



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:** Single
- 3- **Faculty/ University:** Faculty of Pharmacy, Zagazig University
- 4- **Department:** Pharmacy practice
- 5- **Coordinator:** Assis. Prof./ **Gehan Balata**
- 6- **Date of program specification approval:** 2019
- 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
- 10- **Academic Reference Standards:**
 - a. The program ILOs were compared to the general guideline for postgraduate studies, 1st Edition, February 2009 issued by (NAQAA) (National Authority for Quality Assurance and Accreditation).
 - b. The program ILOs were compared to the MSc Clinical Pharmacy provided by School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.

B- Professional Information

1- Program aims:

This Program is designed to extend graduates clinical knowledge and skills necessary to apply pharmacy practice and clinical sciences in various settings including research and academic Institutes as well as private and public hospitals.

The program aims are summarized as follows:

1. Extend graduates knowledge of disease states, pharmacology, pharmacokinetics and therapeutics.
2. Equip graduates with skills necessary to assess drug therapy for effectiveness, safety, compatibility and patient acceptability.
3. Instill a commitment to life-long learning by enhancing and developing learning skills
4. Develop communication skills, time management, critical thinking, problem solving and decision making skills.
5. Develop research abilities through preparation of a complete 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.

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. Demonstrate effective Communication, decision making and leadership skills

2-Intended Learning Outcomes (ILOs):

The Program provides excellent opportunities for students to develop knowledge and 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:

- A1- Illustrate basic theories and principles of clinical practice and other relevant subjects including: Physiology, Biostatistics, Drug interactions, Biotechnology, Instrumental analysis, Biopharmaceutics and Pharmacokinetic, Physical pharmacy, Pharmacotherapy, Interpretation of clinical laboratory data and Advanced and clinical pharmacokinetics.
- A2- Describe physiological functions of the different body organs in healthy and disease states as well as basics of genetics.
- A3- Outline pharmacotherapeutic properties of different groups of drugs, mechanism of action, drug-drug interaction, toxic effects and risks and benefits of commonly used drugs.
- A4- Outline the role of professional pharmacy practice for better patient outcomes.
- A5- Illustrate recent research approaches in the field of clinical pharmacy practice and pharmacotherapy.
- A6- Outline treatment strategies for various GIT, cardiac, and upper respiratory tracts disorders.

- A7- Describe specific pharmacokinetic characteristics of drugs with narrow therapeutic index.
- A8- Outline the basis and applications of instrumental analysis
- A9- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data
- A10- Define ethics of scientific research and legal regulations concerning patient rights as well as basic principles of quality assurance in clinical research.
- A11- Illustrate different methods of biostatistical analysis.

2-2 - Intellectual Skills:

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

- B1- Integrate different aspects of drug usage and pharmacokinetics to suggest solutions for research and professional problems.
- B2- Locate and interpret patient-specific data to maximize their pharmaceutical care.
- B3- Suggest strategies for preventing complications associated with different treatment plans
- B4- Evaluate various therapeutic strategies for individuals with high risk for disease and common medical conditions
- B5- Define a problem and formulate a research question/hypothesis with identifiable objectives and outcomes.
- B6- Design appropriate treatment plans based on patient specific conditions
- B7- Interpret data of statistical analysis as well as information from published literature.
- B8- Solve problems in disease control and drug therapy based on the

accompanying circumstances and underlining reasons.

B9- Integrate knowledge from physical pharmacy to explain the effect of pharmaceutical ingredients on therapeutic outcomes.

2-3 - Professional and Practical Skills:

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

- C1- Perform routine technical procedures including blood collection, separation of plasma and serum samples
- C2 - Construct a good research methodology in the area of clinical pharmacy and pharmacy practice
- C3 - Use laboratory tests dealing with HPLC and GC techniques and other equipment
- C4 - Apply safety guidelines in dealing with chemical reagents and biological samples.
- C5- Demonstrate report writing skills for preparation of a published research.
- C6- Cite relevant published evidence to support written work
- C7- Perform statistical analysis as well as pharmaceutical calculation for dose and regimen determination.

2.4 - General and Transferable Skills:

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

- D1- Communicate efficiently and effectively both in writing and orally
- D2- Use IT appropriately.
- D3- Demonstrate self- learning skills for continuous professional development.

D4- Retrieve information from different resources including online resources, library as well as printed literatures.

D5- Work effectively as a member of team

D6- Develop time management, problem solving and decision making skills.

D7- Demonstrate team leadership in different fields of the profession.

D8- Evaluate performance of others using specific standards.

3- Academic Standards:

a. The program ILOs were compared to the general guideline for postgraduate studies, 1st Edition, February 2009 issued by (NAQAA) (National Authority for Quality Assurance and Accreditation).

b. The program ILOs were compared to the MSc Clinical Pharmacy provided by School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.

Matrix1: Comparison of M. Pharm. Sci. Degree in pharmacy practice program with the Academic Reference Standard {ARS, 2009} developed by NAQAAE

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

Matrix 2: Comparison of M. Pharm. Sci. Degree in pharmacy practice program with the Academic Reference Standard {ARS, 2009} developed by NAQAAE

	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.	A1- Illustrate basic theories and principles of clinical practice and other relevant subjects including: Physiology, Biostatistics, Drug interactions, Biotechnology, Instrumental analysis, Biopharmaceutics and Pharmacokinetic, Physical pharmacy, Pharmacotherapy, Interpretation of clinical laboratory data and Advanced and clinical pharmacokinetics. A2- Describe physiological functions of the different body organs in healthy and disease states as well as basics of genetics. A3- Outline pharmacotherapeutic properties of different groups of drugs, mechanism of action, drug-drug interaction, toxic effects and risks and benefits of commonly used drugs. A6- Outline treatment strategies for various GIT, cardiac, and upper respiratory tracts disorders. A7- Describe specific pharmacokinetic

	ARS (2009)	Program ILOs
Intellectual Skills		characteristics of drugs with narrow therapeutic index. A8- Outline the basis and applications of instrumental analysis A9- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data
	2.1.2- Mutual influence between professional practice and its impact on the environment.	A4- Outline the role of professional pharmacy practice for better patient outcomes.
	2.1.3- Scientific developments in the area of specialization.	A5- Illustrate recent research approaches in the field of clinical pharmacy practice and pharmacotherapy.
	2.1.4- Moral and legal principles for professional practice in the area of specialization.	A10- Define ethics of scientific research and legal regulations concerning patient rights as well as basic principles of quality assurance in clinical research. A11- Illustrate different methods of biostatistical analysis.
	2.1.5- Principles and the basics of quality in professional practice in the area of specialization.	
	2.1.6- The fundamentals and ethics of scientific research.	
	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B2- Locate and interpret patient-specific data to maximize their pharmaceutical care. B7- Interpret data of statistical analysis as well as information from published

	ARS (2009)	Program ILOs
		literature.
	2.2.2- Solve specified problems in the lack or missing of some information.	B8- Solve problems in disease control and drug therapy based on the accompanying circumstances and underlining reasons.
	2.2.3- Correlate and integrate different pharmaceutical knowledge to solve professional problems.	B1- Integrate different aspects of drug usage and pharmacokinetics to suggest solutions for research and professional problems. B9- Integrate knowledge from physical pharmacy to explain the effect of pharmaceutical ingredients on therapeutic outcomes.
	2.2.4- Conduct research and write scientific report on research specified topics.	B5- Define a problem and formulate a research question/hypothesis with identifiable objectives and outcomes.
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B4- Evaluate various therapeutic strategies for individuals with high risk for disease and common medical conditions
	2.2.6- Plan to improve performance in the field of specialization.	B6- Design the appropriate treatment based on patient specific condition
	2.2.7- Professional decision-making in the contexts of diverse disciplines.	B3- Suggest strategies for preventing complications associated with different treatment plans

	ARS (2009)	Program ILOs
Professional and Practical Skills	2.3.1- Master basic and modern professional skills in the area of specialization.	C1- Perform routine technical procedures including blood collection, separation of plasma and serum samples C7- Perform statistical analysis as well as pharmaceutical calculation for dose and regimen determination.
	2.3.2- Write and evaluate professional reports.	C2 - Construct a good research methodology in the area of clinical pharmacy and pharmacy practice C5- Demonstrate report writing skills for preparation of a published research. C6- Cite relevant published evidence to support your written work
	2.3.3- Assess methods and tools existing in the area of specialization.	C3 - Use laboratory tests dealing with HPLC and GC techniques and other equipment C4 - Apply safety guidelines in dealing with chemical reagents and biological samples.
General and Transferable Skills	2.4.1- Communicate effectively.	D1- Communicate efficiently and effectively both in writing and orally
	2.4.2- Effectively use information technology in professional practices	D2- Use IT appropriately.

	ARS (2009)	Program ILOs
	2.4.3- Self-assessment and define his personal learning needs. 2.4.8- Continuous and self learning	D3- Demonstrate self- learning skills for continuous professional development.
	2.4.4- Use variable sources to get information and knowledge.	D4- Retrieve information from different resources including online resources, library as well as printed literatures.
	2.4.5- Set criteria and parameters to evaluate the performance of others	D8- Evaluate performance of others using specific standards.
	2.4.6- Work in a team and lead teams carrying out various professional tasks.	D5- Work effectively as a member of team D7- Demonstrate team leadership in different fields of the profession.
	2.4.7- Manage time effectively.	D6- Develop time management, problem solving and decision making skills.

