, A10	B1, B2, B4, B10, B11	C7, C11	D1, D3, D5, D9, D12, D13
<i>Research Methodology & Ethics (GCM-205)</i>	1	A5	B5	C4, C5, C10	D1, D3, D5, D10
<i>Scientific writing and Seminar (GCM-206)</i>	1	A7	B6, B7, B8, B9	C8, C9, C12	D1, D3, D5, D9, D11,D15
Total	8				
Special Courses (8 C.H.)					
Advanced Biochemistry (PBM-201)	2	A2, A3, A4, A13, A15, A17, A19	B3, B5, B6, B12, B14, B15, B16, B17, B18	C1, C2, C4, C5, C7, C10, C12	D1, D3, D4, D5, D6, D7, D8, D9, D10, D11, D14, D15
Clinical Biochemistry (PBM-202)	2	A2, A15, A17	B2, B3, B4, B9, B12	C2, C8, C12	D1, D2, D3, D4, D5
Advanced Molecular Biology (PBM-203)	2	A2	B2, B3, B4, B7, B9	C2, C8	D1, D2, D3, D4, D5
Oncology and Tumor Markers (PBM-204) (elective)	2(E)	A2, A3, A18, A19	B2, B3, B4, B5, B9	C4, C8	D1, D2, D3, D4, D5
Biochemistry Laboratory Techniques (PBM-205) (elective)	2(E)	A2, A3	B2, B3	C1, C2	D2, D8, D9
Total	8				



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
M. Sc. Program Specification
2021/2022
Postgraduate Studies



<u>Thesis</u>	30	A4, A5, A6, A11,A14,A16	B2, B3, B4, B5, B6, B7, B8, B9, B14, B15, B16, B17	C1, C3, C4, C5, C6, C7, C8, C9, C10	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D14
<u>Total</u>	46				

- * *Knowledge and Understanding*
- ** *Intellectual Skills*
- *** *Professional and Practical Skills*
- **** *General and Transferable Skills*



Code	Course title	K.U*																		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19
(GCM-201)	<i>Instrumental Analysis</i>	✓			✓															
(GCM-202)	<i>Statistics and biostatistics</i>	✓											✓							
(GCM-203)	<i>Physical chemistry</i>	✓																		
(GCM-204)	<i>Bioinformatics</i>	✓						✓	✓	✓										
(GCM-205)	<i>Research Methodology & Ethics</i>					✓														
(GCM-206)	<i>Scientific writing and Seminar</i>						✓													
(PBM-201)	<i>Advanced Biochemistry</i>		✓	✓	✓									✓				✓		✓
(PBM-202)	<i>Clinical Biochemistry</i>		✓													✓		✓		
(PBM-203)	<i>Advanced Molecular Biology</i>		✓															✓		✓
(PBM-204)	<i>Oncology and Tumor Markers(E)</i>		✓	✓	✓															
(PBM-205)	<i>Biochemistry Laboratory Techniques(E) Thesis</i>		✓	✓											✓		✓			



* *Knowledge and Understanding*
E Elective course

Code	Course title	IS**																		
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	
(GCM-201)	<i>Instrumental Analysis</i>	√	√																	
(GCM-202)	<i>Statistics and biostatistics</i>	√	√					√												
(GCM-203)	<i>Physical chemistry</i>	√	√											√						
(GCM-204)	<i>Bioinformatics</i>	√	√		√						√	√								
(GCM-205)	<i>Research Methodology & Ethics</i>					√														
(GCM-206)	<i>Scientific writing and Seminar</i>						√	√	√											
(PBM-201)	<i>Advanced Biochemistry</i>			√		√		√		√					√				√	√
(PBM-202)	<i>Clinical Biochemistry</i>		√	√	√	√				√			√							
(PBM-203)	<i>Advanced Molecular Biology</i>		√	√	√			√					√							
(PBM-204)	<i>Oncology and Tumor Markers(E)</i>		√	√	√	√		√					√							
(PBM-205)	<i>Biochemistry Laboratory Techniques(E)</i>		√	√	√															
	<i>Thesis</i>		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

** *Intellectual Skills*

E Elective course



Code	Course title	P.P.S***												
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	
(GCM-201)	<i>Instrumental Analysis</i>				√	√								
(GCM-202)	<i>Statistics and biostatistics</i>			√										
(GCM-203)	<i>Physical chemistry</i>						√							
(GCM-204)	<i>Bioinformatics</i>							√					√	
(GCM-205)	<i>Research Methodology & Ethics</i>				√	√						√		
(GCM-206)	<i>Scientific writing and Seminar</i>							√		√				√
(PBM-201)	<i>Advanced Biochemistry</i>	√	√		√	√					√			√
(PBM-202)	<i>Clinical Biochemistry</i>		√					√						√
(PBM-203)	<i>Advanced Molecular Biology</i>		√					√						
(PBM-204)	<i>Oncology and Tumor Markers(E)</i>				√			√						
(PBM-205)	<i>Biochemistry Laboratory Techniques(E)</i>	√	√											
	<i>Thesis</i>	√		√	√	√	√	√	√	√	√	√	√	√

Professional and **P**ractical Skills
Elective course



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
M.Sc. Program Specification
2021/2022
Postgraduate Studies



Code	Course title	G.T.S****															
		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	
(GCM-201)	<i>Instrumental Analysis</i>	√		√		√											
(GCM-202)	<i>Statistics and biostatistics</i>	√	√	√		√											
(GCM-203)	<i>Physical chemistry</i>	√		√		√											
(GCM-204)	<i>Bioinformatics</i>	√		√		√				√			√				
(GCM-205)	<i>Research Methodology & Ethics</i>	√		√		√						√					
(GCM-206)	<i>Scientific writing and Seminar</i>	√		√		√				√							√
(PBM-201)	<i>Advanced Biochemistry</i>	√	√	√	√	√	√			√		√				√	√
(PBM-202)	<i>Clinical Biochemistry</i>	√	√	√	√	√											
(PBM-203)	<i>Advanced Molecular Biology</i>	√	√	√	√	√											
(PBM-204)	<i>Oncology and Tumor Markers(E)</i>	√	√	√	√	√											
(PBM-205)	<i>Biochemistry Laboratory Techniques(E)</i>		√						√	√							
	<i>Thesis</i>	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

