Zagazig University

Faculty of Pharmacy

Pharmacy Practice Department

Program and Course Specifications

Master & PhD Degrees

Master Degree

Program Specification

Program Specification

A- Basic Information

1- Program title: M.Pharm. Sci. Degree in **pharmacy practice**

2- Program type: Multiple

3- Faculty/ University: Faculty of Pharmacy, Zagazig University

4- Department: Pharmacy practice

5- Coordinator: Assis. Prof./ Gehan Balata

6- Date of program specification approval: Sep 2018

7- Teaching language: English

8. External Evaluator: Prof. Gamal El-Maghrabi (Head of Pharmaceutics department – Faculty of Pharmacy – Tanta University)

9. **Internal Evaluator:** Prof. Nagia ElMegrab

B- Professional Information

1- Program aims:

This Program aims at providing postgraduate students with knowledge, skills and abilities needed to practice the pharmacy profession effectively in various settings including Research Institutes, private and public hospitals and universities.

The program aims are summarized as follows:

1. Provide the community with highly qualified and professionals with skills and ethical values based on National Academic Reference Standards (NARS).

2. Help acquire the necessary knowledge and skills in areas related to Pharmacy practice including pharmacotherapy, pharmacokinetics, patient counselling and medication safety.

3. Develop communication skills, time management, critical thinking, problem solving, decision making, using information technology and design and conduct clinical research.

Consistency of the program aims with the mission of Faculty of Pharmacy:

The faculty of Pharmacy, Zagazig University aims to provide the local and regional community with highly qualified, multidisciplinary and professional pharmacists with ethical values and able to participate in the development of drug industry and quality assurance as well as contribute to a distinguished health service to the society. This is achieved through developing and upgrading the academic programs, teaching and learning methods, supporting various student activities, developing the abilities of the staff members, their assistants and administrative members, enhancing the oriented applied and scientific research and providing the continuous pharmaceutical education.

1.1 Graduate attributes:

The master degree of Pharmacy practice aims at developing the following attributes, upon successful completion of the program.

The graduate will be qualified to:

1. Demonstrate ethical, legal, social and civic responsibility as a researcher and member of the discipline.
2. Have the fundamental knowledge and professional skills for proper application in the field of pharmacy practice
3. Analyze, evaluate information and solve professional problems
4. Conduct clinical research, write and evaluate scientific reports
5. Develop continuous and self learning abilities

6. Communicate and work effectively in a team

2-Intended Learning Outcomes (ILOs):

The Program provides excellent opportunities for students to demonstrate knowledge and understanding qualities and develop skills appropriate for Pharmacy practice Master of sciences degree.

2-1- Knowledge and Understanding :

On successful completion of the Master degree Program, students will be able to:

A.1- Discuss the therapeutic efficacy of homogenous and heterogeneous dosage forms

A.2- Describe physiological functions of the different body organs

A.3- Outline pharmacotherapeutic properties of different groups of drugs, mechanism of action, drug-drug interaction, toxic effects and risks and benefits of commonly used drugs.

A.4- Describe the applications of biopharmaceutics and pharmacokinetics

A.5- Outline treatment strategies for various GIT, cardiac, and upper respiratory tracts disorders.

A.6- Describe specific pharmacokinetic characteristics of most important drugs

A.7- Outline the basis and applications of instrumental analysis

A.8- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data

A.9- Define ethics of scientific research and professional work

2-2 - Intellectual Skills:

On successful completion of the Master degree Program, students will be able to:

B.1- Choose the proper technique to follow up various treatment regimens

B.2- Interpret and correlate patient clinical data versus clinical picture

B.3- Suggest strategies for preventing complications associated with different treatment plans

B.4- Evaluate various therapeutic strategies for individuals with high risk for disease and common medical conditions

B.5- Construct a clinical research study

B.6- Design the appropriate treatment based on patient specific condition

B.7- Statistically analyze different types of data

2-3 - Professional and Practical Skills:

on successful completion of the Master degree Program, students will be able to:

C.1-. Perform routine technical procedures including blood collection, separation of plasma and serum samples

C.2- Construct a good research methodology in the area of clinical pharmacy and pharmacy practice

C.3- Use laboratory tests dealing with HPLC and GC techniques & equipments

C.4- Recommend a treatment regimen and monitoring parameters to ensure safe and effective use of medicines

C.5- Apply safety guidelines in dealing with chemical reagents and biological samples.

C.6- Demonstrate report writing skills

2.4 - General and Transferable Skills:

On successful completion of the Master degree Program, students will be able to:

D.1- Interact effectively with patient , colleagues ,and professionals

D.2- develop computer skills such as internet, word processing, SPSS and data sheet for collecting scientific materials.

D.3- Demonstrate self- learning skills in the field of pharmacotherapy, oncology, and pediatrics

D.4- Evaluate information from different including online resources, library as well as printed literatures

D.5- Work effectively as a member of team to achieve tasks

D.6- Prioritize work and meet deadlines to achieve goals

3- Academic Standards:

Faculty is committed to the Academic References Standards for postgraduate studies (March 2009).

Matrix1: Comparisons of Clinical Pharmacy Master program with the Academic Reference Standard {ARS, 2009} developed by NAQAAE

Attributes of the graduates (ARS, 2009)	Attributes of the graduates (pharmacy practice Master program)
1. Apply the specialized knowledge he has acquired in his professional practice	1.Have the fundamental knowledge and professional skills for proper application in the field of pharmacy practice
2. Identify and solve professional problems 5. Take decisions using available information	4. Analyze, evaluate information and solve professional problems
4. Show good communication and leadership skills	7. Communicate and work effectively in a team
3. Use technology effectively in his professional practice 6. Use available resources efficiently	5. Conduct clinical research, write and evaluate scientific reports
7. Aware of his role in community service and development	2. Demonstrate ethical, legal, social and civic responsibility as a researcher and member of the discipline.
8. Reflect commitment to integrity, credibility and accountability	
9. Be a lifelong learner and able to develop himself	6. Develop continuous and self learning abilities

Matrix 2: Comparison between Master degree program ILOs and the Academic Reference Standards, 2009.

	ARS (2009)	Program ILOs
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A.1- Discuss the therapeutic efficacy of homogenous and heterogeneous dosage forms A.2- Describe physiological functions of the different body organs A.3- Explain pharmacotherapeutic properties of different groups of drugs, mechanism of action, drug-drug interaction, toxic effects and risks and benefits of commonly used drugs. A.4- Describe the applications of biopharmaceutics and pharmacokinetics A.7- Outline the basis and applications of instrumental analysis
	2.1.2- Mutual influence between professional practice and its impact on the environment.	A.5- Outline treatment strategies for various GIT, cardiac, and upper respiratory tracts disorders
	2.1.3- Scientific developments in the area of specialization.	A.8- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data A.9- Define ethics of scientific research and professional work

	ARS (2009)	Program ILOs
	2.1.4- Moral and legal principles for professional practice in the area of specialization.	A.9- Define ethics of scientific research and professional work
	2.1.5- Principles and the basics of quality in professional practice in the area of specialization.	A.8- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data
	2.1.6- The fundamentals and ethics of scientific research.	A.9- Define ethics of scientific research and professional work
Intellectual Skills	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B.1- Choose the proper technique to follow up various treatment regimens B.2- Interpret and correlate patient clinical data versus clinical picture
	2.2.2- Solve specified problems in the lack or missing of some information.	B.3- Suggest strategies for preventing complications associated with enteral nutrition and parenteral nutrition
	2.2.3-Correlate and integrate different pharmaceutical knowledge to solve professional problems.	B.4- Evaluate various therapeutic strategies for individuals with high risk for disease and common medical conditions
	2.2.4- Conduct research and write scientific report on research specified topics.	B.5- Construct a clinical research study B.7- Statistically analyze different types of data

	ARS (2009)	Program ILOs
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B.6- Design the appropriate treatment based on patient specific condition
	2.2.6- Plan to improve performance in the field of specialization.	
	2.2.7- Professional decision-making in the contexts of diverse disciplines.	
Professional and Practical Skills	2.3.1- Master basic and modern professional skills in the area of specialization.	C.1-. Perform routine technical procedures including blood collection, separation of plasma and serum samples
	2.3.2- Write and evaluate professional reports.	C.6- Demonstrate report writing skills
	2.3.3- Assess methods and tools existing in the area of specialization.	C.2- Construct a good research methodology in the area of clinical pharmacy and pharmacy practice C.3- Use laboratory tests dealing with HPLC and GC techniques & equipments C.4- Recommend a treatment regimen and monitoring parameters to ensure safe and effective use of the intravenous fluids C.5- Apply safety guidelines in dealing with chemical reagents and biological samples.

	ARS (2009)	Program ILOs
General and Transferable Skills	2.4.1- Communicate effectively.	D.1- Interact effectively with patient , colleagues ,and professionals.
	2.4.2- Effectively use information technology in professional practices	D.2- Develop computer skills such as internet, word processing, SPSS and data sheet for collecting scientific materials.
	2.4.3- Self-assessment and define his personal learning needs.	D.3- Demonstrate self- learning skills in the field of pharmacotherapy, oncology, and pediatrics
	2.4.4- Use variable sources to get information and knowledge.	D.4- Evaluate information from different including online resources, library as well as printed literatures
	2.4.5- Set criteria and parameters to evaluate the performance of others	D.5- Work effectively as a member of team to achieve tasks
	2.4.6- Work in a team and lead teams carrying out various professional tasks.	
	2.4.7- Manage time effectively.	D.6- Prioritize work and meet deadlines to achieve goals
	2.4.8- Continuous and self learning.	D.3- Demonstrate self- learning skills in the field of pharmacotherapy, oncology, and pediatrics

4-Curriculum Structure and Contents:

a- Program duration: **3-5** years

b- Program structure:

- The Masters program can be completed in 3-5 years.
- The Faculty of pharmacy implements the credit hour system.
- Each academic year consists of 2 semesters
- Minimum credit hours that can be registered each semester: 8 credit hours
- Maximum credit hours that can be registered each semester: 12 credit hours
- The program is structured as:

1- Courses: General (1 year) and Special

No. of credit hours for program courses:

General : 20 credit hours(Compulsory: 12, Elective: (2x4) 8)

Special: (3courses x4 hours) 12 credit hours

2- Thesis: 30 hours

The candidate must complete a research project on an approved topic in the Pharmaceutical Sciences. To fulfill this requirement the student must present (written and orally) a research proposal and write a thesis.

3- General University Requirements: 10 credit hours including:

a- TOEFL (400 units)

b- Computer course

c- Study plan:

Course Code	Course Title	Credit hours	Program ILOs Covered	Final exam duration
	General Courses:			
PP1	Physiology	2	A2,D3,D4,D5	2 hours
PP 2	Biostatistics	2	A9,B7,D3,D4,D5	2 hours
PP 3	Elective course 1 (Drug interaction)	4	A3,B4,B6,D3,D4,D5	2 hours
PP 4	Elective course 2 Drug induced disease	4	A3,B4,B6,D3,D4,D5	2 hours
PP 5	Instrumental analysis	4	A7,A8,C3,D3,D4,D5	2 hours
PP 6	Biopharmaceutics and Pharmacokinetic	2	A4,B6,D4,D5	2 hours
PP 7	Physical pharmacy	2	A1,D3,D4,D5	2 hours
	Special Courses:			
PPsp1	Pharmacotherapy	4	A3,A5,A8,B1,B2,B4,B6,D1,D2,D3,D4,D5	3 hours
PPsp2	Interpretation of clinical laboratory data	4	A7,A8,B2,B3,C3, C5,D1,D2,D3,D4,D5	3 hours
PPsp3	Advanced and clinical pharmacokinetic	4	A4,,B1,B6,C4, D1,D2,D3,D4,D5,	3 hours

	Thesis	30	A1, A2, A4, A5, A6,A7, A8, A9 B1, B2, B3, B4, B5, B6, B7, C1, C2, C3,C4, C5, D1, D2, D3, D4, D5, D6	

Elective courses: Applied pharmacology, Drug-drug interactions (ME6), Drug induced disease, Biotechnology (ME4)

d. Learning Outcomes in Domains of Teaching Strategies & Assessment Methods:

ILOs	teaching method	assessment method
Knowledge and Understanding Intellectual Skills	Lectures Case study Self learning	Written and oral Exam
Professional and practical Skill	Case study Problem solving Thesis	Practical Exam Case discussion Rubric
Intellectual Skills General and Transferable Skills	Group presentation Structured Assignment Thesis	Oral Exam Rubric

5-Program admission requirements:

General Admission Conditions

- The Applicant should finish or being permanently or temporarily exempted from the military service and temporary exemption

should be valid for at least one year from the date of beginning of study. (Exceptions apply for demonstrators and assistant lecturers).

- The applicant admission to the M.Sc. program should be no later than ten years from the time of graduation.
- Acquisition of an approval from the Faculty Council following an approval of concerned Departmental Board as well as Graduate Studies and Research Committee recommendation within a maximum of one month for any conditions stated by the concerned Departmental Board.

Admission Conditions for M.Sc. degree

In addition to the general admission conditions stated before, applicants are admitted to M.Sc. degree upon fulfillment of the following:

The applicants should be holders of Bachelor in Pharmaceutical Sciences from any Faculty of Pharmacy with a general grade at least good (cancelled by a decision of the university council) affiliated to the Egyptian Universities or an equivalent degree granted by any institute recognized by the Supreme Council of Universities.