Matrix 3: Comparison of M. Pharm. Sci. Degree in pharmacy practice program with MSc Clinical Pharmacy provided by School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
Knowledge and Understanding	1. Demonstrate an in-depth understanding of the therapeutic process and critically discuss its importance in Pharmacy.	A1- Illustrate basic theories and principles of clinical practice and other relevant subjects including: Physiology, Biostatistics, Drug interactions, Biotechnology, Instrumental analysis, Biopharmaceutics and Pharmacokinetic, Physical pharmacy, Pharmacotherapy, Interpretation of clinical laboratory data and Advanced and clinical pharmacokinetic. A3- Outline pharmacotherapeutic properties of different groups of drugs, mechanism of action, drug-drug interaction, toxic effects and risks and benefits of commonly used drugs. A4- Outline the role of professional pharmacy practice for better patient outcomes. B3- Suggest strategies for preventing complications associated with different treatment plans

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
	2. Critically discuss the aetiology and epidemiology of major diseases and their treatment.	A2- Describe physiological functions of the different body organs in healthy and disease states as well as basics of genetics.
	3. make reasoned recommendations for the drug treatment of various pathologies in the light of published studies and procedures.	A6- Outline treatment strategies for various GIT, cardiac, and upper respiratory tracts disorders.
	4. evaluate the influence and limitations of laboratory data on drug therapy and patient care.	B2- Locate and interpret patient-specific data to maximise their pharmaceutical care.
	5. apply appropriate methodology for successful monitoring and evaluation of drug usage and therapeutic outcomes.	A7- Describe specific pharmacokinetic characteristics of drugs with narrow therapeutic index. A9- Illustrate principles of the classic and modern methods for monitoring different drug levels and interpretation of clinical data
	6.interpret and evaluate prescriptions and other relevant and appropriate orders for drugs and medicines.	B4- Evaluate various therapeutic strategies for individuals with high risk for disease and common medical conditions
	7. appraise critically a patient's medication and formulate a pharmaceutical care plan, suggesting, where necessary, interventions that need to be	B6- Design the appropriate treatment based on patient specific condition

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
	made.	
	8. recognise and resolve modifiable risk factors for health and appropriate means of client education and the promotion of healthy lifestyles.	B8- Solve problems in disease control and drug therapy based on the accompanying circumstances and underlining reasons. (Partially covered)
	9. demonstrate an appreciation of the place of complementary and alternative therapies in modern healthcare.	(Partially covered)
	10. design and carry out an original research project, based upon novel hypotheses and analysis and utilising higher level communication skills. Gain appropriate Ethics Committee consent when required.	A10- Define ethics of scientific research and legal regulations concerning patient rights as well as basic principles of quality assurance in clinical research. A11- Illustrate different methods of biostatistical analysis. B1- Integrate different aspects of drug usage and pharmacokinetics to suggest solutions for research and professional problems. B5- Define a problem and formulate a research question/hypothesis with identifiable objectives and outcomes.
	11. write up original research in the style of published research or a paper.	C5- Demonstrate report writing skills for preparation of a published research.

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
Intellectual Skills	12. Develop critical thinking, interpretive and problem solving capabilities.	D6- Develop time management, problem solving and decision making skills. B9- Integrate knowledge from physical pharmacy to explain the effect of pharmaceutical ingredients on therapeutic outcomes.
	13. develop methodologies to address hypotheses.	C2 - Construct a good research methodology in the area of clinical pharmacy and pharmacy practice
	14. demonstrate critical appraisal skills to evaluate current research in the discipline of pharmacy	A5- Illustrate recent research approaches in the field of clinical pharmacy practice and pharmacotherapy. B7- Interpret data of statistical analysis as well as information from published literature.
	15. use information technology effectively to gather, integrate and communicate information relevant to pharmacy.	C6- Cite relevant published evidence to support your written work D2- Use IT appropriately.
and Practical	16. apply evidence based medicine to patient care and reflect on clinical practice.	D4- Retrieve information from different resources including online resources, library as well as printed literatures.

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
	17. elicit appropriate information from clients and the recognition of the symptoms of common diseases with appropriate counselling and advice on the correct use of drugs and medicines, both prescribed and non-prescribed; the recognition of the need to refer major conditions.	Not covered
	18. have an ability to take responsibility for, and successfully undertake, an on-going, reflective learning programme.	D3- Demonstrate self- learning skills for continuous professional development.
	19. be competent in performing pharmaceutical calculations.	C7- Perform statistical analysis as well as pharmaceutical calculation for dose and regimen determination.
General and Transferable Skills	20. demonstrate use of appropriate communication to gain the co-operation of relevant stakeholders (including patients, senior and peer colleagues, and other professionals where possible).	D1- Communicate efficiently and effectively both in writing and orally

	School of Pharmacy and Biomolecular Sciences, University of Brighton, UK.	Program ILOs
	21. demonstrate ability to use skills to make decisions in complex situations where there are several factors that require analysis, interpretation and comparison.	B8- Solve problems in disease control and drug therapy based on the accompanying circumstances and underlining reasons. D6- Develop time management, problem solving and decision making skills.
	22. demonstrate ability to work as a member of a team.	D5- Work effectively as a member of team D7- Demonstrate team leadership in different fields of the profession
	23. take action based on own interpretation of broad professional policies/procedures where necessary	D8- Evaluate performance of others using specific standards. (Partially covered)
	Not covered	A8- Outline the basis and applications of instrumental analysis C1- Perform routine technical procedures including blood collection, separation of plasma and serum samples C3 - Use laboratory tests dealing with HPLC and GC techniques and other equipment C4 - Apply safety guidelines in dealing with chemical reagents and biological samples.

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: pharmacoepidemiology studies, drug utilisation research, regulations, patient and medicines safety, organisational systems, transfer of care and disease specific research.

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/ IELTS (400 units)

b- Computer course

c- Study plan:

Course Code	Course Title	Credit hours	Program ILOs Covered	Final exam duration
	General Courses:			
M112	Physiology	2	A1, A2, A4, B7, D1, D4	2 hours
M111	Biostatistics	2	A1, A11, B7, D1, D2	2 hours
ME6	Elective course 1 (Drug interaction)	4	A1, A3, A4, B3, B4, D5, D6	4hours
ME7	Elective course 2 Drug induced disease	4	A1, A3, B4, B8, D1, D4	4 hours
ME4	Biotechnology		A1, A2, A5, B7,D2, D4, D5	
M102	Instrumental analysis & chromatographyII	4	A1, A8,C3, D2, D5, D7	4 hours
M104	Biopharmaceutics and Pharmacokinetic	2	A1, B1, D2, D4	2 hours
M103	Physical pharmacy	2	A1, B9, D2, D4	2 hours
	Special Courses:			
CPsp1	Pharmacotherapy	4	A1, A3, A4, A5, A6, A9, B2,B3, B4,B6, B8, D1, D2, D3	4 hours
CPsp2	Interpretation of clinical laboratory data	4	A1, A4, A9, B2, B4, B6, B8, D1, D2, D3	4 hours
	Advanced and clinical	4	A1, A4, A7, B2, B4,	4 hours

CPsp3	pharmacokinetic		B6,C7, D1, D3, D6	
	Thesis	30	A1, A2, A3, A4, A5, A6,A7, A9, A10, A11, B1, B2, B3, B4, B5, B6, B7, B8, B9, C1, C2, C3,C4, C5, C6, C7, D1, D2, D3, D4, D5, D6, D7, D8	

Elective courses:, Drug-drug interactions, Drug induced disease, Biotechnology

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, 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 (General & Special) 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-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%

7-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

8-Methods of program evaluation

Evaluator	Method	Sample
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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 International Benchmark Questionnaires	100%

Program coordinator: Assis. Prof./ Gehan Balata

Head of Department: Assis. Prof./ Gehan Balata

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: Pharmacology & Toxicology
- Date of specification approval: 2019

1- Basic information:

Title: Pharmacotherapy

Code: CPsp1

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 learning outcomes (ILOs) of Pharmacotherapy:

Knowledge and Understanding	
a1	List clinical manifestations, complications, goals of pharmacotherapy and patient education of selected conditions such as gastrointestinal (GI), cardiac, and upper respiratory tracts disorders.
a2	List clinical uses, pharmacokinetics, clinically significant side effects, drug interactions and contraindications to medications used in the management of the selected conditions such as gastrointestinal (GI), cardiac, and upper .respiratory tracts disorders
Intellectual skills	
b1	Identify drug-related problems and recommend the appropriate pharmacotherapy treatment.
b2	Design a treatment plan for patients presenting with a life-threatening conditions.
General and Transferable Skills	
d1	Use computer skills to present information
d2	Collect information from a variety of sources
d3	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
5	Diarrhea Constipation Irritable bowel syndrome
6	Upper and lower respiratory diseases Suppurative lung disease
7	Chronic obstructive pulmonary disease Activity (review article)
8	Pleural effusion
9	Interstitial lung disease
10	Tumors of lung
11	Pulmonary embolism
12	Cardiovascular diseases Hypertension
13	Heart failure Student presentation
14	Acute coronary syndrome
15	Final exam

5- Teaching and Learning Methods:

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

6- Student Assessment methods:

Written exam assess: a1, a2, b1

Oral exam assess: a1, a2, b1, b2

Activity assess: d1, d2, d3

Assessment schedule:

Assessment (1): Activity	Week 7,13
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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.

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ISBN-13: 9780781748452

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

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

**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

**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.

☐ **Course Coordinator:** Prof.Dr. / Ahmed Fahmy

☐ **Head of Department:** Prof Dr/ Mona Fouad

Matrix I of Pharmacotherapy course								
Course Contents		ILOs of Pharmacotherapy course						
		Knowledge and understanding		Professional and practical skills		General and transferable skills		
Lectures		a1	a2	b1	b2	d1	d2	d3
1	GIT diseases GERD Peptic ulcer	x	x	x	x			
2	Upper GIT bleeding Inflammatory bowel disease	x	x	x	x			
3	Complication of liver disease Nausea and vomiting	x	x	x	x			
4	Pancreatitis	x	x	x	x			
5	Diarrhea Constipation Irritable bowel syndrome	x	x	x	x			
6	Upper and lower respiratory diseases Suppurative lung disease	x	x	x	x			
7	COPD Activity (review article)	x	x	x	x	x	x	x
8	Pleural effusion	x	x	x	x			
9	Interstitial lung disease	x	x	x	x			
10	Tumors of lung	x	x	x	x			
11	Pulmonary embolism	x	x	x	x			
12	Cardiovascular diseases Hypertension	x	x	x	x			
13	Heart failure Student presentation	x	x	x	x	x	x	x
14	Acute coronary syndrome	x	x	x	x			

Matrix II of pharmacotherapy

Matrix II of pharmacotherapy											
ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods			Method of Assessment		
						Lectures	Self-learning	Open discussion	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A3 A6 A9	a2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	2.1.2- Mutual influence between professional practice and its impact on the environment .	A4	a1	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	

	2.1.3- Scientific developments in the area of specialization.	A5	a1 a2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
Intellectual Skills	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B2	b1 b2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	2.2.2 -Solve specified problems in the lack or missing of some information.	B8	b1 b2	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B4	b1	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	

	2.2.6- Plan to improve performance in the field of specialization	B6	b1	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
General & Transferable skills	2.4.1- Communicate effectively.	D.1	d3	Activity (Review article-Presentation)	Scientific papers, text books and Internet					X	X
	2.4.2- Effectively use information technology in professional practices	D.2	d1	Activity (Review article-Presentation)	Scientific papers, text books and Internet						X
	2.4.3- Self-assessment and define his personal learning needs.	D.3	d2	Activity (Review article-Presentation)	Scientific papers, text books and Internet		X				X

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: Biochemistry
- Date of specification approval: 2019

1- Basic information:

Title: **Interpretation of clinical laboratory data**

Code: CPsp2

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	Describe the appropriate use and risks of hypertonic and hypotonic saline, treatment regimen and monitoring parameters required to ensure safe and effective use of these intravenous fluids
a2	Determine the electrolytes disorders and how to manage them
a3	Determine a patient-specific PN formula and monitoring plan based on the type of intravenous access, nutritional needs, co morbidities, and clinical condition.
a4	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 and monitoring plan based on individual patient signs and symptoms regarding electrolyte abnormalities.
General and Transferable Skills	
d1	Communicate effectively in oral and written ways
d2	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	Enteral nutrition
13	Parenteral nutrition
14	Activity (review article)
15	final exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- collaborative teaching

6- Student Assessment methods:

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

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

Activity assess: d1, d2

Assessment schedule:

Assessment (1): Activity	Week 6,14
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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.