General and Transferable Skills
E Elective course



6- Student Assessment Methods

6.1- Written exam (special courses).	To assess Knowledge and Understanding and Intellectual Skills
6.2- Oral exam (special courses).	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
6.3- Scientific seminar for thesis registration	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
6.4- Published scientific research paper.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills
6.5- Thesis writing	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills
6.5- Public presentation and discussion of the thesis.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills

7- Program Admission Requirements

- 7.1- The candidate should hold a bachelor degree in pharmacy from any faculty of pharmacy from Egypt or Arabian countries or foreign universities recognized by the Supreme Council of Universities recognized by the Supreme Council of Universities with minimum general grade of "**Good**". Candidates having Diploma in the area of specialty are preferred. It is possible to enroll foreign students with general grade "**Good**".
- 7.2- The candidate should be available for study at least two days per week throughout the duration of study.
- 7.3- The candidate should possess at least grade "**Good**" in the subject of the specialty.
- 7.4- The department council starts the registration process for the candidate after his/her successful passing of the general courses of the first semester.
- 7.5- The candidate should follow postgraduate rules of by-law (2014) and its modified by-law (2017) of Faculty of Pharmacy-Mansoura University.

8-Regulations for progression and program completion

- 8.1- The minimum duration of time to gain the master degree is two years from the date of enrollment or 18 months from the date of registration of the master thesis.
- 8.2- The maximum duration of time to gain the master degree is 5 years from the date of registration, putting in consideration the periods of enrollment suspension. It is possible to



extend this period up to two years (one year at a time) based on a request from the candidate's major supervisor, a suggestion from the department council and the committee of graduate studies & research and the approval of the faculty council. The final decision should be endorsed by the university council of graduate studies & research.

- 8.3- The student has to pass the assigned courses, and to practically do a scientific research thesis for complete fulfillment of the M.Sc. degree.
- 8.4- An annual progress report is presented by the supervisors of Thesis to the DeptCouncil by December.
- 8.5- The candidate should follow postgraduate rules of by-law (2014) and its modified by-law (2017) of Faculty of Pharmacy-Mansoura University.

9-Facilities Required for Search:

- 9.1- Computers.
- 9.2- Library and digital library supplied by recent scientific books and journals.
- 9.3- Laboratories with enough chemicals, apparatus and advanced instruments.
- 9.4- Access to research engines for scientific periodicals in the field of Biochemistry.

10-Thesis

A thesis should be prepared by the student for complete fulfillment of the masterdegree.

11- Evaluation of program

Evaluator	Method	Sample
Internal evaluator	Program evaluation Courses evaluation	Program report Courses report
External evaluator	Program evaluation Courses evaluation	Program report Courses report
Stakeholders	Questionnaires	To be Attached
Postgraduates	Questionnaires	To be Attached
Self-evaluation	Matrices	To be Attached
Supervisors of Thesis	Reports	Reports of staff members of committee to evaluate the thesis



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
M. Sc. Program Specification
2021/2022
Postgraduate Studies



Program Coordinator: Ass. Prof. Dr. Mohamed El mesery

Head of Department: Ass. Prof. Dr. Mohamed El mesery

Signature:

Date: 8/11/2021,

Annex 1

Attach courses and thesis specifications.



Program: Master in Pharmaceutical Sciences
(Biochemistry)

Biochemistry Department

Master Thesis Specification

Academic Year: 2021/2022

رئيس القسم
أ.م.د/ محمد السيد المسيري

signature



A-Basic Information

1	Faculty	Pharmacy
2	Program Title:	Master in Pharmaceutical Sciences (Biochemistry)
3	Program Type:	Single
4	Department (s):	Biochemistry
	Total credits of the Thesis	42 C. H.
	Total credits of the Program	50 C.H.
5	Final award of the Program:	Master degree of Pharmaceutical Sciences (Biochemistry)
6	Coordinator:	Head of Department
7	External Evaluator(s):	Prof. Dr. Sahar El swefy
8	Date of Program Specification Approval:	<i>Department council: 8 / 11 /2021,</i> <i>Faculty council:</i>

B-Professional Information

1-Aims

The overall aims of the thesis:

- 1.1 Mastering of advanced knowledge, professional research skills, attitudes and values in the field of Biochemistry and integrating with the relevant subjects in his/her professional practice.
- 1.2 Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Clinical Biochemistry.
- 1.3 Master practical research procedures according to the good laboratory practice (GLP) basics in chemistry labs and perform experiments with safety guidelines.
- 1.4 Applying the scientific thinking approaches and problem based learning in fields of Clinical biochemistry.
- 1.5 Designing and conducting research projects.
- 1.6 Analyze and interpret results and information acquired from primary literature sources.



1.7 Manipulate computer program, online database, software and other IT skills to get information and analyze the obtained research data.

