Academic Reference Standards (ARS)
for
Master degree in Pharmaceutical Sciences
(*Clinical Pharmacy*)
Clinical Pharmacy & Pharmacy Practice Department

ARS

Academic Year: 2021/2022

Dept. of Clinical Pharmacy
& Pharmacy Practice

رئيس القسم
أ.د/ محمد الحسيني شمس

Master Degree of Clinical Pharmacy

The Academic Reference standards (ARS) for Master of Clinical Pharmacy Program regarding attributes and capabilities of the graduates were based essentially on the General Academic Reference Standards of graduate student published by the National Authority for Quality Assurance and Accreditation of Education (NAQAAE, 2009). The following Specific Academic Standards for this program were approved by the Faculty Council on 20/3/2021

Academic Reference standards for Master of Clinical Pharmacy

General attributes of the Graduates of Master Program

By the end of this program, the graduate should demonstrate comprehensive knowledge, clear understanding and outstanding skills as follows:

a. Provide patient centered pharmaceutical care and be a valuable member of health care team.
b. Provide proper patient counseling as hospital or community pharmacist.
c. Manage pharmacy operations in hospitals such as; participating in pharmaceutical care plan for patients, patient counseling, adverse drug management, dose adjustment in special populations
d. Provide information and education services to community and patients about rational use of medications and medical devices.

1. Knowledge and Understanding

1.1. Principles of pharmacokinetics and biopharmaceutics with applications in therapeutic drug monitoring, dose modification and bioequivalence studies.
1.2. Principles of clinical pharmacology, pharmacovigilance and the rational use of drugs.
1.3. Recognize different study designs and, methods of biostatistical analysis.
1.4. Comprehend principles of pathophysiology of diseases and participate with other health care professionals in improving health care services using evidence-based data.
1.5. Ethical consideration in clinical research and pharmacy practice.

2. Intellectual Skills

2.1. Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions and designing proper therapeutic plan.

2.2. Calculate and adjust dosage and dose regimen of medications.
2.3. Assess drug interactions, medication errors, ADRs and pharmacovigilance.
2.4. Formulation of clinical question, generation of test hypothesis using suitable study design and analysis of experimental results as well as published literature.
2.5. Analyze and evaluate information evidence-based information needed in pharmaceutical field and pharmacy practice.
2.6. Collect patients' specific data and using statistics' software to draw conclusions about safety and efficacy of therapeutic plan in specific patient.

3. Professional and Practical Skills

3.1. Individualize medicines and design monitoring plan based on understanding of etiology and pathophysiology of diseases and patient's specific factors to maximize benefit and reduce risk.
3.2. Advise patients and other health care professionals about safe and proper use of medicines.
3.3. Conduct research studies and analyze the results using computational tools.
3.4. Applying principles of clinical pharmacokinetics, and therapeutic drug monitoring (TDM) to adjust drug regimens when necessary.

4. General and Transferable Skills

4.1. Work effectively in a team, communicate clearly with healthcare professional and patients and, applying ethics to respect patient's confidentiality.
4.2. Retrieve and evaluate information from online sources to improve professional competencies and, implement writing and presentation skills to present collected information.
4.3. Practice independent learning and self- evaluation needed for continuous professional development.
4.4. Demonstrate creativity, time management abilities, critical thinking, problem-solving and decision-making abilities.

Program: Master in Pharmaceutical Sciences (*Clinical Pharmacy)*

Clinical Pharmacy &Pharmacy Practice Department

Dept. of Clinical Pharmacy
& Pharmacy Practice

Program Specification

Academic Year: 2021/2022

رئيس القسم
أ.د/ محمد الحسيني السبيعي شمس

A-Basic Information

1	**Faculty**	**Pharmacy**
2	**Program Title:**	**Master in Pharmaceutical Sciences (Clinical Pharmacy)**
3	**Program Type:**	**Single**
4	**Department (s):**	**Department of Clinical Pharmacy & Pharmacy Practice**
5	**Final award:**	**Master degree in Clinical Pharmacy**
6	**Coordinator:**	**--**
7	**External Evaluator(s):**	--
8	**Date of Program Specification Approval:**	**Department council: 7/5/2022**

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 clinical pharmacy.