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- **Course Coordinators:** Prof . Hoda ElSayed
 - **Head of Department:** Sahar ElSwefie

• تم اعتماد التوصيف بمجلس الكلية بتاريخ

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	b1	b2	d1	d2
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	Enteral nutrition				√				
13	Parenteral nutrition				√				
14	Activity (review article)							√	√

Matrix II of Interpretation of clinical laboratory data

ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods			Method of Assessment		
						Lectures	Self-learning	Open discussion	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A9	a1 a2 a3	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	-2.1.2Mutual influence between professional practice and its impact on the environment.	A4	a4	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
Intellectual Skills	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B2	b1 b2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	

	2.2.2 -Solve specified problems in the lack or missing of some information.	B8	b1 b2	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization .	B4	b1	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	2.2.6- Plan to improve performance in the field of specialization	B6	b1	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
General & Transferable skills	2.4.1- Communicate effectively.	D.1	d1	Activity (Review article- Presentation)	Scientific papers, text books and Internet					X	X

	2.4.2- Effectively use information technology in professional practices	D.2	d1	Activity (Review article-Presentation)	Scientific papers, text books and Internet						X
	2.4.3- Self-assessment and define his personal learning needs.	D.3	d2	Activity (Review article-Presentation)	Scientific papers, text books and Internet		X				X

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: 2019

1- Basic information:

Title: **Advanced and clinical pharmacokinetic**
Code: CPsp3
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 commonly used drugs with narrow therapeutic index, individualize drug dosage based on both population & patient's specific parameters.

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 including renal and hepatic dysfunction, obesity, heart failure, etc....
a3	Outline therapeutic ranges and pharmacokinetic parameters for drugs with narrow therapeutic index which need therapeutic drug monitoring such as tacrolimus, cyclosporine, vancomycin, phenobarbital, digoxin, lithium , phenytoin, methotrexate,...
Intellectual skills	
b1	Investigate the effect of age and disease state on pharmacokinetics of drugs such as tacrolimus, cyclosporine, vancomycin, phenobarbital, digoxin, lithium , phenytoin, methotrexate, etc....
b2	Suggest the proper therapeutic monitoring plan for drugs with narrow therapeutic index .e.g tacrolimus, cyclosporine, vancomycin, phenobarbital, digoxin, lithium , phenytoin, methotrexate, etc....
Professional and practical skills	
c1	Calculate loading and maintenance dose of different drugs using the pharmacokinetic parameters method
General and Transferable Skills	
d1	Develop communication skills with others
d2	Demonstrate independent learning skills.
d3	Develop time management, decision making and problem solving skills

4. Course Content of Advanced and clinical pharmacokinetic

Week number	Lecture contents (4hrs/week)
1	Drug dosing in special populations: - Renal and hepatic disease - Dialysis
2	Drug dosing in special populations: ➤ heart failure ➤ obesity ➤ drug interactions
3	Drug monograph of phenytoin Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters
4	TDM of phenytoin
5	Drug monograph of Lithium Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters
6	TDM of lithium
7	Drug monograph of Methotrexate Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters
8	TDM of methotrexate
9	Drug monograph of Tacrolimus Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters
10	TDM of Tacrolimus
11	Drug monograph of some selected antibiotics Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters
12	Therapeutic drug monitoring
13	Drug monograph of Digoxin Therapeutic plasma concentration

	Toxic concentration Pharmacokinetic parameters
14	TDM of digoxin (Student presentation)
15	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Team based learning
- Case discussion
- Problem solving

6- Student Assessment methods:

Written exam assess: a1, a2, a3, b1, b2, c1

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

Activity assess: a3, d1, d2, d3

Assessment schedule:

Assessment (1): Activity	Week 14
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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.

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- **Course Coordinators: Prof Hanaa Abd El-Fattah El-Ghamry & Dr. Mohamed Wali**
 - **Head of Department: Assis. Prof/ Gehan Balata**

Matrix I of Advanced and clinical pharmacokinetic										
Week number	Course Contents	Knowledge and understanding			Intellectual skills		Professional and practical skills	General and Transferable skills		
		a1	a2	a3	b1	b2	c1	d1	d2	d3
1	Drug dosing in special populations: ☐ Renal and hepatic disease ☐ Dialysis	√	√							
2	Drug dosing in special populations: ☐ heart failure ☐ obesity ☐ drug interactions	√	√							
3	Drug monograph of phenytoin Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					
4	TDM of phenytoin	√	√	√	√	√	√			
5	Drug monograph of Lithium Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					
6	TDM of lithium	√	√	√	√	√	√			
7	Drug monograph of Methotrexate Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					

8	TDM of methotrexate	√	√	√	√	√	√			
9	Drug monograph of Tacrolimus Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					
10	TDM of Tacrolimus	√	√	√	√	√	√			
11	Drug monograph of some selected antibiotics Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					
12	Therapeutic drug monitoring	√	√	√	√	√	√			
13	Drug monograph of Digoxin Therapeutic plasma concentration Toxic concentration Pharmacokinetic parameters	√	√	√	√					
14	TDM of digoxin	√	√	√	√	√	√			
15	Student presentation	√						√	√	√

Matrix II of Advanced and clinical pharmacokinetic

ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods			Method of Assessment		
						Lectures	Self-learning	Open discussion	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A7	a1 a2 a3	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	-2.1.2Mutual influence between professional practice and its impact on the environment.	A4	a3	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
Intellectual Skills	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve	B2	b1 b2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	

	problems										
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization .	B4	b1 b2	All the topics	Scientific papers, text books and Internet	X	X	X	X	X	
	2.2.6- Plan to improve performance in the field of specialization	B6	b1	All the topics	Scientific papers, text books and Internet	x	x	x	x	x	
Professional and practical skills	-2.3.1 Master basic and modern professional skills in the area of specialization.	C7	c1	TDM of drugs	Scientific papers, text books and Internet	x	x	x	x	x	
General & Transferable skills	2.4.1- Communicate effectively.	D.1	d1	Activity (Presentation)	Scientific papers, text books and Internet					X	X

	2.4.3- Self-assessment and define his personal learning needs.	D.3	d2	Activity (Presentation)	Scientific papers, text books and Internet		X				X
	-2.4.7Manage time effectively.	D6	d3	Activity (Presentation)	Scientific papers, text books and Internet	x	x		x		x

General Courses

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: 2019

1- Basic information:

Title: **Physiology**

Lectures: 2 hrs/week

Total: 2hrs/week

Code: **M112**

Credit hours: 2 hrs/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 in healthy and disease states.

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	Use literature and scientific evidences to take decisions concerning physiological problems
General and Transferable skills	
d1	Communicate effectively in oral and written forms.
d2	Retrieve information from different resources

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	final exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion

6- Student Assessment methods:

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

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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.

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- **Course Coordinator: Prof. / Hany El-Bassossy**

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

Matrix I of Physiology course						
Week number	Course Contents	Knowledge and understanding		Intellectual skills	General & Transferable skills	
		a1	a2	b1	d1	d2
1	Nerve & Muscle	X	X	X		
2	Autonomic Nervous System 1	X	X	X		
3	Autonomic Nervous System 2	X	X	X		
4	Cardiovascular System 1	X	X	X		
5	Cardiovascular System 2	X	X	X		
6	Central Nervous System 1	X	X	X		
7	Central Nervous System 2	X	X	X		
8	Kidney	X	X	X		
9	Respiratory System- Activity	X	X	X	x	X
10	GIT	X	X	X		
11	Endocrine System 1	X	X	X		
12	Endocrine System 2	X	X	X		
13	Blood physiology	X	X	X		
14	Membrane physiology	X	X	X		

Matrix II of Physiology										
ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods		Method of Assessment		
						Lectures	Self-learning	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A2	a1	All the topics	Scientific papers, text books and Internet	X	X	X	X	
	2.1.2- Mutual influence between professional practice and its impact o the environment.	A.4	a2	All the topics	Scientific papers, text books and Internet	X	X	X	X	
Intellectual Skills	2.2.7- Professional decision-making in the contexts of diverse disciplines.	B7	b2	All the topics	Scientific papers, text books and Internet	X	X	X	X	

General & Transferable skills	2.4.1- Communicate effectively.	D1	d1	Activity	Scientific papers, text books and Internet	X	X		X	X
	2.4.4- Use variable sources to get information and knowledge.	D4	d2	Activity	Scientific papers, text books and Internet	X	X			X

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: 2019

1- Basic information:

Title: **Biostatistics**

Lectures: 2 hrs/week

Total: 2hrs/week

Code: **M111**

Credit hours: 2 hrs/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	Communicate effectively with others
d2	Develop IT skills

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	final exam

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, d2

Assessment schedule:

Assessment (1): Activity	Week 9
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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

Matrix I of Biostatistics course

Week number	Course Contents	Knowledge & understanding		Intellectual skills		General & Transfer able skills	
		a1	a2	b1	b2	d1	d2
1	General principle of biostatistics 1	x	x				
2	General principle of biostatistics 2		x				
3	Presentation of data	x		X			
4	Descriptive statistics	x		X			x
5	Measures of central tendency	x					x
6	Measures of variability	x					x
7	Normal frequency distribution curve	x		X			x
8	Probability	x		X			x
9	Comparing of two means- Activity	x	x	X		X	x
10	Comparing of more than two means	x	x	X			x
11	Chi square test	x	x	X			x
12	Regression and correlation analysis	x	x	X			x
13	Complex analysis		x	X			x
14	Criteria of good experimental design				X		

