M S in Pharmaceutical Sciences (Pharmacology and Toxicology)

Academic Reference Standards (ARS)

(Department Council Approval on May 2022 and Faculty Council Approval on May 2022)

I. Attributes of the graduate:

The graduates of the Master Degree of Pharmaceutical Sciences (pharmacology and Toxicology) should be capable of:

- Applying the basics and methodologies of scientific research and manipulating its various tools in the field of Pharmacology.
- Mastering of advanced knowledge, professional research skills, attitudes and values in the field of pharmacology and pathophysiology and integrating with the relevant subjects in his/her professional practice.
- Recognizing the current issues in drug discovery and/their different actions.
- Adopting the scientific thinking approaches in subjects relevant to drug uses in variable organs diseases.
- Identifying and solving problems in the field of pharmacotherapy and pharmacogenomics.
- 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 principles and fundamentals of pharmacology and other related fields.

1.2 Recognize the recent and advanced scientific evaluations tools in the field of drug use and discovery.

1.3 Recall basics of pharmacotherapy, pathophysiology and pharmacogenomics.

1.4 Distinguish the value of ethics and legal issues of research and professional practice in pharmacology.

1.5 Identify principles and fundamentals of professional practice in the field of pharmacology and therapeutics.

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 pharmacology.

2.2 Deduce solutions for specialized problems in absence of given information.

2.3 Integrate information to solve professional problems.

2.4 Develop methodological of scientific studies upon design of research protocols.

2.5 Assess risk related to professional practice.

2.6 Plan for development in pharmacy and pharmacology.

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 pharmacology and related fields.

3.2 Assess methods and techniques used in drug discovery and evaluation.

3.3 Write and evaluate professional research reports in pharmacology.

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.

4.9 Show awareness of ethics and legal issues of research and professional practice in pharmacology.

(Department Council Approval on May 2022 and
Faculty Council Approval on May 2022)

Dept. of Pharmacology and Toxicology	Course Specification	Master courses

Biostatistics Master courses
Course Specification
Academic year: 2021/2022

البرنامج **ماجستير**	**توصيف مقرر** **الاحصاء الحيوي-1** **Biostatistics**
رئيس القسم **أ د. غادة محمد صديق**	**منسق المقرر** **د/ داليا حسن الكاشف**

Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Toxicology and Forensic chemical analysis Diploma Program
Molecular and biochemical Toxicology-1 Course Specification

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	----
Program on which the course is given	Master courses
Academic Level	Postgraduate
Academic year	2021/2022 - First semester
Date of course specification approval	12/2021

A.Basic Information : Course data :

Course Title	Biostatistics
Course Code	PHD-101
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	0
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

This course is designed to help students to make interpretation of any data using statistical analysis. Also the student can determine different methods of sampling, handle the results of different experimental and research studies using suitable statistical techniques.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Recognize the important role of biostatistics in biomedical science.
a 2	Determine different methods of sampling.
a3	Show ability to organize data for appropriate statistical analysis and calculation

2.2. Intellectual Skills

After completion of the course, graduates will be able to

b1	Differentiate between types of variables.
b2	Interpret dispersion of data around the mean

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Understand basic concepts of probability and statistics
c2	Interpret results from applied tests of significance.
c3	Learn how to handle the results of different experimental and research studies using appropriate statistical techniques.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Have competence in background mathematics.
d2	Use information technology tools by learning about different statistics softwares.

3. Course Contents

Week No.	Lecture Topics	Hours
1	**Introduction (definition of Biostatistics, types, methods of data collection and methods of data presentation)**	2
2	**Measures of central tendency& dispersion**	2
3	**Correlation and regression**	2
4	**Chi square test**	2
5	**Student "t " test**	2
6	**Sampling**	2
7	**One way ANOVA**	2
8	**Two-way ANOVA**	2
9	**Applications on prism software**	**2**
Total: 9 weeks		**18**

1- 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 (definition of Biostatistics, types, methods of data collection and methods of data presentation)**	a1	b1	c1, c2	d1
2	**Measures of central tendency& dispersion**	a2	b1	c1, c2, c3	d2
3	**Correlation and regression**	a3	b1	c1, c2, c3	d1, d2
4	**Chi square test**	a3	b1	c1, c2, c3	d1, d2
5	**Student "t " test**	a3	b1	c1, c2, c3	d1, d2
6	**Sampling**	a3	b1	c1, c2, c3	d1, d2
7	**One way ANOVA**	a3	b2	c1, c2, c3	d1, d2
8	**Two-way ANOVA**	a3	b2	c2,c3	d1, d2
9	**Applications on prism software**	a3	b2	c2,c3	d1, d2

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

5- Teaching and Learning Methods:

	Lectures using white board.
	Lectures using power point and data show.

6- Student Assessment:

	Assessment Methods		Assessment Schedule	Weighing of Assessments
Assessment 1	**Written Exam (Final)**	**To assess knowledge, understanding and intellectual thinking**	weeks 11	80%
Assessment 2	**Oral Exam**	**To assess knowledge, understanding and intellectual thinking, self-presentation and confidence**	weeks 11	20%

7- List of References

	Reference	Type

1.	Aviva, P. (2005): Medical Statistics at a Glance, Blackwell Company, 2nd, ed., Philadelphia	book
2.	Lectures notes prepared by staff members	**Course notes**

8- Facilities required for teaching and learning

-Class room	Smart lecture rooms provided with Data show
- Library	Supplied by recent scientific books and journals.
- Others	Access to research engines for scientific periodicals.

9. Signature

Course Coordinator	Head of Department	Date
Dr. Dalia Hassan El-Kashef	**Prof Dr. Ghada M. Suddek**	12/2021

* Date of Dept. Council Approval

Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Msc in Pharmaceutical Sciences (Pharmacology and Toxicology) Program
Drug discovery and evaluation
Course Specification

Dept. of Pharmacology and Toxicology	Course Specification	Msc in Pharmaceutical Sciences (Pharmacology and Toxicology)

M.S. in Pharmaceutical Sciences (Pharmacology)

Course Specification

Academic year: 2021/2022

البرنامج	توصيف مقرر
ماجستير الادوية والسموم	Drug discovery and evaluation اكتشاف الدواء و تقييمه

رئيس القسم	منسق المقرر
أ د. غادة محمد صديق	أ.م.د. منار جمال عبد الحميد هلال

Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Msc in Pharmaceutical Sciences
(Pharmacology and Toxicology)
Program
Drug discovery and evaluation
Course Specification

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	Pharmacology and Toxicology
Program on which the course is given	Master in Pharmacology and Toxicology
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11-1-2022

A.Basic Information : Course data :

Course Title	Drug Discovery and Evaluation
Course Code	PHM 203
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	--
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