The Faculty council is allowed, on consent of the concerned Departmental Board as well as Graduate Studies and Research Committee, to accept student for registration of M.Sc. degree if he has got a diploma from one of the Egyptian Universities in one of the pharmaceutical sciences fields, Faculties, or Institutes that are recognized by the Supreme Council of Universities with a general grade of Good regardless his grades in bachelor degree.

Students should fulfill all the admission requirements stated by the concerned Departmental Board (ICDL certificate, local TOEFL certificate with a grade at least 400).

Admission has to be done within the period announced by the university.

Candidate thesis discussion isn't before one calendar year from research point registration.

Regulations to complete the program:

The Faculty Council, in compliance with the concerned Departmental Board as well as Graduate Studies and Research Committee recommendation awards the M.Sc. degree upon fulfillment of the following requirements:

- Carrying out a deep research in the area of specialization for at least one or two calendar years and at most three years from the time of registration.
- The student has to succeed in all courses examinations.
- Acceptance of the research thesis by the Jury Committee according to statement 104 of universities regulating law.

Cancellation of Registration

The Faculty Board is allowed to cancel registration for M. Sc. programs in the following circumstances

- Student's failure to pass the course examinations for two times.
- Student's nonattendance or unsatisfactory progress (at least two annual reports) in research work being reported by the advisors and chief supervisor to the Departmental Board

and forwarded to the Graduate Studies and Research Committee recommendation for approval of cancellation.

- Dissertation refusal by the Jury Committee.

Incapability of the student to graduate by the deadlines indicated

6- Admission Policy:

The faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (ESCU).

7-Student assessment methods:

Method	ILOS
Written exam	Knowledge and Understanding and Intellectual Skills
Oral exam	Knowledge and Understanding ,Intellectual Skills and General and Transferable Skills
Activity	Intellectual Skills and General and Transferable Skills
Seminars	Knowledge and Understanding ,Intellectual Skills & General and Transferable Skills
Follow up	Professional and practical Skills & General and Transferable Skills
Thesis and oral presentation	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and Transferable Skills

Grade Scale	Grade point average value (GPA)	Numerical scale
A+	5	≥ 95%
A	4.5	90- < 95%
B+	4	85- < 90%
B	3.5	80- < 85%
C+	3	75- < 80%
C	2.5	70- < 75%
D+	2	65- < 70%
D	1.5	60- < 65%
F	1	< 60%

8-Failure in Courses:

Students who fail to get 60% (1 point). In this case, students can register the course again and their grades are those obtained on repeating the course with maximum GPA being 3

9-Methods of program evaluation

Evaluator	Method	Sample
Internal evaluator: Prof. Nagia ElMegrab	Program evaluation Courses evaluation	Program report Courses report
External evaluator: Prof. Gamal ElMaghrabi	Program evaluation Courses evaluation	Program report Courses report
Others methods	Matrix with ARS Questionnaires	**100%**

Program coordinator: Assis. Prof./ Gehan Balata

Head of Department: Assis. Prof./ Gehan Balata

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Special Courses

Pharmacotherapy

Course specification of Pharmacotherapy

A- Course specifications:

- Program on which the course is given: Master of Pharmacy Practice
- Major or Minor element of program: Major
- Department offering the program: Pharmacy practice
- Department offering the course: Pharmacy practice
- Date of specification approval: 2018

1- Basic information:

Title: Pharmacotherapy
Code: PPsp1
Lectures: 4 hrs/week Credit hours: 4 hrs/week
Total: 4hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to understand treatment strategies and recognize pertinent information for educating patients and prescribers regarding the appropriate use of pharmacologic agents for various GIT, cardiac, and upper respiratory tracts disorders as well as critically read and discuss the current literature in the field

3. Intended learningoutcomes (ILOs) of Pharmacotherapy:

Knowledge and Understanding	
a1	List the national guideline treatment strategies of gastrointestinal (GI), cardiac, and upper respiratory tracts disorders.
a2	Explain the current National Institutes of Health National Heart, Lung and Blood Institute guidelines.
a3	Discuss indications for warfarin, goal international normalized ratio (INR), and therapy duration for specific patients
a 4	Describe how to design a treatment plan for a patient receiving warfarin who needs to undergo an invasive procedure
a5	Formulate evidence-based treatment strategies for patients with acute decompensated heart failure and of idiopathic pulmonary arterial hypertension
a6	Recognize pertinent information for educating patients and prescribers regarding the appropriate use of pharmacologic agents for various GI, cardiac, and upper respiratory tracts disorders.
Intellectual skills	
b1	Differentiate between clinical signs, symptoms, risk factors, and treatment of both Helicobacter pylori– and nonsteroidal anti-inflammatory drug– associated PUD
b2	Select the appropriate acute and preventive treatment for pediatric and adult patients with asthma, adult patients with chronic obstructive pulmonary disease, and conditions requiring anti- coagulation, depending on patient-specific factors.
b3	Differentiate between goals and treatment for hypertensive emergencies and hypertension without progressive organ damage.
b4	Suggest a treatment plan for patients presenting with a life-threatening arrhythmia.
General and Transferable Skills	
d1	Use computer skills to present information
d2	Collect information from a variety of sources
d3	Maintain ethics and respect-based relationships with colleagues and patients.
d4	Improve scientific brain storming capabilities of team members

4. Course Content:

Week number	Lecture contents (4hrs/week)
1	GIT diseases GERD Peptic ulcer
2	Upper GIT bleeding Inflammatory bowel disease
3	Complication of liver disease Nausea and vomiting
4	Pancreatitis **Activity (seminar)**
5	Diarrhea Constipation Irritable bowel syndrome
6	**Upper and lower respiratory diseases** Supprative lung disease
7	Chronic obstructive pulmonary disease
8	Pleural effusion
9	Interstitial lung disease **Activity (review article)**
10	Tumors of lung
11	Pulmonary embolism
12	**Cardiovascular diseases** Hypertension
13	Heart failure **Student presentation**
14	Acute coronary syndrome
15	Revision and open discussion

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Case study
- Critical thinking

6- Student Assessment methods:

Written exam assess: a1, a2, a3,a4, a5,a6, b1, b2, b3,b4

Oral exam assess: a1, a2, a3,a4, a5,a6, b1, b2, b3,b4

Activity assess: d1, d2, d3, d4

Assessment schedule:

Assessment (1): Activity	Week 4,9,13
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers:

B- Essential books:

Applied Therapeutics,
Authors: Mary Anne Koda-Kimble (Editor), Wayne A. Kradjan (Editor), Lloyd Yee Young (Editor), Brain K. Alldredge (Editor), Robin L. Corelli (Editor), Mary Ann Koda-Kimble, B. Joseph Guglielmo
Publication Date: Latest Edition
Publisher: Lippincott Williams & Wilkins
Dimensions:11.25"H x 8.75"W x 3.25"D; 9.65 lbs.
ISBN-10: 0781748453
ISBN-13: 9780781748452
1**. Clinical Pharmacy and therapeutics**

Walker Roger, Edwards C.R.W.:
3 Rev Ed
Elsevier Health Sciences (United Kingdom), 2002
Paperback, 960 pages
ISBN: 9780443071379
ISBN-10: 0443071373

2. Pharmacotherapy:
A Pathophysiologic Approach (6th Ed.) And Pharmacotherapy
Casebook A Patient Focused Approach (6th Ed.)
Authors: Joseph T. Dipiro, L. Michael Posey, Robert L. Talbert, Gary C. Yee, Gary R. Matzke, Barbara G. Wells
Publication Date: Latest Edition
Publisher: McGraw-Hill
ISBN-10: 0071447911
ISBN-13: 9780071447911

3- Basic & Clinical Pharmacology (Basic and Clinical Pharmacology) (Paperback)
Bertram G. Katzung (Author)
Paperback: 1179pages
Publisher: McGraw-Hill Medical; (2006) Latest edition
Language: English
ISBN-10: 0071451536
ISBN-13: 978-0071451536

4-Goodman & Gilman's The Pharmacological Basis of Therapeutics (Goodman and Gilman's the Pharmacological Basis of Therapeutics) (Hardcover)
Laurence Brunton (Author), John Lazo (Author), Keith Parker (Author)
Publisher: McGraw-Hill Professional; Latest edition
Language: English
ISBN-10: 0071422803
ISBN-13: 978-0071422802

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show, air conditioned teaching halls.

- **Head of Department: Assis. Prof./ Gehan Balata**

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Matrix I of Pharmacotherapy														
Week number	Course Contents	Knowledge and understanding						Intellectual Skills				General and Transferable Skills			
		a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	d1	d2	d3	d4
1	**GIT diseases** GERD Peptic ulcer	√					√	√							
2	Upper GIT bleeding Inflammatory bowel disease	√					√	√							
3	Complication of liver disease Nausea and vomiting	√					√								
4	Pancreatitis **Activity (seminar)**	√					√					√	√	√	√
5	Diarrhea Constipation Irritable bowel syndrome	√					√								
6	**Upper and lower respiratory diseases** Supprative lung disease	√	√				√		√						
7	COPD	√	√				√		√						
8	Pleural effusion	√	√				√		√						
9	Interstitial lung disease **Activity (review article)**	√	√				√		√			√	√	√	√
10	Tumors of lung	√					√		√						
11	Pulmonary embolism	√		√	√		√		√						
12	**Cardiovascular diseases** Hypertension	√				√	√			√					
13	Heart failure **Student presentation**	√		√	√	√	√					√	√	√	√
14	Acute coronary syndrome	√		√	√		√				√				
15	Revision and open discussion	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Interpretation of clinical laboratory data

Course specification of Interpretation of clinical laboratory data

A- Course specifications:

- Program on which the course is given: Master of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: Pharmacy practice
- Department offering the course: Pharmacy practice
- Date of specification approval: April 2018

1- Basic information:

Title: **Interpretation of clinical laboratory data**
Code: PPsp2
Lectures: 4 hrs/week Credit hours: 4 hrs/week
Total: 4hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to recommend a treatment regimen and monitoring parameters to ensure safe and effective use of the intravenous fluids and strategies for preventing complications associated with EN and PN. In addition to interpret laboratory data and deal with the patient according to the results.

3. Intended learning outcome s (ILOs) of Interpretation of clinical laboratory data

Knowledge and Understanding	
a1	Suggest an appropriate intravenous fluid regimen and monitoring parameters given a patient's clinical characteristics.
a2	Discuss the appropriate use and risks of hypertonic and hypotonic saline, and recommend a treatment regimen and monitoring parameters to ensure safe and effective use of these intravenous fluids
a3	Determine the electrolytes disorders and how to manage them
a4	Recommend a patient-specific EN formula, infusion rate, and monitoring parameters.
a5	Determine a patient-specific PN formula and monitoring plan based on the type of intravenous access, nutritional needs, co morbidities, and clinical condition.
a6	Outline strategies for preventing complications associated with EN and PN.
Intellectual skills	
b1	Calculate the osmolarity of intravenous fluids and normal plasma osmolarity
b2	Recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms regarding electrolyte abnormalities.
General and Transferable Skills	
d1	Use computer skills to present information
d2	Collect information from a variety of sources
d3	Maintain ethics and respect-based relationships with colleagues and patients.
d4	Improve scientific brain storming capabilities of team members
d5	Show independent learning skills.

4. Course Content

Week number	Lecture contents (4hrs/week)
1	Fluid management
2	Osmolality
3	Hypertonic saline
4	Hypotonic intravenous fluids
5	Hyponatremia and hypo-osmolal states
6	**Activity (seminar)**
7	Hypernatremia and hyperosmolal states
8	Disorders of K+
9	Disorders of magnesium homeostasis
10	Disorders of phosphorus homeostasis
11	Disorders of calcium homeostasis
12	Enternal nutrition
13	Parenternal nutrition
14	**Activity (review article)**
15	Revision

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- collaborative teaching

6- Student Assessment methods:

Written exam assess: a1, a2, a3, a4, a5, a6, b1, b2.

Oral exam assess: a1, a2, a3, a4, a5, a6, b1, b2.

Activity assess: d1, d2, d3, d4, d5

Assessment schedule:

Assessment (1): Activity	Week 6,14
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers

B- Essential books:

Adelin Albert. Multivariate Interpretation of Clinical Laboratory Data (Statistics: A Series of Textbooks and Monographs) 1st Edition. Amazon.com. ISBN-13: 978-0824777357

David Andersson. Lab Values: Everything You Need to Know about Laboratory Medicine and its Importance in the Diagnosis of Diseases. Medical Creations (Editor).

Camille Heusghem. Advanced Interpretation of Clinical Laboratory Data (Clinical and Biochemical Analysis) 1st Edition. ISBN-13: 978-0824717445

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show, air conditioned teaching halls.