Matrix II of Biostatistics										
ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods		Method of Assessment		
						Lectures	Self learning	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1	a1	General principle of biostatistics 1- Presentation of data - Descriptive statistics - Measures of central tendency - Measures of variability - Normal frequency distribution curve - Probability - Comparing of two means - Comparing of more than two means - Chi square test - Regression and correlation analysis	Scientific papers, text books and Internet	X	X	x	x	
	2.1.5- Principles and the basics of quality in professional practice in the area of specialization.	A11	a2	General principle of biostatistics 1 - General principle of biostatistics 2	Scientific papers, text books and Internet	X	x	x	x	

Intellectual Skills	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B7	b1 b2	Presentation of data - Descriptive statistics - Normal frequency distribution curve - Probability - Comparing of two means - Comparing of more than two means - Chi square test - Regression and correlation analysis - Complex analysis Criteria of good experimental design	Scientific papers, text books and Internet	X	x	x	x	
	2.4.1- Communicate effectively.	D1	d1	Activities- Revision	Scientific papers, text books and Internet	X	x		x	x

General & Transferable skills	2.4.2- Effectively use information technology in professional practices	D2	d2	Activities- Revision	Scientific papers, text books and Internet	X	x		x	x
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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: 2019

B- Basic information:

Title: Drug interaction

Code: -

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 and drug-herb interaction
5	- Drug interaction of antibiotics
6	- Drug interaction of CVS acting agents
7	case presentation (activity)
8	- Drug interaction of respiratory system –acting agents
9	- Drug interaction of CNS acting agents
10	- Drug interaction of CVS acting agents
11	- Drug interaction of GI tract acting agents
12	- Drug interaction of agents used for kidney disorders
13	- Drug interaction of endocrine system- acting agents
14	- Drug interaction of agents used for obesity and anemia
15	Final exam

E- Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion
- Case 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, d2

Assessment schedule:

Assessment (1): Activity	Week 7
Assessment (2): Written exam	Week 15
Assessment (4): Oral exam	Week 15

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, 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 : Churchill 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: Ass.Prof. / Shaimaa El-Shazly

Head of department: Prof. Mona Fouad

تم مناقشة و اعتماد توصيف المقرر بمجلس القسم

Matrix I of Drug interaction course								
Course contents		ILOs for drug interaction course						
		knowledge & understanding			intellectual skills		Transferable and general skills	
Lectures		a1	a2	a3	b1	b2	d1	d2
1	Overview of drug interactions		x					
2	Mechanisms of drug interactions	x						
3	Management of drug interactions			x				
4	Drug-food interactions	x	x	x			X	
5	Drug-smoking interactions	x	x	x			X	
6	Drug-environment interactions	x	x	x			X	
7	Drug interactions of anti-infective agents	x	x	x			X	
8	Drug interactions of cardiovascular acting agents	x	x	x			X	
9	Drug interactions of CVS acting agents	x	x	x			X	
10	Drug interactions of CNS acting agents	x	x	x			X	
11	Drug interactions of endocrine acting agents	x	x	x				
12	Case studies				x	x	X	x
13	Case studies				x	x	X	x

Matrix II of Drug interaction course

Academic Reference Standards (ARS)		Program ILOs	Course ILOs	Course contents	Source	Teaching & learning methods		Method of assessment		
						Lecture	Self learning	Written exam	Oral exam	Activity
2.1.1	Theories and fundamentals related to the field of learning as well as in related areas.	A1 A3	a1 a2 a3	All topics	Scientific papers, text books and Internet	X	x	x	x	
2.1.2	Mutual influence between professional practice and its impact on the environment.	A4	a3	Management of drug interactions	Scientific papers, text books and Internet	X	x	x	x	
2.2.5	Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B4	b1	Case study	Scientific papers, text books and Internet	X		x	x	

2.2.7	Professional decision-making in the contexts of diverse disciplines.	B3	b2	Case study	Scientific papers, text books and Internet	X		x	x	
2.4.6	Work in a team and lead teams carrying out various professional tasks.	D5	d1	Case study	Scientific papers, text books and Internet	X			x	x
2.4.7	Manage time effectively	D6	d2	Case study	Scientific papers, text books and Internet	X			x	x

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: 2019

1- Basic information:

Title: **Drug Induced Diseases**

Lectures: 4 hrs/week

Total: 4hrs/week

Code: - **ME7**

Credit hours: 4 hrs/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	Explain 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	Communicate effectively with others
d2	Retrieve information from different resources

4. Course Content of Drug Induced Disease:

1	Introduction to drug induced-diseases
2	Drug-induced hepatotoxicity (Toxic response of the liver and mechanism of toxicity)
3	Drug-induced hepatotoxicity (Diagnosis and management)
4	Drug-induced nephrotoxicity (Toxic response of the kidney and mechanism of toxicity)
5	Drug-induced nephrotoxicity (Diagnosis and management)
6	Drug-induced CVS diseases (Toxic response of the heart and vascular system)
7	Drug-induced CVS diseases (Mechanism of toxicity)
8	Drug-induced CVS diseases (Diagnosis and treatment)
9	Activity
10	Drug-induced CNS diseases (Structure and functions of brain blood barrier, toxic response of brain and spinal cord)
11	Drug-induced CNS diseases (Mechanism of toxicity)
12	Drug-induced CNS diseases (Diagnosis and treatment)

13	Presentations
14	Open discussion & revision
15	Final exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- 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 15
Assessment (3): oral exam	Week 15

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

Matrix I of Drug Induced Disease course

Week number	Course Contents	Knowledge and understanding		Intellectual skills		General & Transferable skills	
		a1	a2	b1	b2	d1	d2
1	Introduction to drug induced-diseases	X					
2	Drug-induced hepatotoxicity (Toxic response of the liver and mechanism of toxicity)	X					
3	Drug-induced hepatotoxicity (Diagnosis and management)	X			X		
4	Drug-induced nephrotoxicity (Toxic response of the kidney and mechanism of toxicity)	X			X		
5	Drug-induced nephrotoxicity (Diagnosis and management)	X					
6	Drug-induced CVS diseases (Toxic response of the heart and vascular system)		X	X			
7	Drug-induced CVS diseases (Mechanism of toxicity)		X	X			
8	Drug-induced CVS diseases (Diagnosis and treatment)		X	X			
9	Activity		X	X		x	X
10	Drug-induced CNS diseases (Structure and functions of brain blood barrier, toxic response of brain and spinal cord)		X	X			
11	Drug-induced CNS diseases (Mechanism of toxicity)		X	X			
12	Drug-induced CNS diseases (Diagnosis and treatment)		X	X			
13	Presentations	X	X	X	X		
14	Open discussion & revision	X	X	X	X	x	X

Matrix II of Drug Induced Disease										
ARS		Program ILOs	Course ILOs	Course content	Source	Teaching and learning methods		Method of Assessment		
						Lectures	Self-learning	Written exam	Oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A3	a1 a2	Introduction to drug-induced disease Drug-induced hepatotoxicity 1 Drug-induced nephrotoxicity 1 Drug-induced 1 CVS toxicity Drug-induced 1 CNS toxicity	Scientific papers, text books and Internet	X	X	X	X	
	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B8	b1	Drug-induced hepatotoxicity 2 Drug-induced nephrotoxicity 2 Drug-induced 3 CVS toxicity Drug-induced 3 CNS toxicity	Scientific papers, text books and Internet	X	X	X	X	

	2.2.5- Evaluate and manage risks and potential hazards in professional practices in the area of specialization	B4	b2	Drug-induced hepatotoxicity 1 Drug-induced nephrotoxicity 1 Drug-induced 2 CVS toxicity Drug-induced 2 CNS toxicity	Scientific papers, text books and Internet	X	X	X	X	
General & Transferable skills	2.4.1- Communicate effectively.	D1.	d1	Activity	Scientific papers, text books and Internet	X	X		X	X
	2.4.4- Use variable sources to get information and knowledge.	D4.	d2	Activity	Scientific papers, text books and Internet	X	X		X	X

Instrumental Analysis & ChromatographyII

Course specification of Instrumental Analysis & ChromatographyII

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: 2019
- **Basic information:**

Title: Instrumental Analysis	Code: M102
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 outcomes (ILOs):

A- Knowledge and Understanding	
a1	Outline the basis, theory and operation of different instrumental techniques of analysis.
a2	Describe different pharmaceutical and biological applications of instrumental techniques.
B- Intellectual skills	
b₁	Select the most appropriate instrumental technique in pharmaceutical and biological assay.
b₂	Integrate knowledge gained from different instrumental techniques in designing analytical system for analytes of complex nature
D- General and Transferable skills	
d₁	Acquire Computer skills like preparing presentations and collecting information through different data-bases.
d₂	Work effectively as a member of team
d₃	Demonstrate leadership capability

4. Course Contents:

Week No.	Content
1	Instrumental Analysis: *Introduction *Principles
2	[Ultraviolet (UV) and Visible spectrophotometry *Theory *Instrumentations
3	[Infrared (IR) spectroscopy]. *Theory *Instrumentations
4	Applications of UV and IR
5	Nuclear magnetic resonance (NMR). *Theory **Instrumentations
6	Mass-spectrometry (MS) *Theory *Pharmaceutical and biological applications.
7	Applications of NMR and MS
8	Electrochemistry Conductometry, Potentiometry. *Theory *Pharmaceutical and biological applications.
9	Chromatography: *Introduction *Classification
10	Quantitative and Qualitative Chromatographic techniques *Basis *Pharmaceutical and biological applications
11	HPLC *Basis *Types Isocratic flow and gradient elution Particle size, Pore size, Pump pressure, detectors and applications
12	Gas Chromatography *Basis *Pharmaceutical and biological applications *Detectors

13	Student activities
14	Student activities
15	final exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Student scientific presentation.
- Course assignments
- Internet based search
- Problem solving

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 8
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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

A-Scientific papers

B- Essential books:

- Modern Analytical Chemistry, David Harvey, McGraw-Hill Companies, first edition, 2002.
- Principles of Instrumental Analysis, [Douglas A. Skoog](#), [F. James Holler](#), [Crouch](#) Thomson Brooks/Cole, 2007
- Handbook of instrumental techniques of analytical chemistry, Frank A. Settle, Prentice Hall PTR, 1997.