1.1 Possess the core knowledge concerning the principles of pathophysiology of diseases and pharmacotherapy to be able to participate with other health care professionals in improving health care services using evidence-based data and manage uncommon or highly complex cases.
1.2 Plan, design and conduct research using appropriate methodologies.
1.3 Able to be a life-long learner for continuous improvement of professional knowledge and skills.
1.4 Develop presentation, promotion, marketing, business administration, numeric and computation skills.
1.5 Demonstrate capability of communication skills, time management, critical thinking, problem-solving, 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	Recognize clinical pharmacy practices that maximize patient safety, classify data of selected diseases.
A2	Explain required monitoring parameters for different cases, categorize and prioritize patient medication problems.
A3	Define basics of clinical investigation, principles of research design, and methodologies.
A 4	Understand the importance of regulation of clinical research, including ethical considerations and compare different designs.
A5	Recognize the evidence based medicine for treating of certain disease conditions.
A6	Management the adverse drug events, and promote rational use of drugs.
A7	Recall pharmacokinetic principles and understand the equations that conceptualize basic principles.
A 8	List basic pharmacokinetic principles which reinforces individualization of drug dosing regimens of narrow therapeutic index drugs.
A 9	Explain the theories and fundamentals of instrumental analysis, statistics and biostatistics, physical chemistry and bioinformatics.
A 10	Distinguish the basics and ethics of scientific research in the area of pharmaceutical care.
A 11	Identify ethical and legal principles of professional practice in the field of clinical pharmacy

b- Intellectual Skills

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

B1	Design therapeutic plan for certain disease conditions.
B2	Manage drug therapy problems effectively and manage reporting of adverse drug events.
B3	Evaluate current developments in the field of clinical research.
B4	Generate and test hypotheses using appropriate experimental design with due regard to regulatory issues.

B 5	Plan and implement original research, interpret data from a different sources.
B 6	Interpret relevant clinical data for assessing certain diseases conditions.
B 7	Outline the role of the pharmacist in the pharmaceutical care plan.
B 8	Apply the basic pharmacokinetic principles and design proper regimen for certain narrow therapeutic index drugs
B 9	Select a dosing strategy for special patient groups, modify and follow up drug dosing regimens
B 10	Analyze and evaluate the gained information in the field of instrumental analysis, biostatistics, physical chemistry, bioinformatics and drug development.
B 11	Integrate various professional knowledge to solve problems.

c- Professional and Practical Skills

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

C1	Implement practices that maximize patient safety and optimize drug therapy outcomes
C2	Analyze data using relevant computational tools and packages.
C3	Monitor patient's response for pharmaceutical care plans and individualize therapy for each patient
C 4	Construct a pharmaceutical care plan and patient couseling.
C 5	The use of therapeutic drug monitoring to optimize therapy in individual patients.
C 6	Apply pharmacokinetics knowledge to optimize the clinical use of specific drugs.
C7	The design of the initial dosing regimen and subsequent adjustments of dosages of some narrow therapeutic index drugs.
C 8	Develop different research methodologies and good experimental and reporting skills in the separation and structural elucidation of the naturally occurring compounds.
C 9	Manage safely and efficiently advanced technological research tools and equipment's relevant to separation and biological screening of natural products.

d. General and Transferable Skills

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

D1	Communicate effectively with the healthcare team members.
D2	Apply learned ethics to respect patient's confidentiality.
D3	Manipulate computer program, online database, software and other IT to get information and analyze the obtained research data.
D4	Perform self- assessment and identifying personal educational needs.
D5	Promote critical thinking, problem-solving and decision-making capabilities.
D6	Manage time efficiently.
D7	Work effectively in a team and leading teams.

3-Academic Reference Standards (ARS):

Approved by both the department and faculty councils
Department Council Approval Date: 7/5/2022

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**	A7,A8
	1.2	A1, A2, A6
	1.3	A3, A9
	1.4	A5
	1.5	A4, A10, A11
2. **Intellectual Skills**	**2.1**	B1, B7
	2.2	B8, B9
	2.3	B2, B11
	2.4	B4, B5
	2.5	B3, B10
	2.6	B6
3. **Professional and Practical Skills**	**3.1**	C1, C3
	3.2	C4
	3.3	C2, C8, C9
	3.4	C5, C6, C7
4. **General and Transferable Skills**	**4.1**	D1, D2, D7
	4.2	D3
	4.3	D4
	4.4	D5,D6

4-Curriculum Structure and Contents

4.1 The candidate gains his master degree after 46 credit hours of study (16 credit hours of courses and 30 credit hours for thesis).

