كلية الصيدلة

جامعة المنصورة

توصيف مقررات برنامج
بكالوريوس الصيدلة
لائحة فارم دى
2024/2023

Created By: Quality Assurance Unit

فهرس المحتويات

بكالوريوس الصيدلة (فارم دى- Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Biotechnology **(PM 414)**	**اسم المقرر : التقنية الحيوية** **(PM 414)**
Academic Level: level 4	**المستوى الأكاديمي : الرابع**
Scientific department: **Microbiology and Immunology**	**القسم العلمي :** **الميكروبيولوجي و المناعة**
Head of Department: **Prof. Dr. El-Sayd E. Habib**	**رئيس القسم:** **أ .د /.السيد الشربينى حبيب**
Course Coordinator: **Prof. Dr. Ramdan Hassan Ibrahim**	**منسق المقرر :** **ا.د/ رمضان حسن إبراهيم**

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Microbiology and Immunology**
Department supervising the course	**Microbiology and Immunology**
Program on which the course is given	**Bachelor in Pharmacy- Pharm D**
Academic Level	**Level 4, first semester, 2023-2024**
Date of course specification approval	**10/9/2023**

Basic Information: Course data:

Course Title	**Biotechnology**
Course Code	**PM 414**
Prerequisite	**Registration**
Teaching credit Hours: Lecture	**2**
Teaching Credit Hours: Practical/ tutorial	**1**
Total Credit Hours	**3**

B. Professional Information:

1. Course Aims:

On completion of the course, the student will be able to

Have the knowledge about the use of microorganisms in different fields of biotechnology.

Be familiar with different fermentation processes and their products.

Detect and monitor genetically engineered M.O and its use in making protein of interest or drug

Recognize the use of recombinant DNA technology in the pharmaceutical and medical fields.

Understand the basics of gene therapy and its applications in the treatment of genetic disorders.

Identify bioremediation and its applications.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	Define the importance of biotechnology and its uses
1.1.2	1.1.2.1	Identify terms related to genetic engineering and bioremediation
	1.1.2.2	Differentiate between different types of fermentation processes
1.1.3	1.1.3.1	Recognize the use of microorganisms in the production of important pharmaceutical products
1.1.7	1.1.7.1	Identify the basics of gene therapy and its uses in treatment of monogenic and polygenic disorders
	1.1.7.2	Illustrate the use of genetic engineering in production of some drugs

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.2.1	2.2.1.1	Manipulate suitable methods for the production of fermented products
2.2.2	2.2.2.1	Analyze how to encode and transfer regions of the genetic material of the microorganisms and its use in the synthesis of important proteins
2.2.3	2.2.3.1	Differentiate between DNA manipulation techniques
2.2.4	2.2.4.1	Manipulate gene therapy and its applications in treatment of genetic disorders

Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.2.3	3.2.3.1	Determine the use of monoclonal antibodies in the treatment of cancer

Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Retrieve and evaluate information, solve problems and work effectively in a team
4.2.1	4.2.1.1	Communicate effectively in a scientific language by verbal and written means in the field of health care and pharmaceutical preparations regarding the studied topics
4.2.2	4.2.2.1	Use information technology tools to retrieve clinical laboratory data from different sources to improve professional competencies
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development

3- Course Contents

Week No.	Lecture topics	Lecture credit Hours
1	Introduction to biotechnology , its uses, screening and isolation of Industrial Microorganisms	2
2	Fermentation technology, Composition of fermentation media , Major parts of fermenter, Fermenter control& monitoring	2
3	Types of fermentation techniques Bioreactors of solid state fermentation	2

4	Production of major Pharmaceutical products (antibiotics and enzymes). Production of some health care products from microbial fermentations: (a) Cephalosporin antibiotic (b) Vitamin B12 (self-learning)	2
5	Microbial metabolites Bioremediation and its application	2
6	Industrial strain improvement I (Mutation and protoplast fusion)	2
7	Industrial strain improvement II (cloning) and Application of Recombinant DNA Technology	2
8	Polymerase Chain Reaction and hybridization techniques	2
9	Monoclonal antibodies production-Application of monoclonal antibody (self-learning)	2
10	Bacteriophage biotechnology	2
11	Principle of Gene therapy	2
12	Applications of gene therapy (monogenic and polygenic disorder)	2
13	Genetic diseases	2
14	Revision/quiz	2
15	Start of Final written and oral exam	
Week No.	Practical topics	Practical credit hours
1	Isolation of soil bacteria	1
2	Identification and Examination of soil micro-organisms	1
3	Identifying Antibiotic Producing Microorganisms from Soil	1
4	Mutation	1
5	Polymerase Chain Reaction (PCR)	1
6	Gel electrophoresis	1
7	Cloning	1

8	**Midterm exam**	-
9	**SDS-PAGE**	1
10	**Western blot**	1
11	**Southern blot**	1
12	**Northern blot**	1
13	**Western blot, Southern blot, Northern blot revision**	1
14	**Practical exam**	1

4- Teaching and Learning Methods:

No	Teaching and Learning Methods	week	K. elements to be addressed
4.1	Advanced lecture	1-14	(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1), (4.2.1.1)
4.2	Hybrid learning: On line learning through My mans "Mansoura university "	1-14	(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1), (4.2.1.1) (4.2.2.1)
4.3	Practical works and tutorials	1-14	(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (2.2.1.1), (2.2.2.1), (2.2.3.1), (4.1.2.1), (4.2.1.1), (4.2.2.1)
4.4	Self-learning	4 & 9	(4.1.2.1), (4.2.1.1), (4.2.2.1), (4.3.2.1)
4.5	العروض التوضيحية Demos	1-13	(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1), (4.2.1.1)

5- Student Assessment:

Assessment Methods:

1- Periodical (Mid-term exam) / Course work	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1),(4.2.1.1), (4.3.2.1)**
2-Practical exam using OSPE	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (2.2.1.1), (2.2.2.1), (2.2.3.1), (4.1.2.1), (4.2.1.1), (4.2.2.1)**
3-Written exam	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1)**
4-Oral	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.7.1), (1.1.7.2), (2.2.1.1), (2.2.2.1), (2.2.3.1), (2.2.4.1), (3.2.3.1),(4.2.1.1), (4.3.2.1)**

Assessment schedule

Assessment 1	Periodical (Mid-term exam)/Course work	6-9th week
Assessment 2	Practical applying OSPE	14 th week
Assessment 3	Written	Start from 15th week
Assessment 4	Oral	Start from 15th week
Other assessment		

Weighing of assessments

1	Periodical (Mid-term exam)/Course work	15%
2	Practical examination & tutorial	25%
3	Final-term examination	50%
4	Oral examination	10%
Total		100%

6- Facilities required for teaching and learning

Classroom	Data show- Computers, sound system-Internet, Platform

Laboratory facilities	Media- Sterile tools- chemical reagent- Data show- Computers, Internet, Platform
Library	Books

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	eBook
2	Recorded videos prepared by stuff members	Videos on platform
3.	Walsh, G. (2013). Pharmaceutical Biotechnology: Concepts and Applications. E book.	eBook
4.	Adair, J. R., Bickerstaff, G. F., Bugeja, V. C., Cartwright, E. J., Chaplin, M. F., Elles, R., Fussenegger, M. (2009). Molecular biology and biotechnology. Cambridge: Royal Society of Chemistry.	eBook
	Sue Carson, Heather Miller, Melissa Srougi, D. Scott Witherow (2019) Molecular Biology Techniques, A Classroom Laboratory Manual, 4th Edition, Academic Press	eBook
5.	https://en.wikipedia.org/wiki/Industrial_fermentation 2.https://www.wiley.com/en-us/Principles+and+Applications+of+Fermentation+Technology-p-9781119460480 3. https://bioprocessing.weebly.com/types-of-fermenters.html 4. https://biologyreader.com/fermentor.html 5. Front. Sustain. Food Syst., 09 August 2019 | https://doi.org/10.3389/fsufs.2019.00063 6. https://link.springer.com/chapter/10.1007/978-94-017-0661-2_2 https://08101lexb-1103-y-https-www-sciencedirect-com.mplbci.ekb.eg/science/article/pii/B9780128219720000198 https://0810llgzn-1103-y-https-inspec--direct--app-theiet-org.mplbci.ekb.eg/an/21858646 https://pubmed.ncbi.nlm.nih.gov/35573236/	Websites

8- Matrix

Course content and key element

Course contents / K. elements	Domain : 1							Domain 2					Domain: 3		Domain:4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.3.1	1.1.7.1	1.1.7.2		2..2.1.1	2..2.2.1	2..2.3.1	2.2.4.1		3.2.3.1		4.1.2.1	4.2.1.1	4.2.2.1	4.3.2.1
Introduction to biotechnology , its uses, screening and isolation of Industrial Microorganisms	√		√					√										
Fermentation technology, Composition of fermentation media , Major parts of fermenter, Fermenter control& monitoring	√		√					√										
Types of fermentation techniques Bioreactors of solid state fermentation	√		√	√				√	√									
Production of major Pharmaceutical products (antibiotics and enzymes). Production of some health care products from	√		√	√				√	√						√	√	√	√

microbial fermentations: (a) Cephalosporin antibiotic (b) Vitamin B12 (self-learning)																		
Microbial metabolites **Bioremediation and its application**	√	√		√				√	√									
Industrial strain improvement I (Mutation and protoplast fusion)		√	√			√			√	√								
Industrial strain improvement II (cloning) and Application of Recombinant DNA Technology		√	√			√		√	√	√			√		√			
Polymerase Chain Reaction and hybridization techniques		√				√				√			√					
Monoclonal antibodies production-Application of monoclonal antibody (self-learning)		√	√	√	√	√		√	√	√			√		√	√	√	√
Bacteriophage biotechnology					√						√		√					
Principle of Gene therapy		√			√						√		√					
Applications of gene therapy (monogenic and polygenic disorder)		√			√						√		√		√			
Genetic diseases		√			√						√		√					

	1.1.1.1	**1.1.2.1**	**1.1.2.2**	**1.1.3.1**	**1.1.7.1**	**1.1.7.2**		**2..2.1.1**	**2..2.2.1**	**2.2.3.1**	**2.2.4.1**		**3.2.3.1**		**4.1.2.1**	**4.2.1.1**	**4.2.2.1**	**4.3.2.1**
Isolation of soil bacteria	√														√	√	√	
Identification and Examination of soil micro-organisms	√			√				√							√	√	√	
Identifying Antibiotic Producing Microorganisms from Soil			√					√	√						√		√	
Mutation		√				√				√					√	√		
Polymerase Chain Reaction (PCR)		√				√				√					√			
Gel electrophoresis		√				√				√					√			
Cloning		√				√				√					√	√		
SDS-PAGE		√				√				√					√	√		

Western blot		√				√				√					√			
Southern and Northern blot		√				√				√					√			
Western blot, Southern and Northern blot Revision															√	√	√	

Matrix 2. Between course contents, learning methods and assessment

Course Contents	Teaching and Learning Methods					Assessment methods			
	Advanced lecture	Hybrid learning	Self-learning	Practical works and tutorials	Demos العروض التوضيحية	Corse Work (mid-term Exam)	Practical/sheet	Written	Oral
Introduction to biotechnology , its uses, screening and isolation of Industrial Microorganisms	✓	✓				✓		✓	✓
Fermentation technology, Composition of fermentation media , Major parts of fermenter, Fermenter control& monitoring	✓	✓				✓		✓	✓
Types of fermentation techniques Bioreactors of solid state fermentation	✓	✓			✓	✓		✓	✓

Production of major Pharmaceutical products (antibiotics and enzymes). Production of some health care products from microbial fermentations: (a) Cephalosporin antibiotic (b) Vitamin B12 (self-learning)	✓	✓	✓		✓	✓		✓	✓
Microbial metabolites Bioremediation and its application	✓	✓			✓	✓		✓	✓
Industrial strain improvement I (Mutation and protoplast fusion)	✓	✓						✓	✓
Industrial strain improvement II (cloning) and Application of Recombinant DNA Technology	✓	✓			✓			✓	✓
Polymerase Chain Reaction and hybridization techniques	✓	✓			✓			✓	✓
Monoclonal antibodies production-Application of monoclonal antibody (self-learning)	✓	✓	✓			✓		✓	✓
Bacteriophage biotechnology	✓	✓						✓	✓
Principle of Gene therapy	✓	✓						✓	✓
Applications of gene therapy (monogenic and polygenic disorder)	✓	✓						✓	✓

Genetic diseases	✓	✓						✓	✓
B) Practical Part:									
Course Contents	**Teaching and Learning Methods**					**Assessment methods**			
	Advanced lecture	**Hybrid learning**	**Self-learning**	**Practical works and tutorials**	**العروض التوضيحية Demos**	**Corse Work (mid-term Exam)**	**Practical/sheet**	**Written**	**Oral**
Isolation of soil bacteria		✓		✓			✓		
Identification and Examination of soil micro-organisms		✓		✓			✓		
Identifying Antibiotic Producing Microorganisms from Soil		✓		✓			✓		
Mutation		✓		✓		✓	✓		
Polymerase Chain Reaction (PCR)		✓		✓	✓	✓	✓		
Gel electrophoresis		✓		✓			✓		
Cloning		✓		✓	✓		✓		
SDS-PAGE		✓		✓	✓		✓		
Western blot		✓		✓		✓	✓		
Southern and Northern blot		✓		✓			✓		
Revision				✓			✓		

Course Specification

2023- 2024

Pharm D Program

Faculty of Pharmacy

Mansoura University

Course Coordinator	**Prof. Dr. Ramdan Hassan Ibrahim**
Head of Department	**Prof. Dr. El-Sayed E. Habib** **Date: 10/9/ 2023**

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmacology-III	**اسم المقرر: فارماكولوجي-3**
Academic Level: Level 4	**المستوى الأكاديمي: الرابع**
Scientific department: Pharmacology & Toxicology	**القسم العلمي: الأدوية والسموم**
Head of Department: Prof. Manar Ahmed Nader	**رئيس القسم: ا.د/ منار أحمد نادر**
Course Coordinator: Prof. Nashwa Abu-Elsaad	**منسق المقرر: ا.د/ نشوى أبو السعد**

niversity	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Pharmacology & Toxicology**
Department supervising the course	**Pharmacology & Toxicology**
Program on which the course is given	**Bachelor's in pharmacy -Pharm D**
Academic Level	**Fourth level, first semester, 2023/2024**
Date of course specification approval	**2023/9/18**

A- Basic Information: Course data:

Course Title	**Pharmacology-3**
Course Code	**PH 416**
Prerequisite	**Physiology**
Teaching Hours/ week: Lecture:	**2**
Practical:	**1**
Total Credit Hours	**3 (Credit H)**

B- Professional Information:

1- Course Aims:

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

1- **Describe mechanisms of action, prototypic examples and therapeutic applications of drugs drugs acting on endocrine system and central nervous system.**

2- **Also, students will be aware of immunosuppressants. Stem cell therapy is also included. The anti-inflammatory, analgesics as well as gout treatments are also included.**

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements:

Domain 1: fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.4	**1.1.4.1**	Identify drugs' mechanism of action, therapeutic effects and assess their suitability, effectiveness, and safety in individuals and populations, using knowledge from fundamental sciences.
1.1.8	**1.1.8.1**	Use health informatics to improve the quality of health and nutritional care, manage resources and optimize patient safety and understand metabolic disorders.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.4.5	**2.4.5.1**	Adapt and take proper action when signs, symptoms and risk factors that relate to medical or health problems that fall into the scope of practice of other health professionals are encountered.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.2.1	**3.2.1.1**	Perform principles of pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.2.1	**4.2.1.1**	Retrieve clear language, pace, tone and non-verbal communication and writing skills when dealing with patients, other health team and communities.
4.3.2	**4.3.2.1**	Use artificial technology whenever possible to present relevant information.