C- Suggested books:

- British Pharmacopoeia, HM Stationery Office, London, UK, PA, 2007,
- Martindale: The Complete Drug Reference, Pharmaceutical Press; 35 edition (2007) .

Websites and journals:

- www.rsc.org
- www.sciencedirect.com
- www.pubmed.com
- www.medline.com
- Guidance for Industry: Q2B of Analytical Procedures; Methodology: International Conference of Harmonization (ICH). Nov. 1996 ([http:// www.fda.gov/oc/ohrt/guidance /1320fnl.pdf](http://www.fda.gov/oc/ohrt/guidance/1320fnl.pdf)).
- Journal of Chromatography A and B, Separation sciences, Analytical and Bioanalytical Chemistry, Bioanalysis, Analytical letters.

Facilities required for teaching and learning:

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

Course Coordinators: Prof Dr/ Hisham Ezzat

Head of Department: Prof Dr/ Magda ElHenawi

Matrix I of Instrumental Analysis & ChromatographyII								
Course Contents		ILOs						
		Knowledge and understanding		Intellectual skills		General and Transferable skills		
		a1	a2	b1	b2	d1	d2	d3
1	Instrumental Analysis: *Introduction *Principles	X						
2	[Ultraviolet (UV)and Visible spectrophotometry *Theory *Instrumentations	X	x	x				
3	[Infrared (IR) spectroscopy]. *Theory *Instrumentations	X	x	x				
4	Applications of UV and IR	X	x	x				
5	Nuclear magnetic resonance (NMR). *Theory **Instrumentations	X	x	x				
6	Mass-spectrometry (MS) *Theory *Pharmaceutical and biological applications.	X	x	x				
7	Applications of NMR and MS	X	x	x				
8	Electrochemistry Conductometry, Potentiometry. *Theory *Pharmaceutical and biological applications.	X	x	x				
9	Chromatography: *Introduction *Classification	X						
10	Quantitative and Qualitative Chromatographic techniques *Basis	X	x	x				

	*Pharmaceutical and biological applications							
1 1	HPLC *Basis *Types Isocratic flow and gradient elution Particle size, Pore size, Pump pressure, detectors and applications	x						
1 2	Gas Chromatography *Basis *Pharmaceutical and biological applications * Detectors	x						
1 3	Student activities			x	x	x	x	x
1 4	Student activities			x	x	x	x	x

Matrix II of Instrumental Analysis & Chromatography II

Matrix II of Instrumental Analysis & Chromatography II										
ARS		Program ILOs	Course ILOs	Course contents	Source	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	Oral Exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A8	a1-a2	Instrumental Analysis-- UV-visible spectrophotometry, Fluorometry--IR--- NMR-- Conductometry, Potentiometry--MS-- ---chromatography-- -HPLC, GC, applications	Textbooks, Scientific papers and self learning	x	x	X	x	

Professional and practical skills	2.3.3- Assess methods and tools existing in the area of specialization.	C3	b1-b2	Instrumental Analysis-- UV-visible spectrophotometry, Fluorometry--IR--- NMR-- Conductometry, Potentiometry--MS-- ---chromatography-- -HPLC, GC, applications	Textbook s, Scientific papers and self learning	x	x	X	x	
General and Transferable Skills	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity	Textbook ,Scientifi c papers and self learning		x			x
	2.4.6- Work in a team and lead teams carrying out various	D5	d2	Activity	Textbook Scientific papers and self		x			x

	professional tasks.		d3		learning					
		D7								

Biotechnology

Course Specification of Biotechnology

A- Course specifications:

- **Program on which the course is given:** Master of Pharmaceutical Sciences
- **Major or minor element of programs:** Major
- **Department offering the program:** Pharmacy Practice
- **Department offering the course:** Microbiology and Immunology department in conjunction with Biochemistry department
- **Date of specification approval:** 2019

1-Basic Information:

Title: Biotechnology

Code: ME4 -

Credit hours: 4hrs/week

Lectures: 4hrs/week

Total: 4hrs/week

2- Overall aims of the course:

On completion of the course, the student will be able to describe the components of biotechnology, the exploitation of gene cloning and recombinant DNA technology in production of useful microbial industrial strains and in monoclonal antibody technology, apply conventional genetic approaches and molecular genetics approaches in biotechnology, explain the bases of molecular genetics, and basic gene cloning strategies and tools and explore the basis of stem cell biotechnology and the regenerative medicine.

3-Intended learning outcomes (ILOS) of Biotechnology:

A- Knowledge and Understanding	
1a	Outline the principles of biotechnology techniques
2a	Explain how to manage and exploit knowledge of DNA cloning, recombinant DNA, and applied technology
3a	Summarize recent medical biotechnology applications.
a4	Identify the principles of stem cell biotechnology and regenerative medicine
B- Intellectual skills	
b1	Express the principles biotechnology in medicine, agriculture and pollution control.
b2	Relate the principles of recombinant DNA technology in gene cloning and assessment of the microbial transformation
b3	Discuss the principles of PCR technology in the assessment of microbial mutation, gene detection, gene sequencing & forensic medicine
D- General and transferable skills	
d1	Develop computer skills as internet and power point in the activities.
d2	Gain information from various sources as text books, scientific journals, internet,...etc.
d3	Work effectively as a team member

4-Course content of Biotechnology:

Week No.	Lecture content (2 hrs/week) (Microbiology Department)	Lecture content (2 hrs/week) (Biochemistry Department)
1	Introduction to biotechnology	Pharmacokinetics and pharmacodynamics of peptides and protein drugs a- Elimination of protein therapeutics b- Distribution of protein therapeutics
2	DNA Recombination: • Naturally occurring genetic recombination • Artificially occurring genetic recombination (in laboratory)	Pharmacokinetics and pharmacodynamics of peptides and protein Drugs c- Protein binding of protein d- Chemical modification of protein therapeutics
3	Requirements for genetic engineering	Hematopoietic Growth Factor a- Chemical description b- Pharmaceutical concerns c- Clinical and practice aspects d- Toxicities
4	Gene Cloning: • General strategy for gene cloning • Obtaining the target genes	INTERLEUKINS a- Interleukins 1-17 b- Introduction and chemical Description – Pharmacology
5	Gene Cloning: • Finding suitable cloning vectors • Joining target gene(s) to vector • Insertion of hybrid (recombinant) DNA into expression host (transformation) and	INTERLEUKINS c- Interferon's alpha , Beta , Gamma d- Pharmaceutical concerns e- Clinical and Practice aspects

	selection of transformant	
6	Applications of genetic engineering Activity	INSULIN a- Introduction b- Pharmacology and Formulations c- Pharmaceutical concerns, chemical and physical stabilities d- Clinical and practice aspects Activity
7	Polymerase chain reaction (PCR) Types of PCR • Traditional PCR • rt PCR • Real time PCR	Growth hormones a- hGH structure , Isolation b- Pharmacology
8	Applications of PCR: 1- gene amplification for: • gene cloning • gene sequencing • gene control drug production 2- diagnosis of microbial infections 3- in forensic medicine	Growth hormones c- Protein manufacture , formulations d- Clinical use
9	Monoclonal antibody (MAb) technology (synthesis of Ab in laboratory): • hybridoma technology • production & selection of Ab • types of genetically engineered MAb (mouse, chimeric, humanized, human) • nomenclature of MAb	Dispensing Biotechnology products a- Introduction – Storage b- Handling c- Preparations

	according to the target and source Global Marketing pharmaceutically useful MAb	
10	Stem cells technology: - Types of stem cells - Isolation - Culturing - Applications of stem cells in regenerative medicine	Dispensing Biotechnology products d- Administration e- Outpatient/Homecare use f- Patient assessment
11	Advances in vaccine preparation	Biotechnology for pharmaceutical products a- Hormones b- Preparation of vaccines and other biological products
12	Gene sequencing	Biotechnology for pharmaceutical products c- Old , modern Biotechnology d- Applications in Medicine- industry – Agriculture – Ecology
13	Microarray technology	PCR , LCR ,applications in forensic medicine- Mutations- RFLP.....etc
14	Presentation of students activities and open discussion	
15	Final exam	

5-Teaching and Learning Methods:

- Lectures
- Self learning
- Open discussion and presentations
- Critical thinking

6-Student Assessment methods:

- Written exams to assess: a1, a2, a3, a4, b1, b2, b3
- Oral exam to assess: a1, a2, a3, a4, b1, b2, b3
- Activity to assess: d1, d2, d3

Assessment schedule:

Assessment (1): Activity	Week 6,14
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

Weighting of Assessment:

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

7-References &books:

A- Scientific papers

B- Essential books:

1. Crommelin, D.A.; and Sindeler, R.D. (1997). Pharmaceutical Biotechnology. Hartwood Academic Publishers. The Netherlands.
2. Glick, B.P.; and Pasterternak, J.J. (1994). Molecular Biotechnology-Principles Applications of recombinant DNA. AS Press, Washington, D.C., USA.
3. Thieman, W.J.; Palladino, M.A. (2008). *Introduction to Biotechnology*. Pearson/Benjamin Cummings. ISBN 0-321-49145-9.
4. Higuchi, R., Dollinger, G., Walsh, P.S. & Griffith, R. (1992) Simultaneous amplification and detection of specific DNA sequences. *Biotechnology*, 10, 413–417. [The first description of real-time PCR].

5. VanGuilder, H.D., Vrana, K.E. & Freeman, W.M. (2008) Twenty-five years of quantitative PCR for gene expression analysis. *Biotechniques*, 44, 619–624.