4.2 The candidate should study at least 16 credit hours of graduate courses. The courses will possess the code [200]. 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.

4.3 The candidate should perform research thesis (30 credit hours) in a subject assigned by the supervision committee, endorsed by the department council, the committee of graduate studies & research and the faculty council.

4.4 The candidate should publish at least one scientific research paper in scientific journals before the approval of a committee of discussion and judgment.

5- Program Courses

1- 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****
First Semester - *General Courses (8 C.H.)*					
Instrumental Analysis **(GCM-201)**	**2**	A9	B10, B11	C 8, C 9	D1, D4
Statistics and biostatistics (GCM-202)	**2**	A9	B10, B11	C8	D1, D3, D4, D6
Physical chemistry (GCM-203)	**1**	A9	B10, B11	C 8, C 9	D1, D4, D5
Bioinformatics (GCM-204)	**1**	A9	B10, B11	C 8	D3
Research Methodology & Ethics (GCM-205)	**1**	A 10	B10, B11	C 8, C 9	D2, D5
Scientific writing and Seminar (GCM-206)	**1**	A11	B10, B11	C 8, C 9	D7
Total	**8**				
Second Semester *- Special Courses (8 C.H.)*					
Clinical pharmacy and pharmacoepidemeology (PPM-201)	**2**	A1, A2	B1, B2	C1	D1, D7
Clinical research design (PPM-202)	**2**	A3, A4	B3, B4, B5	C2	D2, D5, D4
Pharmacotherapy (PPM-203) elective	**2**	A5, A6	B6, B7, B8	C3, C4	D1, D7
Clinical pharmacokinetics (PPM-204)	**2**	A7, A8	B9	C5, C6, C7	D3, D5, D6
Pharmacoeconomics and pharmacovigilance (PPM-205) elective	**2**	A1, A6	B3, B4, B5	C2	D1, D7
Total	**8**				
Thesis	**30**				
Total	**46**				

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

Code	Course title	K.U*										I.S**										
		a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	b11
(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											√										√	√
(PPM-201)	Clinical pharmacy and pharmacoepidemeology	√	√										√	√									
(PPM-202)	Clinical research design			√	√										√	√	√						
(PPM-203)	Pharmacotherapy **E**					√	√											√	√	√			
(PPM-204)	Clinical pharmacokinetics							√	√												√		
(PPM-205)	Pharmacoeconomics and pharmacovigilance **E**	√					√																

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

Code	Course title	P.P ***									G.T**						
		c1	c2	c3	c4	c5	c6	c7	c8	c9	d1	d2	d3	d4	d5	d6	d7
(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								√	√							√
(PPM-201)	Clinical pharmacy and pharmacoepidemeology	√									√						√
(PPM-202)	Clinical research design		√									√		√	√		
(PPM-203)	Pharmacotherapy			√	√						√						√
(PPM-204)	Clinical pharmacokinetics					√	√	√					√		√	√	
(PPM-205)	Pharmacoeconomics and pharmacovigilance **E**		√								√						√

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

6- Student Assessment Methods

6.1- Written exam.

6.2- Oral exam.

6.2- Published scientific research paper.

6.3- Public presentation and discussion of the Thesis.

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 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* clinical pharmacy.

10-Thesis

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

Program Coordinator: Dr. Moetaza M. Soliman

Head of Department: Prof. Dr. Mohamed E. E. Shams

Signature:

Annex 1

Attach courses and thesis specifications.

Program: Master in Pharmaceutical Sciences (*Clinical Pharmacy*)

Clinical Pharmacy& Pharmacy Practice Department

Dept. of Clinical Pharmacy
& Pharmacy Practice

Master Thesis Specification

Academic Year: 2021/2022

رئيس القسم

أ.د/ محمد الحسيني شمس

A-Basic Information

1	**Faculty**	**Pharmacy**
2	**Program Title:**	**Master in Pharmaceutical Sciences (*Clinical Pharmacy*)**
3	**Program Type:**	**Single**
4	**Department (s):**	**Pharmacy Practice**
	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 (*Clinical Pharmacy*)**
6	**Coordinator:**	**Main supervisor** **The spec should be general for all Theses in the department, and Head of department should be the coordinator of all Theses**
7	**External Evaluator(s):**	
8	**Date of Program Specification Approval:**	***Department council: 7/5/2022***

B-Professional Information

1-Aims

The overall aims of the thesis:

1.1	To learn basic skills and fundamental knowledge in clinical research and scientific writing.
1.2	To learn how to assess the gap of knowledge in specific topic and design a good clinical question.
1.3	To learn how to interpret and discuss the results of clinical research.