3- Course Contents

A) Theoretical part

Week No.	Topics	Hours
1	Introduction to immunopharmacology Introduction to centrally acting drugs	2
2	Management of abnormal immune responses-Sedative Hypnotics	2
3	Management of abnormal immune responses-Anti-seizure drugs	2
4	Immunosuppressants-Antipsychotics	2
5	Immunosuppressants-Mood stabilizers	2
6	Diabetes mellitus and antidiabetic drugs	2
7	Opioid Analgesics	2
8	NSAIDs-Hypothalamus and pituitary hormones	2
9	Thyroid hormones and anti-thyroid drugs	2
10	Antidepressants Parathyroid hormones and drugs affecting drugs bone metabolism	2
11	Antiparkinsonian drugs-Adrenocortical steroids	2
12	Thyroid hormones and anti-thyroid drugs	2
13	Gonadal hormones and inhibitors- anesthetics (part 1)	2
14	Gonadal hormones and inhibitors- anesthetics (part 2) (self learning)	2
15	**Final Written and Oral Exam**	--

B) Practical part

Week No.	Topics	Hours
1	Immunopharmacology case (swollen hands)	1
2	Immunopharmacology case (type I hypersensitivity case)	1
3	Immunopharmacology case scaly annular plaque	1
4	ADHD case	1
5	Management of pain	1
6	Types and management of Headache	1
7	Poly cystic ovarian syndrome	1
8	Midterm exam	-

9	Obesity	1
10	Cushing syndrome	1
11	Alcohol	1
12	Alzheimer's disease case (part 1)	1
13	Alzheimer's disease case (part 2)	1
14	**Practical exam**	--

4- Teaching and Learning Methods:

Teaching and learning Methods		**Weeks No.**	**Key elements to be addressed**
4.1	Advanced lecture	1-14	**1.1.4.1, 1.1.8.1, 2.4.5.1**
4.2	Practical works and tutorials	1-14	**3.2.1.1, 4.2.1.1, 4.3.2.1**
4.3	Hybrid learning • Online learning through MyMans as recorded video lectures. • Interactive discussion through MyMans	1-14	**1.1.4.1, 1.1.8.1, 2.4.5.1**
4.4	Collaborative learning: through research projects	4-12	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1, 4.2.1.1, 4.3.2.1**
4.5	Self-learning	14	**4.2.1.1, 4.3.2.1**
4.6	Case study	1-12	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1, 4.2.1.1, 4.3.2.1**
4.7	Presentations	4-12	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1, 4.2.1.1, 4.3.2.1**
4.8	computer aided learning	1-14	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1, 4.2.1.1, 4.3.2.1**

5- Student Assessment:

a- Assessment Methods:

Assessment Methods	**Key elements to be assessed**
1- Periodical (Mid-term exam / Course work)	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1**
2- Practical exam using OSPE	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1**
3- Written exam	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1**
4- Oral exam	**1.1.4.1, 1.1.8.1, 2.4.5.1, 3.2.1.1, 4.2.1.1, 4.3.2.1**

b- Assessment schedule:

Assessment 1	Periodical (Mid-term/ Course work)	7-9th week

Assessment 2	Practical exam (OSPE)	14th week
Assessment 3	Written exam	Start from the 15th week
Assessment 4	Oral exam	Start from the 15th week

c- Weighing of assessment:

1	Periodical (Mid-term/ Course work)	15%
2	Practical exam	25%
3	Written exam	50%
4	Oral exam	10%
Total		100%

6- Facilities required for teaching and learning:

Classroom	Data show- Computers, sound system-Internet, Platform
Laboratory facilities	Media- Sterile tools- chemical reagent- Data show- Computers, Internet, Platform
Library	Books

7- List of References

No	Reference	Type
1.	Katzung B, Kruidering-Hall M, Tuan RL, Vander TW, Trevor A (2021). Katzung and Trevor's Pharmacology Examination and	**Book**
2.	Ritter J, Flower R, Henderson G, Loke YK, MacEwan D, Rang H (2020) Rang and Dale's pharmacology 9th edition.	**Book**
3.	Whalen K, Panavelil TA (2014) Lippincott Illustrated Reviews: Pharmacology, 6th Edition.	**Book**
4.	Katzung B, Masters S, Trevor A (2012) Basic and Clinical Pharmacology 12th Edition	**Book**
5.	ACCP guidelines (https://www.accp.com/) Egyptian Knowledge Bank (https://www.ekb.eg/)	**websites**

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents	Course Key elements					
	Domain: 1		Domain: 2	Domain: 3	Domain: 4	
	1.1.4.1	1.1.8 .1	2.4.5.1	3.2.1.1	4.2.1.1	4.3.2.1
Introduction to immunopharmacology - centrally acting drugs	✓	-	✓	✓		
Management of abnormal immune responses Sedative Hypnotics	✓	✓	✓	✓		
Management of abnormal immune responses Anti-seizure drugs	✓	✓	✓	✓		
Immunosuppressants-Antipsychotics	✓	✓	✓	✓		
Immunosuppressants - Mood stabilizers	✓	✓	✓	✓		
Diabetes mellitus and antidiabetic drugs	✓	✓	✓	✓		
Opioid Analgesics	✓	✓	✓	✓		
NSAIDs-Hypothalamus and pituitary hormones	✓	✓	✓	✓		
Thyroid hormones and anti-thyroid drugs	✓	✓	✓	✓	✓	✓
Antidepressants- Parathyroid hormones and drugs affecting drugs bone metabolism	✓	✓	✓	✓	✓	✓
Antiparkinsonian drugs-Adrenocortical steroids	✓	✓	✓	✓	✓	✓
Thyroid hormones and anti-thyroid drugs	✓	✓	✓	✓	✓	✓
Gonadal hormones and inhibitors-anesthetics (part 1)	✓	✓	✓	✓	✓	✓
Gonadal hormones and inhibitors-anesthetics (part 2) (self learning)	□	?	?	?	?	?

B)Practical part:

Course contents	Course Key elements					
	Domain: 1		Domain: 2	Domain: 3	Domain: 4	
	1.1.4.1	1.1.8 .1	2.4.5.1	3.2.1.1	4.2.1.1	4.3.2.1
Immunopharmacology case (swollen hands)	✓		✓	✓	✓	✓
Immunopharmacology case (type I hypersensitivity case)	✓		✓	✓	✓	✓
Immunopharmacology case scaly annular plaque	✓		✓	✓	✓	✓
ADHD case	✓		✓	✓	✓	✓
Management of pain	✓		✓	✓	✓	✓
Types and management of Headache	✓		✓	✓	✓	✓
Poly cystic ovarian syndrome		✓	✓	✓	✓	✓
Obesity		✓	✓	✓	✓	✓
Cushing syndrome		✓	✓	✓	✓	✓
Alcohol	✓		✓	✓	✓	✓
Alzheimer’s disease case (part 1)	✓		✓	✓	✓	✓
Alzheimer’s disease case (part 2)	?		?	?	?	?

Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

Course Contents	Teaching and Learning methods						Assessment methods			
	Advanced Lecture	Hybrid learning	Collaborative learning	Self-learning	Case study	Computer aided learning	Corse Work	Practical/ Tutorial	Written	Oral
Introduction to immunopharmacology - centrally acting drugs	✓						✓		✓	✓
Management of abnormal immune responses- Sedative Hypnotics	✓				✓		✓		✓	✓
Management of abnormal immune responses- Anti-seizure drugs	✓		✓		✓	✓	✓		✓	✓
Immunosuppressants- Antipsychotics	✓						✓		✓	✓
Immunosuppressants - Mood stabilizers	✓	✓							✓	✓
Diabetes mellitus and antidiabetic drugs	✓		✓			✓			✓	✓
Opioid Analgesics	✓				✓				✓	✓
NSAIDs-Hypothalamus and pituitary hormones	✓	✓			✓				✓	✓
Thyroid hormones and anti-thyroid drugs	✓								✓	✓
Antidepressants- Parathyroid hormones and drugs affecting drugs bone metabolism	✓		✓			✓			✓	✓
Antiparkinsonian drugs- Adrenocortical steroids	✓	✓							✓	✓
Thyroid hormones and anti-thyroid drugs	✓								✓	✓
Gonadal hormones and inhibitors- anesthetics (part 1)	✓	✓	✓	✓		✓	✓		✓	✓
Gonadal hormones and inhibitors- anesthetics (part 2) (self learning)	☐	☐	☐	☐		☐	☐		☐	☐

B) Practical part:

Course Contents	Teaching and Learning methods						Assessment methods			
	Practical work/ tutorial	Hybrid learning	Collaborative learning	Self-learning	Case study	Computer aided	Corse Work	Practical/ Tutorial	Written	Oral
Immunopharmacology case (swollen hands)	✓	✓			✓		√	✓		
Immunopharmacology case (type I hypersensitivity case)	✓	✓			✓		√	✓		
Immunopharmacology case scaly annular plaque	✓	✓	✓	✓	✓	✓	√	✓		
ADHD case	✓	✓			✓		√	✓		
Management of pain	✓	✓			✓		√	✓		
Types and management of Headache	✓	✓	✓	✓	✓	✓	√	✓		
Poly cystic ovarian syndrome	✓	✓			✓		√	✓		
Obesity	✓	✓			✓		√	✓		
Cushing syndrome	✓	✓			✓		√	✓		
Alcohol	✓	✓	✓	✓	✓	✓	√	✓		
Alzheimer's disease case (part 1)	✓	✓			✓		√	✓		
Alzheimer's disease case (part 2)	□	□			□		√	□		

Course Coordinator	Prof. Nashwa Abu-Elsaad
Head of Department	Prof. Manar Ahmed Nader

Approval Date: 18/9/2023

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Applied & Forensic Pharmacognosy	**اسم المقرر: عقاقير تطبيقية وشرعية**
Academic Level: Level 4	**المستوى الأكاديمي : الرابع**
Scientificdepartment: Pharmacognosy	**القسم العلمي : العقاقير**
Head of Department: **Prof. Mahmoud Fahmi Elsebai**	**رئيس القسم :** **أ.د/ محمود فهمى السباعى**
Course Coordinator: **Assoc. Prof. Marwa Elsbaey**	**منسق المقرر :** **أ.م.د/ مروة السباعي**

Course Specification

2023- 2024

Pharm D Program

Faculty of Pharmacy

Mansoura University

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Pharmacognosy Department**
Program on which the course is given	**Pharmacognosy Department**
Academic Level	**Bachelor's in pharmacy-Pharm D**
Date of course specification approval	**Level 4, first semester**

A- Basic Information: Course data:

Course Title	**Applied & Forensic Pharmacognosy**
Course Code	**PG 416**
Prerequisite	
Teaching Hours/ week: Lecture:	**1**
Practical:	**1**
Total Credit Hours	**2**

B- Professional Information:

1- Course Aims:

This course enables the students to:

- Gain knowledge concerning quality control, sampling, structural, physical, and analytical standards, purity, safety, and adulteration of drugs.
- Be aware of the modern chromatographic techniques for the evaluation of natural products.
- Realize the basic knowledge about the application of plant biotechnology for the production of pharmaceutically active materials.
- Know an overview on forensic pharmacognosy including plants and their natural products.
- Comprehend the drug dependents, narcotics, psychotropic, and poisonous plants.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements:

Domain 1: fundamental knowledge

Program Key element No.	Course Key element No.	Course Key Element
1.1.1	**1.1.1.1**	Distinguish the quality control from herbal aspects, sampling, structural, physical, and analytical standards, purity, safety, and adulteration of drugs.
1.1.3	**1.1.3.1**	Identify the principles and fundamentals of forensic pharmacognosy including narcotics, psychotropic substances and poisonous plants that constitute health hazards, drug misuse and drug abuse.
	1.1.3.2	Understand the basic knowledge about the application of plant biotechnology and tissue culture for the production of pharmaceutically active materials.

Domain 2: professional and ethical practice

Program Key element No.	Course Key element No.	Course Key Element
2.2.2	**2.2.2.1**	Evaluate the quality control from herbal aspects, sampling, structural, physical, and analytical standards, purity, safety, and adulteration of drugs.
2.4.1	**2.4.1.1**	Choose appropriate methods for handling and applications of narcotics, psychotropic substances, and poisonous plants to discard any harm to public.
2.4.4	**2.4.4.1**	Assess toxicity profiles of narcotics, psychotropic substances, and poisonous plants.

Domain 4: personal practice

Program Key element No.	Course Key element No.	Course Key Element
4.1.2	4.1.2.1	Retrieve and evaluate information, solve problems, and work effectively in a team.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development.

3- Course Contents

A) Theoretical part

Week No.	Topics	Hours
1	Forensic Pharmacognosy (Cannabis and Cannabinoids)	1
2	Forensic Pharmacognosy (Opiate raw material and Opioids)	1
3	Applied Pharmacognosy (Crude drug evaluation, Introduction)	1
4	Applied Pharmacognosy (Potential contaminants)	1
5	Forensic Pharmacognosy (CNS stimulant drugs, Hallucinogenic drugs)	1
6	Forensic Pharmacognosy (Coca bush and coca products, CNS stimulants)	1
7	Applied Pharmacognosy (Methods of evaluation)	1
8	Applied Pharmacognosy (Detection of adulteration and contamination)	1
9	Applied Pharmacognosy (Tools and culture media for plant tissue culture PTC, Types of plant tissue culture, Difficulties encountered in plant tissue culture)	1
10	Applied Pharmacognosy (Applications of PTC, Micropropagation)	1
11	Applied Pharmacognosy (Production of secondary metabolites by PTC)	1
12	Applied Pharmacognosy (Production of biopharmaceuticals by PTC)	1
13	Biopharmaceuticals and PTC	1
14	Revision and quiz	--
15	Final Written and Oral Exam	--

B) Practical part

Week No.	Topics	Hours
1	Structural standards (Microscopical linear measurements)	1
2	Structural standards (Ratio values)	1
3	Microbial Contamination	1

4	Adulteration of Crude drugs (Part I)	1
5	Adulteration of Crude drugs (Part II)	1
6	Phytochemical screening of vegetable drugs (Part I)	1
7	Phytochemical screening of vegetable drugs (Part II)	1
8	Midterm exam	-
9	TLC Analysis	1
10	Extractive values	1
11	methods of extraction	1
12	Moisture content determination	1
13	Ash values determination	1
14	Practical exam	--

Teaching and Learning Methods:

Teaching and learning Methods		Weeks No.	Key elements to be addressed
4.1	Demos through computer aided learning: a. Lectures using data show, power Point presentations and demos b. Hybrid leaning Online learning through my mans "Mansoura university "as recorded – video lectures Interactive discussion through My Mans	1-14 3, 5,7 13	1.1.1.1, 1.1.3.1, 1.1.3.2, 2.2.2.1, 2.4.1.1, 2.4.4.1, 4.1.2.1, 4.3.2.1
4.1	Self-learning	13	1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1
4.2	Practical session using chemicals and laboratory equipment and/ or tutorials	1-14	1.1.1.1, 1.1.3.1, 1.1.3.2, 2.2.2.1, 2.4.1.1, 2.4.4.1, 4.1.2.1, 4.3.2.1
4.3	Simulation based learning in practical sessions and lectures	3, 5,7 13	1.1.1.1, 1.1.3.1, 1.1.3.2, 2.2.2.1, 2.4.1.1, 2.4.4.1
4.4	Problem – based learning and brainstorming in lectures	6 9-13	1.1.1.1, 1.1.3.1, 1.1.3.2, 2.2.2.1, 2.4.1.1, 2.4.4.1

4- Student Assessment:

a- Assessment Methods:

Assessment Methods	Key elements to be assessed
1- Periodical (Mid-term exam / Course work)	1.1.1.1, 1.1.3, 1.1.3.2
2- Practical exam using OSPE	2.2.2.1, 2.4.1.1, 2.4.4.1, 4.1.2.1, 4.3.2.1
3- Written exam	1.1.1.1, 1.1.3.1, 1.1.3.2, 4.1.2.1, 4.3.2.1
4- Oral exam	1.1.1.1, 1.1.3.1, 1.1.3.2, 2.2.2.1, 2.4.1.1

b- Assessment schedule:

Assessment 1	Periodical (Mid-term/ Course work)	7-9th week
Assessment 2	Practical exam (OSPE)	14th week
Assessment 3	Written exam	15th week
Assessment 4	Oral exam	15th week

c- Weighing of assessment:

1	Periodical (Mid-term/ Course work)	15%
2	Practical exam	25%
3	Written exam	50%
4	Oral exam	10%
Total		100%

5- Facilities required for teaching and learning.