C- Suggested books:

1. Biotechnology in health care: an introduction to biopharmaceuticals
2. Ermak G., (2013), Modern Science & Future Medicine (second edition)

D- Websites: pubmed, Science direct, Nejm, Wileyinterscience

Facilities required for teaching and learning:

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

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- **Course Coordinators: Prof. Dr/ Ashraf Ahmed Kadry**

Prof. Dr/ Mohammed El-Sewedy

- **Head of Department: Prof. Dr/ Nehal El-sayed**

Matrix II of Biotechnology										
ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A2	a1- a2- a3-a4	Introduction to biotechnology- Bioprocess- Downstream processing- Cell culture- Hybridoma technology- Medical biotechnology- Medicine from cultured cells- DNA Recombination & Application of genetic engineering - Principle of PCR technology and gene amplification.- Applications and advances in PCR- Hybridoma technology& Monoclonal antibody(MAb)- technology & Production Nomenclature of Mabs- Global Marketing	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.1.3- Scientific developments in the area of specialization.	A5		Pharmaceutically useful monoclonal antibodies - Applications and advances in PCR -Vaccine preparations- Stem cells technology & Regenerative medicine.	Textbooks, Scientific papers and self learning	x	x	x	x	

	2.2.1- Analyze and evaluate information in the field of specialization and analogies to solve problems	B7	b1-b2-b3	Medical biotechnology- Medicine from cultured cells- DNA Recombination & Application of genetic engineering - Applications and advances in PCR- Hybridoma technology& Monoclonal antibody(MAb)- technology & Production Nomenclature of Mabs- Global Marketing Pharmaceutically useful monoclonal antibodies - Applications and advances in PCR -Vaccine preparations- Stem cells technology & Regenerative medicine.	Textbooks, Scientific papers and self learning	x	X	x	x	
	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation of reports and open discussion	Textbooks, Scientific papers and self learning	x	X			x
	2.4.4- Use variable sources to get information and knowledge.	D4	d2	Activity - presentation of reports and open discussion						
	2.4.6- Work in a team and lead teams carrying out various professional tasks.	D5	d3	Activity - presentation of reports and open discussion		x	X		x	x

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:** 2019

1- Basic information:

Title: **Biopharmaceutics and pharmacokinetics** Code: **M104**
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 principles and different applications of biopharmaceutics and pharmacokinetics.

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

Knowledge and Understanding	
a1	Outline different pharmacokinetic parameters and bioavailability
a2	Enumerate different factors affecting the rate of absorption, distribution, biotransformation and elimination of drugs.
a3	State the applications of pharmacokinetics in different clinical situations
Intellectual skills	
b1	Select the appropriate methods for estimation of bioavailability and drug clearance in the body
b2	Apply 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 Biopharmaceutics and pharmacokinetics:

Week number	Lecture content (2 hrs/week)
1	Factors affecting bioavailability (biological and physiological)
2	Physicochemical factors, advantages and disadvantages of oral administration.
3	Distribution and factors affecting it.
4	Elimination , biotransformation, and urinary excretion .
5	Minor routes of drug elimination
6	Use of physical and animal models to evaluate bioavailability.
7	Review on bioequivalence study through revision of certain scientific research papers.(activity)
8	Pharmacokinetic models, volume of distribution, and total body clearance.
9	Problems in determination of bioavailability of urine and saliva sample.
10	Loading dose, steady state, lag time, and flip-flop.
11	Method of residuals, therapeutic drug monitoring, and dosage regimen design.
12	Pharmacokinetic parameters.
13	Kidney and liver function tests.
14	Haemodialysis.
15	final exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- 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
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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, Wiley 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

Matrix I of Biopharmaceutics and Pharmacokinetics								
Course Contents		ILOs of Bipopharmaceutics and Pharmacokinetics course						
		Knowledge and understanding			Intellectual skills		Transferable and general skills	
		a1	a2	a3	b1	b2	d1	d2
1	Factors affecting bioavailability (biological and physiological)		x					
2	Physicochemical factors, advantages and disadvantages of oral administration.		x					
3	Distribution and factors affecting it.		x					
4	Elimination , biotransformation, and urinary excretion .		x					
5	Minor routes of drug elimination		x					
6	Use of physical and animal models to evaluate bioavailability.	x						
7	Review on bioequivalence study through revision of certain scientific research papers.			x		x	x	x
8	Pharmacokinetic models, volume of distribution, and total body clearance.	x						
9	Problems in determination of bioavailability of urine and saliva sample.	x			x			
10	Loading dose, steady state, lag time, and flip-flop.	x			x			
11	Method of residuals, therapeutic drug monitoring, and dosage regimen design.	x		x	x	x		
12	Pharmacokinetic parameters.	x			x			
13	Kidney and liver function tests.			x				
14	Haemodialysis.			x				

Matrix II of Biopharmaceutics and pharmacokinetics										
ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1	a1- a2- a3	All topics	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.2.3-Correlate and integrate different pharmaceutical knowledge to solve professional problems.	B1	b1-b2	All topics	Textbooks, Scientific papers and self learning	x	X	x	x	

General and transferable skills	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation	Textbooks, Scientific papers and self learning	x	X			x
	2.4.4- Use variable sources to get information and knowledge.	D4	d2	Activity - presentation		x	x			x

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:** 2019

1- Basic information:

Title: **Physical pharmacy**
Lectures: 2 hrs/week
Total: 2 hrs/week

Code: **M103**
Credit hours: 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	List 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	Final exam

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
Assessment (2): Written exam	Week 15
Assessment (3): oral exam	Week 15

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, Wileyinterscience

Facilities required for teaching and learning:

1. **For lectures:** Black (white) boards, data show.
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- **Course Coordinators: Prof Dr/ Mahmoud Abdul-Ghany Mahdy**
- **Head of Department: Prof Dr/ Nagia ElMegrab**

Matrix I of Physical pharmacy

Week number	Course Contents	Knowledge and understanding			Intellectual skills		General & Transferable skills	
		a1	a2	a3	b1	b2	d1	d2
1	Equilibrium phenomena (Strong and weak acid, bases, buffers, distribution).	x						
2	Modifications in complexation and protein binding.			x	x			
3	Drug release & dissolution applications in drug assessment.	x						
4	Types of flow and their importance in drug formulations	x						
5	Surface and interfacial phenomena and their role in pharmaceutical manufacture	x						
6	Metal complexes & Organic molecular complexes applications			x	x			
7	•Occlusion compounds, Complexation , method of analysis and applications (Presentation)			x	x		x	x
8	State of matter Ideal gas law	x						
9	Colligative properties of solutions with correlation in drug formulations	x						
10	Phase rule	x						
11	Recent applications of Disperse systems	x				x		

12	New models for Phase equilibria	x					
13	Recent trends of Polymer science in drug delivery		x		x		

Matrix II of Physical pharmacy										
ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1	a1- a2- a3	All topics	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.2.3-Correlate and integrate different pharmaceutical knowledge to solve professional problems.	B9	b1-b2	All topics	Textbooks, Scientific papers and self learning	x	X	x	x	

General and transferable skills	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation	Textbooks, Scientific papers and self learning	x	X			x
	2.4.4- Use variable sources to get information and knowledge.	D4	d2	Activity - presentation		x	x			x

Thesis Specification

Thesis of Master Degree

A- Thesis 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 thesis:** Pharmacy practice
- **Date of specification approval:** 2019

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 driven from the research findings.

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
1 st	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.
2 nd	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.
3 rd	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.
4 th	- 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.
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5- Teaching and Learning Methods:

- Self learning (Activities, Research....)
- Lab work
- Seminar
- reporting
- Critical thinking
- Solving problem
- 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: Assis. Prof. Gehan Balata**

تم إيماده بمجلس القسم بتاريخ 2019

Master of pharmacy practice																																					
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	A10	A11	B1	B2	B3	B4	B5	B6	B7	B8	B9	C1	C2	C3	C4	C5	C6	C7	D1	D2	D3	D4	D5	D6	D7	D8	
General courses	Biopharmaceutics and Pharmacokinetic	√											√																	√		√					
	Physiology	√	√		√													√											√			√					
	Bioststistics	√									√							√											√	√							
	Instrumental analysis & chromatography II	√							√														√						√			√			√		
	Drug interaction	√			√	√										√	√																√	√			
	Drug induced disease	√			√											√				√									√			√					
	Physical pharmacy	√																			√										√		√				
	Biotechnology	√	√			√												√												√		√	√				
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:** Single
- 3- Faculty/ University:** Faculty of Pharmacy, Zagazig University
- 4- Department:** Pharmacy Practice
- 5- Coordinator:** Assis. Prof. Gehan Balata
- 6- Date of program specification approval:** 2019
- 7- Language of study:** English
- 8- Academic Reference Standards:**
 - a. The program ILOs were compared to the general guideline for postgraduate studies, 1st Edition, February 2009 issued by (NAQAA) (National Authority for Quality Assurance and Accreditation).
 - b. The program ILOs were compared to the Ph.D program in clinical pharmacy introduced by school of pharmacy, University of Southern California.

B- Professional Information

1- Program aims:

This Program aims at extending the knowledge and skills of postgraduate master students in the field of pharmacy practice for application in various settings including research and academic Institutes as well as private and public hospitals.

The program aims are summarized as follows:

1. Produce graduates with advanced knowledge in clinical pharmacy practice.

2. Build up students capabilities to critically evaluate current research and practice.
3. Produce graduates with critical thinking, integrative capabilities and problem-solving skills.
- 4-Develop individual research abilities that include: formulating a research question, study design, data collection and analysis and preparation of a published 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.

1.1 Graduate attributes:

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

1. Demonstrate 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. Demonstrate a high level of critical thinking, problem solving and decision making skills
4. Show Self-motivation, attention to detail, time-management, communication and computer skills
5. Conduct a clinical research with preparation of a published article.

6. Demonstrate ethical, legal, social and civic responsibility as a researcher and member of the discipline

2-Intended Learning Outcomes (ILOs):

The Program provides excellent opportunities for students to demonstrate knowledge 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 theories and principles of Advanced Pharmacotherapy, Clinical Oncology and Pharmacy Practice.
- A.2 Outline drug treatment of various pathologies as well as patient monitoring in the light of published studies and procedures.
- A.3 Outline updated research trends in the fields of clinical pharmacy practice and pharmacotherapy.
- A.4 Identify the effect of new advances in clinical pharmacy on community.
- A.5 Illustrate basic principles of quality assurance in clinical researches.
- A.6 Describe recent techniques applicable to current research in clinical pharmacy.
- A.7 Outline the ethical guideline in reporting data, citing literature and publishing a scientific reports in international journals.

2-2 - Intellectual Skills:

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

- B1. Evaluate the available Data provided in the field of advanced pharmacotherapy and clinical pharmacy practice.

- B2. Select the appropriate solution for disease control and drug therapy depending on patient - specific factors.
- B3. Integrate accumulated knowledge and skills in clinical pharmacy practice and pharmacokinetics to suggest solutions for research and professional problems.
- B.4. Elaborate plans for enhancing performance in the field of clinical pharmacy based on recent available evidence based information.
- B.5. Select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease.
- B.6. Design and carry out an original research project.
- B7. Write up original research in the style of published research or a paper.