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	Etiology, epidemiology, laboratory diagnosis and clinical features of different diseases and their pharmacotherapeutic approaches.
a2	Scientific writing principles.
a3	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions.
a4	Different designs of clinical studies, and hierarchy of evidence.
a5	Methods of biostatistical analysis and pharmaceutical calculations.

b- Intellectual Skills

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

b1	Using presentation skills efficiently.
b2	Research skills and critical appraisal of clinical research.
b3	Analyze and interpret experimental results as well as published literature.
b4	Analyze and evaluate evidence-based information needed in pharmacy practice.

c- Professional and Practical Skills

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

c1	Extracting and collecting related patient's data from healthcare team and patient's sheet.
c2	Using different statistical software for statistical analysis of the results.
c3	Conduct research studies and analyze the results.
c4	Employ proper documentation

d. General and Transferable Skills

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

d 1	Communicate with healthcare team effectively.
d 2	Retrieve and evaluate information from different sources to improve professional competencies.
d 3	Practice independent learning needed for continuous professional development.
d 4	Implement writing and presentation skills.
d 5	Use numeracy, calculation and statistical methods as well as information technology tools.
d 6	Demonstrate critical thinking, problem-solving and decision-making abilities.

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, a2, a3			
3	Objectives/Rational	a2, a4	b2		d4, d6
4	Results and Discussion	a5	b2, b3, b4	c2, c3, c4	d1, d2
5	Experimental Work	a5	b1	c1, c2, c3, c4	d3, d4, d5, d6
6	Conclusion		b3, b4	c4	d2, d4, d6

* ***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:

1. A written Thesis
2. Published Research Paper(s)
3. Public Defense
4. Committee-in-Charge Report
5. 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 *
Prof Dr. Mohamed E. E. Shams	**Prof Dr. Mohamed E. E. Shams**	**7/ 5 / 2022**

* Date of Dept. Council Approval

Dept. of Clinical Pharmacy & Pharmacy Practice	Course Specification	Master Clinical pharmacy

Master Clinical Pharmacy

Course Specification

Academic year: 2021/2022

توصيف مقرر **حركيه الدواء الاكلينيكيه** **Clinical Pharmacokinetics**	**البرنامج** **ماجيستير الصيدله الاكلينيكيه**
منسق المقرر **ا. د. نهى اسامه منصور**	**رئيس القسم** **أ د. محمد الحسيني السبيعى شمس**

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy & Pharmacy Practice
Department supervising the course	----
Program on which the course is given	Clinical Pharmacy Master Program
Academic Level	Postgraduate
Academic year	2020/2022 second semester
Date of course specification approval	February 2022

A.Basic Information : Course data :

Course Title	Clinical pharmacokinetics
Course Code	PPM203
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	0
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

Introduce the models of linear and dose-dependent systems in pharmacokinetics. Pharmacokinetic applications in therapeutic drug monitoring and patient care; specific drugs and disease states, effects of age and concomitant drug administration.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
A7	a1	Enhance the knowledge of basic pharmacokinetic principles which reinforces clinical pharmacokinetics to the individualization of drug dosing regimens.
A8	a2	Extensive explanations, equations and graphical illustrations to conceptualize principles

A8	a3	Enhance the knowledge of the pharmacokinetics of narrow therapeutic index drugs of common use and unique pharmacokinetics.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B9	b1	Explain the basic pharmacokinetic principles (Volume of distribution, clearance, half life etc.)
	b2	Explain the pharmacokinetic principles and properties of the drugs included in the course.
	b3	Select a dosing strategy for special patient groups and individual patients by performing pharmacokinetic calculations.
	b4	Apply the use of therapeutic drug monitoring to modify and follow up drug dosing regimens.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C5	c1	The use of drug concentrations and pharmacokinetic principles to optimize therapy in individual patients (Therapeutic drug monitoring).
	c2	Enhance the student's therapeutic problem-solving skills so that he/she can integrate and apply pharmacokinetic principles to the optimization of drug dosing regimens.
C6	c3	Apply pharmacokinetics knowledge to clinical use of specific drugs through the solution of problems commonly encountered in the clinical practice setting.
C7	c4	The design of the initial regimen and subsequent adjustments of dosages

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D3	d1	Manipulate computer program to get pharmacokinetic information

D5	d2	Promote critical thinking, problem-solving and decision-making capabilities
D6	d3	Manage time efficiently.