- **Course Coordinators: Prof . hoda ElSayed**
- **Head of Department: Assis. Prof / Gehan Balata**
- **تم اعتماد التوصيف بمجلس الكلية بتاريخ 2018**

Matrix I of Interpretation of clinical laboratory data

Week number	Course Contents	Knowledge and understanding						Intellectual Skills		General and Transferable Skills				
		a1	a2	a3	a4	a5	a6	b1	b2	d1	d2	d3	d4	d5
1	Fluid management	√						√						
2	Osmolality	√						√						
3	Hypertonic saline		√					√						
4	Hypotonic intravenous fluids		√					√						
5	Hyponatremia and hypo-osmolal states		√					√						
6	**Activity (seminar)**									√	√	√	√	√
7	Hypernatremia and hyperosmolal states		√					√						
8	Disorders of K+			√					√					
9	Disorders of magnesium homeostasis			√					√					
10	Disorders of phosphorus homeostasis			√					√					
11	Disorders of calcium homeostasis			√					√					
12	Enternal nutrition				√	√	√							
13	Parenternal nutrition				√	√	√							
14	**Activity (review article)**									√	√	√	√	√
15	Revision	√	√	√	√	√	√	√	√	√	√	√	√	√

Advanced and clinical pharmacokinetic

Course specification of Advanced and Clinical Pharmacokinetic

A- Course specifications:

- Program on which the course is given: Master of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: pharmacy practice
- Department offering the course: pharmacy practice
- Date of specification approval: April 2018

1- Basic information:

Title: **Advanced and clinical pharmacokinetic**
Code: PPsp3
Lectures: 4 hrs/week
Credit hours: 4 hrs/week
Total: 4hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to describe specific pharmacokinetic characteristics of most important drugs, individualize drug therapy based on both population & patient's specific parameters and develop a pharmaceutical care plan for each patient

3. Intended learning outcome s (ILOs) of Advanced and clinical pharmacokinetic

Knowledge and Understanding	
a1	Discuss various aspects of drug pharmacokinetic properties.
a2	State applications of pharmacokinetics in clinical situations.
a3	Describe methods of measuring pharmacokinetic of drugs.
Intellectual skills	
b1	Identify the problem through analyzing patient data
b2	Demonstrate problem solving skills
b3	Develop an effective pharmaceutical care plan
General and Transferable Skills	
d1	Contact effectively with professionals.
d2	Deal with computer and internet skills.
d3	Evaluate information from different sources.
d4	Develop communication skills with patients and physicians
d5	Show independent learning skills.

4. Course Content of Advanced and clinical pharmacokinetic

Week number	Lecture contents (4hrs/week)
1	**Drug monograph of phenytoin** Therapeutic plasma concentration Toxic concentration
2	Bioavailability, Volume , distribution ,Clearance and Half life of phenytoin
3	• Case study
4	**Drug monograph of Lithium** Therapeutic plasma concentration Toxic concentration
5	Bioavailability, Volume ,distribution ,Clearance and Half life of lithium
6	• Case study
7	**Drug monograph of Methotrexate**

	Therapeutic plasma concentration Toxic concentration
8	Bioavailability, Volume ,distribution ,Clearance and Half life of methotrexate
9	• Case study • **Student Reports**
10	**Drug monograph of Aminoglycoside** Therapeutic plasma concentration Toxic concentration
11	Bioavailability, Volume ,distribution ,Clearance and Half life of Aminoglycoside
12	• Case study
13	**Drug monograph of Digoxin** Therapeutic plasma concentration Toxic concentration
14	Bioavailability, Volume, distribution, Clearance and Half life of digoxin
15	• Case study

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion

6- Student Assessment methods:

Written exam assess: a1, a2, a3, b1, b2 and b3

Oral exam assess: a1, a2, a3, b1, b2 and b3

Activity assess: d1, d2, d3, d4 and d5

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers

B- Essential books:

- Curtis L . Smith, Pharm.D, FCCP, BCPS. Pharmacokinetics: A Refresher. ACCP Updates in Therapeutics® 2017: Pharmacotherapy Preparatory Review and Recertification Course.
- Larry A. Bauer, PharmD, Applied Clinical Pharmacokinetics, 2nd edition, Copyright © 2008 by The McGraw-Hill Companies, Inc.
- Adam M. Persky, PhD, Copyright 2013 © Adam M. Persky

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show.

- **Course Coordinators:Prof Hanaa Abd El-Fattah El-Ghamry & Dr. Mohamed Wali**
- **Head of Department: Assis. Prof/ Gehan Balata**
- **تم اعتماد التوصيف بمجلس الكلية بتاريخ 2018**

Matrix I of Advanced and clinical pharmacokinetic												
Week number	Course Contents	Knowledge and understanding			Intellectual skills			General and Transferable skills				
		a1	a2	a3	b1	b2	b3	d1	d2	d3	d4	d5
1	**Drug monograph of phenytoin** Therapeutic plasma concentration Toxic concentration	√	√	√								
2	Bioavailability, Volume , distribution ,Clearance and Half life of phenytoin	√	√	√								
3	• Case study				√	√	√	√	√	√	√	√
4	**Drug monograph of Lithium** Therapeutic plasma concentration Toxic concentration	√	√	√								
5	Bioavailability, Volume ,distribution ,Clearance and Half life of lithium	√	√	√								
6	• Case study				√	√	√	√	√	√	√	√
7	**Drug monograph of Methotrexate** Therapeutic plasma concentration Toxic concentration	√	√	√								
8	Bioavailability, Volume ,distribution ,Clearance and Half life of methotrexate	√	√	√								
9	• Case study • **Student Reports**				√	√	√	√	√	√	√	√
10	**Drug monograph of Aminoglycoside** Therapeutic plasma concentration	√	√	√								

	Toxic concentration											
11	Bioavailability, Volume ,distribution ,Clearance and Half life of Aminoglycoside	√	√	√								
12	• Case study				√	√	√	√	√	√	√	√
13	**Drug monograph of Digoxin** Therapeutic plasma concentration Toxic concentration	√	√	√								
14	Bioavailability, Volume, distribution, Clearance and Half life of digoxin	√	√	√								
15	• Case study				√	√	√	√	√	√	√	√

Courses offered by other departments

Physiology

Course specification of Physiology

A- Course specifications:

- Program on which the course is given: Master of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: Pharmacy Practice Dept.
- Department offering the course: Pharmacology Dept.
- Date of specification approval: 2018

1- Basic information:

Title: **Physiology** Code: PP1
Lectures: 2 hrs/week Credit hours: 2 hrs/week
Total: 2hrs/week

2- Overall aim of the course:

- On completion of the course, the students will be able to build up comprehensive knowledge on the overall human physiological functions of the different body organs.

3. Intended learning outcome s (ILOs) of Physiology:

Knowledge and Understanding	
a1	Describe the mechanical, physical, and biochemical functions of humans in good health, their organs, and the cells of which they are composed.
a2	Illustrate the interrelationships between physiology and the society in the field of human health.
Intellectual skills	
b1	Withdraw conclusions and observations from previous reports that help the student to conduct his own research and write reports.
b2	Use literature and scientific evidences to take decisions concerning physiological problems

General and Transferable skills	
d1	Communicate effectively and present ideas and findings clearly in oral and written forms.
d2	Participate in seminars and discussions related to the field of physiology.

4. Course Content of Physiology:

Week number	Lecture contents (2hrs/week)
1	Nerve & Muscle
2	Autonomic Nervous System 1 (Sympathetic nervous system)
3	Autonomic Nervous System 2 (Parasympathetic nervous system)
4	Cardiovascular System 1 (Structure, functions and properties of the heart)
5	Cardiovascular System 2 (Heart rate, cardiac output and blood pressure)
6	Central Nervous System 1 (Structure of brain and spinal cord)
7	Central Nervous System 2 (Reflexes and pain)
8	Kidney (Structure, function and urine formation)
9	Respiratory System (Structure and functions of the lung, mechanism of breathing) Activity (Review article- Presentation)
10	GIT (Functions of gastric secretions and Neurohormonal regulation)
11	Endocrine System 1 (Hypothalamus, thyroid, parathyroid glands)
12	Endocrine System 2 (Adrenal gland and endocrine pancreas)
13	Blood physiology (Functions of blood cells and clotting mechanisms)
14	Membrane physiology (Structure and functions)
15	Revision

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Search on the internet
- Role play

6- Student Assessment methods:

- Written exam to assess: a1, a2, b1 and b2.
- Oral exam to assess: a1, a2, b1, b2, d1 and d2.
  Activity to assess: d1, d2

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers

B- Essential books:

- Linda S. Costanzo (2007). Board Review Series: Physiology. Lippincott Williams & Wilkins. 4th ed
- Guyton physiology (2006) Arthur C. Guyton, John E. Hall, 11th edition Elsevier Inc.
- Clinical physiology (2005) An Examination Primer Ahis Banerjee, Cambridge University Press.

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show.

- **Course Coordinator: Prof. / Mona Fouad**
    - **Head of Department: Prof. / Mona Fouad**

Biostatistics

Course specification of Biostatistics

A- Course specifications:

- Program on which the course is given: Master of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: Pharmacy Practice Dept
  Department offering the course: Pharmacology Dept.

- Date of specification approval: 2018

1- Basic information:

Title: **Biostatistics** Code: PP2
Lectures: 2 hrs/week Credit hours: 2 hrs/week
Total: 2hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to design a good research experiment, statistically analyze the results of research experiments, and interpret the results of statistical analysis of experimental data using statistical computer programs.

3. Intended learning outcome s (ILOs) of Biostatistics:

Knowledge and Understanding	
a1	Identify the fundamentals and principles of Biostatistics.
a2	List the different methods of statistical analysis.
Intellectual skills	
b1	Analyze statistically and interpret data obtained from pharmacological experiments in different forms.
b2	Assess the types of decision errors that can occur during using statistical tests.
General and Transferable skills	
d1	Maintain ethics and respect-based relationships with colleagues.

4. Course Content of Biostatistics:

Week number	Lecture contents (2hrs/week)
1	Computer-aided general Principle of biostatistics 1
2	Computer-aided General Principle of biostatistics 2
3	Computer-aided Presentation of data
4	Computer-aided Descriptive statistics
5	Computer-aided Measures of central tendency
6	Computer-aided Measures of variability
7	Computer-aided Normal frequency distribution curve
8	Probability
9	Comparing of two means Activity
10	Comparing of more than two means
11	Chi square test
12	Computer-aided Regression and correlation analysis
13	Complex analysis

14	Criteria of good experimental design
15	Revision

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Computer statistical program training
- Open discussion

6- Student Assessment methods:

- Written exam to assess: a1, a2, b1 and b2.
- Oral exam to assess: a1, a2, b1, b2 and d1.
- Activity to assess: d1

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• oral exam	15	15 %
TOTAL	**100**	**100%**

1- References and books:

A-Scientific papers

B- Essential books:

- Danial W (1995). Biostatistics: A foundation for analysis in health science. (6th ed.) New York: John Wipij & sensing

C- Electronic resources

- Dom Spina (2003) Statistics Workshop distance learning material. British Pharmacological Society University of Manchester

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show.

- **Course Coordinators: Dr/ Shaimaa El-Shazly**
- **Head of Department: Prof. Mona Fouad**

Drug interaction

Course Specification of Drug interaction

A- Course specifications:

- Program (s) on which the course is given: Master of Pharmaceutical Sciences

- Major or Minor element of program: Major
  Department offering the program: Pharmacy practice

  Department offering the course: Pharmacology

  Date of specification approval: 2018

B- Basic information:

Title: Drug interaction Code: PP3

Credit Hours:

- Lectures : 2 hrs/week
- Practical:---
- Tutorials: ---
- Total: 2hrs/week

C- Professional information:

1-Overall Aims of the Course:

On completion of the course, students will be able to describe the mechanisms of drug interactions , understand the clinical significance of interactions between drugs and demonstrate how to manage different types of drug interactions

2-Intended Learning Outcomes of Drug Interaction (ILOs):

Knowledge and Understanding	
a1	Describe the basic mechanisms of drug interactions
a2	Outline the clinical significance of drug interactions
a3	Enumerate the general methods for the management of drug interactions
Intellectual skills	
b1	Differentiate between adverse and beneficial interactions of drugs
b2	Suggest novel methods for the management of drug interactions
Transferable and general skills	
d1	Demonstrate critical thinking and decision making
d2	Work effectively as a member of a team

D- Contents:

Week No.	Lecture (2 hrs/week)
1	Overview of drug interactions
2	Mechanisms of drug interactions
3	Management of drug interactions
4	Drug-food interactions
5	Drug-smoking interactions
6	Drug-environment interactions
8	Drug interactions of anti-infective agents
9	Drug interactions of cardiovascular acting agents
10	Drug interactions of CVS acting agents
11	Drug interactions of CNS acting agents
12	Drug interactions of endocrine acting agents
13	Case studies
14	Case studies
15	Revision & Open discussion

E- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion

F- Student Assessment Methods:

1. Written exam to assess: a1, a2, a3, b1, b2, d1
2. Oral exam to assess: a1, a2, a3, b1, b2, d1
3. Activity a1, a2, a3, d1

Assessment schedule:

Assessment (1): Activity	Week 7
Assessment (2): Written exam	Week 16
Assessment (4): Oral exam	Week 16

Weighting of Assessment

Assessment method	Marks	Percentage
Written exam	75	75%
Oral exam	15	15%
Activity	10	10%
TOTAL	100	100%

G- Facilities Required for Teaching and Learning:

Black (white) board, overhead projectors, Data show.