2-3 - Professional and Practical Skills:

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

- C1- Carry out a wide range of professional skills in the fields of clinical pharmacy, drug interactions, pharmacodynamics and pharmacokinetics.
- C2- Use research tools and equipment relevant to clinical research including HPLC, ELSIA , RTPCR , Immunohistochemistry and others with application of good laboratory practice
- C3- Interpret clinical data and write professional reports.
- C4- Elaborate different strategies to enhance practical work

2-4 - General and Transferable Skills:

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

- D1- Communicate effectively with colleagues, other professionals and patients.

- D.2- Use the advanced computer and statistical skills required for the preparation and submission of a complete research article
- D.3- Retrieve information from different information sources
- D.4- Implement writing and presentation skills
- D.5- Work effectively as a member or a leader of team and evaluate the performance of colleagues.
- D.6- Capable of self-evaluation and determination of needs required for professional development
- D.7- Demonstrate time management, problem solving and decision making skills.

3- Academic Standards:

- a. The program ILOs were compared to the general guideline for postgraduate studies, 1st Edition, February 2009 issued by (NAQAA) (National Authority for Quality Assurance and Accreditation).
- b. The program ILOs were compared to the Ph.D program in clinical pharmacy introduced by school of pharmacy, University of Southern California.

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

Attributes of the graduates (ARS, 2009)	Attributes of the graduates (Ph-D Degree in pharmacy practice)
1. Apply the specialized knowledge he has acquired in his professional practice	1. Demonstrate 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. Demonstrate a high level of critical thinking, problem solving and decision making skills
9. Be a lifelong learner and able to develop himself 3. Show good communication and leadership skills 4. Use technology effectively in his professional practice	4. Show Self-motivation, attention to detail, time-management, communication and computer skills
6. Use available resources efficiently	5. Conduct a clinical research with preparation of a published article.
7. Aware of his role in community service and development	6. Demonstrate ethical, legal, social and civic responsibility as a researcher and member of the discipline.
8. Reflect commitment to integrity, credibility and accountability	

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 theories and principles of Advanced Pharmacotherapy, Clinical Oncology and Pharmacy Practice. A.2 Outline drug treatment of various pathologies as well as patient monitoring in the light of published studies and procedures. A.3 Outline updated research trends in the fields of clinical pharmacy practice and pharmacotherapy.
	2.1.2- Fundamentals, methods, techniques, tools and ethics of scientific research.	A.6 Describe recent techniques applicable to current research in clinical pharmacy.
	2.1.3- The ethical and legal principles in pharmacy and academic practices.	A.7 Outline the ethical guideline in reporting data, citing literature and publishing a scientific reports in international journals.
	2.1.4- The principles and bases of quality assurance in professional practice in the field of specialization.	A.5 Illustrate basic principles of quality assurance in clinical researches.
	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.4 Identify the effect of new advances in clinical pharmacy on community.

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
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 available Data provided in the field of advanced pharmacotherapy and clinical pharmacy practice.
	2.2.2- Propose solutions to specified problems in the light of the available data (information).	B2. Select the appropriate solution for disease control and drug therapy depending on patient - specific factors.
	2.2.3- Conduct research studies that add to the current knowledge.	B3. Integrate accumulated knowledge and skills in clinical pharmacy practice and pharmacokinetics to suggest solutions for research and professional problems.
	2.2.4- Formulate scientific papers.	B.6. Design and carry out an original research project. B7. Write up original research in the style of published research or a paper.
	2.2.5- Assess hazards and risks in professional practice in his / her area of specialization.	B.5. 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.	B.4. Elaborate plans for enhancing performance in the field of clinical pharmacy based on recent available evidence based information

ARS vs. Program ILOs for PhD in Pharmacy Practice		
	ARS	Program ILOs
	2.2.7- Take professional decisions and bears responsibility in wide array of pharmaceutical fields.	B3. Integrate accumulated knowledge and skills in clinical pharmacy practice and pharmacokinetics to suggest solutions for research and professional problems.
	2.2.8- Be creative and innovative.	
	2.2.9- Manage discussions and arguments based on evidence and logic.	
Professional and Practical Skills	2.3.1- Mastery of basic and modern professional skills in the area of specialization.	C1- Carry out a wide range of professional skills in the fields of clinical pharmacy, drug interactions, pharmacodynamics and pharmacokinetics.
	2.3.2- Write and critically evaluate professional reports.	C3- Interpret clinical data and write professional reports.
	2.3.3- Evaluate and develop methods and tools existing in the area of specialization.	C2- Use research tools and equipment relevant to clinical research including HPLC, ELSIA , RTPCR , Immunohistochemistry and others with application of good laboratory practice
	2.3.4- Properly use technological means in a better professional practice.	
	2.3.5- Plan to improve professional practices and to improve the performance of other scholars.	C4- Elaborate different strategies to enhance practical work

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, other professionals and patients. D.4- Implement writing and presentation skills
	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 complete research article
	2.4.3- Help others to learn and evaluate their performance.	D.5- Work effectively as a member or a leader of team and evaluate the performance of colleagues
	2.4.5- Use various sources to get information and knowledge.	D.3- Retrieve information from different information sources
	2.4.4- Self- assessment and continuous learning.	D.6- Capable of self-evaluation and determination of needs required for professional development
	2.4.6- Work as a member and lead a team of workers.	D.5- Work effectively as a member or a leader of team and evaluate the performance of colleagues
	2.4.7- Direct scientific meetings and to manage time effectively.	D.7- Demonstrate time management, problem solving and decision making skills

Matrix3: Comparison of the program ILOs with Ph.D program in Clinical and Experimental Therapeutics introduced by school of pharmacy, University of Southern California.

Ph.D program in Clinical and Experimental Therapeutics introduced by school of pharmacy, University of Southern California	Ph.D in pharmacy practice
Achieve and demonstrate deep methodological skill and an understanding of contemporary research in their respective area of emphasis.	A.1 Recall the basic theories and principles of Advanced Pharmacotherapy, Clinical Oncology and Pharmacy Practice. A.2 Outline drug treatment of various pathologies as well as patient monitoring in the light of published studies and procedures. A.3 Outline updated research trends in the fields of clinical pharmacy practice and pharmacotherapy. A.5 Illustrate basic principles of quality assurance in clinical researches. A.6 Describe recent techniques applicable to current research in clinical pharmacy. A.7 Outline the ethical guideline in reporting data, citing literature and publishing a scientific reports in international journals.
Implement innovative research practices under guidance of their faculty advisor and in concert with their research team.	B1. Evaluate the available Data provided in the field of advanced pharmacotherapy and clinical pharmacy practice. B2. Select the appropriate

	solution for disease control and drug therapy depending on patient - specific factors. B3. Integrate accumulated knowledge and skills in clinical pharmacy practice and pharmacokinetics to suggest solutions for research and professional problems. D.3- Retrieve information from different information sources. B.4. Elaborate plans for enhancing performance in the field of clinical pharmacy based on recent available evidence based information. B.5. Select appropriate tests for detecting patients at risk for specific diseases or in the early stage of disease. B.6. Design and carry out an original research project.
Demonstrate understanding and applying contemporary research in their respective area of emphasis to industry contexts and be able to engage in innovative practices informed by such research pertinent to clinical translational research and their area of emphasis in diverse contexts.	A.4 Identify the effect of new advances in clinical pharmacy on community. (Partially covered)
Demonstrate understanding of leading research teams in their respective area of emphasis by mentoring and providing teaching assistance to Pharm.D. students, master's students and fellow Ph.D. students who are less advanced than they are in their respective doctoral programs.	D1-Communicate effectively with colleagues, other professionals and patients. D.5- Work effectively as a member or a leader of team and evaluate the performance of colleagues. (Partially covered)
Launch an independent research agenda in	C1- Carry out a wide range of

their respective area of emphasis under the guidance of their faculty advisor.	professional skills in the fields of clinical pharmacy, drug interactions, pharmacodynamics and pharmacokinetics. C2- Use research tools and equipment relevant to clinical research including HPLC, ELSIA , RTPCR , Immunohistochemistry and others with application of good laboratory practice C3- Interpret clinical data and write professional reports
Complete and orally defend an acceptable dissertation based on original investigation and supervised by their dissertation committee showing mastery of an area of emphasis within clinical translational research, capacity for independent research, and a scholarly result.	B7. Write up original research in the style of published research or a paper. D.2- Use the advanced computer and statistical skills required for the preparation and submission of a complete research article. D.4- Implement writing and presentation skills.

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, A3, B2, B5, C1, D1, D2, D7	4 hours
CPsp5	Clinical Oncology	4	A1, A2, A3, B2, B5, D1, D2, D7	4 hours
CPsp6	Pharmacy Practice	4	A1,A2, A3, B2, C1, C3, D1, D2, D7	4 hours

	Thesis	30	A1, A2, A3, A4, A5, A6, A7 , B1, B2, B3, B4, B5, B6, B7, C1,C2,C3, D1, D2, D3, D4, D5, D6 and D7	
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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 pharmacy practice 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
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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. Fakhr Ghazi	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 International Benchmark Questionnaires	100%

Program coordinator: Assis. Prof./ Gehan Balata

Head of Department: Assis. Prof./ Gehan Balata

Advanced Pharmacotherapy

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: 2019

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 describe etiology, diagnosis and pharmacotherapy of several kidney diseases.