3. Course Contents

Week No.	Topics	Lecture Hours
1	Introduction To Clinical Pharmacokinetics	2
2	IV administration of drugs.	2
3	Oral administration of drugs.	2
4	Continuous IV infusion.	2
5	Two compartmental model of pharmacokinetics.	2
6	Special populations (Drug PK/dosing and hepatic function)	2
7-8	Antibiotics (Aminoglycosides & Vancomycin)	2
9	Cardiovascular agents (Digoxin)	2
10	Anticonvulsants (phenytoin)	2
11	Lithium	2
12	Revision	2
13-15	**Final Exams**	

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 Clinical Pharmacokinetics	a1-a2	b1-b2		d1-d2
2	IV administration of drugs.	a1-a2	b1-b2	c2	d1-d2
3	Oral administration of drugs.	a1-a2	b1-b2	c2	d1-d2
4	Continuous IV infusion.	a1-a2	b1-b2	c2	d1-d2
5	Two compartmental model of pharmacokinetics.	a1-a2	b1-b2	c2	d1-d2
6	Special populations (Drug PK/dosing and hepatic function)	a1-a3	b3-b4	c1, c2, c3, c4	d1-d3
7-8	Antibiotics (Aminoglycosides & Vancomycin)	a3	b3-b4	c1, c2, c3, c4	d1-d3
9	Cardiovascular agents (Digoxin)	a3	b3-b4	c1, c2, c3, c4	d1-d3
10	Anticonvulsants (phenytoin)	a3	b3-b4	c1, c2, c3, c4	d1-d3
11	Lithium	a3	b3-b4	c1, c2, c3, c4	d1-d3

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

5- Teaching and Learning Methods:

5.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Distance learning • On line learning: as Video-recorded lectures, uploaded to the Google drive of the program • Inter active session through Microsoft Teams
5.2	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. To assess understanding, intellectual, professional skills	13-15th week	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	13-15th week	10
				100 %

7- List of References

	Reference	Type
1.	Winter ME. Basic Clinical Pharmacokinetics. 3rd Edition. Spokane, Applied Therapeutics, Inc. 1994	Essential Book **(Text Books)**
2.	Evans WE, Schentag JJ, Jusko WJ. Applied Pharmacokinetics: Principles of Therapeutic Drug Monitoring. 3rd Edition. Spokane, Applied Therapeutics, Inc. 1992	Essential Book **(Text Books)**
3.	Applied clinical pharmacokinetics Larry A. Bauer	Essential Book **(Text Books)**
4.	http://www.sciencedirect.com http:// www.google scholar.com http://www.pubmed.com http://www.ekb.eg	Websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
Others	

9. Signature

Course Coordinator	Head of Department	Date
Dr. Noha Osama Mansour	Prof Dr. Mohamed E. E. Shams	8/2/2022

* Date of Dept. Council Approval

Mansoura University
Faculty of Pharmacy
Postgraduate Studies
Master Clinical Pharmacy Program
Clinical pharmacy and pharmaco-epidemiology
Course Specification

Dept. of Clinical Pharmacy & Pharmacy Practice	Course Specification	Master Clinical pharmacy

Master Clinical Pharmacy

Course Specification

Academic year: 2021/2022

البرنامج	توصيف مقرر
ماجيستير الصيدله الاكلينيكيه	Clinical pharmacy and pharmaco-epidemiology

رئيس القسم	منسق المقرر
أ د. محمد الحسيني السبيعى شمس	د. معتزه محمود سليمان

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy & Pharmacy Practice
Department supervising the course	----
Program on which the course is given	Clinical Pharmacy Master Program
Academic Level	Postgraduate
Academic year	2021/2022 second semester
Date of course specification approval	February, 2022

A.Basic Information : Course data :

Course Title	Clinical pharmacy and pharmaco-epidemiology
Course Code	PPM 201
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	0
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