The course covers different techniques applied for discovery, screening and bioassay of new drugs belongs to different pharmacological categories.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	List methods used to reduce biological variability during a screening procedure
a2	Describe the different preliminary tests used for blind screening of a new substance
a3	State various techniques for screening and evaluation of different pharmacological classes (drugs affecting the autonomic nervous system, cardiovascular system, central nervous system, analgesics, anti-inflammatory drugs….etc.).
a4	Describe different techniques for screening and bioassay of different hormones (pituitary, thyroid, parathyroid, adrenal, pancreatic and sex hormones).
a.5	Describe different statistical tests used for biological evaluation.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

b1	Classify different pharmacologically acting substances.
b2	Relate the importance of screening procedures to the discovery of new pharmacological agents.
b3	Outline the main steps in screening and biological standardization of different hormonal-like substances based on their physiological function or toxic effects.
b4	Compare the potency of the test and standard preparations used in bioassay procedures based on the statistical results.
b.5	Analyze critically the data derived from laboratory and clinical observations and measurements.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Gather information; make logical deductions and critical decisions
c2	Test statistical significance of experimental findings.
c3	Design and conduct complete experimental protocols for biological standardization of different compounds, beginning from problem-recognition to evaluation of results and findings

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Implement writing skills through written examinations.
d2	Communicate clearly by verbal means through group discussions and oral presentations
d3	Retrieve and evaluate information from different sources
d4	Demonstrate critical-thinking abilities
d.5	Use information technology tools

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Screening and bioassay of autonomic acting drugs	2	

2	Screening and bioassay of drugs used in treatment of heart failure	2	
3	Screening and bioassay of anti-arrhythmic drugs Screening and bioassay of antihypertensive drugs	2	
4	Screening and bioassay of analgesic drugs	2	
5-6	Screening and bioassay of drugs affecting inflammatory diseases, rheumatoid arthritis and immunity	4	
7-12	introduction to drug Evaluation Drug discovery- Immunohistochemistry- ELISA and PCR- Drug receptor interaction- Evaluation of drug at biological system- Evaluation of drug affecting blood vessles Evaluation of drug affecting Kidney Evaluation of drug Against Oxidative stress Evaluation of drug affecting Lung Inflammatory pathways and markers	10	
Total: 12 weeks		**22**	**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	Screening and bioassay of autonomic acting drugs	a1, a2, a3, a4	b1,b4	c1, c2	d1,d2
2	Screening and bioassay of drugs used in treatment of heart failure	a1, a3	b4,b5	c1, c2	D2,d4
3	Screening and bioassay of anti-arrhythmic drugs Screening and bioassay of antihypertensive drugs	a1, a3	b4,b5	c1, c3	d1,d2
4	Screening and bioassay of analgesic drugs	a1, a2, a3	b4,b5	c1, c2	d1,d3
5	Screening and bioassay of drugs affecting inflammatory diseases, rheumatoid arthritis and immunity	a1, a2, a3	b4,b5	c1, c3	d1,d4
6	Introduction to drug Evaluation Drug discovery- Immunohistochemistry-				d1,d2, d3, d4, d5

	ELISA and PCR- Drug receptor interaction- Evaluation of drug at biological system- Evaluation of drug affecting blood vessles Evaluation of drug affecting Kidney Evaluation of drug Against Oxidative stress Evaluation of drug affecting Lung Inflammatory pathways and markers	a1, a2, a3, a5	b2, b3, b5	c1, c2, c3	

** 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	**Lectures using whiteboard**
	Video-recorded lectures, uploaded to the University Portal for Online learning
	Activities and **tasks required to develop students' self-learning skills**.
	Tutorial, **Class Activity** and **Group Discussion** to explain what has not been understood
	Interactive Sessions using Microsoft Teams
	Internet search and Research Assignments to design **Formative Assignments**
	Practical Training / Laboratory
	Seminar / Workshop
	Case study
	Role play

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		90 mark
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills		10 mark
				100 %

7- List of References

	Reference	Type
1.	An Introduction to Medicinal Chemistry. 6th Edition, By Graham L. Patrick (Author) **Publisher: Oxford University Press, Oxford; 2017**	Essential Book **(Text Books)**
2.	http:// www.fda.gov http://www.drugs.com http://www.eda.mohp.gov.eg	websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
- Laboratory facilities	**Microscopes, equipment, tools** …….
- Library	**……**
Others	

9. Signature

Course Coordinator	Head of Department	Date
ا.م.د/منار جمال عبد الحميد هلال	أد./غادة محمد صديق	**11/1/2022**

* Date of Dept. Council Approval

Dept. of Pharmacology and Toxicology	Pharmacotherapy I Course Specification	Master of Pharmacology and Toxicology

Master of Pharmacology and Toxicology

Pharmacotherapy I

PHM-202

Course Specification

Academic year: 2021/2022

البرنامج
ماجيستير في العلوم الصيدلية (الأدوية والسموم)

توصيف مقرر
العلاج الدوائي – 1
Pharmacotherapy I

رئيس القسم
أ.د. غادة محمد صديق

منسق المقرر
أ.د. منار أحمد نادر

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	----
Program on which the course is given	Master of Pharmacology and Toxicology
Academic Level	Postgraduate
Academic year	2021/2022 - Second semester
Date of course specification approval	11 / 01 / 2022

A.Basic Information : Course data :

Course Title	Pharmacotherapy I
Course Code	PHM-202
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	------
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

Upon successful completion of the course, the candidate is expected to:

1. Comprehend the basis of the clinical use of medication in the prevention & treatment of disease.
2. Develop a solid foundation for the delivery of pharmaceutical care.
3. Serve the needs of all future pharmacists by focusing on core chronic disease states with an emphasis on outpatient management.
4. Equip health care professionals with the skills and knowledge to contribute effectively to medicines management services and to individual drug therapy decisions in primary and secondary care.
5. Incorporate their learning directly into their workplace and to rise to the challenges presented by the new, patient centered NHS.
6. Formulate hypotheses based on current concepts in pharmacological field.