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	Enumerate different stages in chronic kidney disease
a5	Describe different types of 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 as well as chronic kidney disease
b3	Develop a care plan to manage the common complications observed in patients with chronic kidney disease (e.g., anemia, secondary hyperthyroidism).
Professional and Practical skills	

c1	Select the laboratory and physical assessment parameters used for monitoring pharmacotherapy of different urologic diseases
c2	Apply the best suitable treatment protocol for different urologic disorders
c3	Adjust drug dosage in kidney disease based on pharmacokinetic parameters
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively in an oral and written manner
d3	Promote critical thinking, problem-solving, decision-making, and time managing capabilities

4. Course Content:

Week	Lecture content (4 hr/w)
1 st	ACUTE KIDNEY INJURY (AKI) OR ACUTE RENAL FAILURE: Common definitions Stratification of AKI Risk Factors Associated with AKI
2 nd	ACUTE KIDNEY INJURY (AKI) OR ACUTE RENAL FAILURE: Classifications of AKI Prevention of AKI Treatment and Management of Established AKI
3 rd	• 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
4 th	Tubulointerstitial Disease Chronic interstitial nephritis Papillary necrosis
5 th	CHRONIC KIDNEY DISEASE: Stages in CKD etiology and risk factors

6 th	Albuminuria or Proteinuria Assessment of Kidney Function
7 th	• Diabetic Nephropathy • Non Diabetic Nephropathy
8 th	Assessment and treatment of Hyperlipidemia
9 th	RENAL REPLACEMENT THERAPY: Hemodialysis Peritoneal Dialysis
10 th	MANAGING THE COMPLICATIONS OF CHRONIC KIDNEY DISEASE: Anemia
11 th	MANAGING THE COMPLICATIONS OF CHRONIC KIDNEY DISEASE: Mineral Bone Disorder and Renal Osteodystrophy
12 th	Dosage adjustment in kidney disease Pharmacokinetic Principles Guiding Therapy Adjustments
13 th	Tutorial
14 th	Presentation
15 th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a6, b1- b3, c1-c3

Oral exam to assess: a1- a6, b1- b3, c1-c3, d2

Presentation: a1 - a6, d1- d3

Assessment schedule:

Assessment (1): presentation	Week 14
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://](http://www.kidney.org/sites/default/files/docs/kdoqi_commentary_on_kdigo_anemia.pdf)

[www.kidney.org/sites/default/files/docs/kdoqi](http://www.kidney.org/sites/default/files/docs/kdoqi_commentary_on_kdigo_anemia.pdf)
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 Coordinator: Dr. Ahmad Amin (Clinical pharmacy department - Kafr ElSheikh University)**
 - **Head of Department: Assis. Prof. Gehan Fathy Attia**

Matrix I Advanced Pharmacotherapy																
	Course Contents	Knowledge and understanding						Intellectual skills			Professional & Practical skills			General and Transferable skills		
		a1	a2	a3	a4	a5	a6	b1	b2	b3	c1	c2	c3	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	√	√	√	√	√	√							√	√	√

Matrix II of Advanced Pharmacotherapy

ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A2 A3	a1- a6	All topics	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.2.2- Propose solutions to specified problems in the light of the available data (information).	B2		Managing the complications of chronic kidney disease: • Anemia • Mineral Bone Disorder and Renal Osteodystrophy • Assessment and treatment of Hyperlipidemia • Dosage adjustment in kidney disease • Pharmacokinetic Principles Guiding Therapy Adjustments	Textbooks, Scientific papers and self learning	x	X	x	x	

	2.2.5- Assess hazards and risks in professional practice in his / her area of specialization.	B5	b1-2	Chronic kidney disease: Stages in ckd • Etiology and risk factors • Albuminuria or Proteinuria • Assessment of Kidney Function	Textbooks, Scientific papers and self learning	x	x	x	x	
Professional and practical skills	2.3.1- Mastery of basic and modern professional skills in the area of specialization.	C1	c1 c2 c3	Chronic kidney disease: Stages in ckd • Etiology and risk factors • Albuminuria or Proteinuria • Assessment of Kidney Function Managing the complications of chronic kidney disease: • Anemia •Mineral Bone Disorder and Renal Osteodystrophy Dosage adjustment in kidney disease Pharmacokinetic Principles Guiding Therapy Adjustments						
	2.4.1- Effective communication in its different forms.	D1	d2	Activity - presentation		x	x			x

General and transferable skills	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation	Textbooks, Scientific papers and self learning	x	X			x
	2.4.7- Direct scientific meetings and to manage time effectively.	D7	d3	Activity - presentation		x	x			x

Zagazig university

Pharmacy Practice department

Faculty of Pharmacy

Programs and Courses specifications

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:** 2019

1- Basic information:

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

Code: CPsp5
Lectures: 4 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to plan a treatment plan to manage common complications of cancer chemotherapy, including nausea, vomiting, myelosuppression, infection, anemia, fatigue, cardiotoxicity, and extravasation injury as well as different oncologic emergencies, including hypercalcemia, tumor lysis syndrome, and spinal cord compression.

1- Intended learning outcome s (ILO's) of clinical oncology:

Knowledge and Understanding	
a1	Enumerate different risk factors and causes of complications of cancer chemotherapy, including nausea, vomiting of Chemotherapy-Induced Nausea and Vomiting, myelosuppression, infection, anemia, fatigue, cardiotoxicity, and extravasation injury
a2	Outline the principles of management of the aforementioned cancer complications
a3	Illustrate different guidelines for management of oncologic emergencies, including hypercalcemia, tumor lysis syndrome, and spinal cord compression.
Intellectual skills	
b1	Recommend the proper therapy for managing Chemotherapy-Induced complications
b2	Design pain management plan
b3	Design management plan of different oncologic emergencies, including hypercalcemia, tumor lysis syndrome, and spinal cord compression.
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively with others
d3	Promote critical thinking, problem-solving, decision-making, and time managing capabilities

4. Course Content of clinical oncology:

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:

12 th	Tutorial
13 th	Tutorial
14 th	Presentation
15 th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a3, b1- b3

Oral exam to assess: a1- a3, b1- b3

Presentation: a1 - a3, b1- b , d1- d3

Assessment schedule:

Assessment (1): presentation	Week 14
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.

Coiffier 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

- **Course Coordinator: Dr. Ahmad Amin (Clinical pharmacy department - Kafr ElSheikh University)**
- **Head of Department: Assis. Prof. Gehan Fathy Attia**

Matrix I of Clinical oncology										
Week	Course Contents	Knowledge and understanding			Intellectual skills			General and Transferable skills		
		a1	a2	a3	b1	b2	b3	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	√	√	√	√	√	√	√	√	√

Matrix II of clinical oncology										
ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A2 A3	a1- a3	All topics	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.2.2- Propose solutions to specified problems in the light of the available data (information).	B2 B5			Textbooks, Scientific papers and self learning	x	X	x	x	

	2.2.5- Assess hazards and risks in professional practice in his / her area of specialization.				Textbooks, Scientific papers and self learning	x	x	x	x	
	2.4.1- Effective communication in its different forms.	D1	d2	Activity - presentation	Textbooks, Scientific papers and self learning	x	x			x
General and transferable skills	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation		x	X			x
	2.4.7- Direct scientific meetings and to manage time effectively.	D7	d3	Activity - presentation		x	x			x

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: 2019

1- Basic information:

Title: pharmacy practice

Credit hours: 4 hrs/week

Total: 4 hrs/week

Code: CPsp6

Lectures: 4 hrs/week

2- Overall aim of the course:

On completion of the course, the students will be able to demonstrate a comprehensive understanding of the theoretical clinical knowledge of the management of critically ill patient including: different types of shock, sepsis, cardiac arrest, 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, Acid-Base Disorders
a3	Describe sepsis Syndromes as well as pain scale
a4	Describe causes of Respiratory Failure and complications Associated with Mechanical Ventilation as well as management strategies
Intellectual skills	
b1	Differentiate between different types of shocks as well as their treatment plans
b2	suggest a proper management of PAIN, AGITATION, DELIRIUM, NEUROMUSCULAR BLOCKADE, Post–Cardiac Arrest, hyperglycemia
b3	Recommend a proper Prophylactic therapy for stress ulcers and VENOUS THROMBOEMBOLISM
Professional and Practical skills	
c1	Interpret different hemodynamic parameters, acid-base disturbances
c2	Demonstrate clinical skills in assessment of different Organs Dysfunction, pain , sedation and delirium for ICU patients
c3	Monitor patients during administration of Neuromuscular blockers, blood glucose level as well as determination of nutrition Needs of ICU patients
General and Transferable skills	
d1	Use information technology to collect and present information.
d2	Communicate effectively with others
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
11 th	PREVENTING VENTILATOR-ASSOCIATED PNEUMONIA:
12 th	NUTRITION SUPPORT IN CRITICALLY ILL PATIENTS: Estimating Nutrition Needs Enteral Nutrition Parenteral Nutrition
13 th	Tutorial
14 th	Presentation
15 th	Final written exam

5- Teaching and Learning Methods:

- Lectures
- Self learning
- Case discussion

6- Student Assessment methods:

Written exams to assess: a1 - a4, b1- b3

Oral exam to assess: a1- a4, b1- b3, d2

Presentation: c1- c3, d1- d3

Assessment schedule:

Assessment (1): presentation	Week 14
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.>

[ihiventilatorbundle.org/resources/Pages/Changes/ImplementtheVentilatorBundle.aspx](http://www.ihiventilatorbundle.org/resources/Pages/Changes/ImplementtheVentilatorBundle.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 Coordinator:** Dr. Ahmad Amin (Clinical pharmacy department - Kafr ElSheikh University)
 - **Head of Department:** Assis. Prof. Gehan Fathy Attia

		Matrix I of Pharmacy practice												
Week	Course Contents	Knowledge and understanding				Intellectual skills			Professional & Practical Skills			General & Transferable skills		
		a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	d1	d2	d3
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): • Nonpharmacologic 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											√	√	√

Matrix II of pharmacy practice

ARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods		Method of assessment		
						Lecture	Self learning	Written exam	oral exam	Activity
Knowledge and Understanding	2.1.1- Theories and fundamentals related to the field of learning as well as in related areas.	A1 A2 A3	a1- a4	All topics	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.2.2- Propose solutions to specified problems in the light of the available data (information).	B2			Textbooks, Scientific papers and self learning	x	X	x	x	

Professional and practical skills						x	x	x	x	
	2.3.1- Mastery of basic and modern professional skills in the area of specialization.	C1	c2 c3	Pain, agitation, delirium, and neuromuscular blockade Nutrition support in critically ill patients: Estimating Nutrition Needs • Enteral Nutrition Parenteral Nutrition Glucose control • Treatment Strategies to Achieve Glycemic Control in Critically ill Patients • Monitoring Blood Glucose	Textbooks, Scientific papers and self learning	x	x	x	x	
	2.3.2- Write and critically evaluate professional reports.	C3	c1	Interpretation of hemodynamic parameters: Interpretation of acid-base disturbances:						

General and transferable skills	2.4.1- Effective communication in its different forms.	D1	d2	Activity - presentation	Textbooks, Scientific papers and self learning	x	x			x
	2.4.2- Effectively use information technology in professional practices	D2	d1	Activity - presentation		x	X			x
	2.4.7- Direct scientific meetings and to manage time effectively.	D7	d3	Activity - presentation		x	x			x

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:** 2019

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
1 st	-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.

2 nd	-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
3 rd	-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.
4 th	-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.
5 th	- 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																									
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	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	D1	D2	D3	D4	D5	D6	D7
Special course s	Advanced Therapy	√	√	√						√			√			√			√	√					√
	Clinical Oncology	√	√	√						√			√						√	√					√
	Pharmacy Practice	√	√	√					√	√						√		√	√	√					√
Thesis		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