The course aims at strengthening the basics of professional clinical pharmacy through practical applications, which creates a strong clinical pharmacist and improves work quality in the hospitals and different treatments sites. Pharmaco-epidemiology deals with the study of the use of drugs and their effects in large number of population. The course involves the incidence and total cost of disease, economic impact, and aspects of drug therapy, risks-benefits assessment, and public health systems.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
A1	a1	Identify clinical pharmacy practices that may maximize patient safety.
	a2	Identify subjective and objective data of selected diseases.
A2	a3	Illustrate required monitoring parameters for different cases.
	a4	Identify and prioritize patient medication problems.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B1	b1	Describe the manifestations and reporting of adverse drug reactions and adverse events.
	b2	Describe goals of therapy, including monitoring of response & toxicity.
B2	b3	Manage drug therapy problems effectively.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C1	c1	Identify monitoring parameters of patient's response and therapeutic agents.
	c2	Implement practices that maximize patient safety.
	c3	Implement practices targeting optimum drug therapy outcomes

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D1	d1	Communicate effectively with the healthcare team members
D7	d2	Work effectively in a team and leading teams

3. Course Contents

Week No.	Topics	Lecture Hours
1	Pharmacovigilance and epidemiological methods in adverse drug reaction detection.	2
2	Monitoring anticoagulant therapy.	2
3	Routes of administration of parenteral nutrition - parenteral nutrition in specific disease states.	2
4	Pharmacokinetic drug-drug interactions.	2
5	Principles and goals of drug therapy in the elderly.	2
6	Pharmacoepidemiology and its applications in clinical practice	2
7	Common barriers for pharmaceutical care implementation	2
8	Documentation in clinical pharmacy practice	2
9-11	Clinical trials	2
12	**Revision**	24
13-15	**Final written and oral exam**	

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	Pharmacovigilance and epidemiological methods in adverse drug reaction detection.	a1, a2, a3	b1-b2		
2	Monitoring anticoagulant therapy.	a1, a2, a3	b1-b2	c2	
3	Routes of administration of parenteral nutrition - parenteral nutrition in specific disease states.	a2, a3	b1-b2	c2	
4	Pharmacokinetic drug-drug interactions.	a3,a3	b1-b2	c2	
5	Principles and goals of drug therapy in the elderly.	a1, a2, a3	b1-b2	c2	
6	Pharmacoepidemiology and its applications in clinical practice	a1, a2, a3	b3	c2, c3,	
7	Common barriers for pharmaceutical care implementation	a 1, a4	b3	c2, c3,	
8	Documentation in clinical pharmacy practice	a 2, a3	b3	c2, c3,	
9-11	Clinical trials	a1, a2, a3	b3	c2, c3,	d1

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

5- Teaching and Learning Methods:

5.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Distance learning • On line learning: as Video-recorded lectures, uploaded to the Google drive of the program • Inter active session through Microsoft Teams
5.2	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. To assess understanding, intellectual, professional skills	13-15th week	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	13-15th week	10
				100 %

7- List of References

	Reference	Type
1.	Waller, Patrick. "Getting to grips with the new European Union pharmacovigilan legislation." Pharmacoepidemiology and drug safety 20.5 (2011): 544-549.	Essential Book **(Text Books)**
2.	Epidemiology in medical practice, 5th edition. Churchill Livingstone. New York, London and Tokyo.	Essential Book **(Text Books)**
3.	http://www.sciencedirect.com http:// www.google scholar.com http://www.pubmed.com http://www.ekb.eg	Websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..

9. Signature

Course Coordinator	Head of Department	Date
Dr. Moetaza M. Soliman	**Prof Dr. Mohamed E. E. Shams**	**8 -2-2022**

* Date of Dept. Council Approval

Dept. of Clinical Pharmacy & Pharmacy Practice	Course Specification	Master Clinical pharmacy

Master Clinical Pharmacy

Course Specification

Academic year: 2021/2022

البرنامج ماجيستير الصيدله الاكلينيكيه	توصيف مقرر تصميم البحوث الاكلينيكيه Clinical research design
رئيس القسم أ د. محمد الحسيني السبيعى شمس	منسق المقرر د. معتزه محمود سليمان

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy &Pharmacy Practice
Department supervising the course	----
Program on which the course is given	Clinical Pharmacy Master Program
Academic Level	Postgraduate
Academic year	2021/2022 second semester
Date of course specification approval	February 2022

A.Basic Information : Course data :

Course Title	Clinical research design
Course Code	PPM 202
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	0
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

The stages of the research process, preparation, planning in management. Reviewing the literature, study design and experimental methodology, scientific inquiry and research methodology, protocol development and ethics, types of study and research design, design of clinical trials, design of observational data, source and types of bias, sources of information and datasets.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
A3	a1	Describe principles of clinical investigation.
	a2	Describe principles that govern research design, hypothesis formulation and research methodologies.
A4	a3	Describe the importance of regulation of clinical research, including ethical considerations.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B3	b1	Evaluate current developments in the field of clinical research.
B4	b2	Create and test hypotheses using appropriate experimental design with due regard to regulatory issues.
B5	b3	Design, implement and organize a substantial program of original research.
	b4	Interpret data and evaluate information from a wide range of sources.