2- Intended Learning Outcomes (ILOs)

a. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Explain the principles and fundamentals of pharmacotherapy and basic mechanisms of diseases covered

a2	Recognize major signs and symptoms of selected disease states
a3	Identify drug-related problems and conduct scientific evaluation of drugs' pharmacological effects.
a4	Integrate pharmacology, pathophysiology, pharmacodynamic, pharmacokinetics and other biomedical and pharmaceutical sciences as they pertain to clinical therapeutics of the specific disorders.
a5	Identify appropriate types of data needed to tackle a certain health/disease related problem.

b. Intellectual Skills

After completion of the course, graduates will be able to

b1	Evaluate gained information in the field of pharmacotherapy.
b2	Demonstrate logic and critical thinking to suggest optimum medication for particular health problems with regard to accompanying circumstances and causes.
b3	Select optimal therapeutic agents based on drug pharmacology, which account for relative drug potencies, efficacies and therapeutic outcomes.
b4	Select and recommend appropriate patient focused drug therapy treatment plans.
b5	Interpret and validate the obtained patients' data.
b6	Recommend professional and scientific decisions based on proofs, evidences and available data.

c. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Consult patients about optimum therapeutic approaches with regard to their particular health conditions
c2	Choose and tailor therapeutic plans putting in consideration every aspect concerning drug efficacy, safety, adverse reactions as well as drug interactions.
c3	Monitor expected therapeutic outcomes and potential adverse effects of drug therapy.
c4	Apply treatment guidelines and protocols for selected patient populations.
c5	Evaluate the appropriateness of patient specific drug therapy regimen and treatment plans.
c6	Recording interventions and outcomes and the evidence base behind them contemporaneously in patient records
c7	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance.

d. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Communicate clearly by verbal and written means.
d2	Manipulate computer program, online database, software and other 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 pharmacology.
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.

3. Course Contents

Week No.	Topics	Lecture Hours	Practical / Tutorial hr.
1	Introduction to Pharmacotherapy	2	-
2	Pharmacotherapy of asthma	3	-
3	Pharmacotherapy of hypertension	4	-
4	Pharmacotherapy of diabetes	5	-
5	Pharmacotherapy of peptic ulcer	2	-
6	Pharmacotherapy of parkinsonism	3	-
7	Pharmacokinetics	3	-
8	Pharmacodynamics	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	Introduction to Pharmacotherapy:	a1,a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d2,d3,d4,d5, d6, d7,d8,d9,d10,d11
2	Pharmacotherapy of liver cirrhosis	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
3	Pharmacotherapy of pain	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
4	Pharmacotherapy of hypertension	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
5	Pharmacotherapy of diabetes	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
6	Pharmacotherapy of ulcerative colitis and inflammatory bowel diseases	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
7	Pharmacotherapy of blood disorders and anemia	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
8	Pharmacotherapy of obesity	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
9	Pharmacotherapy of anxiety	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
10	Pharmacotherapy of infectious diseases	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11
11	Pharmacotherapy of oxidative stress and related disorders	a2,a3,a4a,a5	b1,b2,b3,b4,b5,b6	c1,c2,c3,c4,c5,c6,c7	d1,d2,d3,d4,d5,d6, d7,d8,d9,d10,d11

** 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	Activities and **tasks required to develop students' self-learning skills**.
5.4	**Interactive Sessions** using Microsoft Teams
5.5	Internet search and Research Assignments to design **Formative Assignments**
5.6	**Seminar / Workshop**
5.7	**Case study and open discussion**

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 13	90%
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	Week 13	10%
				100 %

7- List of References

	Reference	**Type**
1.	Pharmacotherapy handbook, 7th edition	Hand Book
2.	Katzung; basic and clinical PharmacologyISBN-13: 978-0198749691. ISBN-10: 9780198749691	Book
3.	Internet websites; pubmed, medine,etc....	websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
- Laboratory facilities	**Microscopes, equipment, tools** …….
- Library	**Supplied by recent scientific books and journals.**
Others	**Access to research engines for scientific periodicals.**

9. Signature

Course Coordinator	**Head of Department**	**Date**
Prof. Dr. Manar A. Nader	Prof Dr. Ghada Mohamed Suddek	*11/01/2022

* Date of Dept. Council Approval

Dept. of Pharmacology and Toxicology	Course Specification	MS.D. in pharmaceutical sciences

MS.D. in Pharmaceutical Sciences (Pharmacology)

Course Specification

Academic year: 2022/2021

توصيف مقرر فسيولوجيا الأمراض **Pathophysiology**	البرنامج ماجستير
منسق المقرر أ.د. رانيا رمضان عبد العزيز	رئيس القسم أ د. غادة محمد صديق

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	----
Program on which the course is given	MS.D. in Pharmaceutical sciences (Pharmacology)
Academic Level	Postgraduate
Academic year	2022/2021 - second semester
Date of course specification approval	11/1/2022

A.Basic Information : Course data :

Course Title	Pathophysiology
Course Code	PHM-201
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

1.1 Learn advanced knowledge, professional research skills, attitudes and research and ethical values in the field of pharmacology and pathophysiology and integrate with the relevant subjects in his/her professional practice.

1.2 Provide knowledge and understanding of the basic dysfunctions of the body systems.

1.3 Introduce concepts of abnormal cellular, tissue and system hemostasis.

1.4 Provide comprehensive coverage on the integration of the different body systems pathogenesis

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Define the fundamental pathophysiology of different body systems.

a2	Memorize different body dysfunctions.
a3	Outline mechanisms of different pathophysiological mechanisms affecting different body organs

2.2. Intellectual Skills

After completion of the course, graduates will be able to

b1	Rationalize the integration of abnormalities of body systems
b2	Relate various disorders to their specific physiological basses.
b3	Plan to improve performance and research in the field of pathophysiology
b4	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

c1	Demonstrate excellent skills regarding the interpretation of patient pathophysiological outputs and clinical data

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Work effectively in a team; demonstrate critical thinking, problem solving and decision-making abilities.
d2	Communicate effectively in specialized language and expression of complex issues in terms that professionals and patients can understand.
d3	Transfer properly essential pathophysiological knowledge to the patients or other health professionals
d4	Deal with obstacles and problems.

3. Course Contents

Week No.	Lecture Topics	Hours
1	Introduction to pathophysiology	**2**
2	Vascular disorders	**2**
3	Endocrine disorders	**2**

4	Inflammation and immune response	**2**
5	Respiratory disorders	**2**
6	Urinary disorders	2
7	Prostatic gland disorders	2
8	Pancreatic disorders	2
9	GIT disorders	2
10	Liver disorders	2
11	Haematological disorders	2
Total 11 weeks		22 hr

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 pathophysiology	a1,a2, a3	b1, b2, b3,b4	c1	d1, d2, d3,d4
2	Vascular disorders	a1,a2, a3,	b1, b2, b3,b4	c1	d1, d2, d3,d4
3	Endocrine disorders	a1,a2, a3	b1, b2, b3,b4	c1	d1, d2, d3,d4
4	Inflammation and immune response	a1,a2, a3	b1, b2, b3,b4	c1	d1, d2, d3,d4
5	Respiratory disorders	a1,a2, a3	b1, b2, b3,b4	c1	d1, d2, d3,d4
6	Urinary disorders	a1,a2, a3	b1, b2, b3,b4	c1	d1, d2, d3,d4
7	Prostatic gland disorders	a1,a2, a3	b1, b2, b3,b4	C1	d1, d2, d3,d4
8	Pancreatic disorders	a1,a2, a3	b1, b2, b3,b4	C1	d1, d2, d3,d4
9	GIT disorders	a1,a2, a3	b1, b2, b3,b4	C1	d1, d2, d3,d4
10	Liver disorders	a1,a2, a3	b1, b2, b3,b4	C1	d1, d2, d3,d4
11	Hematological disorders	a1,a2, a3	b1, b2, b3,b4	C1	d1, d2, d3,d4