H- List of References:

1- Essential books:

i- Richard A. Harvey, Michelle A. Clark, Lippincott's Illustrated Reviews Pharmacology 5th ed. Lippincott Williams & Wilkins, 2012

2- Recommended books:

i- H.P.Rang,M.M.Dale,J.M.Ritter& R.J. Flower ed. RANG & DALE Pharmacology 6th 2008 Churchill 2. Livingstone Elsevier London.

ii- Katzung, B.G., ed. Basic and Clinical Pharmacology. 9th ed. New York : McGraw Hill, 2006.

iii- Bennet P.N., and M.J. Brown, eds. Clinical Pharmacology. 10th ed. London : Churchil Livingstone, 2006.

iv- Hardman J.G., L.E. Limbrid, and A.G. Gilman, eds. Goodman & Gilman's the Pharmacological Basis of Therapeutics. 10th ed. New York : McGraw Hill, 2006.

v- Luellmann H., L. Hein, K. Mohr, and D. Bieger. Color Atlas of Pharmacology. 3rd ed. Stuttgart : Thieme, 2005.

vi- Brenner,G.M.andSteven,C.W.., Pharmacology,3rd ed.,2010

3- Periodicals and websites:

- British J Pharmacol,
- European J Pharmacol,
- Pharmacology,
- Pharmacology and Toxicology)

Pubmed.com

www.medconsult.com/www.pharmanet.com

Course Coordinators: **Prof. Dr. Rasha Hassan Abdelghany**

Head of department: **Prof. Mona Fouad**

تم مناقشة و اعتماد توصيف المقرر بمجلس القسم

Drug-Induced Disease

Course specification of Drug-Induced Diseases

A- Course specifications:

- Program on which the course is given: Master of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: Pharmacy Practice Dept
- Department offering the course: Pharmacology Dept.
- Date of specification approval: 2018

1- Basic information:

Title: **Drug Induced Diseases** Code: PP4
Lectures: 4 hrs/week Credit hours: 4 hrs/week
Total: 4hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to define the mechanisms, symptoms and diagnosis of drug-induced diseases and possible preventative methods.

3. Intended learning outcome s (ILOs) of Drug Induced Disease:

Knowledge and Understanding	
a1	Identify the basics of drug kinetics, dynamics and adverse effects.
a2	Identify common diseases induced by drugs and the associated risk factors.
Intellectual skills	
b1	Suggest possible ways to protect against or minimize some common drug-induced diseases.
b2	Specify the hazards of therapeutic regimens and how to properly select suitable regimens in different pathological conditions.
General and Transferable skills	
d1	Counsel patients and prescribers on drug adverse reactions and possible diseases that may emerge as a result of drugs consumption.
d2	Get information regarding adverse effects and interactions from a variety of sources.

4. Course Content of Drug Induced Disease:

Week number	Lecture contents (4hrs/week)
1	Introduction to drug induced-diseases
2	Drug-induced hepatotoxicity 1
3	Drug-induced hepatotoxicity 2
4	Drug-induced nephrotoxicity 1
5	Drug-induced nephrotoxicity 2
6	Drug-induced CVS diseases 1
7	Drug-induced CVS diseases 2
8	Drug-induced CVS diseases 3

9	Activity
10	Drug-induced CNS diseases 1
11	Drug-induced CNS diseases 2
12	Drug-induced CNS diseases 3
13	Presentations
14	Open discussion
15	Revision

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Problem solving
- Open discussion

6- Student Assessment methods:

- Written exam to assess: a1, a2, b1 and b2.
- Oral exam to assess: a1, a2, b1, b2, d1 and d2.
- Activity to assess: d1 and d2.

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• oral exam	15	15 %

TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers

B- Essential books:

- Basic and clinical Pharmacology; 10th Edition, Kantzung B.G McGraw Hill Medical Publishing Division 2007.
- Drug-Induced Diseases: Prevention, Detection, and Management, 2nd Edition, Tisdale J. and Miller D. American Society of Health-System Pharmacists 2010.

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computer, data show.

- **Course Coordinators:**
- **Head of Department: Prof. Mona Fouad**

Instrumental Analysis

Course specification of Instrumental Analysis

A- Course specifications:

- Program on which the course is given: Master's of Pharmaceutical Sciences
- Major or Minor element of program: Major
- Department offering the program: Pharmacy Practice Dept
- Department offering the course: Analytical Chemistry.

- Date of specification approval: 2018

1- Basic information:

Title: Instrumental Analysis Code: PP5
Lectures: 4 hrs/week Credit hours: 4 hrs/ week
Total: 4 hrs/ week

2- Overall aim of the course:

On completion of the course, the students will be able to outline the basis and applications of instrumental analysis and describe theories, operation, pharmaceutical and biological applications of instrumental techniques.

3. Intended learning outcome s (ILOs):

A- Knowledge and Understanding	
a1	Outline the basis, theory and operation of the different instrumental techniques of analysis.
a2	Describe different pharmaceutical and biological applications of instrumental techniques.
B- Intellectual skills	
b_1	Decide the use of most appropriate instrumental technique in pharmaceutical and biological assay.
b_2	Integrate the knowledge gained by studying different instrumental techniques in designing analytical system for analytes of complex nature
D- General and Transferable skills	
d_1	Acquire Computer skills like preparing presentations and collecting information through different data-bases.
d_2	Work effectively as a member of team
d_3	Improve scientific brain storming capabilities of team members

4. Course Contents:

Week number	Content
1	Introduction Principles
2	**Spectroscopy [**Ultraviolet (UV)‑visible spectrophotometry, Fluorometry] Basis Pharmaceutical and biological applications.
3	**Spectroscopy: [**Infrared (IR) spectroscopy]. Basis Pharmaceutical and biological applications

4	**Spectroscopy: [**Atomic absorption spectroscopy]. Basis Pharmaceutical and biological applications
5	**Nuclear magnetic resonance (NMR).** Basis Pharmaceutical and biological applications
6	**Conductometry, Potentiometry.** Basis Pharmaceutical and biological applications.
7	**Mass-spectrometry (MS)** Basis Pharmaceutical and biological applications.
8	**Polarography and Voltammetry** Basis Pharmaceutical and biological applications.
9	**Chromatography:** Introduction Classification
10	**Quantitative and Qualitative TLC** Basis Pharmaceutical and biological applications
11	**HPLC** Basis Types
12	**HPLC** Isocratic flow and gradient elution Parameters Internal diameter Particle size Pore size Pump pressure
13	**HPLC** Detectors Applications
14	**Gas Chromatography** Basis Pharmaceutical and biological applications
15	**Revision and Open discussion**

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Demonstration

6- Student Assessment methods:

Written exams to assess: a1, a2, b1, b2
Oral exam to assess: a1, a2, b1 and b2
Activity to assess: d1, d2 and d3

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers
B- Essential books:
1-Modern Analytical Chemistry, David Harvey, McGraw-Hill Companies, first edition, 2002
2-Guidance for Industry: Q2B of Analytical Procedures; Methodololgy: International Conference of Harmonization (ICH). Nov. 1996 (http:/ www.fda.gov/eder/guidance /1320fnl.pdf)
3- Techniques and instrumentation in analytical chemistry, vol.5, John Edward

4- Comprehensive Analytical Chemistry, XLV, M.L.Marina, A. Rios, (EDS)
5- Handbook of instrumental techniques of analytical chemistry, Frank A. Settle

C- Suggested books:
1- Wilson, Charles Owens; Beale, John Marlowe; Block, John H.; Block, John H.; Gisvold, Ole "Wilson & Gisvold's Textbook of Organic :Medicinal and Pharmaceutical
2- British Pharmacopoeia, HM Stationery Office, London, UK, PA, 2007,
3- Martindale: The Complete Drug Reference, Pharmaceutical Press;35 edition (2007)

D- Websites:
www.tandfonline.com/toc/lanl20/current (Analytical Letters)
www.rsc.org

Facilities required for teaching and learning:

For lectures: Black (white) boards, data show.

- **Course Coordinators: Prof Dr/ Hanaa Saleh**
- **Head of Department: Prof Dr/ Magda ElHenawi**

Biopharmaceutics and pharmacokinetics

Course specification of Biopharmaceutics and pharmacokinetics

Course specifications:

- **Program on which the course is given:** Master of Pharmaceutical Sciences
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy Practice Dept
- **Department offering the course:** Pharmaceutics Dept.
- **Date of specification approval:** 2018

1- Basic information:

Title: **Biopharmaceutics and pharmacokinetics** Code: PP6

Lectures: 2 hrs/week Credit hours: 2 hrs/week
Total: 2hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to demonstrate the applications of biopharmaceutics and pharmacokinetics and estimate recent trends in pharmacokinetics

3- Intended learning outcome s (ILOs) of Biopharmaceutics and pharmacokinetics:

Knowledge and Understanding	
a1	Describe the effects of different factors on the rate of absorption, distribution, biotransformation and elimination of drugs.
a2	Illustrate recent trends in pharmacokinetics
a3	Illustrate the elements affecting drug pharmacokinetic
Intellectual skills	
b1	Apply methods for estimation of bioavailability and drug clearance in the body
b2	Modify pharmacokinetic strategies for modifying drug action.
General and Transferable skills	

d1	Use computer skills to present information
d2	Collect information from a variety of sources

4. Course Content of Biopharmacutics and pharmacokinetics:

Week number	Lecture content (2 hrs/week)
1	• Basic pharmacokinetic relationships • Major pharmacokinetic parameters
2	• Statistical foundations in pharmacokinetic modeling
3	• Physiologic model of hepatic drug elimination
4	• Trends in pharmacokinetics of dug receptor interactions
5	• Imaging techniques in pharmacology
6	• Contribution of positron emission technology in pharmacokinetics studies
7	• Interspecies scaling in pharmacokinetics • **(Presentation)**
8	• Stereo selective pharmacokinetics
9	• Pharmacokinetic strategies in development of prodrug
10	• Carcinogenic risk assessment
11	• The value of bio kinetic data in risk assessment
12	• Physiologic model for cancer
13	• The role of Pharmacokinetics in development of therapeutic proteins
14	• Revision
15	• Open Discussion • **(Final Presentation)**

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Problem solving
- Critical thinking

6- Student Assessment methods:

Written exams to assess: a1, a2, a3, b1, b2
Oral exam to assess: a1, a2, a3, b1, b2, d1
Activities to assess: d1, d2

Assessment schedule:

Assessment (1): Activity	Week 7-15
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific papers

B- Essential books: Applied Biopharmaceutics & Pharmacokinetics, Fifth Edition, Leon Shargel, Susanna Wu-Pong and Andrew Yu, McGraw-Hill Medical (2004)

C- Suggested books: Applied Biopharmaceutics & Pharmacokinetics, Sixth Edition, Leon Shargel, Andrew Yu and Susanna Wu-Pong, McGraw-Hill Medical (2012)

D- Websites: Pubmed, Sciencedirect, Nejm, Weily interscience

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, computers and data show.

- **Course Coordinators: Prof Dr/ Fakhr El-din Ghazy**
- **Head of Department: Prof. Nagia ElMegrab**

Physical Pharmacy

Course specification of Physical Pharmacy

Course specifications:

- **Program on which the course is given:** Master of Pharmaceutical Sciences
- **Major or Minor element of program:** Major
- **Department offering the program** Pharmacy Practice Dept
- **Department offering the course:** Pharmaceutics
- **Date of specification approval:** 2018

1- Basic information:

Title: **Physical pharmacy** Code: PP7
Lectures: 2 hrs/week Credit hours: 2 hrs/week
Total: 2 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to acquire knowledge of the principles of physical pharmacy, design, evaluate and interpret the therapeutic efficacy of homogenous and heterogeneous dosage forms and understand the implications of the physical interactions on the outcome of the drug product and discuss recent trends in applied physical pharmacy.

3- Intended learning outcomes (ILOs) of Physical Pharmacy:

A-Knowledge and Understanding	
a1	Illustrate the principles of physical pharmacy including equilibrium phenomena, dissolution, phase equilibrium, phase rule and disperse systems
a2	Explain the polymer science controlling the formulation modification and use
a3	Mention types of complexation that may occur during preparation of different dosage forms and method of analysis of each type.
B-Intellectual skills	

b1	Apply the knowledge of properties of different ingredients and possible complexation that may occur in improving the formulation of different dosage forms
b2	Modify applications of disperse system using advances in polymer science
D- General and Transferable skills	
d1	Use computer skills to present information
d2	Collect information from a variety of sources

4. Course Content of Physical pharmacy (Master degree):

Week number	Lecture content (2 hrs/w)
1	• Equilibrium phenomena (Strong and weak acid, bases, buffers, distribution).
2	• Modifications in complexation and protein binding.
3	• Drug release &dissolution applications in drug assessment.
4	• Types of flow and their importance in drug formulations
5	• Surface and interfacial phenomena and their role in pharmaceutical manufacture.
6	• Metal complexes &Organic molecular complexes applications
7	• Occlusion compounds, Complexation , method of analysis and applications • **(Presentation)**
8	• State of matter • Ideal gas law
9	• Colligative properties of solutions with correlation in drug formulations+ Activity
10	• Phase rule
11	• Recent applications of Disperse systems
12	• New models for Phase equilibria
13	• Recent trends of Polymer science in drug delivery.
14	• Revision
15	• Open discussion • **(Final Presentation)**

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Critical thinking

6- Student Assessment methods:

Written exams to assess: a1, a2, a3, b1, b2
Oral exam to assess: a1, a2, a3, b1, b2
Activities to assess: d1, d2

Assessment schedule:

Assessment (1): Activity	Week 7-15
Assessment (2): Written exam	Week 16
Assessment (3): oral exam	Week 16

Weighting of Assessment:

Assessment method	Marks	Percentage
• Activity	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A- Essential books:

A-Martin's Physical Pharmacy and Pharmaceutical Sciences, Sixth edition Patrick J. Sinko PhD RPh, Lippincott Williams & Wilkins; (2010)

B- Recommended books:

FASTtrack: Physical Pharmacy (Fast Track Pharmacy Series), 2nd edition , David Attwood and Alexander T. Florence, Pharmaceutical Press; (2012)

C- Websites: Pubmed, Sciencedirect, Weilyinterscience

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, data show.