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C2	c1	Plan a clinical study.
	c2	Monitor and interpret clinical and/or laboratory safety.
	c3	Perform data analysis using relevant computational tools and packages.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D2	d1	Apply learned ethics to respect patient's confidentiality
D4	d2	Perform self- assessment and identifying personal educational needs.
D5	d3	Retrieve, analyze and assimilate complex information.

3. Course Contents

Week No.	Topics	Lecture Hours
1	Systematic reviews and meta-analyses.	2
2	Phases and designs of clinical trial	2
3	Incidence, prevalence, relative risk/risk ratios, and odds ratios	2
4	Bias and confounding in study design	2
5	Hierarchy of study designs, types of study designs	2
6	Drug literature evaluation: basic	2
7	Drug literature evaluation: advanced	2
8	Professional manuscript writing	2
9	Clinical practice guidelines	2
10-11	Statistical analysis	2
12	Revision	2
13-15	Final exam	

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	Systematic reviews and meta-analyses.	a1-a3	b1-b2		
2	Phases and designs of clinical trial	a1-a3	b1-b2	c2	
3	Incidence, prevalence, relative risk/risk ratios, and odds ratios	a1-a3	b1-b2	c2	d1-d4
4	Bias and confounding in study design	a1-a3	b1-b2	c2	d1-d3
5	Hierarchy of study designs, types of study designs	a1-a3	b1-b2	c2	d1-d2
6	Drug literature evaluation: basic	a1-a3	b3-b4	c2, c3,	d1-d3
7-8	Drug literature evaluation: advanced	a3	b3-b4	c2, c3,	d1-d3
9	Professional manuscript writing	a1-a3	b3-b4	c2, c3,	d2-d3
10	Clinical practice guidelines	a3	b3-b4	c2, c3,	d1-d3
11	Statistical analysis	a1-a2	b3-b4	c2, c3,	d1-d3

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

5- Teaching and Learning Methods:

5.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Distance learning • On line learning: as Video-recorded lectures, uploaded to the Google drive of the program • Inter active session through Microsoft Teams
5.2	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. To assess understanding, intellectual, professional skills	13-15th week	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	13-15th week	10
				100 %

7- List of References

	Reference	Type
1.	"Practical Statistics for medical research" - DG Altman, 1996, London: Chapman and Hall.	Essential Book **(Text Books)**
2.	DiCenzo R, ed. Clinical Pharmacist's Guide to Biostatistics and Literature Evaluation. Lenexa, KS: ACCP, 2010.	Essential Book **(Text Books)**
3.	DiPietro NA. Methods in epidemiology: observational study designs. Pharmacotherapy 2010;30: 973-84.	Essential Book **(Text Books)**
4.	http://www.sciencedirect.com http:// www.google scholar.com http://www.pubmed.com http://www.ekb.eg	Websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
Others	

9. Signature

Course Coordinator	Head of Department	Date
Dr. Moetaza M. Soliman	Prof Dr. Mohamed E. E. Shams	8/2/2022

* Date of Dept. Council Approval

Dept. of Clinical Pharmacy & Pharmacy Practice	Course Specification	Master Clinical pharmacy

Master Clinical Pharmacy

Course Specification

Academic year: 2021/2022

البرنامج	توصيف مقرر
ماجيستير الصيدله الاكلينيكيه	Pharmacotherapy

رئيس القسم	منسق المقرر
أ د. محمد الحسيني السبيعى شمس	ا. د. معتزه محمود سليمان

General

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy & Pharmacy Practice
Department supervising the course	----
Program on which the course is given	Clinical Pharmacy Master Program
Academic Level	Postgraduate
Academic year	2021/2022 second semester
Date of course specification approval	February 2022

A.Basic Information : Course data :

Course Title	Pharmacotherapy
Course Code	PPM 204
Prerequisite	------
Teaching Hours: Lecture	2
Practical:	0
Total Credit Hours	2

B. Professional Information

1- Overall Aims of Course:

This course aims at highlighting the latest treatment guidelines for a group of high prevalence chronic diseases with practical applications in the form of case studies and discussions with an emphasis on the role of the clinical pharmacist in dealing with patients and providing a high quality service to them.