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

5- Teaching and Learning Methods:

5.1	**Computer aided learning:** **a. On line learning through My mans "Mansoura university "as recorded – video**

	lectures **b. Inter active discussion through My Mans** **c. Lectures using Data show, PowerPoint presentations**
5.2	**Self-Learning**
5.3	**Formative Assignments**
5.4	**Group Discussion** to explain what has not been understood
5.5	Internet search and Research Assignments to design **Formative Assignments**

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	weeks14-15	90 %
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	weeks14-15	10 %
				100 %

7- List of References

	Reference	**Type**
1.	**Course notes** prepared by graduates	

8- Facilities required for teaching and learning

-Class room	Smart lecture rooms provided with Data show
- Library	Library supplied by recent scientific books and journals.
-Others	Access to research engines for scientific periodicals.

9. Signature

Course Coordinator	**Head of Department**	**Date**
Prof. Dr. **Rania R. Abdelaziz**	**Prof Dr.** **Ghada M. Suddek**	11/1/2022

* Date of Dept. Council Approval

Dept. of Pharmacology and Toxicology	Course Specification	M.S. in pharmaceutical sciences

M.S. in Pharmaceutical Sciences (Pharmacology)

Course Specification

Academic year: 2021/2022

توصيف مقرر **الفارماكولوجيا الجينية** **Pharmacogenomics**	**البرنامج** **ماجستير**
منسق المقرر **أ.د/ طارق مصطفى إبراهيم**	**رئيس القسم** **أ.د/ غادة محمد صديق**

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	----
Program on which the course is given	MS.D. in Pharmaceutical sciences (Pharmacology)
Academic Level	Postgraduate
Academic year	2021/2022 - second semester
Date of course specification approval	11/1/2022

A.Basic Information : Course data :

Course Title	Pharmacogenomics
Course Code	PHM- 200
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	-----
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

1.1 Provide knowledge about the basis of pharmacogenomics.

1.2 Supply the student with information about pharmacologic approaches to genetic manipulation

1.3 Understand the genetic variations that gives rise to different responses (poor efficacy, overdose effects, idiosyncrasy) and adverse effects to representative therapy

1.4 Differentiate between pharmacokinetic and pharmacodynamic polymorphisms.

1.5 Identify sources of information about common pharmacogenetic condition

1.6 Provide essential knowledge about the application of genomic technologies to new drug discovery.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

a1	Explain the principles and fundamentals of pathophysiology, pharmacotherapy and pharmacogenomics.

a2	Identify drug-related problems and conduct scientific evaluation of drugs' pharmacological effects.
a3	Define the principles and the basics of quality in professional practice in the fields of pharmacology and other related fields.
a4	Identify appropriate types of data needed to tackle a certain research problem

2.2. Intellectual Skills

After completion of the course, graduates will be able to

b1	Evaluate gained information in the field of pathophysiology, pharmacotherapy, pharmacogenomics and drug discovery.
b2	Demonstrate logic and critical thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes.
b3	Assess professional and scientific risks in pharmacological and toxicological evaluation of drugs.
b4	Plan to improve performance and research in the field of pharmacology.
b5	Proper choice and tailoring of experimental regimen putting in consideration every aspect concerning drug efficacy, safety, adverse reactions as well as drug

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

c1	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

d1	Practice self- assessment and learning needed for continuous professional development.
d2	Utilize different available information resources relevant to pharmacology.
d3	Promote critical thinking, problem-solving and decision-making capabilities.
d4	Deal with obstacles and problems
d5	Adopt ethical, legal, professional responsibilities and safety guidelines

3. Course Contents

Week No.	Lecture Topics	Hours
1-2	Introduction to genetics	**4**
3-4	Genetic basis of variation in the effects of drugs and xenobiotic substances on the body	**4**
5-6	Genetic basis of adverse drug effects	**4**
7-8	Genetic basis of variability observed in drug pharmacokinetics	**4**
9-10	Genetic variants associated with some disease's pathogenesis	**4**
11-12	Polymorphisms in genes encoding the enzymes responsible for synthesis and intracellular interactions of biological amines	**4**
Total 12 weeks		24 hr

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 genetics	a1	b1	c1	d1
2	Genetic basis of variation in the effects of drugs and xenobiotic substances on the body	a1,a2, a3, a4	b1, b2, b3, b4, b5	c1	d1, d2, d3, d4, d5
3	Genetic basis of adverse drug effects	a1,a2, a3, a4	b1, b2, b3, b4, b5	c1	d1, d2, d3, d4, d5
4	Genetic basis of variability observed in drug pharmacokinetics	a1,a2, a3, a4	b1, b2, b3, b4, b5	c1	d1, d2, d3, d4, d5
5	Genetic variants associated with some disease's pathogenesis	a1,a2, a3, a4	b1, b2, b3, b4, b5	c1	d1, d2, d3, d4, d5
6	Polymorphisms in genes encoding the enzymes responsible for synthesis and intracellular interactions of biological amines	a1,a2, a3, a4	b1, b2, b3, b4, b5	c1	d1, d2, d3, 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	**Lectures using whiteboard**
5.3	Activities and **tasks required to develop students' self-learning skills**.
5.4	**Tutorial**, **Class Activity** and **Group Discussion** to explain what has not been understood
5.5	Internet search and Research Assignments to design **Formative Assignments**

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	weeks14-15	90 %
Assessment 2	**Tutorial / or Practical** assignments **and Semester work**	Assignments prepared by students and sent to the supervisor electronically for evaluation. To assess professional skills		----
Assessment 3	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	weeks14-15	10 %
				100 %

7- List of References

	Reference	Type
1.	Concepts of pharmacogenomics	book
2.	Principles of Pharmacogenomics and Pharmacogenetics	book
3.	Applying pharmacogenomics in therapeutics	book

8- Facilities required for teaching and learning

-Class room	Smart lecture rooms provided with Data show
- Library	Library supplied by recent scientific books and journals.
Others	Access to research engines for scientific periodicals.