1.8 Attaining communication skills, research ethics, time management, decision-making, and team-working.

2-Intended Learning Outcomes (ILOs)

a- Knowledge and Understanding:

Upon successful completion of the thesis, the graduate should be able to efficiently demonstrate the essential knowledge and understanding of:

A4	a1	Utilize effectively all basic and recent techniques used in the field of advanced biochemical research/analysis.
A5	a2	Identify legal and ethical principles for conducting experiments using experimental animals and human volunteers.
A6	a3	Define the principles and the basics of quality in professional practice in the fields of Biochemistry.
A11	a4	Recognize fundamental and modern theories in biochemistry and other relevant subjects including clinical pathology and molecular biology.
A14	a5	Recognize recent research approaches in the medical and genetic fields.
A16	a6	Identify the effect of research in the field of biochemistry.

b- Intellectual Skills

By the end of this thesis, the graduate should be able to:

B2	b1	Demonstrate logic and critical way of thinking to suggest solutions for scientific and professional problems.
B3	b2	Demonstrate creativity and innovative scientific approaches regarding Biochemistry.
B4	b3	Utilize the available professional and scientific resources and research skills to solve problems.
B5	b4	Assess professional and scientific risks in Biochemical analysis.
B6	b5	Plan to improve performance and research in the field of Biochemistry.
B7	b6	Interpret and validate the data.
B8	b7	Recommend scientific decisions based on proofs, evidences and available data.
B9	b8	Participate in professional discussions and communications based on scientific evidences and proofs.
B14	b9	Integrate various aspects of biochemical analysis to suggest solutions for research and professional problems.
B15	b10	Design and conduct different research studies.
B16	b11	Professionally write scientific papers in the fields of biochemistry.



B17	b12	Assess scientific risks in practicing biochemical research.
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c- Professional and Practical Skills

By the end of this thesis, the graduate should be able to:

C1	c1	Collect, preserve, and store biological samples.
C3	c2	Apply various statistical methods for data analysis.
C4	c3	Develop different research methodologies and good experimental and reporting skills in biochemical analysis and prophylaxis of different diseases.
C5	c4	Manage safely and efficiently advanced techniques and equipment relevant to biochemical analysis research.
C6	c5	Outline and illustrate the calculations of obtained Data
C7	c6	Carry out scientific research and contribute to the knowledge in the field of Biochemistry.
C8	c7	Write accurately, evaluate professional reports and publish scientific research papers.
C9	c8	Write thesis in a scientific and precise way.
C10	c9	Illustrate the effect of his/her professional practice on the community.

d. General and Transferable Skills

By the end of this thesis, the graduate should be able to:

D1	d1	Communicate clearly by verbal and written means.
D2	d2	Manipulate computer program, online database, and software to get information and analyze the obtained research data.
D3	d3	Practice self- assessment and learning needed for continuous professional development.
D4	d4	Utilize different available information resources relevant to Biochemistry.
D5	d5	Promote critical thinking, problem-solving and decision-making capabilities.
D6	d6	Deal with obstacles and problems.
D7	d7	Work effectively in a team and offer expertise and advice to others
D8	d8	Develop creativity and time management abilities.
D9	d9	Evaluate and criticize scientific work, literature and research data.
D10	d10	Adopt ethical, legal, professional responsibilities and safety guidelines.
D11	d11	Develop presentation skills, give seminars and defend thesis in public.
D14	d12	Work in a team and acquire team leadership skills.



3- Thesis Contents:

Part	Topics
1	Abstract (Arabic and English)
2	Introduction
3	Aims, Objectives and Rational of the work
4	Results and Discussion, covering all fields
5	Methodology and Experimental Work of all fields
6	Conclusion
7	References

4- Matrix of knowledge and skills of the Thesis:

Part	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
2	Introduction	a4, a5, a6			
3	Objectives/Rational	a1,a2,a3	b1, b2, b3,b5,b10,b11	c1,c3,c6,c7,c8	d1,d4
4	Results and Discussion		b1, b2, b3,b6,b7.b8,b11	c2,c5,c7,c8	d1, d2
5	Experimental Work		b1,b3,b4,b9,b11,b12	c1, c3,c4	d1,d3,d5,d6,d7,d8,d10,d12
6	Conclusion		b3,b4,b9,b11	c3,c6,c7,c8,c9	d1,d9,d11

* Knowledge and Understanding **Intellectual Skills ***Professional and Practical Skills ****General and Transferable Skills

5. Student Assessment:

A written Thesis
Published Research Paper(s)
Public Defense
Committee-in-Charge Report
Dept Council Approval

Guidelines of the Thesis (according to By-Law).

- 1- The minimum period for obtaining a Master is two years from the date of enrolment and 18 months from the date of approval of the University's Graduate Studies Council for registration.
- 2- The maximum limit for obtaining a doctoral degree is five years from the date of registration, taking into account cases of suspension of registration, and registration may be extended upon the request of supervisors and the approval of the relevant department council, the Graduate Studies and Research Committee, and the College Board for an academic year with a maximum of two years.



Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Master Thesis Specification
2021/2022
Postgraduate Studies



- 3- The student must pass the English Language Examination with the minimum score specified by the University Studies Board to approve the Master defense date.
- 4- The number of credit hours for obtaining a master's degree is 46 hours (16 course hours - 30 credit hours per thesis). The student studies courses of at least 16 credit hours of postgraduate courses from code [200], including compulsory general courses (8 credit hours) as the college requirements and compulsory and optional specialized courses (8 credit hours).
- 5- The student conducts a research on a topic determined by the supervisory committee and approved by the relevant department council and the college, graduate studies and research councils.
- 6- The researcher submits, before registering for the academic degree, the research plan in a public discussion in the department to discuss the topic of the thesis, determine the objectives of the research, the extent of its application, potential problems and how to overcome them.
- 7- The scientific thesis is the responsibility of the relevant department council and is accomplished scientifically and technically under the responsibility of the supervisory committee. Scientific, technical and administrative support must be provided to the researcher for its completion, and the supervision committee is formed as follows:
 - 8- The College Council, upon the proposal of the relevant Department Council, appoints a professor who supervises the thesis (principal supervisor). The council may entrust the supervision of the thesis to one of the assistant professors.
 - 9- It is permissible for the supervisors to be many professors or assistant professors, and teachers may participate with a maximum of one in the same specialty.
 - 10- A member from abroad who has experience in the specialty to which the dissertation belongs may be joined to the supervision committee.
 - 11- The student should meet his main supervisor at least once monthly and a semi-annual report must be provided by the supervisor(s) on the progress of student to the department council and the Graduate Studies Committee and the graduate should be given a copy of the report. The annual report must be submitted to the college council in October each year.
 - 12- A postgraduate student registered to obtain a master's degree or a doctorate degree, after completing the thesis preparation, holds a public discussion session on the thesis summary and the results he reached, during which the supervisors determine the extent to which the student fulfills the research point before submitting the thesis to the department council.
 - 13- The principal supervisor submits an application that includes a proposal to form a discussion committee and judge the thesis after preparing it and preparing it for discussion in preparation for presentation to the Postgraduate Studies and Research Committee and then the College Board for approval and is supported by the following:
 - 14- The report on the validity of the dissertation for discussion, signed by the majority of the members of the supervisory committee, one of whom is the main supervisor.
 - 15- A copy of the thesis prepared according to the instructions for writing scientific theses in the faculty.
 - 16- At least one research published in a scientific refereed journal.
 - 17- The committee for discussion and judgment on the dissertation is formed of three members based on the proposal of the relevant department council, the graduate studies and research committee, and the approval of the college council, one of whom is the main supervisor or two members with one vote. And two other members from among the professors or assistant professors, at least one of them is from outside the college for master's theses, and at least one of them is from outside the university for doctoral