- Classroom	Data show- Computers, Internet.
- Laboratory facilities	Microscopes- chemicals- glass wares- white board
- Library	Books and journals

6- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Heinrich, M., Williamson, E. M., Gibbons, S., Barnes, J., & Prieto-Garcia, J. (2017). Fundamentals of pharmacognosy and phytotherapy E-BOOK. Elsevier Health Sciences.	Essential Book
3.	George D. J. (2018.): Poisons - An Introduction for Forensic Investigators ", CRC Press, Taylor & Francis Group, Boca Raton, pp. 247. – 248.	Recommended Book
5.	Khare, B., Mishra, M. K., & Kesharwani, L. (2018). Screening of adulterants in herbal formulations for forensic considerations. Journal of Pharmacognosy and Phytochemistry, 7(2), 532-6.	Recommended Book
6.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com	Website

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents	Course Key elements							
	Domain: 1			Domain: 2			Domain: 4	
	1.1.1.1	1.1.3.1	1.1.3.2	2.2.2.1	2.4.1.1	2.4.4.1	4.1.2.1	4.3.2.1
Forensic Pharmacognosy (Cannabis and Cannabinoids)		✓						
Forensic Pharmacognosy (Opiate raw material and Opioids)		✓			✓			✓
Applied Pharmacognosy (Crude drug evaluation, Introduction)	✓						✓	
Applied Pharmacognosy (Potential contaminants)	✓			✓				✓
Forensic Pharmacognosy (CNS stimulant drugs, Hallucinogenic drugs)		✓			✓	✓		✓
Forensic Pharmacognosy (Coca bush and coca products, CNS stimulants)		✓	✓		✓	✓	✓	
Applied Pharmacognosy (Methods of evaluation)	✓			✓			✓	✓
Applied Pharmacognosy (Detection of adulteration and contamination)	✓			✓				
Applied Pharmacognosy (Tools and culture media for plant tissue culture PTC, Types of plant tissue culture, Difficulties encountered in plant tissue culture)			✓				✓	✓
Applied Pharmacognosy (Applications of PTC, Micropropagation)			✓				✓	✓
Applied Pharmacognosy (Production of secondary metabolites by PTC)			✓				✓	
Applied Pharmacognosy (Production of biopharmaceuticals by PTC)			✓				✓	
Discussion (Self-Learning Topics), (Interactive Lecture)							✓	✓

-Practical part:

Course contents	Course Key elements							
	Domain: 1			Domain: 2			Domain: 4	
	1.1.1.1	1.1.3.1	1.1.3.2	2.2.2.1	2.4.1.1	2.4.4.1	4.1.2.1	4.3.2.1
Structural standards (Microscopical linear measurements)	✓							
Structural standards (Ratio values)	✓							✓
Microbial Contamination	✓			✓			✓	✓
Adulteration of Crude drugs (Part I)	✓			✓			✓	✓
Adulteration of Crude drugs (Part II)	✓			✓			✓	✓
Phytochemical screening of vegetable drugs (Part I)	✓			✓			✓	✓
Phytochemical screening of vegetable drugs (Part II)	✓			✓			✓	✓
TLC Analysis	✓			✓			✓	✓
Extractive values, methods of extraction	✓			✓			✓	✓
Moisture content determination	✓			✓			✓	✓
Ash values determination	✓			✓			✓	✓

Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

Course Contents	Teaching and Learning methods							Assessment methods			
	Lecture	Hybrid leaning	Comp. aided learning	Lab sessions	Self-learning	Simulation	Brain storming	Corse Work	Practical/ Tutorial	Written	Oral
Forensic Pharmacognosy (Cannabis and Cannabinoids)	✓	✓	✓					✓		✓	✓
Forensic Pharmacognosy (Opiate raw material and Opioids)	✓	✓	✓					✓		✓	✓
Applied Pharmacognosy (Crude drug evaluation, Introduction)	✓	✓	✓			✓		✓		✓	✓
Applied Pharmacognosy (Potential contaminants)	✓	✓	✓					✓		✓	✓
Forensic Pharmacognosy (CNS stimulant drugs, Hallucinogenic drugs)	✓	✓	✓			✓				✓	✓
Forensic Pharmacognosy (Coca bush and coca products, CNS stimulants)	✓	✓	✓				✓			✓	✓
Applied Pharmacognosy (Methods of evaluation)	✓	✓	✓			✓				✓	✓
Applied Pharmacognosy (Detection of adulteration and contamination)	✓	✓	✓							✓	✓

Applied Pharmacognosy (Tools and culture media for plant tissue culture PTC, Types of plant tissue culture, Difficulties encountered in plant tissue culture)	✓	✓	✓				✓			✓	✓
Applied Pharmacognosy (Applications of PTC, Micropropagation)	✓	✓	✓				✓			✓	✓
Applied Pharmacognosy (Production of secondary metabolites by PTC)	✓	✓	✓				✓			✓	✓
Applied Pharmacognosy (Production of biopharmaceuticals by PTC)	✓	✓	✓				✓			✓	✓
Discussion (Self-Learning Topics), (Interactive Lecture)	✓	✓	✓		✓	✓	✓				

B) Practical part:

Course Contents	**Teaching and Learning methods**					**Assessment methods**			
	Lecture	**Hybrid learning**	**Comp. aided learning**	**Lab sessions**	**Self-learning**	**Corse Work**	**Practical/Tutorial**	**Written**	**Oral**
Structural standards (Microscopical linear measurements)		✓		✓			✓		
Structural standards (Ratio values)		✓		✓			✓		
Microbial Contamination		✓		✓			✓		

Adulteration of Crude drugs (Part I)		✓		✓			✓		
Adulteration of Crude drugs (Part II)		✓		✓			✓		
Phytochemical screening of vegetable drugs (Part I)		✓		✓			✓		
Phytochemical screening of vegetable drugs (Part II)		✓		✓			✓		
TLC Analysis		✓		✓			✓		
Extractive values, methods of extraction		✓		✓			✓		
Moisture content determination		✓		✓			✓		
Ash values determination		✓		✓			✓		

Course Coordinator	Assoc. Prof. Marwa Elsbaey
Head of Department	**Prof. Mahmoud Fahmi Elsebai**

Approval Date: 6/9/2023

(بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023-2024

Course name: Drug Information	اسم المقرر: معلومات الدواء
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific department: Clinical Pharmacy and Pharmacy Practice	القسم العلمي: الصيدلة الإكلينيكية و الممارسة الصيدلية
Head of Department: Dr. Mohamed Elhusseiny Shams	رئيس القسم: أ.د/ محمد الحسيني شمس
Course Coordinator: Dr. Moetaza Mahmoud Hassab	منسق المقرر: أ.م.د/ معتزه محمود حسب السيد

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Clinical Pharmacy and Pharmacy Practice**
Department supervising the course	
Program on which the course is given	**Bachelors in pharmacy -Pharm D by law**
Academic Level	**Fourth level, first semester, 2023-2024**
Date of course specification approval	**7th September 2023**

2- Basic Information: Course data:

Course Title	**Drug Information**
Course Code	**PP 413**
Prerequisite	**Registration**
Teaching Hours: Lecture	**1**
Practical	**1**
Total Credit Hours	**2 (Credit H)**

3- Course Aims:

1. **Identify drug information resources**
2. **Address a medication related question**
3. **Recognize role of pharmacist as a drug information specialist**
4. **Set drug information centre**

3- Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	Apply core knowledge of pharmaceutical and clinical sciences to provide drug related information in certain case scenarios.
1.1.6	1.1.6.1	Access, retrieve, and critically analyze drug information to answer drug related questions.
1.1.7	1.1.7.1	Gather and critically analyze drug information that may be directed to health professionals to serve patient care.
1.1.8	1.1.8.1	Use drug information to improve the quality of care presented to patients and optimize patient safety.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.5.2	2.5.2.1	Collect, interpret and assess relevant, drug information requested by members of health care team.
2.5.3	2.5.3.1	Use appropriate resources in the search for best available drug information.
2.6.2	2.6.2.1	Practice guidelines of clinical use of medications.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Modify a dosage regimen for a patient based on the disease and drug history to optimize medication use.
3.2.3	3.2.3.1	Integrate best available drug information into pharmacy practice.
3.2.4	3.2.4.1	Provide appropriate drug information to answer medicine related questions.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share decision-making activities with other members of medical team.
4.1.2	4.1.2.1	Retrieve and critically analyze drug information to solve medical problems, and work effectively in a medical team.
4.3.2	4.3.2.1	Apply principles of continuing professional development to meet self needs.

4- Course Contents

Week No.	Lecture Topics	Lecture Credit Hours
1	**Introduction to drug information concept.** **(Definition, history, roles of medication information services. Medication information skills required)**	1
2	**Drug Information Centre [DIC].** **(Drug information center [DIC]: what, why and how? How a new DIC can be established? functions of DIC, requirements for establishing a new DIC?)**	1
3	**Manufacturer-provided drug information.** **Technical information, promotional information, setting up a medicine and therapeutics information center, site identification, staffing and equipment requirements.**	1
4	**Tertiary Drug Information Resources.** **(Advantages and disadvantages of tertiary sources, general tertiary drug information resources, information specific tertiary resources)**	1
5	**Primary Drug Information Resources.** **(Advantages and disadvantages of primary resources,**	1
6	**Primary Drug Information Resources.** **Types of clinical research studies, Design for controlled trials, Observational studies)**	1

7	**Evaluating primary resources.** **(Journal, title, abstract, introduction section, methods, patients/ population, sample size, ethical approval, endpoints, statistical analysis).**	1
8	**Internet Resources.** **(Advantages and disadvantages of using online DI resources, Criteria should be used when determining quality of online material).**	1
9	**Secondary drug information resources.** **(Indexing and abstracting systems, review articles and meta-analyses, clinical practice guidelines).**	1
10	**Review Articles and Systematic Reviews** **Types of review questions, process of conducting systematic, presentation of results in systematic review.**	1
11	**Meta-analyses** **Types of meta-analyses, presentation of results in meta-analysis, evaluation of narrative, systematic reviews, and meta-analysis.**	1
12	**Use of Clinical Practice Guidelines in Patient Care** **What is clinical practice guidelines? What is GRADE? The Level of Evidence (LOE)**	1
13	**Drug Evaluation Monographs** **Why do we need drug evaluation monographs? Commercially prepared monographs, drug class reviews vs. drug evaluation monograph, important considerations while working on drug evaluation monograph, format for drug monograph.**	1
14	**Introduction to conducting systematic reviews (Self learning) and revision.**	1
15	**Final written and oral exam**	
Week No.	**Practical topics**	**Credit hours**
1	**Use of tertiary resources for prescription reviewing and processing**	1

2	Use of tertiary resources for prescription reviewing within hospital setting	1
3	Using "Clinical Key" resource	1
4	Use of general tertiary resources	1
5	Use of specific tertiary resources	1
6	Evaluating Clinical Research Studies	1
7	Using Mobile Applications/ Website in Clinical Settings: Proper Drug Dosing and Preparation	1
8	Midterm exam	-
9	Using Mobile Applications/ Website in Clinical Settings: Drug Interaction Checker, Drug Stability, IV Compatibility	1
10	Using Clinical Practice Guidelines in Patient Care	1
11	Using PubMed in Evidence-Based Practice	1
12	Using Cochrane Library in Evidence-Based Practice	1
13	Using systematic approach to answer drug information inquires	1
14	Practical exam	-

5- Teaching and Learning Methods:

	Teaching and Learning Methods	week
5.1	Computer aided learning: a. On line learning through My mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans c. Advanced lectures using Power point (PPT) presentations and incorporating group discussion and problem based learning	7,14 1-6, 8-14
5.2	Tutorial sessions using patient case studies	1-12
5.3	Self-learning	14
5.4	Formative Assignments	10

6- Student Assessment:

d- Assessment Methods

Assessment Methods	K elements to be assessed
1-Written exam	**1.1.1.1/1.1.6.1/1.1.7.1/1.1.8.1/2.5.2.1/2.5.3.1/2.6.2.1**
2-Practical exam	**2.5.2.1/2.5.3.1/2.6.2.1/3.1.1.1/3.2.3.1/3.2.4.1/4.1.1.1/4.1.2.1/4.3.2.1**
3-Oral	**1.1.1.1/1.1.6.1/1.1.7.1/1.1.8.1/2.5.2.1/2.5.3.1/2.6.2.1/2.5.2.1/2.5.3.1 /2.6.2.1/3.1.1.1/3.2.3.1/3.2.4.1/4.1.1.1/4.1.2.1/4.3.2.1**
4- Periodical (Mid-term exam) / Course work	**1.1.1.1/1.1.6.1/1.1.7.1/1.1.8.1/2.5.2.1/2.5.3.1/2.6.2.1**

e- Assessment schedule

Assessment 1	Mid-term	7-9th week
Assessment 2	Practical	14th week
Assessment 3	Written	Starting from 15th week
Assessment 4	Oral	Starting from 15th week

f- Weighing of assessments

1	Mid-term examination & Semester work	15%
2	Practical examination and tutorial	25%
3	Final-term examination	50%
4	Oral examination	10%
Total		100%

7- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	Data show – computers, internet, round tables
Library	Reference books

- List of References

No	Reference	Type
1.	Lecture notes prepared by teaching staff	Course notes
2.	Remington Education: Drug Information and Literature Evaluation Abate, Marie A.; Blommel, Matthew L. Jan 2013	Essential Book
3.	AHFS - Drug Information Published by the American Society of Health-System Pharmacists 2022.	Essential Book
4.	Lexicomp, Dynamed Plus , Pubmed and BMJ best practice http://www.pubmed.com, www.ekb.eg http://www.sciencedirect.com / http://www.google scholar.com	Websites
5.	https://0810fmzcm-1104-y-https-www-clinicalkey-com.mplbci.ekb.eg/#!/browse/guidelines	Link to self-learning topic

9- Matrix of knowledge and skills of the course

Course contents	Outcomes Domains / Key elements												
	Domain 1				Domain 2			Domain 3			Domain 4		
	1.1.1.1	1.1.6.1	1.1.7.1	1.1.8.1	2.5.2.1	2.5.3.1	2.6.2.1	3.1.1.1	3.2.3.1	3.2.4.1	4.1.1.1	4.1.2.1	4.3.2.1
Introduction to drug information concept.	√	√	√	√	√	√		√	√	√	√	√	√
Drug Information Centre	√	√	√	√	√	√		√	√	√	√	√	√
Manufacturer-provided drug information	√	√	√	√	√	√		√	√	√	√	√	√
Tertiary Resources.	√	√	√	√	√	√	√	√			√	√	√
Primary Resources.	√	√	√	√	√	√		√	√	√	√	√	√
Primary Resources. Types of clinical research studies, Design for controlled trials, Observational studies)	√	√	√	√	√	√		√	√	√	√	√	√
Evaluating Clinical Research Studies.	√	√	√	√	√	√	√	√	√	√	√	√	√
Internet Resources	√	√	√	√	√	√		√	√	√	√	√	√
Secondary Resources								√	√		√	√	√
Review Articles and	√	√	√	√	√	√	√	√					√

Systematic Reviews													
Meta-analyses	√	√	√	√	√	√		√					√
Use of Clinical Practice Guidelines in Patient Care	√	√	√	√	√	√	√	√					
Drug Evaluation Monographs	√	√	√	√	√	√	√	√					
Introduction to conducting systematic reviews.							√	√					√

• Practical topics • Use of tertiary resources for prescription reviewing • Use of tertiary resources within hospital setting • Using "Clinical Key" resource • Use of general tertiary resources • Use of specific tertiary resources	√	√	√	√	√	√	√	√	√	√	√	√	√

• Evaluating primary resources • Using Mobile Applications: Proper Drug Dosing and Preparation • Using Mobile Applications/ Website: Drug Interaction Checker, Drug Stability, IV Compatibility • Using Clinical Practice Guidelines • Using PubMed in Evidence-Based Practice • Using Cochrane Library. • Using systematic approach to answer drug information inquires													

Matrix 2. Between course contents, methods of learning and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	Problem solving	Group discussion	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Introduction to drug information concept.	√				√		√		√	√
Drug Information Centre	√				√		√		√	√
Manufacturer-provided drug information	√			√	√		√		√	√
Tertiary Resources.	√			√	√		√		√	√
Primary Resources.	√			√	√				√	√
Primary Resources. Types of clinical research studies, Design for controlled trials, Observational studies)	√			√	√				√	√
Evaluating Clinical Research Studies.	√			√	√				√	√
Internet Resources		√		√	√				√	√
Secondary Resources	√			√	√				√	√
Review Articles and Systematic Reviews	√			√	√				√	√
Meta-analyses	√			√	√				√	√
Use of Clinical Practice Guidelines in Patient Care	√			√	√				√	√
Drug Evaluation Monographs	√			√	√				√	√
Introduction to conducting systematic reviews.		√				√			√	√

B) Practical Part:

Course Contents		Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Tutorial sessions	Problem solving	Group discussion	Computer-aided learning	Self-learning	Corse Work	Tutorial	Written	Oral
Use of tertiary resources for prescription reviewing and processing			√	√	√	√			√		
Use of tertiery resources for prescription reviewing within hospital setting			√	√	√	√			√		
Using “Clinical Key” resource			√	√	√	√			√		
Use of general tertiery resources			√	√	√	√			√		
Use of specific tertiery resources			√	√	√	√			√		
Evaluating Clinical Research Studies			√	√	√	√			√		