9. Signature

Course Coordinator	Head of Department	Date
Prof. **Tarek Mostafa Ibrahim**	**Prof.** **Ghada M. Suddek**	11/1/2022

* Date of Dept. Council Approva

Program: Master in Pharmaceutical Sciences (*Pharmacology and Toxicology*)

Pharmacology and Toxicology Department

Master Thesis Specification

Academic Year: 2021/2022

رئيس القسم

أ.د/منار احمد نادر

A-Basic Information

1	**Faculty**	**Pharmacy**
2	**Program Title:**	**Master in Pharmaceutical Sciences (***Pharmacology and Toxicology***).**
3	**Program Type:**	**Single**
4	**Department (s):**	***Pharmacology and Toxicology***
	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 (Pharmacology and Toxicology)**
6	**Coordinator:**	**Dr. Sara Hesham**
7	**External Evaluator(s):**	Prof. Dr. George samir
8	**Date of Program Specification Approval:**	***Department council: May 2022, Faculty council: May 2022***

B-Professional Information

1-Aims

The overall aims of the thesis:

1.1	Master advanced knowledge, professional research skills, attitudes and research and ethical values in the field of pharmacology and toxicology.
1.2	Apply the basics and methodologies of scientific research and manipulate various tools in the field of pharmacology and toxicology.
1.3	Formulate hypotheses based on current concepts in pharmacological field.
1.4	Analyze and interpret results and information acquired from primary literature sources.
1.5	Attain communication skills, research ethics, time management, decision-making, and team-working.
1.6	Manipulate computer program, online database, software and other IT skills to get information and analyze the obtained research data.

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:

A1	Evaluate pharmacological effects of drugs.
A2	Utilize effectively all basic and recent techniques and technological tools.
A3	Identify the legal and ethical issues of research and professional practice in pharmacology.
A4	Identify appropriate types of data needed to tackle a certain research problem.

B- Intellectual Skills

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

B1	Demonstrate logic and critical thinking to suggest solutions for scientific and professional problems according to accompanying circumstances and causes.
B2	Utilize the available professional and scientific resources and research skills to solve problems.
B3	Assess professional and scientific risks in pharmacological and toxicological evaluation of drugs.
B4	Plan to improve performance and research in the field of pharmacology.
B5	Interpret and validate the obtained research data.
B6	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs.
B7	Proper choice and tailoring of experimental regimen putting in consideration every aspect concerning drug efficacy, safety, adverse reactions as well as drug interactions.

C- Professional and Practical Skills

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

C1	Apply different statistical methods for data analysis and validation.
C2	Develop different research methodology.
C3	Manage safely and efficiently advanced technological research tools and equipment relevant to drug discovery and evaluation research.
C4	Carry out scientific research and contribute to the knowledge in the field of pharmacology.
C5	Write accurately and evaluate professional reports and publish scientific research papers in scientific journals and conferences.
C6	Write thesis in a scientific and precise way.

D. General and Transferable Skills

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

D1	Manipulate lab instruments, computer program, online database, software and other IT to get information and analyze the obtained research data.
D2	Promote critical thinking, problem-solving and decision-making capabilities.
D3	Deal with obstacles and problems.
D4	Work effectively in a team and offer expertise and advice to others
D5	Evaluate and criticize scientific work, literature and research data.
D6	Adopt ethical, legal, professional responsibilities and safety guidelines.
D7	Develop presentation skills, give seminars and defend thesis in public.

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	A1, A3, A4	B1	-	D1
3	Objectives/Rational	A2,A3, A4	B1, B4	-	D1, D2, D3
4	Results and Discussion	A1, A2, A3, A4	B1, B2, B3, B4, B5	C1, C5, C6	D1, D2, D3, D4, D5
5	Experimental Work	A1, A2, A3	B7	C1, C2, C3, C4	D2, D3, D5
6	Conclusion	-	B6	C5, C6	D4, D7

* ***K**nowledge and **U**nderstanding* *****I**ntellectual **S**kills* ******P**rofessional and **P**ractical **S**kills* *******G**eneral and **T**ransferable **S**kills*

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.

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	√
Library	√
Others	-------

Thesis Coordinator	Head of Department	Date
Dr. Sara Hesham	Prof Dr. Manar Nader	May 2022

* Date of Dept. Council Approval May 2022

Program: Master in Pharmaceutical Sciences (*Pharmacology and Toxicology*)

Pharmacology and Toxicology department

Program Specification

Academic Year: *2021/2022*

رئيس القسم

أ.د/ منار احمد نادر

A-Basic Information

1	**Faculty**	**Pharmacy**
2	**Program Title:**	**Master in Pharmaceutical Sciences (Pharmacology and toxicology)**
3	**Program Type:**	**Single**
4	**Department (s):**	**Department of pharmacology and toxicology**
5	**Final award:**	**Master degree in pharmacology and toxicology**
6	**Coordinator:**	**Dr. Sara Hesham**
7	**External Evaluator(s):**	**Prof. Dr.George samir**
8	**Date of Program Specification Approval:**	***Department council: 15/3/2021,*** ***Faculty council: 20/3/2021***

B-Professional Information

1-Program Aims

Upon successful completion of the program, the master candidate is expected to demonstrate comprehensive knowledge, clear understanding and outstanding skills in the field of Pharmacology and Toxicology. The candidate is expected to:

1.1	Master advanced knowledge, professional research skills, attitudes and research and ethical values in the field of pharmacology, pathophysiology, pharmacotherapy and pharmacogenetics and integrat with the relevant subjects in his/her professional practice
1.2	Apply the basics and methodologies of scientific research and manipulate various tools in the field of pharmacology and toxicology.
1.3	Master practical research procedures according to the good laboratory practice (GLP) basics in pharmacology labs and perform experiments with adaptation of safety guidelines.
1.4	Master all traditional and up to date techniques implemented in the field of drug discovery and their different actions.
1.5	Apply the scientific thinking approaches and adapt problem based learning in subjects relevant to pharmacotherapy and pharmacogenomics.

1.6	Formulate hypotheses based on current concepts in pharmacological field.
1.7	Design and conduct research projects.
1.8	Analyze and interpret results and information acquired from primary literature sources.
1.9	Manipulate computer program, online database, software and other IT skills to get information and analyze the obtained research data.
1.10	Attain 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 principles and fundamentals of pathophysiology, pharmacotherapy and pharmacogenomics.
A2	Explain the theories and fundamentals of drug discovery and their application in different diseases from different etiologies and pathophysiologies.
A3	Identify drug-related problems and conduct scientific evaluation of drugs' pharmacological effects.
A4	Utilize effectively all basic and recent techniques and technological tools.
A5	Identify the legal and ethical issues of research and professional practice in pharmacology.
A6	Define the principles and the basics of quality in professional practice in the fields of pharmacology and other related fields.
A7	Identify appropriate types of data needed to tackle a certain research problem.
A8	Identify all basic techniques in instrumental analysis.
A9	Explain the basic principles of physical chemistry.