theses (the two are from outside the college) according to the text of Article 153 of the Universities Organization Law.

18- The department council approves the individual reports, the group report, and what indicates that the student has made the proposed amendments from the discussion and judgment committee and submitted them to the Graduate Studies and Research Committee and the College Board in preparation for presentation to the University Council.

19- The date of awarding the academic degree is the date on which the University Council approved the College Board's recommendation for grants.

20- The college council, based on the proposal of the discussion and judgment committee, may return the message to the student to correct the errors and complete what the committee deems short of or submit another message in case the thesis is rejected.

6 – Facilities Required:

Laboratory	Laboratories with enough chemicals, apparatus and advanced instruments.
Library	Library and digital library supplied by recent scientific books and journals.
Others	Computers

Thesis Coordinator	Head of Department	Date
Ass.Prof Dr. Mohamed El mesery	Ass.Prof Dr. Mohamed El mesery	8/11/2021

* Date of Dept. Council Approval: **Date of course specification approval: 8/11/2021**



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



Dept. Of Biochemistry	Course Specification	Master's degree in Pharmaceutical Sciences (Biochemistry)
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Master's degree in Pharmaceutical Sciences (Biochemistry)

Course Specification

Academic year: 2021/2022

البرنامج
ماجستير الكيمياء الحيوية

توصيف المقرر
كيمياء حيوية متقدمة
Advanced Biochemistry

رئيس القسم
أ.م.د. محمد المسيري

منسق المقرر
ا. د. امال محمد الجيار



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	----
Program on which the course is given	Master's degree in Pharmaceutical Sciences (Biochemistry)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	14/12/2021

A. Basic Information : Course data :

Course Title	Advanced Biochemistry
Course Code	BPM-201
Prerequisite	-----
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	0 عدد الساعات الزمنية
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

1. To provide comprehensive coverage of major metabolic pathways those take place in human body and the consequences of any defect in their action.
2. To learn the interrelationship between carbohydrates, lipid and protein metabolism.
3. To equip students with skills those are of value to future employment in some areas of biology

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



A2	a1	Define the principles of body function in health and diseases states as well as the etiology, epidemiology, laboratory diagnosis, clinical features of different diseases and their pharmacotherapeutic approaches.
A3	a2	Recognize the current problems, the recent and advanced scientific development in fields of Biochemical analysis.
A4	a3	Utilize effectively all basic and recent techniques and technological tools used in the field of advanced biochemical research/analysis.
A13	a4	Understand the concepts of the biosynthetic and metabolic pathways and their relation to a pathophysiology of diseases.
A15	a5	Identify the effect of research in the field of Clinical biochemistry, clinical pathology on community development.
A17	a6	Identify different diseases associated with metabolic disorders.
A19	a7	Understand the potential effect of vitamins in treating cancers

2.2. Intellectual Skills

After completion of the course, graduates will be able to

B3	b1	Demonstrate creativity and innovative scientific and professional approaches regarding Biochemistry.
B5	b2	Assess professional and scientific risks in Biochemical analysis.
B6	b3	Plan to improve performance and research in the field of Biochemistry.
B12	b4	Analyze and evaluate information in the fields of Clinical biochemistry and molecular biology.
B14	b5	Integrate different aspects of biochemical analysis, drug metabolism and pharmacokinetics to suggest solutions for research and professional problems.
B15	b6	Design and conduct research studies.
B16	b7	Professionally write scientific papers in the fields of Clinical biochemistry and molecular biology.
B17	b8	Assess professional and scientific risks in practicing biochemical research.
B18	b9	Suggest plans for enhancing performance in the field of Clinical biochemistry.



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

C1	c1	Collect, preserve, and store biological samples.
C2	c2	Apply the practical research to analyze blood sample constituents and interpret abnormal Laboratory data
C4	c3	Develop different research methodologies and good experimental and reporting skills in biochemical analysis, prophylaxis and management of different diseases.
C5	c4	Manage safely and efficiently advanced technological research tools and equipments relevant to biochemical analysis research.
C7	c5	Carry out scientific research and contribute to the knowledge in the field of Biochemistry.
C10	c6	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance.
C12	c7	Write and evaluate biochemical reports

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

D1	d1	Communicate clearly by verbal and written means.
D3	d2	Practice self- assessment and learning needed for continuous professional development.
D4	d3	Utilize different available information resources relevant to Biochemistry.
D5	d4	Promote critical thinking, problem-solving and decision-making capabilities.
D6	d5	Deal with obstacles and problems.
D7	d6	Work effectively in a team and offer expertise and advice to others.
D8	d7	Develop creativity and time management abilities.
D9	d8	Evaluate and criticize scientific work, literature and research data.
D10	d9	Adopt ethical, legal, professional responsibilities and safety guidelines.
D11	d10	Develop presentation skills, give seminars and defend thesis in public.
D14	d11	Work in a team and acquire team leadership skills.
D15	d12	Efficient time management