Using Mobile Applications/ Website in Clinical Settings: Proper Drug Dosing and Preparation			√	√	√	√			√		
Using Mobile Applications/ Website in Clinical Settings: Drug Interaction Checker, Drug Stability, IV Compatibility			√	√	√	√			√		
Using Clinical Practice Guidelines in Patient Care			√	√	√	√			√		
Using PubMed in Evidence-Based Practice			√	√	√	√			√		
Using Cochrane Library in Evidence-Based Practice			√	√	√	√			√		
Using systematic approach to answer drug information inquires			√	√	√	√		√	√		

Course Coordinator	**Dr. Moetaza Mahmoud Hassab**

	Moetaza Soliman
Head of Department	**Prof. Dr. Mohamed Elhusseiny Shams**
	Mohamed Shams

Date: 7/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification Academic year: 2023/2024

Clinical Biochemistry – Course Code: PB-414

Course name: Clinical Biochemistry	**اسم المقرر: الكيمياء الحيوية الإكلينيكية**
Academic Level: Level Four	**المستوى الأكاديمي: المستوى الرابع**
Scientific department: Biochemistry Dept.	**القسم العلمي: الكيمياء الحيوية**
Acting Head of Department: **Dr. Noha M.H. Abdel-Rahman**	**قائم بعمل رئيس مجلس القسم:** **د. نهى منصورحسن عبد الرحمن**
Course Coordinator: **Prof. Dr. Mamdouh M. El-Shishtawy**	**منسق المقرر:** **أ.د. ممدوح محمد الششتاوي**

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Biochemistry**
Department supervising the course	**Biochemistry**
Program on which the course is given	**B. Pharm. (Pharm D)**
Academic Level	**Level Four, First Semester, 2023-2024**
Date of course specification approval: **Date of Department Council Approval:** **Date of Faculty Council Approval:**	 **16th September 2023** **20th September 2023**

A. Basic Information: Course data:

Course Title	**Clinical Biochemistry**
Course Code	**PB 414**
Prerequisite	**Biochemistry-2**
Teaching credit hours: Lecture	**2**
Teaching Credit Hours: Practical/ tutorial	**1**
Total Credit Hours	**3**

B. Professional Information:

1.Course Aims:

This course aims to enable the students to:

- Understand:

✓ The functional state of liver, kidney, heart, and bone in health and disease.
✓ Some disorders of lipids and carbohydrate metabolism.
✓ The different laboratory diagnostic tests of liver, kidney, heart, and bone and lab differentiation of hyperlipidemia and lipoproteinemia.
✓ Some endocrine disorders (Pituitary and thyroid glands) by studying (classification of hormones, mechanisms of action, and dysfunction).

- Be aware of the value of measuring plasma proteins, albumin/globulin ratio, recent diagnostic biomarkers, electrolytes, blood gases and acid-base balance.
- Have the skills of handling, preservation, storage, and analysis of biological samples, such as abnormalities of urine analysis, blood analysis and Complete Blood Count (CBC).

2- Course key elements:

Upon completing the course, the student will be able to dominate the following key elements:

Domain 1: fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	Describe the functions of liver, kidney, heart, and bone in health and disease state.
	1.1.1.2	Differentiate different disorders of lipids, carbohydrates, the etiology, laboratory diagnosis and clinical features of Diabetes Mellitus.
1.1.4	1.1.4.1	Analyze knowledge from biochemistry to understand drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.
1.1.5	1.1.5.1	Interpret different lab investigations to solve problems related to human health.
1.1.6	1.1.6.1	Handle and analyze biological samples to identify abnormalities in urine and serum.

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.1.2	2.1.2.1	Employ healthcare and pharmacy ethics that respect patients' rights and value diversity in society.
2.3.1	2.3.1.1	Handle and dispose hazardous chemicals, biological samples safely.
2.3.2	2.3.2.1	Choose best practices and adhere to high safety standards for management of biological samples.
2.4.3	2.4.3.1	Recognize signs, symptoms and risk factors that relate to different health problems and take appropriate action.
2.4.5	2.4.5.1	Evaluate pharmacological and non-pharmacological systemic approaches designed for management of various disorders affecting on various body organs.
2.5.2	2.5.2.1	Collect, interpret, and analyze biochemical data requested in pharmaceutical profession
2.5.3	2.5.3.1	Participate in the conception and performance of research studies that employ updated and simple biochemical analysis techniques.

Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Utilize the concepts of biochemistry and the foundations of genomics in various diseases in order to be capable of their management.
3.1.3	3.1.3.1	Conduct laboratory tests using colorimetric technique on serum samples for identification of diseases.
3.1.4	3.1.4.1	Outline the characters, laboratory diagnosis, and clinical features of different diseases and their treatment and prevention.
3.2.5	3.2.5.1	Provide education and counseling to other healthcare professionals to support the patients with safe, effective, and cheap care plan.

Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share decision-making stages with other medical team members with conducting effective time management skills.
4.1.2	4.1.2.1	Retrieve and evaluate information, solve problems, and work effectively in a team.
4.2.1	4.2.1.1	Use clear language, pace, tone, and non-verbal communication and writing skills when dealing with patients, other health team and communities.
4.2.2	4.2.2.1	Utilize advanced technologies and channels whenever possible to present relevant information.
4.3.1	4.3.1.1	Carry out self-evaluation strategies to improve pharmaceutical professional skills.
4.3.2	4.3.2.1	Promote continuous professional development by practicing self and independent learning.

3- Course Contents:

Week No.	Topics	Lecture Cr. Hrs
1	Introduction.	2
2	Myocardial infarction.	1
	Diagnostic enzymology/Group Discussion.	1
3	Liver structure, functions, liver disease, Liver function tests.	2
4	Blood glucose regulations, insulin structure, action, and function	2
5	Diabetes mellitus: types, risk factors, symptoms, and complications /Student activity by preparation of power point presentation.	2
6	Kidney function tests	2
7	Urine analysis	1
	Blood analysis/Class Work/Activity.	1
8	CBC, Electrolytes	2
9	Pituitary disorders	2
10	Thyroid disorders	2
11	Endocrine Testing Protocols/Case study.	2
12	Metabolic bone disease	1
	Lab differentiation of hyperlipidemia/Seminars through Microsoft Teams.	1
13	Blood gases, Acid-base balance	2
14	Revision and quiz	-
15	**Final written and oral exams**	-
Week No.	**Practical Topics**	**Practical Cr. Hrs.**
1	Patient Sample collection and the use of laboratory.	1
2	Laboratory Diagnosis of Diabetes Mellitus/ Complications of Diabetes Mellitus	1
3	Oral Glucose Tolerance Test/**case study.**	1
4	Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus.	1
5	Tests for Evaluation of Liver Function (Total protein, ALT, AST).	1
6	Determination of serum bilirubin (total and direct) /**case study**.	1
7	Tumor markers.	1
8	Midterm exam	-
9	Acute myocardial infarction/**Presentation**.	1

10	Diagnosis of renal dysfunction (Renal tubular acidosis)/ **Presentation**.	1
11	Diagnosis of renal dysfunction (Diabetes insipidus)/ **Presentation**.	1
12,13	Revision**case study**.	2
14	**Sheet and Practical Exam**	-

4- Teaching and Learning Methods:

		Week	K. elements to be addressed
4.1	Advanced lectures using Power Point (PPT) presentations.	1-14	**1.1.1.1, 1.1.5.1, 1.1.6.1,**
4.2	Practical session using chemicals and laboratory equipment and/or tutorials.	1-14	**2.3.1.1**
4.3	Activities and tasks required to develop students' self-learning skills.	7-13	**4.3.2.1**
4.4	Class Activity and Group Discussion to explain what has not been understood.	7, 9-11	**4.1.1.1, 4.1.2.1, 4.2.1.1**
4.5	Hybrid Learning and computer-aided learning: Interactive Sessions using Microsoft Teams.	1-14	**1.1.1.1, 1.1.5.1, 1.1.6.1,**
4.6	Internet search and Research Assignments to design Formative Assignments.	7-11	**4.3.2.1**
4.7	Presentation.	4-9	**4.2.1.1, 4.2.2.1**
4.8	Case study.	2-13	**2.4.5.1**

5- Student Assessment:

a- Assessment Methods:

	Assessment Methods	K elements to be assessed
1	Written exam	**1.1.1.1, 1.1.1.2, 1.1.5.1, 2.4.5.1, 3.1.4.1**
2	Practical exam (OSPE)	**1.1.5.1, 2.3.1.1, 2.3.2.1, 3.1.3.1**
3	Oral exam	**1.1.1.1, 1.1.1.2, 3.1.4.1, 4.1.2.1,4.2.1.1**
4	Periodical (Mid-term Exam)/Course work	**1.1.1.1, 1.1.1.2, 1.1.5.1, 2.4.5.1, 3.1.4.1, 4.1.2.1, 4.2.1.1, 4.2.2.1, 4.3.2.1**

b. Assessment schedule

Assessment 1	Periodical (Mid-term Exam)/Course work	7-9th week
Assessment 2	Practical Exam and Practical Sheet Exam	14th week
Assessment 3	Written exam	15th week
Assessment 4	Oral exam	15th week

c. Weighing of assessments

1	Periodical (Mid-term) exam\ Course work	15%
2	Practical Exam and Practical Sheet Exam	25%
3	Final term written examination	50%
4	Oral examination	10%
Total		100%

6- Facilities required for teaching and learning

-Classroom	Data show- Computers, Internet.
-Laboratory facilities	Chemicals – glassware – whiteboard – colorimeter – automatic pipettes
-Library	Textbooks

7- List of References

No	Reference	Type
1.	**Electronic book prepared by staff members (2023/2024).**	**Course notes**
2.	**Recorded videos prepared by staff members.**	**Videos on platform**
3.	**Clinical Chemistry, William Marshall, Marta Lapselky, Andrew Day, 8th edition, 2016.**	**Textbook**

4.	**Lippincott Illustrated Reviews: Biochemistry, 8th Edition by Emine E. Abali, Susan D. Cline, David S. Franklin, Susan M. Viselli January 2021**	**Textbook**
5.	**Basic Clinical Laboratory techniques, Barbara Estridge, Anna Renoylds (Eds), 6th edition, 2011.**	**Textbook**
6.	**https://www.ncbi.nlm.nih.gov/books/NBK459183/** **https://www.ekb.eg**	**Websites**

8- Matrix 1. Course contents versus course k. elements:

Course contents / K. elements	Domain 1					Domain 2							Domain 3				Domain 4					
	1.1.1.1	1.1.1.2	1.1.4.1	1.1.5.1	1.1.6.1	2.1.2.1	2.3.1.1	2.3.2.1	2.4.3.1	2.4.5.1	2.5.2.1	2.5.3.1	3.1.1.1	3.1.3.1	3.1.4.1	3.2.5.1	4.1.1.1	4.1.2.1	4.2.1.1	4.2.2.1	4.3.1.1	4.3.2.1
A) Theoretical part																						
Introduction.		✓		✓	✓	✓	✓	✓					✓									
Diagnostic enzymology – Myocardial infarction	✓			✓					✓	✓		✓	✓		✓							
Liver structure, functions, liver disease, Liver function tests.	✓			✓					✓	✓	✓		✓		✓	✓						
Blood glucose regulations, insulin structure, action, and function		✓		✓	✓				✓				✓		✓	✓						
Diabetes mellitus: types, risk factors, symptoms, and	✓		✓	✓					✓	✓					✓	✓						

complications /Student activity by preparation of power point presentation.																					
Kidney function tests		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓						
Urine analysis, Blood analysis/Class Work/Activity.		✓		✓											✓	✓	✓				
CBC, Electrolytes				✓					✓				✓		✓	✓				✓		✓
Pituitary disorders				✓	✓			✓		✓		✓			✓							
Thyroid disorders	✓	✓	✓	✓				✓	✓	✓		✓	✓		✓	✓	✓					
Endocrine Testing Protocols/Case study.	✓			✓						✓					✓	✓	✓	✓		✓	✓	✓
Metabolic bone disease, Lab differentiation of hyperlipidemia/Seminars through Microsoft Teams.	✓			✓						✓					✓	✓	✓	✓		✓	✓	✓
Blood gases, Acid-base balance.	✓			✓						✓					✓	✓	✓	✓		✓	✓	✓

B) Practical Topics

Patient Sample collection and the use of laboratory.		✓	✓	✓	✓	✓	✓	✓			✓	✓		✓		✓					
Laboratory Diagnosis of Diabetes Mellitus/ Complications of Diabetes Mellitus		✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Oral Glucose Tolerance Test/**case study.**		✓		✓	✓		✓	✓			✓			✓	✓	✓					
Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus.		✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓					
Tests for Evaluation of Liver Function (Total protein, ALT, AST).	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Determination of serum bilirubin (total and direct) /**case study**.	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tumor markers.	✓			✓					✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Acute myocardial infarction/**Presentation**.	✓	✓		✓					✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

Diagnosis of renal dysfunction/ **Presentation**.	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Revision**case study**.	✓	✓	✓	✓	✓				✓		✓			✓	✓		✓	✓	✓	✓	✓	✓

9-Matrix 2. course contents, methods of learning and assessment

A) Theoretical Part												
Course contents	**Teaching and learning methods**								**Assessment methods**			
	Advance lectures	**Hybrid leaning**	**Lab session**	**Presentation**	**Research assignments**	**Case study**	**Class activity**	**Self-learning**	**Corse Work**	**Practical**	**Written**	**Oral**
Introduction.	✓	✓							✓		✓	✓
Diagnostic enzymology –Myocardial infarction	✓	✓							✓		✓	✓
Liver structure, functions, liver disease, Liver function tests.	✓	✓							✓		✓	✓
Blood glucose regulations, insulin structure, action, and function	✓	✓							✓		✓	✓
Diabetes mellitus: types, risk factors, symptoms, and complications /Student activity by preparation of power point presentation.	✓	✓		✓					✓		✓	✓
Kidney function tests	✓	✓							✓		✓	✓
Urine analysis, Blood analysis/Class Work/Activity.	✓	✓					✓		✓		✓	✓
CBC, Electrolytes	✓	✓									✓	✓
Pituitary disorders	✓	✓									✓	✓
Thyroid disorders	✓	✓									✓	✓
Endocrine Testing Protocols/Case study.	✓	✓				✓		✓			✓	✓
Metabolic bone disease, Lab differentiation of hyperlipidemia/Seminars through Microsoft Teams.	✓	✓						✓			✓	✓
Blood gases, Acid-base balance.	✓	✓						✓			✓	✓
B) Practical part												
Patient Sample collection and the use of laboratory.		✓	✓							✓		
Laboratory Diagnosis of Diabetes Mellitus/		✓	✓			✓				✓		

Complications of Diabetes Mellitus												
Oral Glucose Tolerance Test/**case study.**		✓	✓			✓				✓		
Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus.		✓	✓	✓		✓				✓		
Tests for Evaluation of Liver Function (Total protein, ALT, AST).		✓	✓	✓		✓				✓		
Determination of serum bilirubin (total and direct) /**case study**.		✓	✓	✓		✓				✓		
Tumor markers.		✓	✓		✓	✓		✓		✓		
Acute myocardial infarction/**Presentation**.		✓	✓	✓	✓	✓		✓		✓		
Diagnosis of renal dysfunction/ **Presentation**.		✓	✓	✓	✓	✓	✓	✓		✓		
Revision**case study**.		✓	✓		✓	✓	✓	✓		✓		

9- Signature:

Course Coordinator	
Prof. Dr. Mamdouh M. El-Shishtawy	
Head of Department:	
Assist. Prof. Noha M.H. Abdel-Rahman	

Date of Department Council Approval: 16/9/2023
Date of Faculty Council Approval: 20/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmaceutical technology I	**اسم المقرر: التكنولوجيا الصيدلية 1**
Academic Level: Level 4	**المستوى الأكاديمي: الرابع**
Scientific department: Pharmaceutics	**القسم العلمي: الصيدلانيات**
Head of Department: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**رئيس القسم:** **أ.د/ إرهان إبراهيم أبوهاشم**
Course Coordinator: **Prof. Dr. Hassan Mohamed Hassan Elsabbagh**	**منسق المقرر:** **أ.د/حسن محمد حسن الصباغ**

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmaceutics
Department supervising the course	Pharmaceutics
Program on which the course is given	**Bachelor in Pharmacy -Pharm D by law**
Academic Level	Fourth level, First semester, 2023-2024
Date of course specification approval	September 2023

A. Basic Information: Course data:

Course Title	**Pharmaceutical technology I**
Course Code	**PT 418**
Prerequisite	**Pharmaceutics I**
Teaching Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**3**

B. Professional Information:

4- Course Aims:

1. Orienting the students to industrial pharmacy introduction, basic principles of various unit operations.
2. Recognizing different applications of these unit operations in pharmaceutical industry.
3. Knowing the different types of equipment used in large scale production of different dosage forms.

Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.7	**1.1.7.1**	List the basic principles of industrial pharmacy including various unit operations.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.3.3	**2.3.3.1**	Apply the principles of proper disposal of recalled, expired and unusable pharmaceutical products.
2.2.3	**2.2.3.1**	Specify basic principles for the use of various equipment and machines for production of different pharmaceutical products, besides their numerous applications.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.2.2	**4.2.2.1**	Apply the principles of the possibility of artificial technology use whenever possible.
4.3.2	**4.3.2.1**	Practice self-learning to improve professional skills

3- Course Contents

Week No.	Topics	Credit Hours
1	Filtration and Filter aids	2
2	Classification of filtration equipment	2
3	Heat transfer (Fourier's law)	2
4	Heat transfer (The basic mechanisms)	2
5	Extraction (Factors influencing the rate of extraction, equipment)	2
6	Drying (Equipment (classification, construction, operation)	2
7	Evaporation (Equipment (classification, construction, operation)	2
8	Evaporators accessories (condensers)	2
9	Crystallization (Steps of crystallization	2
10	Crystallization equipment	2
11	Centrifugation (definition, significance)	2
12	Centrifugation (application, theory)	2
13	Centrifugation equipment	2
14	Revision and quiz	-
15	**Final and oral exam**	-
Week No.	**Practical topics**	**Credit hours**
1	- Introduction to quality control tests - Dryers	1
2	-Determination of tablet diameter & thickness -Filters	1
3	-Determination of tablet hardness -Filters	1
4	-Weight uniformity of tablet & capsule -Filters	1
5	-Tablet Friability - Evaporators	1
6	-Tablet disintegration	1
7	- Evaporators	1
8	Midterm exam	-
9	-Content uniformity of tablets	1
10	- Centrifuges	1

11	-Tablet dissolution test	1
12	- Evaporators accessories (condensers)	1
13	-Crystallizers	1
14	**Sheet & tutorial exam**	**-**

4- Teaching and Learning Methods:

	Teaching and Learning Methods	**Weeks**	**K. elements to be addressed**
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • Online learning through my mans "Mansoura university" as recorded video lectures Interactive discussion through My Mans & Advanced lectures.	**1-14**	**1.1.7.1, 2.2.3.1, 4.2.2.1, 4.3.2.1**
4.2	Practical tutorials using data show and books / problem solving	**1-14**	**1.1.7.1, 2.3.3.1, 2.2.3.1**
4.3	Self-learning	**6**	**4.3.2.1**
4.4	Class Activity Discussion / presentation	**3-11**	**4.2.2.1, 4.3.2.1**

5- Student Assessment:

g- Assessment Methods:

1-Written exam	1.1.7.1, 2.2.3.1
2-Practical exam applying OSPE	2.3.3.1, 2.2.3.1
3-Oral	1.1.7.1, 2.2.3.1, 4.2.2.1
4- Periodical (Mid-term exam) / Course work	1.1.7.1, 2.2.3.1, 4.2.2.1

h- Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7-9th week
Assessment 2	Practical examination and tutorial	14th week
Assessment 3	Written exam	Start at 15th week
Assessment 4	Oral exam	Start at 15th week

i- Weighing of assessments

6- Facilities required for teaching and learning

1	Periodical (Mid-term) exam / Course work	15%
2	Practical examination and tutorial	25%
3	Final-term written examination	50%
4	Oral examination	10%
Total		100%

Classroom	Data show- Computers, Internet, Platform
Library	Books and Pharmacopoeia

7-List of References

No	Reference	Type
1.	Electronic book “Pharmaceutical technology I” prepared by staff members.	Course notes
2.	Recorded videos prepared by stuff members	Videos on platform
3.	“Chemical Engineering Design by Gavin Towler (Elseveir) 2nd edition (2012).	Essential Book
4.	The theory and practice of industrial pharmacy 2nd Ed., lea & Febiger, Philadelphia, (2002).	Essential Book
5.	"Encyclopedia of Pharmaceutical Science and Technology" 4th Ed., james Swarbrick, by CRC Press, (2013).	Essential Book
6.	"Current Research in Pharmaceutical Technology" 1st Ed., Sabine Globig and William Hunter JR., (2011).	Essential Book
7.	**http://www.sciencedirect.com** **http://www.google.com,** **http://www.pubmed.com** **https://www.ekb.eg**	Websites

Matrix 1: of course content versus course k. elements:

Theoretical part:							
Course contents	**Domains**						
	Domain 1		**Domain 2**			**Domain 4**	
	1.1.7.1		**2.3.3.1**	**2.2.3.1**		**4.1.2.1**	**4.3.2.1**

Filtration and Filter aids	√						
Classification of filtration equipment	√			√			
Heat transfer (Fourier's law)			√				
Heat transfer (The basic mechanisms)	√			√			
Extraction (Factors influencing the rate of extraction, equipment)	√		√	√			
Drying (Equipment (classification, construction, operation)	√			√		√	√
Evaporation (Equipment (classification, construction, operation)	√			√			
Evaporators accessories (condensers)	√		√	√			
Crystallization (Steps of crystallization	√			√			
Crystallization equipment	√						
Centrifugation (definition, significance)	√			√			
Centrifugation (application, theory)	√						
Centrifugation equipment	√		√	√			
Practical part:							
Course contents	**Domains**						
	Domain 1		**Domain 2**			**Domain 4**	
	1.1.7.1		**2.3.3.1**	**2.2.3.1**		**4.1.2.1**	**4.3.2.1**
- Introduction to quality control test				√			
-Determination of tablet diameter & thickness -Filters	√			√			

-Determination of tablet hardness -Filters	√		√	√			
-Weight uniformity of tablet & capsule - Dryers	√			√		√	√
-Tablet Friability - Evaporators	√		√	√		√	
-Tablet disintegration	√			√		√	
- Evaporators	√			√		√	
-Content uniformity of tablets -Centrifuges	√		√	√		√	
-Tablet dissolution test	√		√	√		√	
- Evaporators accessories (condensers)	√			√		√	
-Crystallizers	√			√		√	

Matrix 2. Between course contents, methods of learning and assessment

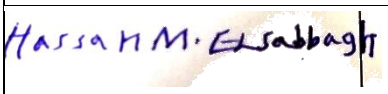
A) Theoretical part:

Course contents	Teaching and learning methods				Assessment method		
	Advanced lecture	Hybrid based learning	Oral presentations	Self-learning	Corse work/mid-term	written	oral
Filtration and Filter aids	√				√	√	√
Classification of filtration equipment	√				√	√	√
Heat transfer (Fourier's law)	√				√	√	√
Heat transfer (The basic mechanisms)	√				√	√	√
Extraction (Factors influencing the rate of extraction, equipment)	√					√	√
Drying (Equipment (classification, construction, operation)	√		√	√		√	√
Evaporation (Equipment (classification, construction, operation)	√	√				√	√
Evaporators accessories	√					√	√

(condensers)							
Evaporators accessories (condensers)	√					√	√
Crystallization (Steps of crystallization	√					√	√
Crystallization equipment	√					√	√
Centrifugation (definition, significance)	√					√	√
Centrifugation (application, theory)	√					√	√
Centrifugation equipment	√					√	√

A) practical part:

Course contents	Teaching and learning methods				Assessment method		
	Hybrid based learning	Lab sessions	Problem solving	Oral presentations	Practical	written	Oral
- Introduction to quality control tests - Dryers	√	√	√		√		
-Determination of tablet diameter & thickness -Filters	√	√	√		√		
-Determination of tablet hardness -Filters	√	√	√	√	√		
-Weight uniformity of tablet & capsule -Filters	√	√	√	√	√		
-Tablet Friability - Evaporators	√	√	√	√	√		
-Tablet disintegration	√	√	√	√	√		
- Evaporators	√	√	√	√			
-Content uniformity of tablets -Centrifuges	√	√	√	√	√		
-Tablet dissolution test	√	√	√	√	√		
- Evaporators accessories (condensers)	√	√		√			
-Crystallizers	√	√		√			

Course Coordinator	**Prof. Dr. Hassan Mohamed Hassan Elsabbagh**
	
Head of Department	**Prof. Dr. Irhan Ibrahim Abu Hashim**
	

Approval Date: 20/9/2023

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: **Medicinal chemistry-1**	**اسم المقرر :** **كيمياء دوائية-1**
Academic Level: **level 4**	**المستوى الأكاديمي : الرابع**
Scientific department: **Medicinal chemistry**	**القسم العلمي :** **الكيمياء الدوائية**
Head of Department: **Prof. Dr. Mohamed Ahmed Moustafa**	**رئيس القسم :** **أ.د/ محمد أحمد مصطفى**
Course Coordinator: **Prof. Dr. Hussein I. El-Subbagh**	**منسق المقرر:** **أ.د. حسين إبراهيم الصباغ**

University	Mansoura
Faculty	Pharmacy
Department offering the course	Medicinal Chemistry
Program on which the course is given	Bachelor's Degree in Pharmacy - PharmD
Academic Level	Fourth level, First semester, 2023/2024
Date of course specification approval	6/9/2023

C- Basic Information: Course data:

Course Title	Medicinal Chemistry-1
Course Code	PD411
Prerequisite	Organic Chemistry III
Teaching Hours/ week: Lecture:	2
Practical:	1
Total Credit Hours	3

D- Professional Information:

5- Course Aims:

This course enables the students to:

- Identify the principles of medicinal chemistry.
- Study physicochemical properties of drugs, drug-receptor interaction, the molecular aspects governing drugs' pharmacokinetics (ADME) and pharmacodynamics.
- Explain the different phases of drug metabolism and the enzymes involved.
- Understand the mode of action and structure activity relationship (SAR) of drugs affecting autonomic nervous system (ANS), cardiovascular drugs and diuretics.
- Know the chemistry, synthesis and nomenclature of drugs affecting ANS, cardiovascular drugs and diuretics.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements:

Domain 1: fundamental knowledge

Program Key Element No.	Course Key Element No.	Course Key Element
1.1.1	1.1.1.1	Recognize in depth and breadth knowledge of pharmaceutical and biomedical sciences related to drug action and *in vivo* biotransformation of drugs.
1.1.2	1.1.2.1	Apply proper pharmaceutical and medical terminology including abbreviation and symbols used in pharmacy profession.
	1.1.2.2	Recognize international non-proprietary names (generic names) of drugs.
1.1.4	1.1.4.1	Recognize different properties of drugs, including molecular mechanism of action, clinical uses, drug interactions, contra-indications, adverse drug reactions (ADRs) and structure-activity relationship (SAR).
1.1.7	1.1.7.1	Manipulate knowledge gained in medicinal chemistry to provide information about drug production and proper use of drugs.

Domain 2: professional and ethical practice

Program Key Element No.	Course Key Element No.	Course Key Element
2.5.3	2.5.3.1	Adapt concepts of medicinal chemistry used in the systematic approach applied in drug development.

Domain 3: pharmaceutical care

Program Key Element No.	Course Key Element No.	Course Key element
3.2.1	3.2.1.1	Adapt principles of medicinal chemistry and pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions.
3.2.5	3.2.5.1	Apply medicinal chemistry aspects of drugs to support the patients, and community in making informed decisions about their care plan including OTC preparations.

Domain 4: personal practice

Program Key Element No.	Course Key Element No.	Course Key Element
4.1.2	4.1.2.1	Appraise information, analyze data, identify problems and present solutions depending on medicinal chemistry aspects.
	4.1.2.2	Participate collaboratively and independently as drug chemistry expert within healthcare team.
4.2.1	4.2.1.1	Communicate effectively in a proper scientific language by verbal and written means in the field of health care related to the studied topics.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development and life-long learning.

7- Course Contents

C) Theoretical part

Week No.	Topics	Hours
1	**Introduction to Medicinal Chemistry. Mechanisms of drug absorption. Physicochemical properties of drugs.**	2
2	**Hydrophilic / lipophilic properties. Electronic and steric effects of substituents.**	2
3	**Drug receptor interaction, isosterism and bioisosterism** **Introduction to drug metabolism and Phase I Reactions: Oxidation Reactions.**	2
4	**Hydrolysis Reactions. Oxidation and reduction reactions.**	2
5	**Hydrolysis and conjugation. Factors affecting drug metabolism**	2
6	**Adrenergic agonists (part 1)**	2
7	**Adrenergic agonists (part 2). Adrenergic antagonists (part 1).**	2
8	**Adrenergic antagonists (part 2). Antihypertensive drugs (part 1).**	2
9	**Antihypertensive drugs (part 2).** **Antianginal drugs.**	2
10	**Antihyperlipidemic drugs. Anticoagulant drugs**	2
11	**Diuretics**	2
12	**Cholinergic agonists.**	2
13	**Cholinergic antagonists (Self learning)**	2
14	**Revision and quiz**	2
15	**Final Written and Oral Exam**	--

D) Practical part

Week No.	Topics	Hours
1	Acid-base properties of drugs, predicting the degree of ionization of drug molecules.	1
2	Hydrophilic and lipophilic properties, Hansch constant and LogP problem solving	1
3	Types of receptor interactions.	1
4	Case study on physicochemical properties of drug action.	1
5	Exam on Physicochemical properties of drug action.	1
6	Case study: adrenergic drugs	1
7	Case study: antianginal and antihypertensive drugs	1
8	Midterm exam	-
9	Case study: anticoagulants	1
10	Case study: antihyperlipidemic drugs	1
11	Case study: diuretics	1
12	Case study: cholinergic drugs	1
13	Case study: anti-cholinergic drugs	1
14	**Practical exam**	--

8- Teaching and Learning Methods:

No.	Teaching and learning Methods	Week No.	Key elements to be addressed
4.1	Computer aided learning: a. Lectures using Data Show, Power Point Presentations b. Distance learning • Online learning through My Mans "Mansoura university "as recorded – video lectures • Interactive discussion through My Mans (Microsoft teams)	1-14	1.1.1.1, 1.1.1.2, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.2	Self-learning	13	2.5.3.1, 3.2.1.1, 3.2.5.1, 4.3.2.1
4.3	Tutorial sessions using Data Show, Power Point Presentations and possible applications of OSCE	1-14	1.1.1.1, 1.1.1.2, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.4	Class Activity: Group discussion offline and online	1-9	4.1.2.1, 4.2.1.1, 4.3.2.1

4.5	Problem – based learning and brainstorming	1-9	1.1.1.1, 1.1.1.2, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.2.1.1, 4.1.2.2., 4.3.2.1

9- Student Assessment:

j- Assessment Methods:

Assessment Methods	Key elements to be assessed
1- Periodical (Mid-term exam / Course work)	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 4.1.2.1, 4.3.2.1
2- Practical exam using OSPE	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
3- Written exam	1.1.1.1, 1.1.1.2, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.3.2.1
4- Oral exam	1.1.1.1, 1.1.1.2, 1.1.2.1, 1.1.2.2, 4.1.2.1

k- Assessment schedule:

Assessment 1	Periodical (Mid-term/ Course work)	7-9th week
Assessment 2	Practical exam (OSPE)	14th week
Assessment 3	Written exam	15th week
Assessment 4	Oral exam	15th week

l- Weighing of assessment:

1	Periodical (Mid-term/ Course work)	15%
2	Practical exam	25%
3	Written exam	50%
4	Oral exam	10%
Total		100%

10- Facilities required for teaching and learning.

- Classroom	Data show- Computers, Internet. (Available)
- Laboratory facilities	Data show and white board. (Available)
- Library	Textbooks.