- **Course Coordinators: Prof Dr/ Mahmoud Abdul-Ghany Mahdy**
- **Head of Department: Prof Dr/ Nagia ElMegrab**

Thesis Specification

Thesis of Master Degree

A- Thesis specifications:

- **Program on which the course is given:** Master of Pharmaceutical sciences (Pharmacy practice)
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy practice
- **Department offering the thesis:** Pharmacy practice
- **Date of specification approval:** 2017/2018

1- Basic information:

Title: Master Thesis in pharmacy practice

Credit hours: 30 hrs

2- Overall aim of the thesis:

After being accepted by the Faculty authority, the candidate has to recall the research plan of the University and the Faculty to select the research area which he/she is going to fit with

On completion of the thesis, the students will be able to:

- Design a robust study to answer the research question
- Identify and perform different techniques and methods used in the experimental work according to the designed protocol
- Collect all the data needed to answer the research question using the developed study design
- Analyze the results of the study in the light of prior knowledge

- Draw conclusions about the contribution to knowledge made by the study.

3- Intended learning outcome's (ILOs):

Knowledge and Understanding	
a1	Outline theoretical and principles of pharmacy practice related to main objectives of the thesis
a2	Determine the problem the thesis will handle in correlation with the community and surrounding environment
a3	Explain clearly the principles of pharmacotherapy
a4	Understand any legal aspects related to the thesis work.
a5	Demonstrate GLP and quality assurance related to practical work of the thesis
a6	Identify and apply scientific experimental ethics.
Intellectual skills	
b1	Solve problems related to practical work by obtained quantitative data from the practical work
b2	Discuss professional problems and suggest solutions relay on standard guidelines
b3	Combine required specialties to manage the subject under study
b4	Integrate scientific results and write report following conducting research
b5	Manage risks and hazards related to professional practical area
b6	Design a laboratory protocol for the work
b7	Decide what to do with full responsibility in scientific research
Professional and practical skills	

c1	Apply different techniques related to practical thesis work.
c2	Use and evaluate practical data to write report
c3	Apply various data collection tools involved in the protocol
General and Transferable skills	
d1	Communicate effectively with all people related to the work
d2	Use information technology in review and thesis preparation
d3	Evaluate the work and learning needs
d4	Use various sources to get information about the subject understudy
d5	Set rules for evaluation and judging others performance.
d6	Work effectively as a member of a team
d7	Acquire time management skills
d8	Study independently and plan research studies.

4. Thesis Content:

Steps	Content
1st	Suggest the possible points/ problems of research that the candidate can work on in the frame of the aim of work and choose proper point related to the problems of the community and surrounding environment. Collect all available information about this subject by all possible means. Use internet, journals, books and others thesis to get previous and recent information about the subject understudy. Design the protocol including the steps of work following the suitable timetable.

	Integrate different knowledge (pharmacotherapy guidelines, medication safety, biostatistics, ……..) to solve suggested problem. Continuous evaluation to the thesis outcome according to the schedule.
2nd	Identify different practical techniques and methods to collect data related to the subject under study. Operate scientific instruments according to instructions. Evaluate and manage hazards (chemical and biological) throughout the whole practical work. Organize the experimental work according to the designed protocol (either individual, parallel or sequential experiments). Apply treatment protocols according to guidelines Perform lab analysis, x-ray, gene analysis when required Apply ethical recommendations during dealing with humans/ experimental animals. Understand any legal aspects related to the thesis work.
3rd	Collect raw data including patients demographic data, tested parameters, others Interpret raw data to get valuable information. Perform statistical analysis for the results. Present and describe the results graphically. Suggest solution to the problem understudy based on this presented data.
4th	- Communicate with supervisors to discuss results Work effectively as a member of a team (e.g. Supervisors, various professionals and Technicians, patients).

	Present the results periodically in seminars. Write scientific reports on the obtained results with conclusive significance. Discuss obtained results in comparison with pervious literatures. Suggest possible recommendations based on the outcome of the thesis and decide future plans. Summarize the thesis in an understandable Arabic language for non professionals. Write references in the required form (Thesis, Paper…….). Demonstrate the thesis in a final power point presentation. Continue self-learning throughout the experimental work and writing scientific papers.

5- Teaching and Learning Methods:

- Self-learning (Activities, Research….)
- Open discussion

6- References:

Lau AH. Glomerulonephritis. In: DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 9th ed. New York: McGraw-Hill, 2014:705-28.

Facilities required for:

1. Zagazig University Hospital
2. **For practical work:** U.V spectrophotometer, centrifuge, PCR, ELISA, Gamma counter, Electrophoresis

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- **Head of Department: Prof. Gehan Balata**

تم إعتماده بمجلس القسم بتاريخ 2017

Master of pharmacy practice (2017/2018)																														
Program Courses		Program intended learning outcomes																												
		Knowledge and understanding									Intellectual skills							Professional & Practical skills			General and transferable skills									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5	D6	
General courses	Biopharmaceutics and Pharmacokinetic				√																						√		√	
	Physiology		√																							√	√	√		
	Bioststistics									√							√									√	√	√		
	Instrumental analysis							√	√											√						√	√	√		
	Drug interaction			√										√		√										√	√	√		
	Drug induced disease			√										√		√										√	√	√		
	Physical pharmacy	√																								√	√	√		
Special courses	Pharmacotherapy			√		√			√		√	√		√		√								√	√	√	√	√		
	Interpretation of clinical laboratory data							√	√			√	√							√		√		√	√	√	√	√		
	Advanced and clinical pharmacokinetic				√						√					√					√			√	√	√	√	√		
Thesis		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Program and Course Specifications

Ph.D. Degree

Program Specification

Program Specification

A- Basic Information

1- Program title: PhD. Pharm. Sci Degree in **pharmacy Practice**

2- Program type: Monodisciplinary.

3- Faculty/ University: Faculty of Pharmacy, Zagazig University

4- Department: Pharmacy Practice

5- Coordinator: Assis. Prof. Gehan Balata

6- Date of program specification approval: 2018

B- Professional Information

1- Program aims:

This Program aims at providing postgraduate students with knowledge, skills and abilities needed to practice the pharmacy profession effectively in various settings including Research Institutes, private and public hospitals and universities.

The program aims are summarized as follows:

1. Provide the community with highly qualified and professionals with skills and ethical values based on National Academic Reference Standards (NARS).
2. Have the advanced and in-depth knowledge and skills in areas related to, pharmacotherapy, pharmacokinetics , medication safety and gene expression
3. Figure out importance of the pharmaceutical care to ensure that the patients drug therapy is appropriate, safe, effective for the condition being treated and cost-effective.

4-Plan study, develop data collection tools and perform the required analysis for the conduct of clinical research

6- Effectively use information technology for the preparation and submission of a detailed literature review

7-Actively participate in the awareness and development of the community.

Consistency of the program aims with the mission of Faculty of Pharmacy:

The faculty of Pharmacy, Zagazig University aims to provide the local and regional community with highly qualified, multidisciplinary and professional pharmacists with ethical values and able to participate in the development of drug industry and quality assurance as well as contribute to a distinguished health service to the society. This is achieved through developing and upgrading the academic programs, teaching and learning methods, supporting various student activities, developing the abilities of the staff members, their assistants and administrative members, enhancing the oriented applied and scientific research and providing the continuous pharmaceutical education.

1.1 Graduate attributes:

The PhD of Clinical Pharmacy aim to provide graduates with the opportunity to develop the following attributes, upon successful completion of the program , the graduate will be able to:

1. Develop in depth and broad knowledge of pharmacy practice and treatment regimens in case of oncology, critical care and renal failure patients.
2. Identify a therapeutic issue concerning an individual patient
3. Make decisions regarding rational drug therapy and patient needs.

4. Demonstrate a high level of critical thinking, problem solving and decision making skills as a member of the health care team
5. Show Self-motivation, attention to detail, time-management and communication skills
6. Ask questions, create research hypotheses, and design methodologies to answer research questions
7. Perform self-directed learning
8. Communicate technical information to patients that effect changes in habits and lifestyle that result in better patient care
9. Lead initiatives to improve and transform health care
10. Communicate ideas effectively to a range of audiences inside and outside the field of study or discipline and to the wider community.

2-Intended Learning Outcomes (ILOs):

The Program provides excellent opportunities for students to demonstrate knowledge and understanding qualities and develop skills appropriate for pharmacy practice PHD of sciences degree.

2-1- Knowledge and Understanding :

On successful completion of the PhD degree Program, students will be able to:

A.1- Recall the basic and advanced information of clinical pharmacy , pharmacy practice and their relevant subjects including clinical pharmacokinetics and pharmacotherapy

A.2 Describe the currently accepted standard treatments and monitoring parameters for adjust anticoagulant therapy according to INR, other clinical findings, and/or patient factors.

A.3 Provide ambulatory care for life threatening cases and evaluate the best therapeutic option to deal with critical case.

A.4 Design patient specific therapeutic plan according to the published guidelines

A.5 Identify the appropriate pharmacotherapeutic plan to manage patients with cancer, renal failure as well as ICU patients.

A.6 Develop a care plan to manage the common complications associated with chronic kidney disease (CKD) , endocrine and metabolic disorders.

A.7 Classify acute kidney injury (AKI) based on patient history, physical examination, and laboratory values.

A.8 Illustrate the most appropriate screening and prevention strategy for different types of cancers as well as patient-specific therapy and monitoring plan for each stage of cancer.

A.9 Manage toxicities associated with therapeutic interventions for CML and CLL.

A.10 Outline the ethical guideline in reporting data , citing literature and publishing a scientific reports in international journals.

A.11 Enumerate the legal authorities for professional academic practices.

2-2 - Intellectual Skills:

On successful completion of the PhD degree Program, students will be able to:

B1. Evaluate the various therapeutic agents used in treating endocrine and metabolic disorders .

B2. Select the appropriate plans for preventing, monitoring and treating adverse reactions associated with treatment of different types of cancer .

B3. Interpret hemodynamic parameters and acid-base status in critically ill patients .

B4. Differentiate between various types of shock .

B5. Select the appropriate acute and preventive treatment for various clinical cases depending on patient - specific factors .

B6. Correlate between the specialized knowledge in the field of pharmacy practice for the advancement of scientific research to serve the profession of pharmacy

B.7. Collect clinical and theoretical data required to design a scientific article.

B8. Select suitable genomic & proteomic tools for diagnosis of different types of cancer &hereditary disorders.

B9- Select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease

B10. Manage seminars and open discussion settings in the field of clinical pharmacy and relevant fields.

B.11Take professional and scientific decisions to develop suitable care plan to ensure that the patient's drug therapy is appropriate, safe, and effective

B12- Demonstrate creativity and innovation in pharmacy practice research

2-3 - Professional and Practical Skills:

on successful completion of the PhD degree Program, students will be able to:

C1- Apply the clinical data underlying therapeutic treatment recommendations

C2- Interpret patient history, physical examination, and laboratory values to classify clinical cases

C3- Perform high quality laboratory techniques that fulfill good laboratory practice in clinical pharmacy research studies.

C4- Apply laboratory experiments safely with appropriate techniques , including HPLC, ELSIA , RTPCR , Immunohistochemistry.

C5- Correlate basic fundamentals with new genetic profiling tools to enhance his performance

C6- Use the recent computer software and hardware for data acquisition and analysis.

C7-Conduct clinical trials to satisfy patient's needs and improve hospital pharmacy services.

C8- Interpret clinical data and write professional reports.

2-4 - General and Transferable Skills:

On successful completion of the PhD degree Program, students will be able to:

D1- Communicate effectively with colleagues and a wider audience in a variety of media.

D.2- Use the advanced computer and statistical skills required for the preparation and submission of a detailed literature review

D.3- Educate different populations including physicians, nurses and patients with different cultures

D.4- Use computer and internet skills to get information and knowledge from accredited and accomplished sites on the internet

D.5- Work effectively as a member or a leader of team.

D.6- Capable of self-evaluation and determination of needs required for professional development

D.7- Demonstrate time management skills to achieve goals.

3- Academic Standards:

Faculty is committed to the Academic References Standards for postgraduate studies (March 2009).

Matrix1: Comparisons of graduate attributes of pharmacy practice Ph-D program with the Academic Reference Standard {ARS, 2009} developed by NAQAAE

Attributes of the graduates (ARS, 2009)	Attributes of the graduates (pharmacy practice Ph.D program)
1. Apply the specialized knowledge he has acquired in his professional practice	1. Develop in depth and broad knowledge of pharmacy practice and

	treatment regimens in case of oncology, critical care and renal failure patients.
2. Identify and solve professional problems 5. Take decisions using available information	2. Identify a therapeutic issue concerning an individual patient 3. Make decisions regarding rational drug therapy and patient needs.
4. Show good communication and leadership skills	8. Communicate technical information to patients that affect changes in habits and lifestyle that result in better patient care 9. Lead initiatives to improve and transform health care
3. Use technology effectively in his professional practice 6. Use available resources efficiently	6. Ask questions, create research hypotheses, and design methodologies to answer research questions
7. Aware of his role in community service and development	10. Communicate ideas effectively to a range of audiences inside and outside the field of study or discipline and to the wider community.
8. Reflect commitment to integrity, credibility and accountability	
9. Be a lifelong learner and able to develop himself	7. Perform self-directed learning

Other graduate attributes exceeding ARS 2009:

4. Demonstrate a high level of critical thinking, problem solving and decision making skills as a member of the health care team
5. Show Self-motivation, attention to detail, time-management and communication skills

Matrix 2: Comparison between PhD degree program ILOs and the Academic Reference Standards, 2009.