B- Intellectual Skills

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

B1	Evaluate gained information in the field of pathophysiology, pharmacotherapy, pharmacogenomics and drug discovery.
B2	Demonstrate logic and critical 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 pharmacology.
B4	Utilize the available professional and scientific resources and research skills to solve problems.

B5	Assess professional and scientific risks in pharmacological and toxicological evaluation of drugs
B6	Plan to improve performance and research in the field of pharmacology.
B7	Interpret and validate the obtained research data.
B8	Participate in comprehensive scientific and professional discussions and communications based on scientific evidences and proofs.
B9	Proper choice and tailoring of experimental regimen putting in consideration every aspect concerning drug efficacy, safety, adverse reactions as well as drug interactions.
B10	Utilize the available instruments properly to generate accurate and precise data.

C- Professional and Practical Skills

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

C1	Apply different statistical methods for data analysis and validation.
C2	Develop different research methodology.
C3	Manage safely and efficiently advanced technological research tools and equipment relevant to drug discovery and evaluation research.
C4	Carry out scientific research and contribute to the knowledge in the field of pharmacology.
C5	Write accurately and evaluate professional reports and publish scientific research papers in scientific journals and conferences.
C6	Write thesis in a scientific and precise way.
C7	Illustrate the effect of his/her professional practice on the community in addition to different methods of environmental development and maintenance.
C8	Write different research methodology in a clear and proper way.

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 lab instruments, computer program, online database, software and other 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 pharmacology.
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.

3-Academic Reference Standards (ARS):

Approved by both the department and faculty councils
Department Council Approval Date: *15/3/2021,*
Faculty Council Approval Date: *20/3/2021*

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	A3, A4
	1.1	A1, A2, A3
2. **Intellectual Skills**	**2.1**	B1
	2.2	B2, B3, B4
	2.3	B5, B7
	2.4	B6, B8
3. **Professional and Practical Skills**	**3.1**	C1,C2, C3
	3.2	C4, C5, C6
	3.3	C7
4. **General and Transferable Skills**	**4.1**	D1
	4.2	D2
	4.3	D3

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	Instrumental Analysis	***General*** *Compulsory*	2	Fall
GCM-202	**Statistics and biostatistics**	***General*** *Compulsory*	2	Fall
GCM-203	**Physical chemistry**	***General*** *Compulsory*	1	Fall
GCM-204	**Bioinformatics**	***General*** *Compulsory*	1	Fall
GCM-205	**Research Methodology & Ethics**	***General*** *Compulsory*	1	Fall
GCM-206	**Scientific writing and Seminar**	***General*** *Compulsory*	1	Fall
PHM-201	**Pathophysiology**	***Special*** *Compulsory*	2	Spring
PHM-202	**Pharmacotherapeutics I**	***Special*** *Compulsory*	2	Spring
PHM-203	**Drug discovery and Evaluation**	***Special*** *Compulsory*	2	Spring
PHM-204	**Molecular Pharmacology**	***Elective***	2	Spring
PHM-205	**Pharmacogenomics**	***Elective***	2	Spring
Total (Courses)			16	
	Thesis		30	
Total			46	

2- Achievement of Program Intended Learning Outcomes by its components

Course	C.H/ week	Program ILOs (by No.)			
		K.U*	IS**	P.P.S***	G.T.S****
First Semester - *General Courses (8 C.H.)*					
Instrumental Analysis (GCM-201)	2	A8	B10	C1, C3, C8	D1, D2
Statistics and biostatistics (GCM-202)	2	A1	B1, B2, B7	C1	D2, D9
Physical chemistry (GCM-203)	1	A9	B7, B10	C4, C8	D2, D9
Bioinformatics (GCM-204)	1	A1	B1, B2, B4	C5	D4, D10
Research Methodology & Ethics (GCM-205)	1	A5	B5	C2, C3, C8	D2, D5, D9
Scientific writing and Seminar (GCM-206)	1	A7	B6, B7, B8, B9	C6, C7	D10
Total	8				
Second Semester *- Special Courses (8 C.H.)*					
Pathophysiology(PHM-201)	2	A1,A5,A6	B1, B6, B8, B9	C4, C5,C6	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Pharmacotherapeutics I (PHM-202)	2	A1, A3,A5,A6	B1, B2, B3,B5, B6,B8,B9	C4, C5,C6	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Drug discovery and Evaluation (PHM-203)	2	A1,A5,A6	B1, B3, B6, B9	C4, C5,C6	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Molecular Pharmacology (PHM-204) ***(elective)***	2(E)	A2, A4,A5,A6,A7	B1, B2, B3, B4, B6,B7,B9,B10	C1, C2,C3,C5,C6, C7	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Pharmacogenomics (PHM-205) (elective)	2(E)	A2, A4,A5,A6,A7	B1, B2, B3, B4, B6,B7,B9,B10	C1, C2,C3,C5,C6, C7	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Total	8				
Thesis	30	A3, A4, A5,A7	B2, B3, B4, B5, B6, B7, B8, B9,B10	C1, C2, C3, C4, C5, C6, C7	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11
Total	46				

* ***K**nowledge and **U**nderstanding*
** ***I**ntellectual **S**kills*
*** ***P**rofessional and **P**ractical **S**kills*
**** ***G**eneral and **T**ransferable **S**kill*

Code	Course title	K.U*									IS**									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
GCM-201	*Instrumental Analysis*								√											√
GCM-202	***Statistics and biostatistics***	√									√	√					√			
GCM-203	***Physical chemistry***									√							√			√
GCM-204	***Bioinformatics***	√									√	√		√						
GCM-205	***Research Methodology & Ethics***					√									√					
GCM-206	***Scientific writing and Seminar***							√								√	√	√	√	
PHM-201	***Pathophysiology***	√				√	√				√					√		√	√	
PHM-202	***Pharmacotherapeutics I***	√		√		√	√				√	√	√		√	√		√	√	
PHM-203	***Drug discovery and Evaluation***	√			√	√	√				√		√		√			√		
PHM-204	**Molecular Pharmacology** ***(E)***		√		√	√	√	√			√	√	√	√		√	√		√	√
PHM-205	***Pharmacogenomics (E)***		√		√	√	√	√			√	√	√	√		√	√		√	√
Thesis				√	√	√		√				√	√	√	√	√	√	√	√	√

* ***K**nowledge and **U**nderstanding*
** ***I**ntellectual **S**kills*
E ***E**lective course*