11- List of References

No	Reference	Type
1.	Electronic book prepared by staff members.	Course notes
2.	"Foye's Principles of Medicinal Chemistry", 8th edition, (David A. Williams, Thomas L. Lemke & William O. Foye, Editors), Lippincott Williams & Wilkins, 2017	Essential Book
3.	"Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, (J. H. Block and J. M. Beale Jr, Editors), Lippincott Williams & Wilkins, Philadelphia, PA, 2013	Recommended Book
4.	Graham L. Patrick; "An Introduction to Medicinal Chemistry" Oxford University Press, USA; 6th Revised edition, 2017	Recommended Book
5.	Thomas, Gareth, "Fundamentals of Medicinal Chemistry" Wiley-Blackwell; Kindle Edition (2013).	Recommended Book
6.	http://www.sciencedirect.com/ http://www.googlescholar.com/ http://www.pubmed.com https://www.ekb.eg	Website

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents / Key elements	Domain 1					Domain 2	Domain 3		Domain 4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.4.1	1.1.7.1	2.5.3.1	3.2.1.1	3.2.5.1	4.1.2.1	4.1.2.2	4.2.1.1	4.3.2.1
Introduction to Medicinal Chemistry. Mechanisms of drug absorption. Physicochemical properties of drugs.	✓	✓	✓						✓		✓	
Hydrophilic / lipophilic properties. Electronic and steric effects of substituents.	✓		✓						✓		✓	
Drug receptor interaction, isosterism and bioisosterism Introduction to drug metabolism and Phase I Reactions: Oxidation Reactions.	✓		✓	✓	✓	✓	✓	✓	✓		✓	
Hydrolysis Reactions. Oxidation and reduction reactions.	✓		✓	✓	✓	✓	✓	✓	✓		✓	

Hydrolysis and conjugation. Factors affecting drug metabolism	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Adrenergic agonists (part 1)	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Adrenergic agonists (part 2). Adrenergic antagonists (part 1).	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Adrenergic antagonists (part 2). Antihypertensive drugs (part 1).	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Antihypertensive drugs (part 2). Antianginal drugs.	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Antihyperlipidemic drugs. Anticoagulant drugs	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Diuretics	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Cholinergic agonists.	✓		✓	✓	✓		✓		✓	✓		✓		✓	
Cholinergic antagonists (Self learning)	✓	✓	✓	✓	✓		✓		✓	✓		✓	✓	✓	✓

B) Practical part:

Course contents / Key elements	Domain 1						Domain 2		Domain 3			Domain 4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.4.1	1.1.7.1		2.5.3.1		3.2.1.1	3.2.5.1		4.1.2.1	4.1.2.2	4.2.1.1	4.3.2.1
Acid-base properties of	✓	✓	✓	✓	✓		✓					✓	✓	✓	✓

drugs, predicting the degree of ionization of drug molecules.														
Hydrophilic and lipophilic properties, Hansch constant and LogP problem solving	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓
Types of receptor interactions.	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓
Case study on physicochemical properties of drug action.	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓
Exam on Physicochemical properties of drug action.	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: adrenergic drugs	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: antianginal and antihypertensive drugs	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: anticoagulants	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: antihyperlipidemic drugs	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: diuretics	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
Case study: cholinergic drugs	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓

Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

Course Contents	Teaching and Learning methods				Assessment methods		
	Lecture	Hybrid leaning	Comp. aided learning	Self-learning	Corse Work	Written	Oral
Introduction to Medicinal Chemistry. Mechanisms of drug absorption. Physicochemical properties of drugs.	✓	✓	✓		✓	✓	✓
Hydrophilic / lipophilic properties. Electronic and steric effects of substituents.	✓	✓	✓		✓	✓	✓
Drug receptor interaction, isosterism and bioisosterism Introduction to drug metabolism and Phase I Reactions: Oxidation Reactions.	✓	✓	✓		✓	✓	✓
Hydrolysis Reactions. Oxidation and reduction reactions.	✓	✓	✓		✓	✓	✓
Hydrolysis and conjugation. Factors affecting drug metabolism	✓	✓	✓			✓	✓
Adrenergic agonists (part 1)	✓	✓	✓			✓	✓
Adrenergic agonists (part 2). Adrenergic antagonists (part 1).	✓	✓	✓			✓	✓
Adrenergic antagonists (part 2). Antihypertensive drugs (part 1).	✓	✓	✓			✓	✓
Antihypertensive drugs (part 2). Antianginal drugs.	✓	✓	✓			✓	✓
Antihyperlipidemic drugs. Anticoagulant drugs	✓	✓	✓			✓	✓
Diuretics	✓	✓	✓			✓	✓
Cholinergic agonists.	✓	✓	✓			✓	✓
Cholinergic antagonists (Self learning)	✓	✓	✓	✓		✓	✓

B) Practical part:

Course Contents	Teaching and Learning methods			Assessment methods
	Hybrid learning	Comp. aided learning	Lab sessions	Practical/Tutorial
Acid-base properties of drugs, predicting the degree of ionization of drug molecules.	✓	✓	✓	✓
Hydrophilic and lipophilic properties, Hansch constant and LogP problem solving	✓	✓	✓	✓
Types of receptor interactions.	✓	✓	✓	✓
Case study on physicochemical properties of drug action.	✓	✓	✓	✓
Exam on Physicochemical properties of drug action.	✓	✓	✓	✓
Case study: adrenergic drugs	✓	✓	✓	✓
Case study: antianginal and antihypertensive drugs	✓	✓	✓	✓
Case study: anticoagulants	✓	✓	✓	✓
Case study: antihyperlipidemic drugs	✓	✓	✓	✓
Case study: diuretics	✓	✓	✓	✓
Case study: cholinergic drugs	✓	✓	✓	✓

Course Coordinator **Prof. Dr. Hussein I. El-Subbagh**

Head of Department **Prof. Dr. Mohamed Ahmed Moustafa**

Approval Date: 6/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmacy Legislations and Regulatory Affairs (PP 414)	**اسم المقرر: تشريعات صيدلية وأمور تنظيمية**
Academic Level: Level 4	**المستوى الأكاديمي: الرابع**
Scientific department: Clinical Pharmacy and Pharmacy Practice	**القسم العلمي: الصيدلة الإكلينيكية والممارسة الصيدلية**
Head of Department: **Prof. Dr. Mohamed El Husseiny El Sebeay Shams**	**رئيس القسم:** **أ.د/ محمد الحسينى السبيعى شمس**
Course Coordinator: **Prof. Dr. Marwa S. El-Dahhan**	**منسق المقرر:** **أ.د/ مروه صلاح الدين منصور الدهان**

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Clinical Pharmacy and Pharmacy Practice**
Department supervising the course	**Clinical Pharmacy and Pharmacy Practice**
Program on which the course is given	**Bachelor's Degree in Pharmacy – Pharm D**
Academic Level	**Fourth level, First Semester, 2023/2024**
Date of course specification approval	**7/9/2023**

6- Basic Information: Course data:

Course Title	**Legislations and Regulatory Affairs**
Course Code	**PP 414**
Prerequisite	**--------**
Teaching Hours: Lecture	**1**
Practical	**0**
Total Credit Hours	**1 (Credit H)**

7- Professional Information:

1- Course Aims:

1. Gain comprehensive knowledge of the law that governs and affects the practice of pharmacy.
2. Know the legal principles for non-controlled and controlled prescriptions and OTC drug requirements.
3. Gain knowledge about how to open new pharmacies, medical stores, factories, scientific offices, medicine registration, pharmacies and medicine stores management.
4. Illustrate the pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles and moral rules.

2- Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	Outline the different types of pharmaceutical products.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.1.1	2.1.1.1	Discriminate the legislations concerning pharmacy practice.
2.1.2	2.1.2.1	Apply the regulations that protect patients' rights regarding prescription of drugs and privacy of patients.
2.1.3	2.1.3.1	Accept patient's rights and accept that major illness require referral to healthcare specialist while minor illness can be treated by over-the-counter medicines.
2.3.2	2.3.2.1	Classify different types of narcotic drugs as well as their dispensing and storage.
	2.3.2.2	Discriminate between different types of pharmaceutical products and medicinal plants.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.3.2	4.3.2.1	Practice self-learning to improve professional skills

3- Course Contents

Week No.	Topics	Credit Hours
1	قانون مزاولة مهنة الصيدلة و التسجيل بنقابة الصيادلة	1
2	المؤسسات الصيدلية	1
3	قواعد فتح المؤسسات الصيدلية	1
4	أحكام خاصة لكل نوع من أنواع المؤسسات الصيدلية	1

5	أنواع المستحضرات الصيدلية.	1
6	أحكام عامه وعقوبات الجزء الأول	1
7	أحكام عامه وعقوبات الجزء الثاني	1
8	التعريف بجداول المواد المخدرة و قواعد صرفها	1
9	مكـــافحة المـــخدرات واستعمالها والاتجار فيها	1
10	قيد وصرف الجواهر المخدرة	1
11	تنظيم تداول بعض المواد والمستحضرات الصيدلية المؤثرة علي الحالة النفسية	1
12	قانون التكليف	1
13	لائحة تقاليد المهنة (علاقة الصيدلى بالمريض "التعلم الذاتى")	1
14	قـــانـــون قمع الغش والتدليس	1
15	Final Written and Oral Exam	---

4- Teaching and Learning Methods:

	Teaching and Learning Methods	Weeks	K. elements to be addressed
5.1	Advanced lecture including (group discussion)	1-14	1.1.1.1/ 2.1.1.1 2.1.2.1/ 2.1.3.1 2.3.2.1/ 2.3.2.2/4.3.2.1
5.2	Hybrid learning	7, 14	1.1.1.1/ 2.1.1.1 2.1.2.1/ 2.1.3.1 2.3.2.1/ 2.3.2.2
5.3	Self-learning	13	4.3.2.1

5- Student Assessment:

m- Assessment Methods:

Assessment Methods	K elements to be assessed
1- Periodical (Mid-term exam) / Course work	1.1.1.1/2.1.1.1/2.1.2.1/2.3.2.2
2- Written exam	1.1.1.1/2.1.1.1/2.1.2.1/2.1.3.1/2.3.2.1/2.3.2.2

n- Assessment schedule

Assessment 1	**Periodical (Mid-term exam) / Course work**	7-9 th week
Assessment 2	**Written**	Starting from 15th week

o- Weighing of assessments

1	**Periodical (Mid-term exam) / Course work**	**25%**
2	**Practical examination & Semester work**	**---**
3	**Final-term examination**	**75%**
4	**Oral examination**	**---**
5	**Other types of assessment**	**---**
Total		**100%**

6- Facilities required for teaching and learning

Classroom	**Data show- Computers, sound system-Internet, Platform**
Library	**Books**

7- List of References

No	Reference	Type
1.	Lecture notes prepared by the teaching staff	Course notes
2.	Adeboye Adejare, Ed., Remington: The Science and Practice of Pharmacy, Elsevier Science, Business & Economics, 2020, 1175 pages.	Essential Book
3.	by Ahmed El Sharkawy and Menna Abouzekry, Sharkawy & Sarhan Law Firm, Apr-2021	Recommended article
4.	https://www.egyptlawfirm.net/%D9%82%D8%A7%D9%86%D9%88%D9%86-%D8%B1%D9%82%D9%85-127-%D9%84%D8%B3%D9%86%D8%A9-1955-%D9%81%D9%8A-%D8%B4%D8%A3%D9%86-%D9%85%D8%B2%D8%A7%D9%88%D9%84%D8%A9-%D9%85%D9%87%D9%86%D8%A9-%D8%A7%D9%84%D8%B5/	Websites

8- Matrix:

a- Matrix 1. Course content and key element

Course contents	Outcomes Domains / Key elements								
	Domain 1		Domain 2						Domain 4
	1.1.1.1		2.1.1.1	2.1.2.1	2.1.3.1	2.3.2.1	2.3.2.2		4.1.2.1
قانون مزاولة مهنة الصيدلة و التسجيل بنقابة الصيادلة.	✓		✓	✓		✓			✓
المؤسسات الصيدلية	✓		✓						✓
قواعد فتح المؤسسات الصيدلية	✓		✓						✓
أحكام خاصة لكل نوع من أنواع المؤسسات الصيدلية	✓		✓			✓			✓
أنواع المستحضرات الصيدلية.	✓			✓	✓		✓		✓
أحكام عامه وعقوبات الجزء الأول	✓		✓				✓		✓
أحكام عامه وعقوبات الجزء الثاني	✓		✓				✓		✓
التعريف بجداول المواد المخدرة و قواعد صرفها.	✓					✓			✓
مكافحة المخدرات واستعمالها والاتجار فيها	✓					✓			✓
قيد وصرف الجواهر المخدرة	✓					✓			✓
تنظيم تداول بعض المواد والمستحضرات الصيدلية المؤثرة علي الحالة النفسية	✓			✓			✓		✓
قانون التكليف	✓		✓						✓
لائحة تقاليد المهنة (علاقة الصيدلى بالمريض "التعلم الذاتى")	✓			✓		✓	✓		✓
قانون قمع الغش والتدليس	✓		✓						

b- Matrix 2. Between course contents, learning methods and assessment

Course contents	Teaching and Learning Methods			Assessment methods	
	Advanced lecture	On line learning	Self-learning	Corse Work and mid-term Exam	Written Exam
قانون مزاولة مهنة الصيدلة و التسجيل بنقابة الصيادلة.	✓			✓	✓
المؤسسات الصيدلية	✓			✓	✓
قواعد فتح المؤسسات الصيدلية	✓			✓	✓
أحكام خاصة لكل نوع من أنواع المؤسسات الصيدلية	✓			✓	✓
أنواع المستحضرات الصيدلية.	✓				✓
أحكام عامه وعقوبات الجزء الأول	✓				✓
أحكام عامه وعقوبات الجزء الثاني	✓				✓
التعريف بجداول المواد المخدرة و قواعد صرفها.	✓	✓			✓
مكـــافحة المـــخدرات واستعمالها والاتجار فيها	✓				✓
قيد وصرف الجواهر المخدرة	✓				✓
تنظيم تداول بعض المواد والمستحضرات الصيدلية المؤثرة علي الحالة النفسية	✓				✓
قانون التكليف	✓				✓
لائحة تقاليد المهنة (علاقة الصيدلى بالمريض "التعلم الذاتى")	✓		✓		✓
قـــانـــون قمع الغش والتدليس		✓			✓

Course Coordinator	**Prof. Dr. Marwa Salah El-Din El-Dahhan** Marwa Salah
Head of Department	**Prof. Dr. Mohamed El Husseiny El Sebeay Shams** M.Shams

Approval Date: 7/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Clinical Pharmacokinetics	اسم المقرر: حركية الدواء الإكلينيكية
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific department: Clinical Pharmacy and Pharmacy Practice	القسم العلمي: الصيدلة الإكلينيكية والممارسة الصيدلية
Head of Department: Prof. Mohammed El-Houseiny Shams	رئيس القسم: أ.د.محمد الحسيني شمس
Course Coordinator: Assoc. Prof. Moetaza M. Soliman	منسق المقرر: أ.م.د/ معتزه محمود سليمان

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy and Pharmacy Practice
Department supervising the course	Clinical Pharmacy and Pharmacy Practice
Program on which the course is given	**Bachelor in Pharmacy -Pharm D by law**
Academic Level	Fourth level, second semester, 2022-2023
Date of course specification approval	7th September 2023

A. Basic Information: Course data:

Course Title	**Clinical Pharmacokinetics**
Course Code	**PP 425**
Prerequisite	**Registration**
Teaching Hours: Lecture	**2**
Teaching Credit Hours: Tutorial	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

1. Course Aims:

1. Introduce the models of linear and dose-dependent systems in pharmacokinetics.
2. Pharmacokinetic applications in therapeutic drug monitoring and patient care.
3. Specific drugs and disease states, effects of age and concomitant drug administration.
4. Dose adjustment according to patients' characteristics.

2. Course Key elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	**1.1.1.1**	Recognize knowledge of basic and clinical pharmacokinetics.
1.1.5	**1.1.5.1**	Apply the principles of basic and clinical pharmacokinetics to solve problems related to patient health**.**
1.1.9	**1.1.9.1**	Perform pharmacokinetic calculations.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.4	**2.2.4.1**	Adopt the principles pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, and bioequivalence studies.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	**3.1.1.1**	Modify a dosage regimen for a patient-based presence of renal or hepatic problems and in case of elderly patients to optimize medication use.
3.2.5	**3.2.5.1**	Advise doctors, nurses, and other prescribers about the best dosing regimens for medication therapy that require therapeutic drug monitoring.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	**4.1.1.1**	Share decision-making activities with other health professional team members to individualize dosage regimen for specific cases.
4.3.2	**4.3.2.1**	Apply principles of continuing professional development to meet self needs.