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
Knowledge and Understanding	2.1.1- Fundamental and in-depth knowledge and basic theories in the field of specialty and the closely related areas of pharmaceutical sciences.	A.1- Recall the basic and advanced information of clinical pharmacy , pharmacy practice and their relevant subjects including clinical pharmacokinetics and pharmacotherapy A.2 Describe the currently accepted standard

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
		treatments and monitoring parameters for adjust anticoagulant therapy according to INR, other clinical findings, and/or patient factors. A.5 Identify the appropriate pharmacotherapeutic plan to manage patients with cancer, renal failure as well as ICU patients. A.6 Develop a care plan to manage the common complications associated with chronic kidney disease (CKD) , endocrine and metabolic disorders. A.7 Classify acute kidney injury (AKI) based on patient history, physical examination, and laboratory values. A.8 Illustrate the most appropriate screening and prevention strategy for different types of cancers as well as patient-specific therapy and monitoring plan for each stage of cancer. A.9 Manage toxicities associated with therapeutic interventions for CML and CLL.
	2.1.2- Fundamentals, methods, techniques, tools and ethics of scientific research.	A.10 Outline the ethical guideline in reporting data , citing literature and publishing a scientific reports in

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
		international journals.
	2.1.3- The ethical and legal principles in pharmacy and academic practices.	A.11 Enumerate the legal authorities for professional academic practices.
	2.1.4- The principles and bases of quality assurance in professional practice in the field of specialization.	A.4 Design patient specific therapeutic plan according to the published guidelines
	2.1.5- All relevant knowledge concerning the impact of professional practice on society and environment and the ways of their conservation and development.	A.3 Provide ambulatory care for life threatening cases and evaluate the best therapeutic option to deal with critical case.
Intellectual Skills	2.2.1- Analyze, evaluate the data in his / her specified area, and utilize them in logical inference processes (induction/deduction).	B1. Evaluate the various therapeutic agents used in treating endocrine and metabolic disorders . B2. Select the appropriate plans for preventing, monitoring and treating adverse reactions associated with treatment of different types of cancer . B3. Interpret hemodynamic parameters and acid-base status in critically ill patients . B4. Differentiate between various types of shock .

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
	2.2.2- Propose solutions to specified problems in the light of the available data (information).	B5. Select the appropriate acute and preventive treatment for various clinical cases depending on patient - specific factors
	2.2.3- Conduct research studies that add to the current knowledge.	B6. Correlate between the specialized knowledge in the field of pharmacy practice for the advancement of scientific research to serve the profession of pharmacy
	2.2.4- Formulate scientific papers.	B.7. Collect clinical and theoretical data required to design a scientific article.
	2.2.5- Assess hazards and risks in professional practice in his / her area of specialization.	B9. Select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease
	2.2.6- Plan to improve performance in the pharmaceutical area of interest.	B8. Select suitable genomic & proteomic tools for diagnosis of different types of cancer &hereditary disorders.
	2.2.7- Take professional decisions and bears responsibility in wide array of pharmaceutical fields.	B.11Take professional and scientific decisions to develop suitable care plan to ensure that the patient's drug therapy is appropriate, safe, and effective
	2.2.8- Be creative and innovative.	B12- Demonstrate creativity and innovation in pharmacy practice research.

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
	2.2.9- Manage discussions and arguments based on evidence and logic.	B10. Manage seminars and open discussion settings in the field of clinical pharmacy and relevant fields.
Professional and Practical Skills	2.3.1- Mastery of basic and modern professional skills in the area of specialization.	C1- Apply the clinical data underlying therapeutic treatment recommendations C2- Interpret patient history, physical examination, and laboratory values to classify clinical cases
	.3.2- Write and critically evaluate professional reports.	C7-Conduct clinical trials to satisfy patient's needs and improve hospital pharmacy services. C8- Interpret clinical data and write professional reports.
	2.3.3- Evaluate and develop methods and tools existing in the area of specialization.	C3- Perform high quality laboratory techniques that fulfill good laboratory practice in clinical pharmacy research studies. C4- Apply laboratory experiments safely with appropriate techniques , including HPLC, ELISA , RTPCR , Immunohistochemistry.
	2.3.4- Properly use technological means in a better professional practice.	C5-Correlate basic fundamentals with new genetic profiling tools to enhance his performance
	2.3.5- Plan to improve professional practices and to improve the performance of other scholars.	C6- Use the recent computer software and hardware for data acquisition and analysis.

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
General and Transferable Skills	2.4.1- Effective communication in its different forms.	D1- Communicate effectively with colleagues and a wider audience in a variety of media.
	2.4.2- Efficiently use the information technologies (IT) in improving the professional practices.	D.2- Use the advanced computer and statistical skills required for the preparation and submission of a detailed literature review
	2.4.3- Help others to learn and evaluate their performance.	D.3- Educate different populations including physicians, nurses and patients with different cultures
	2.4.5- Use various sources to get information and knowledge.	D.4- Use computer and internet skills to get information and knowledge from accredited and accomplished sites on the internet
	2.4.4- Self- assessment and continuous learning.	D.5- Work effectively as a member or a leader of team.
	2.4.6- Work as a member and lead a team of workers.	. D.6- Capable of self-evaluation and determination of needs required for professional development
	2.4.7- Direct scientific meetings and to manage time effectively.	D.7- Demonstrate time management skills to achieve goals.

4-Curriculum Structure and Contents:

Program duration: **3- 5** years

b- Program structure:

- The PhD program can be completed in 3-5 years.
- The Faculty of pharmacy implements the credit hour system.
- The program is structured as:

1- Courses:

No. of credit hours for program courses:

Special: (3x4) 12

2- Thesis: 30 hours

The candidate must complete a research project on an approved topic in the area of Pharmacy Practice. To fulfill this requirement the student must present (written and orally) a research proposal and write a thesis.

3- General University Requirements: 10 credit hours including:

a- TOEFL (500 units)

b- Computer course

c-number of semesters: 2 semester

c- Study plan:

Course Code	Course Title	Credit hours	Program ILOs Covered	Exam duration
	Special Courses:			
CPsp4	Advanced Pharmacotherapy	4	A1, A2, A5, A6, A7, A8, A9, B1, B2, B3,B4, B5, D1, D2, D4, D5, D6	4 hours
CPsp5	Clinical Oncology	4	A5, A8, A9, B1,B2,B3, B4, B5,B8, D1, D2 and D5	4 hours

CPsp6	Pharmacy Practice	4	A3,A5, A6, A7, B1, B2, B3, B4, B5, D1, D2, D5, and D7	4 hours
	Thesis	30	A10, A11 ,B6, B7, B10, B12,C1,C2,C3,C4,C5,C6 ,C7, D1, D2, D3, D4, D5, D6 and D7	

d. Learning Outcomes in Domains of Teaching Strategies & Assessment Methods:

ILOs	teaching method	assessment method
Knowledge and Understanding Intellectual Skills	Lectures Case study Self learning	Written and oral Exam
Professional and practical Skill	Case study Problem solving Thesis	Practical Exam Case discussion Rubric
Intellectual Skills General and Transferable Skills	presentation Thesis	Oral Exam Rubric

5-Program admission requirements:

Applicants are admitted to PhD degree any time throughout the academic year upon fulfillment of the following:

1. The applicants should be holders of Bachelor in Pharmaceutical Sciences from any Faculty of Pharmacy and also complete M.Sc. degree of Clinical pharmacy affiliated to the Egyptian Universities affiliated to the Egyptian Supreme Council of Universities (ESCU).
2. Students should fulfill all the admission requirements stated by the concerned Departmental Board.

Regulations to complete the program:

Conditions of granting the degree

The Faculty Council, in compliance with the concerned Departmental Board as well as Graduate Studies and Research Committee recommendation awards the PhD degree upon fulfillment of the following requirements:

1. Carrying out a deep research in the area of specialization for at least two calendar years from the time of registration.
2. The student has to succeed in all courses examinations.
3. Acceptance of the research thesis by the judges Committee according to statement 104 of universities regulating law.

Cancellation of Registration

The Faculty Board is allowed to cancel registration for PhD programs in the following circumstances:

1. Student's failure to pass the course examinations for two times.
2. Student's nonattendance or unsatisfactory progress in research work being reported by the advisors to the Departmental Board and forwarded to the Graduate Studies and Research Committee for approval of cancellation.
3. Dissertation refusal by the Jury Committee.
4. Incapability of the student to graduate by the deadlines indicated

6- Admission Policy:

The faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (ESCU).

7-Student assessment methods:

Method	ILOS
Written exam	Knowledge and Understanding and Intellectual Skills
Oral exam	Knowledge and Understanding ,Intellectual Skills and General and Transferable Skills
presentation	Intellectual Skills and General and Transferable Skills
Follow up	Professional and practical Skills & General and Transferable Skills
Thesis and oral presentation	Knowledge and Understanding, Intellectual Skills, Professional and practical Skills & General and

	Transferable Skills

Grade Scale	Grade point average value (GPA)	Numerical scale
A+	5	≥ 95%
A	4.5	90- < 95%
B+	4	85- < 90%
B	3.5	80- < 85%
C+	3	75- < 80%
C	2.5	70- < 75%
D+	2	65- < 70%
D	1.5	60- < 65%
F	1	< 60%

8-Failure in Courses:

Students who fail to get 60% (1 point)

9-Methods of program evaluation

Evaluator	Method	Sample
Internal evaluator: Prof. Nagia ElMegrab	Program evaluation Courses evaluation	Program report Courses report
External evaluator: Prof. Gamal ElMaghrabi	Program evaluation Courses evaluation	Program report Courses report
Others methods	Matrix with ARS Questionnaires	**100%**

Program coordinator: Assis. Prof./ Gehan Balata

Head of Department: Assis. Prof./ Gehan Balata

تم اعتماد التوصيف بمجلس الكلية بتاريخ 2018

Advanced Pharmacotherapeutics

Course specification of advanced pharmacotherapy

Course specifications:

- **Program on which the course is given:** PhD of Pharmacy Practice
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy Practice Dept.
- **Department offering the course:** Pharmacy Practice Dept.
- **Date of specification approval:** 2018

1- Basic information:

Title: **advanced pharmacotherapy** Code: CPsp4
Credit hours: 4 hrs/week Lectures: 4 hrs/week
Total: 4 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to:

1. Categorize acute kidney injury (AKI) as prerenal, intrinsic, or postrenal, based on patient history, physical examination, and laboratory values.
2. Identify risk factors for AKI.
3. Formulate preventive strategies to decrease the risk of developing AKI in specific patient populations.
4. Formulate a therapeutic plan to manage AKI.
5. Identify medications and medication classes associated with acute and chronic kidney damage.
6. Describe characteristics that determine the efficiency of removal of drugs by dialysis.
7. Classify the stage or category of chronic kidney disease (CKD) based on patient history, physical examination, and laboratory values.
8. Identify risk factors for the progression of CKD.
9. Formulate strategies to slow the progression of CKD.
10. Assess for the presence of common complications of CKD.
11. Develop a care plan to manage the common complications observed in patients with CKD (e.g., anemia, secondary hyperthyroidism).

3- Intended learning outcome s (ILO's):

Knowledge and Understanding	
a1	Define some terminologies related to ACUTE KIDNEY INJURY
a2	Explain DRUG-INDUCED KIDNEY DAMAGE
a3	Describe Tubulointerstitial Disease & Postrenal (Obstructive) Nephropathy and Papillary necrosis
a4	Identify different stages in chronic kidney disease
a5	Differentiate between Hemodialysis and Peritoneal dialysis
a6	Outline different complications of chronic kidney disease
Intellectual skills	
b1	Differentiate between different classes of acute kidney injury
b2	Identify Risk Factors Associated with AKI
b3	identify risk factors of chronic kidney disease
b4	recommend proper treatment for Hyperlipidemia
b5	Develop a care plan to manage the common complications observed in patients with chrnic kidney disease (e.g., anemia, secondary hyperthyroidism).
Professional and Practical skills	
c1	Develop a Treatment plan for acute kidney injury
c2	Control DRUG-INDUCED KIDNEY DAMAGE
c3	Assess Kidney Function properly
c4	monitor and manage Diabetic and nondiabetic Nephropathy
c5	Adjust drug dosage in kidney disease based on pharmacokinetic parameters
c6	Assess for the presence of common complications of chronic kidney disease
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively in a verbal manner
d3	Promote critical thinking، problem-solving، decision-making، and time managing capabilities

4. Course Content:

Week	Lecture content (4 hr/w)

1st	ACUTE KIDNEY INJURY (AKI) OR ACUTE RENAL FAILURE: Common definitions Stratification of AKI Risk Factors Associated with AKI
2nd	ACUTE KIDNEY INJURY (AKI) OR ACUTE RENAL FAILURE: Classifications of AKI Prevention of AKI Treatment and Management of Established AKI
3rd	• DRUG-INDUCED KIDNEY DAMAGE: • Aminoglycoside nephrotoxicity • Radiographic contrast media nephrotoxicity related to intravenous contrast use • Cisplatin and carboplatin nephrotoxicity • Amphotericin B nephrotoxicity • Nonsteroidal anti-inflammatory drugs • Cyclosporine and tacrolimus
4th	Tubulointerstitial Disease Chronic interstitial nephritis Papillary necrosis
5th	CHRONIC KIDNEY DISEASE: Stages in CKD etiology and risk factors
6th	Albuminuria or Proteinuria Assessment of Kidney Function
7th	• Diabetic Nephropathy • Non Diabetic Nephropathy
8th	Assessment and treatment of Hyperlipidemia
9th	RENAL REPLACEMENT THERAPY: Hemodialysis Peritoneal Dialysis
10th	MANAGING THE COMPLICATIONS OF CHRONIC KIDNEY DISEASE: Anemia
11th	MANAGING THE COMPLICATIONS OF CHRONIC KIDNEY DISEASE: Mineral Bone Disorder and Renal Osteodystrophy
12th	Dosage adjustment in kidney disease Pharmacokinetic Principles Guiding Therapy Adjustments

13th	Tutorial
14th	Presentation
15th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a6, b1- b5
Oral exam to assess: a1- a6, b1- b5, d2
Presentation: c1- c6, d1- d3

Assessment schedule:

Assessment (1): presentation	Week 10
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

Weighting of Assessment:

Assessment method	Marks	Percentage
• Presentation	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific Papers:

Inker LA, Astor BC, Fox CH, et al. KDOQI commentary on the 2012 Clinical Practice Guideline for the evaluation and management of CKD. Am J Kidney Dis 2014;63:713-35.