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



3. Course Contents

Week No.	Topics	Lecture Hours
1	Enzymes	2
2	Vitamins	2
3	Biological oxidation	2
4	Oxidative stress and antioxidants	2
5,6,7	Metabolism of carbohydrates and lipids	6
8,9	Amino acids and protein metabolism	4
10	Inflammation mediators	2
11,12	Body fluids (blood, breast milk, cerebrospinal fluid, semen and urine)	4
Total: 12 weeks		24

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S*****
1	Enzymes	a4,a6	b2, b4	c2,c7	d2,d3,d8
2	Vitamins	a1, a7	b3,b4	c2,c7	d1,d2,d3,d4
3	Biological oxidation	a1	b5,b6	c4,c5	d3,d4,d5
4	Oxidative stress and antioxidants	a1	b4,b5,b6	c4,c5	d6,d7,d8



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



5,6,7	Metabolism of carbohydrates and lipids	a4,a6	b5,b6,b8	c5,c6,c7	d3,d4, d5,d6,d7,d8
8,9	Amino acids and protein metabolism	a4,a6	b4,b6	c5,c6,c7	d1,d2,d5, d11,d12
10	Inflammation mediators	a1	b2,b3,b6	c1,c2,c3	d4,d5, d11,d12
11,12	Body fluids (blood, breast milk, cerebrospinal fluid, semen and urine)	a1,a3	b3,b4,b5	c1,c2,c3,c4	d1,d2,d3,d4, d5,d6,d7,d8

* Knowledge and Understanding
 Practical Skills

**Intellectual Skills

***Professional and

****General and Transferable Skills

5- Teaching and Learning Methods:

5.1	Lectures using Power Point (PPT) presentations
5.2	Video-recorded lectures, uploaded to the University Portal for Online learning

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	Written Exam (Final)	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 15	90%
Assessment 2	Oral Exam	To assess understanding, intellectual skills, General and Transferable skills	Week 15	10%
				100 %



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Advanced Biochemistry Course
Specification



7- List of References

	Reference	Type
1.	Lippincott's Illustrated Reviews: Biochemistry. Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier; 6th edition-2014.	Books
2.	Harper's Biochemistry. Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell 29th edition-2012.	Books

8- Facilities required for teaching and learning

- **Computers**
- **Library supplied by recent scientific books and journals.**

9. Signature

Course Coordinator	Head of Department	Date
Prof.Dr. Amal Mohamed El-Gayar	Assis.Prof . Mohamed El-Mesery	14/12/2021

* Date of Dept. Council Approval:
14/12/2021



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



Dept. Of Biochemistry	Course Specification	Master's degree in Pharmaceutical Sciences (Biochemistry)
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Master's degree in Pharmaceutical Sciences (Biochemistry)

Course Specification

Academic year: 2021/2022

البرنامج
ماجستير الكيمياء الحيوية

توصيف مقرر
كيمياء حيوية اكلينيكية
Clinical Biochemistry

رئيس القسم
أ.م.د. محمد المسيرى

منسق المقرر
أ.د. ليلي أحمد عيسى



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	----
Program on which the course is given	Master's degree in Pharmaceutical Sciences (Biochemistry)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	14/12/2021

A. Basic Information : Course data :

Course Title	Clinical Biochemistry
Course Code	BPM-202
Prerequisite	-----
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	0 عدد الساعات الزمنية
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

- a. Mastering of advanced knowledge, professional research skills, attitudes and values in the field of Biochemistry and integrating with the relevant subjects in his/her professional practice.
- b. Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Biochemistry.
- c. Master practical research procedures according to the good laboratory practice (GLP) basics in chemistry labs and perform experiments with safety guidelines.
- d. Applying the scientific thinking approaches and problem based learning in fields of Clinical biochemistry.
- e. Formulating hypotheses based on current concepts in Clinical Biochemistry field.

- Intended Learning Outcomes (ILOs)



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



2.1. Knowledge and Understanding

After completion of the course, graduates will be able to

A2	a1	Define the principles of body function in health and diseases states as well as the etiology, epidemiology, laboratory diagnosis, clinical features of different diseases and their pharmacotherapeutic approaches.
A15	a2	Identify the effect of research in the field of Clinical biochemistry, clinical pathology on community development.
A17	a3	Identify different diseases associated with metabolic disorders.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

B2	b1	Demonstrate logic and critical way of thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes.
B3	b2	Demonstrate creativity and innovative scientific and professional approaches regarding Biochemistry.
B4	b3	Utilize the available professional and scientific resources and research skills to solve problems.
B9	b4	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs.
B12	b5	Analyze and evaluate information in the fields of Clinical biochemistry and molecular biology.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

C2	c1	Apply the practical research to analyze blood sample constituents and interpret abnormal Laboratory data.
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Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



C8	c2	Write accurately, evaluate professional reports and publish scientific research papers in scientific journals and conferences.
C12	c3	Write and evaluate biochemical reports.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

D1	d1	Communicate clearly by verbal and written means.
D2	d2	Manipulate computer program, online database, software and other Information Technology (IT) to get information and analyze the obtained research data.
D3	d3	Practice self- assessment and learning needed for continuous professional development.
D4	d4	Utilize different available information resources relevant to Biochemistry.
D5	d5	Promote critical thinking, problem-solving and decision-making capabilities.