2- Intended Learning Outcomes (ILOs)

2.1. *Knowledge and Understanding*

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
A5	a1	State the pharmacological options for treating the selected diseases.
A6	a2	Identify the evidence based medicine for treating the selected conditions.
	a3	Describe the adverse and toxic effects, and their management of commonly used groups of drugs.

A6	a4	Recognize the rational and general guidelines of the use of drugs in the proper dose in special population such as pediatrics, geriatrics, pregnancy and lactation and in cases of liver and kidney impairment.

2.2. Intellectual Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
B6	b1	Understand relevant lab and clinical data for assessing the severity of the selected diseases.
B7	b2	Design the role of the pharmacist/clinician in the therapeutic plan.
B8	b3	Define goals of therapy, including monitoring of response & toxicity

2.3. Professional and Practical Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
C3	c1	Identify monitoring parameters of patient's response and therapeutic agents.
C4	c2	Individualize therapy for different patients
	c3	Select the most appropriate regimen of therapy.
	c4	Construct a pharmaceutical care plan to include advice to a clinician.

2.4. General and Transferable Skills

After completion of the course, graduates will be able to

Program ILOs No.	Course ILOs No.	Course ILOs
D1	d1	Communicate effectively with the healthcare team members.
D7	d2	Work effectively in a team and leading teams.

3. Course Contents

Week No.	Topics	Lecture Hours
1	Questionnaires used for assessment	2
2	Pharmacotherapy for anxiety.	2
3	Drug treatment in schizophrenia.	2
4	Assessment and management of pain.	2
5-6	Pharmacotherapy of diabetes mellitus	2
7-8	Pharmacotherapy of hypertension	2
9	Pharmacotherapy of heart failure	2
10-11	Pharmacotherapy of asthma	2
12	Pharmacotherapy of thyroid disorders	2
13-15	**Final exams**	

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	Questionnaires used for assessment	a1-a4	b2-b3		
1	Pharmacotherapy for anxiety.	a1-a4	b1-b3	c1-c4	d2
2	Drug treatment in schizophrenia.	a1-a4	b1-b3	c1-c4	d1
3	Assessment and management of pain.	a1-a4	b1-b3	c1-c4	d1
4	Pharmacotherapy of diabetes mellites	a1-a4	b1-b3	c1-c4	d1
5-6	Pharmacotherapy of hypertension	a1-a4	b1-b3	c1-c4	d1-d2
7-8	Pharmacotherapy of heart failure	a1-a4	b1-b3	c1-c4	d1
9	Pharmacotherapy of asthma	a1-a4	b1-b3	c1-c4	d1
10-11	Pharmacotherapy of thyroid disorders	a1-a4	b1-b3	c1-c4	d1

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

5- Teaching and Learning Methods:

5.1	Computer aided learning: a. Lectures using whiteboard or data show, power Point presentations b. Distance learning • On line learning: as Video-recorded lectures, uploaded to the Google drive of the program • Inter active session through Microsoft Teams
5.2	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. To assess understanding, intellectual, professional skills	13-15th week	90
Assessment 2	**Oral Exam**	To assess understanding, intellectual skills, General and Transferable skills	13-15th week	10
				100 %

7- List of References

	Reference	Type
1.	Koda-Kimble and Young's applied therapeutics: the clinical use of drugs. Eds. Brian K. Alldredge, Robin L. Corelli, and Michael E. Ernst. Lippincott Williams & Wilkins, 2012.	Essential Book **(Text Books)**
2.	William D. Linn, PharmD et al Pharmacotherapy in Primary Care: Graw Hill 2011	Essential Book **(Text Books)**
3.	Walker, Roger, and Cate Whittlesea. Clinical pharmacy and therapeutics. Elsevier Health Sciences, 2011.	Essential Book **(Text Books)**
4.	http://www.sciencedirect.com http:// www.google scholar.com http://www.pubmed.com http://www.ekb.eg	Websites

8- Facilities required for teaching and learning

-Class room	**Data show- Computers, Internet**. ……..
Others	

9. Signature

Course Coordinator	Head of Department	Date
Dr. Moetaza M. Soliman	Prof Dr. Mohamed E. E. Shams	8-2-2022

* Date of Dept. Council Approval