Wanner C, Tonelli M; KDIGO Lipid Guideline Development Work Group Members. KDIGO clinical practice guideline for lipid management in CKD: summary of recommendation statements and clinical approach to the patient. Kidney Int 2014;85:1303-9.

B- Essential books:

Lau AH. Glomerulonephritis. In: DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 9th ed. New York: McGraw-Hill, 2014:705-28.
Sowinski KM, Churchwell MD, Decker BS. Hemodialysis and peritoneal dialysis. In: DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 9th ed. New York: McGraw-Hill, 2014:665-85.

C- Suggested books:

Dager W, Halilovic J. Acute kidney injury. In: DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 9th ed. New York: McGraw-Hill, 2014:611-32.
Mohammad RS, Matzke GR. Drug therapy individualization for patients with chronic kidney disease. In: DiPiro JT, Talbert RL, Yee GC, et al., eds. Pharmacotherapy: A Pathophysiologic Approach, 9th ed. New York: McGraw-Hill, 2014:729-43.

D- Websites:

Kidney Disease: Improving Global Outcomes (KDIGO). http://kdigo.org/home/guidelines/.
Kliger AS, Foley RN, Goldfarb DS, et al. KDOQI U.S. commentary on the 2012 KDIGO clinical practice guideline for anemia in CKD. Am J Kidney Dis 2013;62:849-59. Available at http:// www.kidney.org/sites/default/files/docs/kdoqi_ commentary_on_kdigo_anemia.pdf. Accessed October 3, 2014.

Facilities required for teaching and learning:

1. **For lectures:** boards, data show, screen, air conditioned class

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- **Course Coordinators: Assis. Prof. Gehan Fathy Attia**
- **Head of Department: Assis. Prof. Gehan Fathy Attia**
- **Date: 2018--تم اعتماد التوصيف بمجلس القسم بتاريخ أغسطس**

Matrix I Advanced Pharmacotherapeutics																				
	Course Contents	Knowledge and understanding						Intellectual skills					Professional & Practical skills						General and Transferable skills		
		a1	**a2**	**a3**	**a4**	**a5**	**a6**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**c4**	**c5**	**c6**	**d1**	**d2**	**d3**
1	Acute kidney injury (AKI) or acute renal failure:	√						√													
2	**Cont:** Acute kidney injury (AKI) or acute renal failure:	√							√												
3	• Drug-induced kidney damage:	√							√												

4	• Tubulointerstitial disease • Chronic interstitial nephritis • Papillary necrosis		√							√											
5	Chronic kidney disease: Stages in ckd • Etiology and risk factors		√							√											
6	• Albuminuria or Proteinuria • Assessment of Kidney Function		√							√											
7	• Diabetic Nephropathy • Non Diabetic Nephropathy			√															√	√	√	√

8	• Assessment and treatment of Hyperlipidemia			√																	
9	Renal replacement therapy: Hemodialysis Peritoneal Dialysis																				
10	Managing the complications of chronic kidney disease: Anemia				√							√									
11	Managing the complications of chronic kidney disease: • Mineral Bone Disorder and Renal				√							√									

	Osteodystrophy																				
12	Dosage adjustment in kidney disease Pharmacokinetic Principles Guiding Therapy Adjustments				√							√									
13	Tutorial					√	√				√										
14	Presentation					√	√				√		√	√	√	√	√	√	√		

Clinical oncology

Course specification of clinical oncology

Course specifications:

- **Program on which the course is given:** PhD of Pharmacy Practice
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy Practice Dept.
- **Department offering the course:** Pharmacy Practice Dept.
- **Date of specification approval:** 2018

1- Basic information:

Title: **Clinical oncology** Code: CPsp5
Credit hours: 4 hrs/week Lectures: 4 hrs/week
Total: 4 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to:

1. Recommend appropriate pharmacotherapy for managing common complications of cancer chemotherapy, including nausea, vomiting, myelosuppression, infection, anemia, fatigue, cardiotoxicity, and extravasation injury.
2. Identify the appropriate use of growth factors
3. Assess the appropriate pharmacotherapy for managing cancer-related pain.
4. Recommend the appropriate pharmacotherapy for managing oncologic emergencies, including hypercalcemia, tumor lysis syndrome, and spinal cord compression.

1- Intended learning outcome s (ILO's) of Drug Targeting:

Knowledge and Understanding	
a1	Enumerate the risk factors of Chemotherapy-Induced Nausea and Vomiting
a2	Outline the principles of cancer pain management
a3	Explain the principles of chemotherapy-induced bone marrow suppression
a4	List the causes of anemia and fatigue in adult patients with cancer
a5	Describe different chemoprotectants
a6	Identify the causes of chemotherapy induced hypercalcemia
a7	Describe Tumor Lysis Syndrome
a8	Describe the management of extravasation
Intellectual skills	
b1	Recommend the proper therapy for managing Chemotherapy-Induced Nausea and Vomiting
b2	Design pain management plan
b3	Recommend treatment therapy for chemotherapy induced anemia and fatigue
b4	Design hypercalcemia management plan based on the estimation of degree of hypercalcemia
Professional and Practical skills	
c1	Appraise critically treatment options for managing different chemotherapy induced complications
c2	Assess the degree of pain using pain rating scales
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively in a verbal manner
d3	Promote critical thinking، problem-solving، decision-making، and time managing capabilities

4. Course Content of Drug Targeting (PhD degree):

Week	Lecture content (4 hr/w)
1st	**ANTIEMETICS:**

	• Important Definitions Pertaining to Chemotherapy-Induced Nausea and Vomiting (CINV) • Risk Factors for CINV • General Principles for Managing CINV and Radiation-Induced Nausea and Vomiting
2nd	**ANTIEMETICS:** • Emetogenic Potential of Intravenous Chemotherapy Agents • Emetogenic Potential of Oral Chemotherapy Agents • Antiemetics • Emesis Prevention Algorithm
3rd	**PAIN MANAGEMENT:** • Principles of Cancer Pain Management • Diagnosis and Assessment of Pain • Pain Rating Scales • Treatment of Pain
4th	**TREATMENT OF FEBRILE NEUTROPENIA:** • Principles of Chemotherapy-Induced Bone Marrow Suppression • Neutropenia and Febrile Neutropenia • Use of colony-stimulating factors in neutropenia and febrile neutropenia
5th	**THROMBOCYTOPENIA:**
6th	**ANEMIA AND FATIGUE:** • Causes of Anemia and Fatigue in Adult Patients with Cancer • Principles of Anemia and Fatigue
7th	**ANEMIA AND FATIGUE:** • Erythropoiesis-stimulating agents
8th	**CHEMOPROTECTANTS:**
9th	**ONCOLOGIC EMERGENCIES:** A. Hypercalcemia B. Spinal Cord Compression
10th	**ONCOLOGIC EMERGENCIES:** C. Tumor Lysis Syndrome
11th	**MISCELLANEOUS ANTINEOPLASTIC PHARMACOTHERAPY:**
12th	Tutorial
13th	Tutorial
14th	Presentation
15th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a8, b1- b4
Oral exam to assess: a1- a8, b1- b4, d2
Presentation: c1, c2, d1- d3

Assessment schedule:

Assessment (1): presentation	Week 10
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

Weighting of Assessment:

Assessment method	Marks	Percentage
• Presentation	10	10 %
• Written exam	75	75 %
• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific Papers:

Gralla RJ, Raftopoulos H. Progress in the control of chemotherapy-induced emesis: new agents and new studies. J Oncol Pract 2009; 5:130-3.

Coiffler B, Altman A, Pui CH, et al. Guidelines for the management of pediatric and adult tumor lysis syndrome: an evidence-based review. J Clin Oncol 2008;26:2767-78.
Vadhan-Raj S, Fayad LE, Fanale MA, et al. A randomized trial of single-dose rasburicase versus five-daily doses in patients at risk for tumor lysis syndrome. Ann Oncol 2012;23:1640-5.

B- Essential books:

C- Suggested books:

U.S. Department of Health and Human Services (DHHS). Public Health Service Agency for Health Care Policy and Research (AHCPR). Clinical Practice Guideline, No. 9. Management of Cancer Pain. AHCPR Publication 94-0592, March 1994. Washington, DC: DHHS, 1994.

D- Websites:

Multinational Association for Supportive Care in Cancer. MASCC/ESMO Antiemetic Guideline 2010. Available at www.mascc.org. Accessed October 10, 2012
National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Myeloid Growth Factors, version 2.2014. Available at www.nccn.org/professionals/physician_gls/f_ guidelines.asp. Accessed October 12, 2014.

Facilities required for teaching and learning:

1. **For lectures:** boards, data show, screen, air conditioned class

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- **Course Coordinators: Assis. Prof. Gehan Fathy Attia**
- **Head of Department: Assis. Prof. Gehan Fathy Attia**
- **Date: 2018--تم اعتماد التوصيف بمجلس القسم بتاريخ أغسطس**

Matrix I of Clinical oncology																	
Week	Course Contents	Knowledge and understanding								Intellectual skills				Professional & Practical Skills		General and Transferable skills		
		a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	c1	c2	d1	d2	d3
1	**ANTIEMETICS:** • Important Definitions Pertaining to Chemotherapy-Induced Nausea and Vomiting (CINV) • Risk Factors for CINV General Principles for Managing CINV and Radiation-Induced Nausea and Vomiting	√				√	√			√								
2	**ANTIEMETICS:** • Emetogenic Potential of Intravenous Chemotherapy Agents • Emetogenic Potential of Oral Chemotherapy Agents • Antiemetics • Emesis Prevention Algorithm	√				√	√			√	√							

3	**PAIN MANAGEMENT:** • Principles of Cancer Pain Management • Diagnosis and Assessment of Pain • Pain Rating Scales • Treatment of Pain	√				√	√									√	√	√
4	**TREATMENT OF FEBRILE NEUTROPENIA:** • Principles of Chemotherapy-Induced Bone Marrow Suppression • Neutropenia and Febrile Neutropenia • Use of colony-stimulating factors in neutropenia and febrile neutropenia	√				√	√											
5	**THROMBOCYTOPENIA:**	√				√	√				√							
6	**ANEMIA AND FATIGUE:** • Causes of Anemia and Fatigue in Adult Patients with Cancer Principles of Anemia and Fatigue	√				√	√									√	√	√
7	**ANEMIA AND FATIGUE:** Erythropoiesis-stimulating agents	√	√	√		√	√											

8	**CHEMOPROTECTANTS:**	√	√	√		√	√				√						
9	**ONCOLOGIC EMERGENCIES:** A. Hypercalcemia Spinal Cord Compression	√				√	√									√	√	√
10	**ONCOLOGIC EMERGENCIES:** Tumor Lysis Syndrome	√			√	√	√					√						
11	**MISCELLANEOUS ANTINEOPLASTIC PHARMACOTHERAPY:**	√			√	√	√				√	√						
12	Tutorial	√				√	√									√	√	√
13	Tutorial	√				√	√											
14	**Student Presentation**	√				√	√				√			√	√	√	√	√

Pharmacy practice

Course specification of pharmacy practice

Course specifications:

- **Program on which the course is given:** PhD of Pharmacy Practice
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy Practice Dept.
- **Department offering the course:** Pharmacy Practice Dept.
- **Date of specification approval:** 2018

1- Basic information:

Title: **pharmacy practice** Code: CPsp6
Credit hours: 4 hrs/week Lectures: 4 hrs/week
Total: 4 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to:

1. Interpret hemodynamic parameters and acid-base status in critically ill patients.
2. Differentiate between presentation of and treatment strategies for hypovolemic, obstructive, and distributive shock.
3. Discuss the appropriate use of fluids, vasopressors, antibiotics, and corticosteroids in patients with sepsis, severe sepsis, or septic shock.
4. Discuss strategies to optimize the safety and efficacy of therapeutic hypothermia for patients after cardiac arrest.
5. Recommend therapeutic options to minimize delirium and provide optimal analgesia, sedation, neuromuscular blockade, and nutritional support in critically ill patients.
6. Recommend therapeutic options to prevent stress ulcers, venous thromboembolism, hyperglycemia, and ventilator-associated pneumonia in critically ill patients.