3. Course Contents

Week No.	Topics	Lecture Hours
1	Water, electrolytes and hydrogen ion disorders,	1
2	Respiratory disorders	1
3	Disorders of kidney and urinary tract.	2
4	Cardiovascular disorders	1
5	Hormonal disorders	2
6	Porphyryns, bile pigments and jaundice.	1
7	Plasma proteins and pancreatic disorders.	1
8	Hepatobiliary disorders.	1
9	Disorders of carbohydrate metabolism.	4
10	Disorders of amino acids and protein metabolism and collagen diseases.	3
11	Disorders of lipid metabolism.	2



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



12	Disorders of nucleic acids.	1
13	Disorders of minerals and trace elements.	2
Total: 12 weeks		22

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Water, electrolytes and hydrogen ion disorders,	a1,a2	b1, b4, b5	c1,c3	d2,d3
2	Respiratory disorders	a1	b2, b3	c1,c2,c3	d1,d2,d3,d4
3	Disorders of kidney and urinary tract.	a1	b3, b4, b5	c2,c3	d1,d2
4	Cardiovascular disorders.	a1,a2	b1, b2	c1,c2	d3,d4,d5
5	Porphyryns, bile pigments and jaundice.	a1,a3	b2, b5	c1,c2,c3	d1,d3,d4
6	Gastrointestinal and pancreatic disorders.	a1,a2	b3, b4, b5	c1,c3	d4,d5
7	Hepatobiliary disorders.	a1,a3	b1, b2, b3	c1 ,c3	d1, d5



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



8	Disorders of carbohydrate metabolism.	a1,a3	b1,b2,b3, b4, b5	c1,c2,c3	d2,d3,d4
9	Disorders of amino acids and protein metabolism.	a1,a3	b1,b2,b3, b4, b5	c1,c2,c3	d1 ,d4
10	Disorders of lipid metabolism.	a1,a3	b1,b2,b3, b4, b5	c1,c2,c3	d1,d2,d3,d4,d5
11	Disorders of nucleic acids.	a1,a3	b3, b4, b5	c1,c2	d2,d3
12	Disorders of minerals and trace elements.	a1,a3	b3, b5	c2,c3	d1,d4,d5

- * Knowledge and Understanding
- **Intellectual Skills
- ***Professional and Practical Skills
- ****General and Transferable Skills

5- Teaching and Learning Methods:

5.1	Lectures using Power Point (PPT) presentations
5.2	Video-recorded lectures, uploaded to the University Portal for Online learning
5.3	Seminars
5.4	Self-learning

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	Written Exam (Final)	Paper exams that are corrected electronically and/or manually.	Week 14	90%



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Clinical Biochemistry Course
Specification



		To assess understanding, intellectual, professional skills		
Assessment 2	Oral Exam	To assess understanding, intellectual skills, General and Transferable skills	Week 14	10%
				100 %

7- List of References

	Reference	Type
1.	Lippincott's Illustrated Reviews: Biochemistry. Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier; 7th edition-2017.	Books
2.	Clinical Biochemistry, Peter Rae, Mike Crane, Rebecca Pattenden, 10th Edition-2017	Books

8- Facilities required for teaching and learning

- **Computers**
- **Library supplied by recent scientific books and journals.**

9. Signature

Course Coordinator	Head of Department	Date
Prof.Dr. Laila Ahmed Eissa	Ass.Prof . Mohamed El-Mesery	14/12/2021



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical Sciences
(Biochemistry)
Advanced Molecular Biology
Course Specification



Dept. of Biochemistry	Course Specification	Master degree in Pharmaceutical Sciences (Biochemistry)
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Master degree in Pharmaceutical Sciences (Biochemistry)

Course Specification

Academic year: 2021/2022

البرنامج
ماجستير الكيمياء الحيوية

توصيف مقرر
بيولوجيا جزيئية متقدمة
Advanced Molecular Biology

القائم بأعمال رئيس القسم
د. محمد المسيري

منسق المقرر
أ.د. ممدوح محمد الششتاوي



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical Sciences
(Biochemistry)
Advanced Molecular Biology
Course Specification



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	Biochemistry
Program on which the course is given	Master degree in Pharmaceutical Sciences (Biochemistry)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	14/12/2021

A. Basic Information : Course data :

Course Title	Advanced Molecular Biology	
Course Code	BPM-203	
Prerequisite	-----	
Teaching Hours: Lecture	2	عدد الساعات الزمنية
Practical:	0	عدد الساعات الزمنية
Total Credit Hours	2	

B. Professional Information

1- Overall Aims of Course:

1. To know nucleic acid-protein interaction.
2. To know regulation of gene expression, mutation and silencing.
3. To identify molecular biology techniques: recombinant DNA and microarrays.
4. To know phenotyping.

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to-

A8	a1	Understand the importance of DNA and protein sequencing and alignment in biology and drug discovery.
A11	a2	Recognize fundamental and modern theories in biochemistry and other relevant subjects including clinical pathology, molecular biology, physical pharmacy and pharmacokinetics.
A14	a3	Recognize recent research approaches in the medical, genetic and environmental fields.



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical Sciences
(Biochemistry)
Advanced Molecular Biology
Course Specification



2.2. Intellectual Skills

After completion of the course, graduates will be able to-

B2	b1	Demonstrate logic and critical way of thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes
B3	b2	Demonstrate creativity and innovative scientific and professional approaches regarding Biochemistry
B4	b3	Utilize the available professional and scientific resources and research skills to solve problems.
B7	b4	Interpret and validate the obtained research data
B9	b5	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to-

C2	c1	Apply the practical research to analyze blood sample constituents and interpret abnormal Laboratory data
C8	c2	Write accurately, evaluate professional reports and publish scientific research papers in scientific journals and conferences.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to-

D1	d1	Communicate clearly by verbal and written means.
D2	d2	Manipulate computer program, online database, software and other IT to get information and analyze the obtained research data
D3	d3	Practice self-assessment and learning needed for continuous professional development.
D4	d4	Utilize different available information resources relevant to Biochemistry.
D5	d5	Promote critical thinking, problem-solving and decision-making capabilities.