Code	Course title	P.P.S***								G.T.S****										
		C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11
GCM-201	*Instrumental Analysis*	√		√					√	√	√									
GCM-202	*Statistics and biostatistics*	√									√							√		
GCM-203	*Physical chemistry*				√				√		√							√		
GCM-204	*Bioinformatics*					√							√						√	
GCM-205	*Research Methodology & Ethics*		√	√					√		√			√				√		
GCM-206	*Scientific writing and Seminar*						√	√											√	
PHM-201	*Pathophysiology*				√	√	√			√	√	√	√	√	√	√	√	√	√	√
PHM-202	*Pharmacotherapeutics I*				√	√	√			√	√	√	√	√	√	√	√	√	√	√
PHM-203	*Drug discovery and Evaluation*				√	√	√			√	√	√	√	√	√	√	√	√	√	√
PHM-204	Molecular Pharmacology *(E)*	√	√	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√
PHM-205	*Pharmacogenomics (E)*	√	√	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√
Thesis		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√

*** ***P**rofessional and **P**ractical **S**kills*
**** ***G**eneral and **T**ransferable **S**kills*
E ***E**lective course*

5- Student Assessment Methods

5.1- Written exam (general and special courses).	To assess Knowledge and Understanding and Intellectual Skills
5.2- Oral exam (general and pecial courses).	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
5.3- Scientific seminar for thesis registration	To assess Knowledge and Understanding, Intellectual Skills and General and transferable Skills
5.4- Published scientific research paper.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills
5.5- Thesis writing	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills
5.5- Public presentation and discussion of the thesis.	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills

6- Program Admission Requirements

6.1. 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**".

6.2. The candidate should be available for study at least two days per week throughout the duration of study.

6.3. The candidate should possess at least grade "**Good**" in the subject of the specialty.

6.4. The department council starts the registration process for the candidate after his/her successful passing of the general courses of the first semester.

6.5. The candidate should follow postgraduate rules of by-law (**2014**) and its modified by-law **(2017)** of Faculty of Pharmacy-Mansoura University.

7- Regulations for progression and program completion

7.1. 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.

7.2. 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.

7.3. The student has to pass the assigned courses, and to practically do a scientifc research thesis for complete fulfilment of the master degree.

7.4. An annual progress report is presented by the supervisors of thesis to the Dept Council by December.

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- Facilities Required for Search:

8.1- Computers.

8.2- Library and digital library supplied by recent scientific books and journals.

8.3- Laboratories with enough chemicals, apparatus and advanced instruments.

8.4- Access to research engines for scientific periodicals in the field of pharmacology and toxicology.

8.5- Access to research engines for scientific periodicals in the field of drug development and drug analysis.

9-Thesis

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

10- 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

Program Coordinator: Dr. Sara Hesham

Head of Department: Prof. Dr. Manar Ahmed Nader

Signature:

Annex 1

Attach courses specifications.

Program: Master in Pharmaceutical Sciences
(*Pharmacology*)
Pharmacology and toxicology department

Program Report

Academic Year:
2020/2021

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A-Basic Information

1.	**Faculty**	Pharmacy
2.	**Program Title:**	Master in Pharmaceutical Sciences (pharmacology)
3.	**Program Type:**	Single - Graduate
4.	**Department responsible:**	Pharmacology and toxicology department
5.	**Final award of the Program:**	Master degree of Pharmaceutical Sciences (pharmacology)
6.	**External Evaluator(s):**	Prof. Dr. George Samir
7.	**Year of operation:**	2020/2021

B-Statistical Information

Item	Number of students
Started the program	7
Withdrawn	0
Absence	0
Attending the exam	7
Pass	7
Failed	0
% Pass (with respect to those attending the examination)	100%

1. **Number of students started the program 2020/2021:** 6 students.

2. Percentage of students starting the program this year (relative to the previous year):

No. of students this year (2020/2021)	No. of students last year (2019/2020)	No. of students last year (2018/2019)
6	**7**	**7**

3. Number of students completing the program:

No. students completed the program 2020/2021	Starting year of these students
6	Dana abo El-makarem: 2016/2017 Shorouk Atef: 2016/2017 Mohamed Shalaby: 2016/2017 Nadeen Samy: 2017/2018 Nabila Mohammed: 2016/2017 Nagwa Ibrahim: 2017/2018

4. Grades of students completed the program in the academic year 2020/2021:

	Course title	Grade					
		Dana	**Shorouk**	**Mohamed**	**Nadeen**	**Nabila**	**Nagwa**
First Semester General courses:	***Instrumental Analysis (GCM-201)***	75	69	84	76	74	63
	Statistics and biostatistics (GCM-202)	93	97	94	100	87	98
	Physical chemistry (GCM-203)	70	62	69	91	73	82
	Bioinformatics (GCM-204)	97	77	88	98	93	93
	Research Methodology & Ethics (GCM-205)	95	86	76	96	92	79
	Scientific writing and Seminar (GCM-206)	97	92	87	98	94	96
Second semester Special courses:							
	Pharmacotherapeutics I(PHM-202)	92	78	74	92	90	91
	Pharmacogenomics (PHM-205)	90	92	73	98	82	96
	Drug Discovery and Evaluation (PHM-203)	90	83	76	91	94	94
	Pathophysiology	96	92	75	90	75	86

	(PHM-201)						
General University requirements	TOEFL/IELTS	√	√	√	√	√	√
	Thesis Eligibility report	√	√	√	√	√	√
	One published manuscript	√	√	√	√	√	√

- **Grades: no. and percentage of each grade:** Non applicable

C. Professional information

Academic standards

1. **Reference academic standards:** Academic reference standards (ARS) for graduate studies.

2. **Achievement of program Intended Learning Outcomes (ILOs):**

Course Title	ILOs covered
Instrumental Analysis (GCM-201)	a1, a2,b1,b2,b3, d1,d2
Statistics and biostatistics (GCM-202)	a1, a2,a3,b1,b2,b3,d1,d2
Physical chemistry (GCM-203)	a1, a2,b1,b2,b3, d1,d2
Bioinformatics (GCM-204)	a1, a2,b1,b2,b3, d1,d2
Research Methodology & Ethics (GCM-205)	a1, a2,b1,b2,b3, d1,d2
Scientific writing and Seminar (GCM-206)	a1, a2,b1,b2,b3,d1,d2
Pharmacotherapeutics I (PHM-202)	a1, a2,a3,a4,b1,b2,b3,b4, d1,d2,d3,d4
Pharmacogenomics (PHM-205)	a1, a2,a3,b1,b2,b3,d1,d2
Drug Discovery and Evaluation (PHM-203)	a1, a2,a3,a4,b1,b2,b3,d1,d2,d3,d4
Pathophysiology (PHM-201)	a1, a2,a3,b1,b2,b3,b4, d1,d2,d3,d4
Thesis	