3- Intended learning outcome s (ILO's):

Knowledge and Understanding	
a1	Define Arterial blood pressure, central venous pressure, pulmonary capillary wedge pressure, pulmonary artery occlusion pressure

a2	Outline Indicators of Oxygen Delivery
a3	Define different types of shocks
a4	Describe sepsis Syndromes
a5	Outline Steps to Evaluate Acid-Base Disorders
a6	List 2010 American Heart Association (AHA) Guidelines
a7	Describe causes of Respiratory Failure and complications Associated with Mechanical Ventilation
a8	Outline different strategies for PREVENTING VENTILATOR-ASSOCIATED PNEUMONIA
Intellectual skills	
b1	Differentiate between different types of shocks
b2	Identify Causes of Acid-Base Disturbances, Respiratory Failure
b3	Design a proper care for Post–Cardiac Arrest
b4	suggest a proper management of PAIN, AGITATION, DELIRIUM, AND NEUROMUSCULAR BLOCKADE
b5	Recommend Treatment Strategies to Achieve Glycemic Control in Critically Ill Patients
b6	Recommend a proper Prophylactic therapy for stress ulcers and VENOUS THROMBOEMBOLISM
Professional and Practical skills	
c1	Interpret different hemodynamic parameters
c2	Recommend the optimum treatment for each type of shock
c3	Predict different Organs Dysfunction
c4	Interpret acid-base disturbances
c5	assess pain , sedation and delirium for ICU patients
c6	Monitor the patient during administration of Neuromuscular blockers
c7	Monitor blood glucose level for ICU patients
c8	Estimating Nutrition Needs for ICU patients
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively in a verbal manner
d3	Promote critical thinking، problem-solving، decision-making، and time managing capabilities

4. Course Content:

Week	Lecture content (4 hr/w)
1st	INTERPRETATION OF HEMODYNAMIC PARAMETERS: A. Hemodynamics B. Indicators of Oxygen Delivery
2nd	TREATMENT OF SHOCK: A. Diagnosis of Shock Based on Hemodynamic Parameters B. Treatment of Hypovolemic Shock C. Treatment of Obstructive Shock D. Classification of Sepsis Syndromes
3rd	TREATMENT OF SHOCK: • Treatment of Vasodilatory and Distributive Shock
4th	INTERPRETATION OF ACID-BASE DISTURBANCES: Predicted Degrees of Compensation in Acid-Base Disturbances Steps to Evaluate Acid-Base Disorders Causes of Acid-Base Disturbances
5th	ACUTE RESPIRATORY FAILURE
6th	CARDIAC ARREST: 2010 American Heart Association (AHA) Guidelines Post–Cardiac Arrest Care
7th	PAIN, AGITATION, DELIRIUM, AND NEUROMUSCULAR BLOCKADE • The Behavioral Pain Scale • Critical Care Pain Observation Tool • Richmond Agitation-Sedation Scale (RASS) • Sedation-Agitation Scale (SAS) • Dosing strategies for analgesics and sedatives • Assessment and Management of Delirium • Neuromuscular Blockade in ICU Patients
8th	GLUCOSE CONTROL Treatment Strategies to Achieve Glycemic Control in Critically Ill Patients Monitoring Blood Glucose
9th	PREVENTING STRESS ULCERS: Prophylactic therapy for stress ulcers
10th	PHARMACOLOGIC THERAPY FOR PREVENTING VENOUS THROMBOEMBOLISM (VTE):

	Nonpharmacologic Prevention of VTE Pharmacologic Prophylaxis
11th	PREVENTING VENTILATOR-ASSOCIATED PNEUMONIA:
12th	NUTRITION SUPPORT IN CRITICALLY ILL PATIENTS: Estimating Nutrition Needs Enteral Nutrition Parenteral Nutrition
13th	Tutorial
14th	Presentation
15th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a8, b1- b6
Oral exam to assess: a1- a8, b1- b4, d2
Presentation: c1- c8, d1- d3

Assessment schedule:

Assessment (1): presentation	Week 10
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

Weighting of Assessment:

Assessment method	Marks	Percentage
• Presentation	10	10 %
• Written exam	75	75 %

• Oral exam	15	15 %
TOTAL	**100**	**100%**

7- References and books:

A-Scientific Papers:

Berend K, de Vries AP, Gans RO. Physiological approach to assessment of acid-base disturbances. N Engl J Med 2014;371:1434-45.
Jacobi J, Bircher N, Krinsley J, et al. Guidelines for the use of an insulin infusion for the management of hyperglycemia in critically ill patients. Crit Care Med 2012;40:3251-76.
Neil A. Gilchrist NA, Asoh I, Greenberg B. Atypical antipsychotics for the treatment of ICU delirium. J Intensive Care Med 2012;27:354-61.
Dhaliwal R, Cahill N, Lemieux M, et al. The Canadian critical care nutrition guidelines in 2013: an update on current recommendations and implementation strategies. Nutr Clin Pract 2014;29(1):29-43.
Casaer MP, Van den Berghe G. Nutrition in the acute phase of critical illness. N Engl J Med 2014;370:1227-36.

B- Essential books:

C- Suggested books:

D- Websites:

American Heart Association. American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Available
at http://circ.ahajournals.org/cgi/content/full/ 122/18_suppl_3/S640. Accessed November 21, 2014.
IHI ventilator bundle. Available at http://www.
ihi.org/resources/Pages/Changes/Implementthe VentilatorBundle.aspx. Accessed November 21, 2014.

Facilities required for teaching and learning:

1. **For lectures:** boards, data show, screen, air conditioned class

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- **Course Coordinators: Assis. Prof. Gehan Fathy Attia**
- **Head of Department: Assis. Prof. Gehan Fathy Attia**
- **Date: 2018--تم اعتماد التوصيف بمجلس القسم بتاريخ أغسطس**

		Matrix I of Pharmacy practice																							
Week	Course Contents	Knowledge and understanding								Intellectual skills						Professional & Practical Skills								General & Transferable skills		
		a1	**a2**	**a3**	**a4**	**a5**	**a6**	**a7**	**a 8**	**b1**	**b2**	**b3**	**b4**	**b5**	**b6**	**c1**	**c2**	**c3**	**c4**	**c5**	**c6**	**c7**	**c8**	**d1**	**d 2**	**d 3**
1	Interpretation of hemodynamic parameters: A. Hemodynamics B. Indicators of Oxygen Delivery	√										√														
2	Treatment of shock: A. Diagnosis of Shock Based on Hemodynamic Parameters B. Treatment of Hypovolemic Shock C. Treatment of Obstructive Shock Classification of		√									√														

	Sepsis Syndromes																								
3	Treatment of shock: Treatment of Vasodilatory and Distributive Shock																						√	√	√
4	Interpretation of acid-base disturbances: Predicted Degrees of Compensation in Acid-Base Disturbances Steps to Evaluate Acid-Base Disorders Causes of Acid-Base Disturbances			√	√					√	√														
5	Acute respiratory failure			√	√							√													
6	Cardiac arrest: 2010 American Heart Association (AHA) Guidelines Post–Cardiac Arrest Care			√	√																				

7	Pain, agitation, delirium, and neuromuscular blockade • The Behavioral Pain Scale • Critical Care Pain Observation Tool • Richmond Agitation-Sedation Scale (RASS) • Sedation-Agitation Scale (SAS) • Dosing strategies for analgesics and sedatives • Assessment and Management of Delirium Neuromuscular Blockade in ICU Patients			√	√							√	√						√	√					

8	Glucose control • Treatment Strategies to Achieve Glycemic Control in Critically ill Patients • Monitoring Blood Glucose			√	√					√										√	√	√	√			
9	Preventing stress ulcers: Prophylactic therapy for stress ulcers																							√	√	√
10	Pharmacologic therapy for preventing venous thromboembolism (VTE): • Nonpharmacolo g Prevention of VTE • Pharmacologic Prophylaxis			√	√																					
11	Preventing ventilator-			√	√																					

	associated pneumonia:																								
12	Nutrition support in critically ill patients: Estimating Nutrition Needs • Enteral Nutrition • Parenteral Nutrition													√									√	√	√
13	Tutorial					√																	√	√	√
14	Presentation					√																	√	√	√

Thesis Specification

Thesis Specification of PhD Degree

A- Course specifications:

- **Program on which the course is given:** PhD of Pharmaceutical sciences (Pharmacy practice)
- **Major or Minor element of program:** Major
- **Department offering the program:** Pharmacy practice
- **Department offering the thesis:** Pharmacy practice
- **Date of specification approval:** 2017/2018

1- Basic information:

Title: PhD Thesis in Pharmacy practice
Credit hours: 30 hrs

2- Overall aim of the thesis:

After being accepted by the Faculty authority, the candidate has to recall the research plan of the University and the Faculty to select the research area which he/she is going to fit with

On completion of the thesis, the students will be able to:

- Outline the possible protocol for solving harsh problem that the candidate can work after integrating suitable knowledge about this point of research
- Perform highly advanced techniques and methods used in the experimental work according to the designed protocol
- Derive and present the results of the study from the data collected
- Analyze the results of the study in the light of prior knowledge
- Suggest the possible solutions for the problem(s) under investigation.
- Imply new modifications that can be used to develop some techniques/methods.

- Transfer theoretical/practical experience to junior researches.

3- Intended learning outcome's (ILOs):

Knowledge and Understanding	
a1	Illustrate advanced bases of pharmacotherapy, pharmacokinetics, genetics, and medication safety related to main objectives of the thesis
a2	Identify therapy guidelines as well as ethics of clinical research
a3	Understand the legal aspects of for professional and academic practices
a4	Define patients' rights and quality assurance bases related to practical work of the thesis
Intellectual skills	
b1	Solve problems related to practical work by obtained quantitative data from the practical work
b2	Discuss professional problems and suggest solutions relay on different pharmaceutical knowledge and recent information
b3	Plan a research in the field of pharmacy practice that allow discovery of new therapy guidelines and strategies for effective and safe treatment
b4	Integrate scientific results and write report following conducting research
b5	Manage risks and hazards related to professional practical area
b6	Adopt GLP principles in research to develop laboratory performance
b7	Decide what to do with full responsibility in scientific research
b8	Demonstrate creativity and innovation in modifying techniques and in

	utilization of various therapies.
b9	Manage evidence based arguments in the field of pharmacy practice
Professional and practical skills	
c1	Apply recent techniques related to practical thesis work.
c2	Use and evaluate practical data to write report
c3	Develop methods of data collection
c4	Apply technology in methodology development during practical work. Use IT skills in collecting information, presenting results and writing thesis
c5	Modify laboratory techniques.
General and Transferable skills	
d1	Interact with health care professionals and patients.
d2	Use information technology in review and thesis preparation
d3	Set rules for evaluation and judge others performance.
d4	Study independently and evaluate learning needs in pharmacy practice
d5	Reprocess up-to-date information in pharmacy practice
d6	Implement tasks as a member of a team.
d7	Utilize time effectively to achieve goals
d8	Work effectively as leader of a team
d9	Able to present data orally and participate in workshops and conferences
d10	Transfer theoretical/practical experience to junior researches

4. Thesis Content:

Steps	Content
1st	-Suggest the possible points/ problems of research that the candidate can work on in the frame of the aim of work and choose proper point. -Collect recent information about this subject by all possible means. -Use internet, journals, books and others thesis to get previous and recent information about the subject understudy. -Design the protocol including the steps of work following the suitable timetable. -Integrate different knowledge (pharmacological knowledge, pharmacotherapy, biostatistics, genetics……..) to solve suggested problem. -Continuous evaluation to the thesis outcome according to the schedule.

2nd	-Identify different practical techniques and methods to collect data related to the subject under study. -Operate scientific instruments according to instructions and GLP basics when necessary. -Evaluate and manage hazards (chemical and biological) throughout the whole practical work. -Organize the experimental work according to the designed protocol (either individual, parallel or sequential experiments). -Perform lab examination, gene analysis, radiographically imaging, others -Apply ethical recommendations during dealing with humans/ experimental animals
3rd	-Collect raw data of patients demographics, medication administered , side effects and others -Interpret raw data to get valuable information. -Perform statistical analysis for the results. -Present and describe the results graphically. -Suggest solution to the problem understudy based on this presented data.
4th	-Communicate with supervisors to discuss results -Work effectively as a member of a team (e.g. Supervisors, various professionals, patients and Technicians). -Present the results periodically in seminars.

	-Define ethics of clinical research. -Write scientific reports on the obtained results with conclusive significance. -Discuss obtained results in comparison with pervious literatures. -Suggest possible recommendations based on the outcome of the thesis and decide future plans. -Summarize the thesis in an understandable Arabic language for non professionals. -Write references in the required form (Thesis, Paper…….). -Demonstrate the thesis in a final power point presentation. -Continue self-learning throughout the experimental work and writing scientific papers.
5th	- Prepare research paper(s) for publication in national/international journals. - Participate in national/international conferences to present the findings of his/her thesis.

5- Teaching and Learning Methods:

- Self-learning (Activities, Research….)
- Open discussion and presentations

6- References:

1. Berend K, de Vries AP, Gans RO. Physiological approach to assessment of acid-base disturbances. N Engl J Med 2014;371:1434-45.

2. Jacobi J, Bircher N, Krinsley J, et al. Guidelines for the use of an insulin infusion for the management of hyperglycemia in critically ill patients. Crit Care Med 2012;40:3251-76.

Facilities required for:

For practical work: U.V spectrophotometer, centrifuge, PCR, ELISA, Gamma counter, Electrophoresis

Zagazig University Hospital

Head of Department: Assis. Prof. Gehan Balata

PhD of Pharmacy Practice (2017/2018)																																							
Program Courses		Program intended learning outcomes																																					
		Knowledge and understanding											Intellectual skills												Professional and practical skills								General and transferable skills						
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5	D6	D7
Special courses	Advanced Threpeutics	√	√			√	√	√	√	√			√	√	√	√	√																√	√		√	√	√	
	Clinical Oncology					√			√	√			√	√	√	√	√			√													√	√			√		
	Pharmacy Practice			√		√	√	√					√	√	√	√	√																√	√			√		√
Thesis											√	√						√	√			√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√