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical Sciences
(Biochemistry)
Advanced Molecular Biology
Course Specification



3. Course Contents

Week No.	Topics	Lecture Hours
1	Nucleic acid–protein interaction	2
2	Gene expression: methodology	2
3	Gene expression: microarrays	2
4	Regulation of gene expression	2
5	Gene silencing	2
6	Gene mutation	2
7	Genomic biology	2
8	Positional cloning	2
9	Molecular biology techniques: Recombinant DNA.	2
10	Cloning of DNA molecules	2
11	Application of DNA cloning.	2
12	Phenotyping.	2
Total: 12 weeks		24

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S***	G.T.S****
1	Nucleic acid–protein interaction	a1	b1, b5	c1, c2	d2,d3,d4
2	Gene expression: methodology	a1	b3, b4,b5	c1, c2	d1,d2
3	Gene expression: microarrays	a1	b1, b2, b3	c1, c2	d3,d4,d5,



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical Sciences
(Biochemistry)
Advanced Molecular Biology
Course Specification



7- List of References

	Reference	Type
1.	Molecular Biology: David P. Clark, Nanette J. Pazdernik and Michelle R. McGehee, 3 rd edition 2019, Elsevier.	Book
2.	Advanced methods in molecular biology and biotechnology: Khalid Z. Masoodi, Sameena Maqbool Lone, Rovidha Saba Rasool, 1 st edition 2020 Elsevier.	Book

8- Facilities required for teaching and learning

- **Computers**
- **Library supplied by recent scientific books and journals.**

9. Signature

		Signature
Course Coordinator	Prof. Dr. Mammdouh M. El-Shishtawy	
Acting Head of Department	Dr. Mohamed El-Mesery	

Date of course specification approval: 14/12/2021



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



Dept. Of Biochemistry	Course Specification	Master's degree in Pharmaceutical Sciences (Biochemistry)
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Master's degree in Pharmaceutical Sciences (Biochemistry)

Course Specification

Academic year: 2021/2022

البرنامج
ماجستير الكيمياء الحيوية

توصيف مقرر
التقنيات المعملية للكيمياء الحيوية
Biochemistry Laboratory Techniques

القائم بأعمال رئيس القسم
أ.م.د. محمد المسيري

منسق المقرر
أ.م.د. محمد المسيري



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	----
Program on which the course is given	Master's degree in Pharmaceutical Sciences (Biochemistry)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	14/12/2021

A. Basic Information : Course data :

Course Title	Biochemistry Lab Technique
Course Code	BPM-205
Prerequisite	-----
Teaching Hours: Lecture	2 عدد الساعات الزمنية
Practical:	0 عدد الساعات الزمنية
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

- 1-Enable the student to understand the basic principles of various techniques used in molecular biology and biochemical experiments.
- 2 - Teach the students how to analyze data and interpret results from various techniques
- 3- Train the students to perform practical biochemical experiments

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to

A2	a1	Recall the basic principles of molecular biology and tissue culture techniques
A3	a2	Understand the methods required for analyzing biological molecules.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

B2	t	Implement good laboratory practice and guidelines in pharmacy practice.
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Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



B3	D t	Design appropriate methods of analysis of biological molecules and molecular biology
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2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

C1	c1	Determine the proper and safe dispersing of chemicals and pharmaceutical preparations.
C2	c2	Utilise the appropriate methods for extraction, isolation, synthesis, purification, identification and/or standardization of active substances from different origins and for effective and safe dispensing, labeling, storing and distributing of chemicals and biochemical agents.
C3	c3	Apply techniques used in operating pharmaceutical equipments and instruments.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

D2	d1	Use numeric calculation and statistical methods as well as information technology tools.
D8	d2	Present information clearly in written, electronic and oral forms and communicate ideas and arguments effectively.
D9	d3	Understand ethical, legal and safety guidelines.

3. Course Contents

Week No.	Topics	Lecture Hours
1	Introduction to molecular biology and use of computer and internet for research.	2
2	General Laboratory Procedures: accurate measurements, pH metery and sample storage, Centrifugation Techniques	2



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



3	Characterization of Proteins and Nucleic Acids by Electrophoresis	2
4	Western blot technique	2
5	Immuno-techniques: ELISA	4
6-7	Tissue Culture methods	4
8-9	Polymerase chain reaction and cloning	4
10-12	Protein expression and purification methods	4
Total: 12 weeks		24

4- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Week	Topics	Course ILOs			
		K.U*	IS**	P.P.S****	G.T.S*****
1	Introduction to molecular biology and use of computer and internet for research.	a1,a2	b1	c1,c2	d1
2	General Laboratory Procedures: accurate measurements, pH metery and sample storage, Centrifugation Techniques	a1,a2	b1	c1,c2	d1
3	Characterization of Proteins and Nucleic	a2	b1,b2	c1,c2,c3	d1,d2



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



	Acids by Electrophoresis				
4	Western blot technique	a2	b1,b2	c1,c2,c3	d1,d2,d3
5	Immuno-techniques: ELISA	a2	b1,b2	c1,c2,c3	d1,d3
6-7	Tissue Culture methods	a1,a2	b1	c1,c2,c3	d1,d2
8-9	Polymerase chain reaction and cloning	a1,a2	b1	c1,c2,c3	d1,d2,d3
10-12	Protein Expression and purification methods	a1,a2	b1,b2	c1,c2,c3	d2,d3

** Knowledge and Understanding Practical Skills*

***Intellectual Skills*

****Professional and*

*****General and Transferable Skills*

5- Teaching and Learning Methods:

5.1	Lectures using Data Show and Power point presentation
5.2	Video-recorded lectures, uploaded to the University Portal for Online learning

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	Written Exam (Final)	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 14-15	90%



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Biochemistry Laboratory Techniques
Course Specification



Assessment 2	Oral Exam	To assess understanding, intellectual skills, General and Transferable skills	Week 14-15	10%
				100 %

7- List of References

	Reference	Type
1.	Current protocols in molecular biology. Frederick Ausbell. Wiley-Blackwell	Books
2.	Gene cloning and DNA analysis by TA Brown . Wiley-Blackwell	Books