3. Assessment methods:

Assessment Method	Item assessed	ILOs assessed
Written Assessment (written exam, Thesis writing)	**1- Courses** **General 8 Credit Hours** **Special 8 (6+2) Cr. Hours**	a1, a2,b1,b2,b3
Oral Assessment Oral exam,)		a1, a2,b1,b2,b3, d1,d2
Activity		a1, a2,b1,b2,b3, d1,d2
Seminars	**2- Thesis 30 Cr Hours**	a1, a2,b1,b2,b3, d1,d2
Supervisors follow up reports		a1, a2,b1,b2,b3, d1,d2
Practical Assessment (practical work of thesis)		a1,a5,a6,b1, b3, b6, b9,c4, c5,c6
One published manuscript		
Oral presentation of thesis.		
Pass	**3- General University Requirements:** including: a- TOEFL / IELTS b- Computer course	

4. Learning resources:

Adequacy of the number and specialty of the faculty members to the requirements of the program:

-Number of department staff: 17

-Number of master students: 29

-Students/ staff ratio: 1.7:1

•**Regarding teaching general courses: staffs from different departments are** participating in courses delivery

•**Regarding teaching of special courses & thesis supervision:** pharmacology staffs are responsible for courses delivery

•**Adequacy of facilities for thesis completion:**

-research laboratories in the department supported with different instruments in addition to central laboratory in the faculty.

Resources are available for the students such as:

- **Books: Textbooks as**

  Aviva, P. (2005): Medical Statistics at a Glance, Blackwell Company, 2nd, ed., Philadelphia
- **References:** Scientific papers taken from international journals in the field of pharmacology
- **Others: web sites:**

  - https://www.ekb.eg/
  - www.biomed central.com
  - www.science direct.com
  - www. medscape.com.
  - www.Pubmed.com

5. The basis of formation of committees' examiners:

For courses and seminars: Teaching members and the head of department.

For thesis: The examiner committee is composed of:

- The principal supervisor with or without one supervisor from the co-supervision committee plus two evaluators at least one from outside the faculty.

6. System of external examiners: **Available** ■ **Not available** □

Department response to student and external evaluation system:

Department staff members usually respond to the interests of postgraduate students if they prefer to go deep in specific fields.

The system of external evaluation of the program has been established by Prof. George samir Faculty of pharmacy, Delta University. The comments of external evaluator will be taken into consideration in the next action plan.

7. Proposals for program development

a- Program stucture

- **Program duration:** At least 2 years from the date of enrollment or 18 months from the date of registration of the master thesis**.**
- **Program level:** Graduate
- **Structure of program hours:**

	Code	Course Title	Lecture	Total Credit Hours
Semester 1	GCM-201	Instrumental Analysis	2	2
	GCM-202	Biostatistics	2	2
	GCM-203	Physical Chemistry	1	1
	GCM-204	Bioinformatics	1	1
	GCM-205	Research Methodology & Ethics	1	1
	GCM-206	Scientific writing and Seminar	1	1
Semester 2	(PHM-201)	Pathophysiology	2	2
	(PHM-202)	Pharmacotherapeutics I	2	2
	(PHM-203)	Drug Discovery and Evaluation	2	2
		مقرر واحد اختياري من المقررات التالية **Elective**	2	2
	PHM-204	Molecular Pharmacology	2	2
	(PHM-205)	Pharmacogenomics	2	2
Total (courses)			16	16
		Thesis	30	30
Total			46	46

b. Distribution of program courses:

	Course title	Credit hours	Degree			
			Written	Oral	Total	Exam time
Semester 1	Instrumental Analysis	2	80	20	100	2
	Biostatistics	2	80	20	100	2
	Physical Chemistry	1	80	20	100	2
	Bioinformatics	1	80	20	100	2
	Research Methodology & Ethics	1	80	20	100	2
	Scientific writing and Seminar	1	80	20	100	2
Semester	Pathophysiology	2	90	10	100	2

2	Pharmacotherapeutics I	2	90	10	100	2
	Drug Discovery and Evaluation	2	90	10	100	2
	Pharmacogenomics	2	90	10	100	2

c. Completed Thesis details

Title	Name of candidate	Supervised by	Date of master degree
Evaluation of ameliorative potential of some compounds against experimentally induced lung disease'	Nadeen Samy ibrahim	Prof.Dr. Ghada Suddek Dr. Rehab Sabry Dr. Ahmed Ramadan Dr. Marwa Zaghlol	05/01/2021
" Effect of some Compounds against Experimentally - Induced Colon Cancer"	Dana Abo Elmakarem	Prof.Dr. Ghada Suddek Dr. Mirhan Ahmed Makled	27/12/2020
" Influence of some Drugs on Liver Toxicity of some Commonly Used anticancer agents".	Sally Ahmed Abdellattif	Prof.Dr. Ghada Suddek Dr. Rehab Sabry Dr. Mona Abdelrahim	08/12/2020
Potential neuroprotective effect of some drugs on Experimentally induced Parkinson's disease	Shorouk Atef	Prof.Dr. Manar Nader Dr. Dalia Elkashef	23/12/2020
" Management of experimentally induced chronic kidney disease (CKD) via diet"	Mohammed Ahmed shalaby	Prof.Dr. Tarek Mostafa Dr. Nashwa Abu-Elsaad	08/12/2020
" the modulatory effects of some drugs on signaling pathways involved in renal fibrosis: an experimental study	Nabila Mohammed Elsayed	Dr. George Samir Dr. Eman Said	09/05/2021
Study of the potential protective effects of some agents in experimentally induced colitis	Nagwa Ibrahim Mohammed	Prof.Dr. Ghada Suddek Dr. Dalia Elkashef	10/02/2021

d. Course, deletions, additions and modifications

- **Teaching different techniques used in pharmacology lab.**

e. Staff development requirements:

- **More advanced text books are needed.**
- **Improvement of IT facilities.**

8. Action plan

The following action plan will be acted upon throughout year (2021/2022)

Action	Completion date	Responsible party
Updating the course according to the most up-to-date scientific research.	**September 2021**	**All members of the course team.**

9. Action plan for improvement:

Action	Person responsible	Completion date
Revision of program ILOs and make required changes	• Program coordinator	2019-2020
Arrange at least one journal club per year	• Program coordinator	2019 - 2020
Improve research facilities	• Vice dean for postgraduate studies and research	2019-2020
Update course contents	• Program coordinator	2019-2020
Organize different workshops to build up students research abilities	• FLDP center • Faculty training unit	2019-2020

Program coordinator / Head of the department:

Prof. Dr. Manar A. Nader

Vice dean of graduate studies and research

Prof. Dr. Khaled B. Selim