8- Facilities required for teaching and learning

- Library supplied by recent scientific books and journals.
- Smart lecture rooms provided with Data show
- Access to research engines for scientific periodicals.
- Chemical reagents, chemical kits and lab equipment

9. Signature

Course Coordinator	Head of Department	Date
Ass.Prof.Dr. Mohamed El-Mesery	Ass.Prof .Dr. Mohamed El-Mesery	14/12/2021

* Date of Dept. Council Approval: 14/12/2021



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



Dept. Of Biochemistry	Course Specification	Master's degree in Pharmaceutical Sciences (Biochemistry)
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Master's degree in Pharmaceutical Sciences (Biochemistry)

Course Specification

Academic year: 2021/2022

البرنامج
ماجستير الكيمياء الحيوية

توصيف مقرر
الأورام ودلالاتها
Oncology and tumor markers

القائم بأعمال رئيس القسم
أ.م.د. محمد المسيري

منسق المقرر
رئيس القسم



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	----
Program on which the course is given	Master's degree in Pharmaceutical Sciences (Biochemistry)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	14/12/2021

A. Basic Information : Course data :

Course Title	Oncology and tumor markers	
Course Code	BPM-204	
Prerequisite	-----	
Teaching Hours: Lecture	2	عدد الساعات الزمنية
Practical:	0	عدد الساعات الزمنية
Total Credit Hours	2	

B. Professional Information

1- Overall Aims of Course:

- 1- Study the functional state of liver, kidney, heart, bone, GIT and endocrine glands.
- Study the interpretation of the results in relation to health and disease.
- Develop the ability to select chemical investigation those are appropriate to the diagnosis of disease and for the management of treatments.
- Study the different tumor markers and their importance in diagnosis and follow up of different types of cancer.
- Maintain a responsible and critical attitude in the use of the diagnostic services provided by Clinical Biochemistry and Laboratory based specialists.
- Study the difference between normal and cancer cells and the etiology of carcinogenesis.

2- Intended Learning Outcomes (ILOs)

2.1. Knowledge and Understanding

After completion of the course, graduates will be able to



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



A2	a1	Define the principles of body function in health and diseases states as well as the etiology, epidemiology, laboratory diagnosis, clinical features of different diseases
A3	a2	Recognize the current problems, the recent and advanced scientific development in fields of Biochemical analysis.
A18	a3	Define the basic terms of oncology
A19	a4	Understand the potential effect of vitamins in treating cancers

2.2. Intellectual Skills

After completion of the course, graduates will be able to

B2	b1	Demonstrate logic and critical way of thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes.
B3	b2	Demonstrate creativity and innovative scientific and professional approaches regarding Biochemistry.
B4	b3	Utilize the available professional and scientific resources and research skills to solve problems.
B5	b4	Assess professional and scientific risks in Biochemical analysis.
B9	b5	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

C4	c1	Develop different research methodologies and good experimental and reporting skills in biochemical analysis, prophylaxis and management of different diseases.
C8	c2	Write accurately, evaluate professional reports and publish scientific research papers in scientific journals and conferences.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

D1	d1	Communicate clearly by verbal and written means.
D2	d2	Manipulate computer program, online database, software and other Information Technology (IT) to get information and analyze the obtained research data.



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



D3	d3	Practice self- assessment and learning needed for continuous professional development.
D4	d4	Utilize different available information resources relevant to Biochemistry.
D5	d5	Promote critical thinking, problem-solving and decision-making capabilities.

3- Matrix of knowledge and skills of the course (contents versus ILOs of the course)

Topics	Course ILOs			
	K.U*	IS**	P.P.S***	G.T.S*****
Introduction to molecular biology and use of computer and internet for research.	a1,a2	b1	c1,c2	d2,d3
Introduction	a1,a2	b1,b2,b3	c1,c2	d1,d2, d5
Cancer biology.	a3	b1,b2	c1	d3,d4,d5
Cell cycle.	a1,a4	b2,b3,b4,b5	c1,c2	d2,d3
The ideal tumor marker and its purpose, Classification of tumor markers	a2,a3	b1	c2	d1,d2
Oncofetal proteins	a2	b1,b2	c1,c2	d2,d3,d4
Hormones, Enzymes	a4	b1,b5	c1,c2	d2
Tumor-associated antigens, Special proteins	a3,a4	b1,b2,b3	c1	d4,d5
Tissue-bound receptors.	a1	b1,b5	c1	d1,d2,d3
Cytokines and chemokines.	a3	b1,b2	c1,c2	d1,d2
Genes and Miscellaneous markers.	a4	b2,b3	c1	d3,d4,d5



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



Biological factors that affect serum concentrations of tumor markers.	a1,a2,a3	b1,b2,b5	c1,c2	d1
Tumor markers use and relation with tumors.	a1,a4	b1,b5	c1,c2	d1,d2

* *Knowledge and Understanding*

***Intellectual Skills*

****Professional and Practical Skills*

*****General and Transferable Skills*

4- Teaching and Learning Methods:

5.1	Lectures using white board and data show.
5.2	Case study.

5- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	Written Exam (Final)	Paper exams that are corrected electronically and/or manually. To assess understanding, intellectual, professional skills	Week 13	90%
Assessment 2	Oral Exam	To assess understanding, intellectual skills, General and Transferable skills	Week 13	10%
				100 %

6- List of References

	Reference	Type
1.	Lippincott's Illustrated Reviews: Biochemistry. Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier; 7th edition-2018.	Books



Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master's degree in Pharmaceutical
Sciences (Biochemistry)
Oncology and tumor markers Course
Specification



2.	Harper's Biochemistry. Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell 31st edition-2018.	Books
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7- Facilities required for teaching and learning

- **Library supplied by recent scientific books and journals.**
- **Smart lecture rooms provided with Data show**

8-Signature

Course Coordinator	Head of Department	Date
Head of Department	Ass.Prof .Dr. Mohamed El-Mesery	14/12/2021

* Date of Dept. Council Approval: 14/12/2021