3. Course Contents

A. Theoretical part

Week No.	Lecture Topics	Lecture Credit Hours
1	Review of Pharmacokinetics ADME processes (Drug absorption, drug distribution, drug metabolism, and drug excretion, First-order Reactions, Zero-order reactions, First-order half-life, Zero-order half-life,	2
2	Pharmacokinetics after IV bolus administration (Assumptions, equations, pharmacokinetic parameters; half-life, elimination rate constant, The volume of distribution, Total body clearance).	2
3	Pharmacokinetics after Oral administration Determination of the absorption rate constant: The method of residuals, Lag Time, Bioavailability, Bioequivalence, The maximum (peak) drug plasma concentration, The time of maximum drug concentration, The area under the plasma concentration-time curve, determination of the bioavailability	2
4	Pharmacokinetics after IV infusion (Equations and pharmacokinetic parameters, true and practical steady state plasma concentration, sampling blood following cessation of infusion, Wagner method of rapid attainment of steady state.)	2
5	Pharmacokinetics in case of kidney disease (The effect of renal disease on the elimination of drugs, Dosage adjustment in cases of partial or total renal failure)	2
6	Pharmacokinetics in case of liver disease (Dosage adjustment in pediatric patients, The effect of liver disease on the total body clearance)	2
7	Bioavailability and bioequivalence Types of bioavailability, bioequivalence, calculation of bioavailability. Factors affecting bioavailability, Methods and criteria for bioavailability testing	2
8	Multiple dose administration (IV and oral) (Useful pharmacokinetic parameters in multiple dosing, the Dost ratio (r), Loading dose, Maintenance dose, Drug accumulation, Steady-state plasma concentration)	2
9	Non-linear pharmacokinetics (Michaelis-Menten enzyme kinetics, Comparison of linear and Michaelis-Menten (M-M) elimination, Dosage adjustment for phenytoin using individual Vmax and Km values)	2
10	Therapeutic drug Monitoring: Lithium and Digoxin (Therapeutic drug monitoring, Which drugs and why? Key parameters: Digoxin, digoxin clearance, Determination of Digoxin dose regimen, Volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study)	2

11	**Therapeutic drug Monitoring: Aminoglycosides Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study**	**2**
12	**Therapeutic drug Monitoring: Vancomycin Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study**	**2**
13	**Therapeutic drug Monitoring: Theophylline (Rationale for therapeutic drug monitoring, Pharmacokinetic profile (ADME), Clinical case study, Equation resource and examples).**	**2**
14	**Therapeutic drug Monitoring: Carbamazepine (self-learning) (Rationale for therapeutic drug monitoring, Pharmacokinetic profile (ADME), Clinical case study, Equation resource and examples).**	**2**
15	**Compensatory and alternative lecture**	**2**
16	**Revision and quiz**	**2**
17	**Final written and oral exam**	

Tutorial part

Week No.	Tutorial topics	Credit hours
1	Zero and first order Pharmacokinetics, Pharmacokinetics after IV bolus administration	1
2	Pharmacokinetics after Oral administration	1
3	Pharmacokinetics after IV infusion	1
4	Pharmacokinetics in case of kidney disease	1
5	Pharmacokinetics in case of liver disease	1
6	Practical applications using PK solver software.	1
7	Multiple dose administration (IV and oral)	1
8	Midterm exam	-
9	Non-linear pharmacokinetics	1
10	Therapeutic drug monitoring: Lithium and Digoxin	1
11	Therapeutic drug monitoring: Aminoglycosides	1
12	Therapeutic drug monitoring: vancomycin	1
13	Therapeutic drug monitoring: theophylline	1
14	Therapeutic drug monitoring :Carbamezepine (Self-learning)	1
15	Revision and activity	1
16	**Sheet exam (Tutorial exam)**	

4. Teaching and Learning Methods:

	Teaching and Learning Methods	Week	k. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • On line learning through my mans "Mansoura university "as recorded – video lectures Inter active discussion through My Mans	1-16	1.1.1.1/1.1.5.1/ 1.1.9.1/2.2.4.1
4.2	Tutorial sessions using patient case studies	1-16	2.2.4.1/3.1.1.1/ 3.2.5.1/4.1.1.1/ 4.3.2.1
4.3	Self-learning	14	4.1.1.1/4.3.2.1
4.4	Formative Assignments	12,13	4.1.1.1/4.3.2.1
4.5	Class Activity Discussion / problem solving / case study.	1-14	3.1.1.1/ 3.2.5.1/4.1.1.1/ 4.3.2.1

5. Student Assessment:

a- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1/1.1.5.1/1.1.9.1/2.2.4.1
2-Sheet exam	2.2.4.1/3.1.1.1/3.2.5.1/4.1.1.1/4.3.2.1
3-Oral	1.1.1.1/1.1.5.1/1.1.9.1/2.2.4.1/2.2.4.1/3.1.1.1/3.2.5.1/4.1.1.1/4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1/1.1.5.1/1.1.9.1/2.2.4.1

b- Assessment schedule

Assessment 1	**Periodical / Mid-term**	7-9th week
Assessment 2	**Tutorial (sheet)**	16th week
Assessment 3	**Final Written**	Starting from 17th week
Assessment 4	**Oral**	Starting from 17th week

c- Weighing of assessments

1	**Periodical / Mid-term examination & Semester work**	15%
2	**Tutorial (sheet) examination**	25%
3	**Final-term examination**	50%
4	**Oral examination**	10%
Total		100%

6. Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	Data show – computers, internet, round tables
Library	Reference books

7. List of References

No	Reference	Type
1.	Lecture notes prepared by teaching staff	Course notes
2.	Clinical Pharmacokinetics, 1st Edition by Dhillon, Soraya; Kostrzewski, Andrzej J (Mar 2006)	Essential Book
3.	Applied Biopharmaceutics and Pharmacokinetics, 5th Edition by Madjackfrost (2010)	Essential Book
4.	Lexicomp online database Dynamed Plus BMJ best practice http://www.sciencedirect.com http://www.google scholar.com http://www.pubmed.com https://www.ekb.eg	Websites

8. Matrix 1. Course contents and course key elements

Course contents	Outcomes Domains / Key elements							
	Domain 1			Domain 2	Domain 3		Domain 4	
	1.1.1.1	1.1.5.1	1.1.9.1	2.2.4.1	3.1.1.1	3.2.5.1	4.1.1.1	4.3.2.1
A) Theoretical part								
Review of Pharmacokinetics ADME processes	√	√	√	√				
Pharmacokinetics after IV bolus administration	√	√	√	√				
Pharmacokinetics after Oral administration	√	√	√	√				
Pharmacokinetics after IV infusion	√	√	√	√		√		
Pharmacokinetics in case of kidney disease	√	√	√	√	√	√	√	
Pharmacokinetics in case of liver disease	√	√	√	√	√	√	√	
Bioavailability and bioequivalence	√	√	√	√		√	√	
Multiple dose administration (IV and oral)	√	√	√	√				
Non-linear pharmacokinetics	√	√	√	√		√	√	√
Therapeutic drug Monitoring: Lithium and Digoxin	√	√	√	√	√	√	√	√
Therapeutic drug Monitoring: Aminoglycosides	√	√	√	√	√	√	√	√
Therapeutic drug Monitoring: Vancomycin	√	√	√	√	√	√	√	√
Therapeutic drug Monitoring: theophylline	√	√	√	√	√	√	√	√
Therapeutic drug Monitoring: carbamazepine (self-learning)	√	√	√	√	√	√	√	√

Course contents	Outcomes Domains / Key elements							
	Domain 1			Domain 2	Domain 3		Domain 4	
	1.1.1.1	1.1.5.1	1.1.9.1	2.2.4.1	3.1.1.1	3.2.5.1	4.1.1.1	4.3.2.1
B) Tutorial part								
Tutorial topics - Zero and first order Pharmacokinetics, Pharmacokinetics after IV bolus administration - Pharmacokinetics after Oral administration - Pharmacokinetics after IV infusion - Pharmacokinetics in case of kidney disease - Pharmacokinetics in case of and liver disease - Practical applications using PK solver software. - Multiple dose administration (IV and oral) - Non-linear pharmacokinetics - Therapeutic drug Monitoring: Lithium and Digoxin - Therapeutic drug Monitoring: Aminoglycosides - Therapeutic drug Monitoring: Vancomycin - Therapeutic drug Monitoring: theophylline - Therapeutic drug Monitoring: carbamazepine (self-learning)	√	√	√	√	√	√	√	√

Matrix 2. between course contents, methods of learning and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Tutorial sessions	Problem solving	Case Study	Self-learning	Corse Work	Tutorial	Written	Oral
Review of Pharmacokinetics ADME processes	√			√	√		√		√	√
Pharmacokinetics after IV bolus administration	√			√	√		√		√	√
Pharmacokinetics after Oral administration	√			√	√		√		√	√
Pharmacokinetics after IV infusion	√			√	√		√		√	√
Pharmacokinetics in case of kidney disease	√			√	√		√		√	√
Pharmacokinetics in case of liver disease	√			√	√		√		√	√
Bioavailability and bioequivalence	√			√	√		√		√	√
Multiple dose administration (IV and oral)	√			√	√		√		√	√
Non-linear pharmacokinetics	√			√	√				√	√
Therapeutic drug Monitoring: Lithium and Digoxin	√			√	√				√	√
Therapeutic drug Monitoring: Aminoglycosides	√			√	√				√	√
Therapeutic drug Monitoring: Vancomycin	√			√	√				√	√
Therapeutic drug Monitoring: theophylline	√			√	√				√	√
Therapeutic drug Monitoring: carbamazepine (self-learning)	√			√	√	√			√	√

B) Tutorial Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Tutorial sessions	Problem solving	Case Study	Self-learning	Corse Work	Tutorial	Written	Oral
Zero and first order Pharmacokinetics, Pharmacokinetics after IV bolus administration			√	√	√			√		
Pharmacokinetics after Oral administration			√	√	√			√		
Pharmacokinetics after IV infusion			√	√	√			√		
Pharmacokinetics in case of kidney disease and liver disease			√	√	√			√		
Pharmacokinetics in case of kidney disease and liver disease			√	√	√			√		
Practical applications using PK solver software.			√	√	√			√		
Multiple dose administration (IV and oral)			√	√	√			√		
Non-linear pharmacokinetics			√	√	√			√		
Therapeutic drug Monitoring: Lithium and Digoxin			√	√	√			√		
Therapeutic drug Monitoring: Aminoglycosides			√	√	√			√		
Therapeutic drug Monitoring: vancomycin			√	√	√			√		
Therapeutic drug Monitoring: theophylline			√	√	√			√		
Therapeutic drug Monitoring: theophylline (self-learning)			√	√	√	√		√		

Course Coordinator	**Professor Mohamed El-Houseiny Shams** *M.Shams*
Head of Department	**Assoc. Prof. Moetaza M. Soliman** Moetaza Soliman **Date: 7 / 9 / 2023**

(بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Quality Control and pharmaceutical Analysis (PA 425)	**اسم المقرر : رقابة الجودة و التحليل الصيدلي**
Academic Level: Fourth Level	**المستوى الأكاديمي : الرابع**
Scientific department: **Pharmaceutical Analytical Chemistry**	**القسم العلمي : الكيمياء التحليلية الصيدلية**
Head of Department: **Prof. Dr. Jenny Jehan Nasr**	**رئيس القسم :** **ا.د/ جينى جيهان نصر**
Course Coordinator: **Prof. Dr. Fawzia Ibrahim Habib**	**منسق المقرر :** **أ.د/ فوزية إبراهيم حبيب**

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Pharmaceutical Analytical Chemistry**
Department supervising the course	**Pharmaceutical Analytical Chemistry**
Program on which the course is given	**Bachelor in Pharmacy- Pharm D**
Academic Level	**Level four, second semester, 2023/2024**
Date of course specification approval	**10/9/2023**

A. Basic Information: Course data:

Course Title	**Quality Control and Pharmaceutical Analysis**
Course Code	**PA 425**
Prerequisite	**Pharmaceutical Analytical Chemistry II**
Teaching credit Hours: Lecture	**2**
Teaching Credit Hours: Practical/ tutorial	**1**
Total Credit Hours	**3**

B. Professional Information:

1. Course Aims:

This course enables the students to:

- **Give the principle and overall definition of quality control, chemical impurities, types and its control, sampling, documentation, recording procedures.**
- **Pharmacopoeias monographs, types of methods of analysis, assay tolerances.**
- **Conduct stability testing of pharmaceuticals (ICH Guidelines) and develop stability indicating assay methods (SIAM).**
- **Predict stability of pharmaceuticals.**
- **Validate analytical methods (ICH Guidelines).**

2. Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1: Fundamental Knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	Conjugate the principles of different analytical techniques for estimation of pharmaceutical compounds
1.1.2	1.1.2.1	List the different analytical techniques for drugs from synthetic and natural origin.
1.1.3	1.1.3.1	Handle and identify good manufacturing practice and assure quality control criteria in pharmaceutical industry
1.1.4	1.1.4.1	Explore drug stability, appropriateness and effectiveness, drug expiration, and drug withdrawal from market.
1.1.6	1.1.6.1	Investigate the different analytical methods used for analysis of pharmaceutical compounds using GLP guidelines and validation procedures.

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.2.1	2.2.1.1	Identify and qualify pharmaceutical materials and standardization principles
	2.2.1.2	Apply professional ICH guidelines for analytical method validation (Q2R1) and stability testing
2.2.4	2.2.4.1	Implement quality control and quality assurance in addition to pharmaceutical applications
	2.2.4.2	Apply statistical analysis for data elements required for validation of analytical methods.
2.3.1	2.3.1.1	Handle and dispose hazardous chemicals, biological and pharmaceutical items and recognize the ethical guidelines for handling

2.3.2	2.3.2.1	Analysis and interpret quantitative analytical data according to GMP guidelines related to pharmaceutical industry
2.5.1	2.5.1.1	Attain the standards for the regularity of the framework for approved pharmaceuticals. encompassing standards for efficacy, safety, and quality
2.5.3	2.5.3.1	Apply scientific principles of research with the search of the best available evidence

Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share decision-making activities with other pharmacy team members
4.1.2	4.1.2.1	Apply calculations for chemical analysis
4.2.2	4.2.2.1	Use tools to present information clearly
4.3.1	4.3.1.1	Acquire the ability to employ self-evaluation strategies
4.3.2	4.3.2.1	Encourage critical thinking, problem solving and time management to promote the continuous professional development

3- Course Contents:

A. Theoretical part:

Week No.	Topics	Lecture credit Hours
1.	Introduction to quality control	2
2.	Chemical Purity of drugs, Official Methods to QC	2
3.	Sampling and documentation.	2
4.	Pharmaceutical application of (Titrimetric and Electrochemical methods).	2
5.	Pharmaceutical application of (Spectroscopic and Chromatographic methods)	2
6.	Factors affecting drug stability and Stability testing of pharmaceuticals according to ICH conditions.	2

7.	Stability indicating assay methods (SIAM)	2
8.	Identification and characterization of degradation products of pharmaceutical compounds	2
9.	Drug expiration and drug withdrawal.	2
10.	Validation of analytical methods according to ICH Guidelines.	2
11.	Validation of Analytical procedures -accuracy and precision	2
12.	Application of validation parameters.	2
13.	Drug -drug interaction	2
14.	Drug – excipients interaction + self-learning	2
15.	Compensatory and advanced lecture	2
16.	Revision and quiz	2
17.	Final Written and Oral Exam	-

B. Practical part

Week No.	Topics	Hours
1	Assay of Glacial Acetic acid	1
2	Assay of Aspirin in Rivo® Tablets	1
3	Assay of Zinc content in Octozinc® Capsules	1
4	Assay of Magnesium content in Spasmag® Capsules	1
5	Assay of Calcium content in Calcionate® Ampoules	1
6	Limit test for detection of impurities in drug substances -Part I	1
7	Limit test for detection of impurities in drug substances -Part II	1
8	Midterm exam	-
9	Detection of degradation products in drug substances	1

10	Assay of ferrous sulphate.	1
11	Validation of Analytical procedures-Part I	1
12	Validation of Analytical procedures-Part II	1
13	Validation problems	1
14	Assay of Hydroxocobalamin in Depovit B12® amp	1
15	Revision and quiz	1
16	Practical exam	1

4- Teaching and Learning Methods:

No.	Teaching and learning methods	Week	K. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • On line learning through my mans "Mansoura university "as recorded – video lectures • Inter active discussion through My Mans	1-16	1.1.1.1, 1.1.2.1, 1.1.3.1,1.1.4.1, 1.1.6.1, 2.2.1.1, 2.2.1.2 2.2.4.1, 2,2,4,2 2.3.2.1, 2.3.2.1 2.5.1.1, 2.5.3.1 (4.3.2.1)
4.2	Self-learning	14	4.1.1.1, 4.1.2.1, 4.2.2.1, 4.3.1.1 4.3.2.1
4.3	Practical session using chemicals and laboratory equipment and/ or tutorials	1-16	2.2.1.1, 2.2.1.2 2.2.4.1, 2,2,4,2 2.3.2.1, 2.3.2.1, 2.5.1.1, 2.5.3.1,4.1.1.1, 4.1.2.1, 4.2.2.1, 4.3.1.1 4.3.2.1

4.4	Class Activity: Group discussion offline, problem solving and online/ Brainstorming.	10,14	4.1.1.1, 4.1.2.1, 4.2.2.1, 4.3.1.1 4.3.2.1

5- Student Assessment:

a- Assessment Methods:

Assessment Methods	K elements to be assessed
1- Periodical (Mid-term exam / Course work)	1.1.1.1, 1.1.2.1, 1.1.3.1, 1.1.6.1, 2.2.1.1 2.3.2.1, 2.2.4.1,
2- Practical exam using OSPE	2.2.1.1, 2.2.2.1, 2.2.3.1, 2.2.4.1, 2.5.1.1, 4.1.2.1, 4.2.2.1, 4.3.1.1
3- Written exam	1.1.1.1, 1.1.2.1, 1.1.6.1, 2.2.1.1 2.3.2.1, 2.2.4.1,
4- Oral exam	1.1.1.1, 1.1.2.1, 1.1.3.1, 1.1.6.1, 4.3.1.1,4.3.2.1

b. Assessment schedule

Assessment 1	Periodical (Mid-term/ Course work)	7-9th week
Assessment 2	Practical exam (OSPE)	16th week
Assessment 3	Written exam	17th week
Assessment 4	Oral exam	17th week

c. Weighing of assessments

1	Periodical (Mid-term/ Course work)	15%
2	Practical exam	25%
3	Written exam	50%
4	Oral exam	10%
Total		100%

6- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Chemicals- glass wares- white board
- Library	EKB resources

7- List of References

No	Reference	Type
1.	Practical course notes and recorded videos prepared by the department staff members	Course notes
2.	Recorded videos prepared by the department staff members	Videos on platform
3.	Theoretical course Notes prepared by staff members	Course notes
4.	Quality Control of Pharmaceuticals: Compendial Standards and Specifications, Md. Sahab Uddin, Scholars' Press (2017).	Book
5.	Pharmaceutical Quality Assurance, B.P. Nagori, Ajay Gaur, Renu Solanki, Vipin Mathur, Scientific Publishers (2018).	Book
6.	Christian, G.D. and O'Reilly, J.E., in "Instrumental Analysis" 6th Ed., Prentice Hall, New Jersy (2013).	Book
7.	Miller JC & Miller JN Statistics and Chemometrics for Analytical Chemistry, 6th edn. Pearson Education Limited: Harlow, England (2010).	Book
8.	Different pharmacopoeias: USP 2016; BP 2016 and EP 2016.	Book
9.	Dan Gikonyo, Anthony Gikonyo, Duncan Luvayo, and Premanand Ponoth, Drug expiry debate: the myth and the reality, Afr Health Sci. 2019, 19(3):2737–2739.	Journal article
10.	GUIDELINES ON Assessment of safety and efficacy that impact withdrawal, suspension or revocation of registration procedures or marketing authorization license, 2023, Egyptian Drug authority.	Journal article
11.	Hinal Patel, Albert Wertheimer, Qian Ding, Comparison of Drug Withdrawal Processes in the U.S. and Other Nations, Innov Pharm, 2021 Jun 10;12(3):10.24926/iip.v12i3.3939	
12.	ICH Harmonized Tripartite Guideline, Validation of Analytical Procedures: Text and Methodology, Q2(R1), Current Step 4 Version, Parent Guidelines on Methodology Dated November 6, 1996, Incorporated in November 2005. at: http://www.ich.org/LOB/media/MEDIA417.pdf.	Website
13	ICH Harmonized Tripartite Guidelines. Stability testing of new drug substances and products, Q1A (R2) (2003). Accessed 25 October 2010 at: http://www.ich.org/LOB/media/MEDIA419.pdf	Website
14	https://WWW.sciencedirect.com https://WWW.google scholar.com https://WWW.ekb.eg https://WWW.pubmed.com	Website

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents		Course Key elements																
	Domain: 1						Domain: 2							Domain: 4				
	1.1.1.1	1.1.2.1	1.1.3.1	1.1.4.1	1.1.6.1	2.2.1.1	2.2.1.2	2.2.4.1	2.2.4.2	2.3.1.1	2.3.2.1	2.5.1.1	2.5.3.1	4.1.1.1	4.1.2.1	4.2.2.1	4.3.1.1	4.3.2.1
Introduction to quality control			✓			✓		✓		✓	✓							
Chemical Purity of drugs, Official Methods to QC			✓			✓		✓		✓	✓	✓						
Sampling and documentation.						✓		✓		✓	✓							
Pharmaceutical application of (Titrimetric and Electrochemical methods).	✓	✓			✓						✓		✓					
Pharmaceutical application of (Spectroscopic methods and chromatographic methods)	✓	✓			✓						✓		✓					

Factors affecting drug stability and Stability testing of pharmaceuticals according to ICH conditions.				✓			✓										✓
Stability indicating assay methods (SIAM)				✓			✓										✓
Identification and characterization of degradation products of pharmaceutical compounds				✓			✓				✓						✓
Drug expiration and drug withdrawal.				✓			✓				✓						✓
Validation of analytical methods according to ICH Guidelines.					✓	✓	✓		✓		✓	✓				✓	✓
Validation of Analytical procedures **-Accuracy and precision**					✓	✓	✓		✓		✓	✓				✓	✓
Application of validation parameters					✓	✓	✓		✓		✓	✓				✓	✓
Drug -drug interaction				✓	✓	✓		✓				✓					

Drug – excipients interaction + self-learning				✓	✓	✓		✓				✓		✓	✓	✓	✓	✓

B) Practical part:

Course contents	**Course Key elements**																
	Domain: 1					**Domain: 2**								**Domain: 4**			
	1.1.1.1	**1.1.2.1**	**1.1.3.1**	**1.1.4.1**	**1.1.6.1**	**2.2.1.1**	**2.2.1.2**	**2.2.4.1**	**2.2.4.2**	**2.3.1.1**	**2.3.2.1**	**2.5.1.1**	**2.5.3.1**	**4.1.1.1**	**4.1.2.1**	**4.2.2.1**	**4.3.1.1**	**4.3.2.1**
Assay of Glacial Acetic acid						✓				✓			✓			✓		
Assay of Aspirin in Rivo® Tablets						✓				✓		✓	✓		✓	✓		
Assay of Zinc content in Octozinc® Capsules						✓				✓		✓			✓	✓		
Assay of Magnesium content in Spasmag® Capsules						✓						✓			✓	✓		
Assay of Calcium content in Calcionate® Ampoules						✓						✓			✓	✓		

Limit test for detection of impurities in drug substances-Part I						✓	✓					✓	✓	✓	✓	✓	✓	
Limit test for detection of impurities in drug substances-Part II						✓	✓					✓	✓	✓	✓	✓	✓	
Detection of degradation products in drug substances						✓	✓					✓		✓		✓	✓	
Assay of ferrous sulphate tablets.					✓	✓				✓		✓						
Validation of Analytical procedures-Part I						✓		✓		✓	✓			✓	✓		✓	✓
Validation of Analytical procedures-Part II						✓	✓	✓	✓		✓			✓	✓		✓	✓
Validation problems					✓	✓	✓		✓		✓			✓	✓		✓	✓
Assay of Hydroxocobalamin in Depovit B12® amp					✓	✓	✓		✓		✓			✓	✓		✓	✓

Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

Course Contents	Teaching and Learning methods					Assessment methods			
	Lecture	Distance leaning	Class Activity	Lab sessions	Self-learning	Periodical (Mid-term/ Course work)	Practical/ Tutorial	Written	Oral
Introduction to quality control	✓					✓		✓	✓
Chemical Purity of drugs, Official Methods to QC	✓					✓		✓	✓
Sampling and documentation.	✓					✓		✓	✓
Pharmaceutical application of (Titrimetric and Electrochemical methods).	✓			✓		✓		✓	✓
Pharmaceutical application of (Spectroscopic& Chromatographic methods).	✓			✓				✓	✓

Factors affecting drug stability and Stability testing of pharmaceuticals according to ICH conditions.	✓							✓	✓
Stability indicating assay methods (SIAM)	✓							✓	✓
Identification and characterization of degradation products of pharmaceutical compounds	✓	✓		✓				✓	✓
Drug expiration and drug withdrawal.	✓	✓						✓	✓
Validation of analytical methods according to ICH Guidelines.	✓		✓	✓				✓	✓
Validation of Analytical procedures **-Accuracy and precision**	✓		✓	✓				✓	✓
Application of validation parameters	✓		✓	✓				✓	✓
Drug -drug interaction	✓		✓		✓			✓	✓
Drug excipients interaction + self-learning	✓		✓		✓			✓	✓

B) Practical part

Course Contents	Teaching and Learning methods					Assessment methods			
	Lecture	Distance learning (Videos)	Class Activity	Lab sessions	Self-learning	Periodical (Mid-term/ Course work)	Practical/Tutorial	Written	Oral
Assay of Glacial Acetic acid		✓		✓			✓		
Assay of Aspirin in Rivo® Tablets		✓		✓			✓		
Assay of Zinc content in Octozinc® Capsules		✓		✓			✓		
Assay of Magnesium content in Spasmag® Capsules		✓		✓			✓		
Assay of Calcium content in Calcionate® Ampoules		✓		✓			✓		
Limit test for detection of impurities in drug substances – Part I		✓		✓			✓		

Limit test for detection of impurities in drug substances– Part II		✓		✓			✓		
Detection of degradation products in drug substances		✓		✓			✓		
Assay of ferrous sulphate tablets.		✓		✓			✓		
Validation of Analytical procedures– Part I		✓	✓	✓			✓	✓	✓
Validation of Analytical procedures– Part II		✓	✓	✓			✓	✓	✓
Validation problems		✓	✓	✓			✓	✓	✓
Assay of Hydroxocobalamin in Depovit B12® amp		✓	✓	✓			✓	✓	✓

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

Course Coordinator	**Prof. Dr. Fawzia Ibrahim Habib.**
Head of Department	**Prof. Dr. Jenny Jehan Mohamed Ahmed Nasr** 

Approval Date: 10/9/2023

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Phytotherapy and Aromatherapy (PG427)	اسم المقرر :العلاج بالأعشاب والنباتات العطرية
Academic Level: level 4	المستوى الأكاديمي: الرابع
Scientific department: Pharmacognosy	القسم العلمي: العقاقير
Head of Department: **Prof. Mahmoud F. Elsebai**	رئيس القسم : أ. د./ محمود فهمي السباعي
Course Coordinator: **Prof. Amal A. A. Sallam**	منسق المقرر : أ.د/ أمل أحمدعطوه سلام

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy
Program on which the course is given	Bachelor's Degree in Pharmacy - PharmD
Academic Level	Fourth level, Second semester, 2023/2024
Date of course specification approval	… /9/2023

-Basic Information: Course data:

Course Title	Phytotherapy and Aromatherapy
Course Code	PG427
Prerequisite	Pharmacognosy 1
Teaching Hours/ week: Lecture:	2
Practical:	1
Total Credit Hours	3

-Professional Information:

8- Course Aims:

This course enables the students to:

- Identify the concepts of phytotherapy, different types of complementary and alternative medicines with emphasis on herbal remedies, nutritional supplements, homeopathies, aromatherapy.
- know guidelines for prescribing herbal medicinal drugs on the basis of the pharmacological properties of these drugs including therapeutic uses, mechanism of action, dosage, adverse reactions, contraindications & drug interactions.
- Gain an understanding of medicinal plants portfolios in relation to phytopharmaceuticals in the Egyptian Market.

2- Course k. elements:

Upon completing the course, the student will be able to dominate the following key elements:

Domain 1: fundamental knowledge

Program K. Element no.	Course K. Element no.	Course K. Element
1.1.1	1.1.1.1	Identify the different types of complementary and alternative medicines including aromatherapy.
	1.1.1.2	Recognize the concept of phytotherapy, complementary and alternative medicine including aromatherapy.
1.1.3	1.1.3.1	Identify the main sources of herbal drugs used in phytotherapy and aromatherapy and their phytoconstituents responsible for the activity
1.1.4	1.1.4.1	Explain the mechanism of action, therapeutic uses and adverse drug reactions of plants used in phytotherapy and aromatherapy.
1.1.5	1.1.5.1	Apply fundamentals of herbal medicine to find suitable formulations for different diseases.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.1	2.2.1.1	Select drugs from natural origin to be used for treatment of diseases of the different systems.
2.3.1	2.3.1.1	Recognize the appropriate methods for preparation and handling of herbal drug formulations used in phytotherapy.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.2.3	3.2.3.1	Utilize naturally occurring drugs for preparation of herbalformulations that can be used safely for treatment of different body system diseases
	3.2.3.2	Suggest the suitable food items that help with the phytomedicine in treatment of certain disease.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	**Retrieve and evaluate information, solve problems, and work effectively in a team.**
4.2.1	4.2.1.1	**Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics.**
4.3.2	4.3.2.1	**Practice independent learning to promote continuous professional development.**

12- Course Contents

C) Theoretical part

Week No.	Topics	Hours
1	Introduction: Forms of complementary and alternative medicine which do not use medicinal plants, Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda. Herbal products regulation	2
2	Important natural products used in phytotherapy of the gastrointestinal system	2
3	Important natural products used in phytotherapy of the cardiovascular system	2
4	Important natural products used in phytotherapy of the respiratory system and the endocrine system	2

5	Important natural products used in phytotherapy of the musculoskeletal system and the reproductive system	2
6	Important natural products used in phytotherapy of the central nervous system and the renal system	2
7	Important natural products used in phytotherapy of the eye, the ear, nose and orthopharynx Herbal drugs used in obesity Nutrition in different diseases (**self-learning).**	2
8	Supportive Therapies for Stress, Aging and Debility	2
9	Herbal drugs used in obesity (continue)	2
10	Aromatherapy	2
11	Aromatherapy	2
12	Herb-drug interactions	2
13	Herbal formulation and dosage forms	2
14	Herbal formulation and dosage forms	2
15	Compensatory and alternative lecture	2
16	**Revision and quiz**	--
17	**Final Written and Oral Exam**	--

D) Practical part

Week No.	Topics	Hours
1	Identification of powdered: Leaves (Senna leaflets, Rosemary, Guajava); powdered Flowers (Clove and Chamomile); powdered Herbs (Peppermint and Thyme).	1
2	Identification of powdered Seeds: (Linseed and Fenugreek); powdered Fruits: (Anise and Capsicum); powdered Roots and Rhizomes: Liquorice, Ginger and Rhubarb; powdered Barks: (Cinchona and Cassia).	1
3	Scheme for identification of unknown medicinal herbal teas + Identification of unknown medicinal herbal teas	1
4	Phytotherapy and diseases of body systems: Gastro Intestinal Tract (GIT) (case studies and group discussions).	1
5	Phytotherapy and diseases of body systems: Cardiovascular system (CVS), Respiratory system (case studies and group discussions).	1
6	Phytotherapy and diseases of body systems: Musculoskeletal system, Renal system (case studies and group discussions).	1

7	Phytotherapy and diseases of body systems: obesity (case studies and group discussions).	1
8	Midterm exam	-
9	Phytotherapy and diseases of body systems: aging and stress (case studies and group discussions).	1
10	Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis & bronchitis)	1
11	Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis & bronchitis) (continue).	1
12	Aromatherapy: Case studies and Group Activity Presentations (Back Pain, Bloating & constipation, Colic)	1
13	Aromatherapy: Case studies and Group Activity Presentations (Body odor, Athlete's foot, Burn).	1
14	Identification of unknown medicinal herbal teas.	1
15	Revision and activity	1
16	**Practical exam**	1

Teaching and Learning Methods:

	Teaching and learning Methods	Week No.	K. elements to be addressed
4.1	Advanced lecture	1-16	1.1.1.1, 1.1.1.2, 1.1.3.1, 1.1.4.1, 1.1.5.1, 2.2.1.1, 2.3.1.1, 3.2.3.1, 4.3.2.1
4.2	Distance learning: Online learning through “My Mans” "Mansoura university platform”	1-16	1.1.1.1, 1.1.1.2, 1.1.3.1, 1.1.4.1, 1.1.5.1, 2.2.1.1, 2.3.1.1, 3.2.3.1, 4.3.2.1
4.3	Practical session using chemicals and laboratory equipment and/ or tutorials	1-16	1.1.3.1, 1.1.5.1 2.2.1.1, 3.2.3.1, 4.1.2.1
4.4	Self-learning	7	3.2.3.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.5	Collaborative learning: Group discussions	1-10	1.1.3.1, 2.2.1.1, 2.3.1.1, 3.2.3.1
4.6	Collaborative learning: Research assignments	9-10	4.1.2.1, 4.2.1.1, 4.3.2.1
4.7	Case study	4-10	1.1.3.1, 1.1.4.1, 1.1.5.1, 2.2.1.1, 2.3.1.1, 3.2.3.1, 3.2.3.2, 4.1.2.1

13- Student Assessment:

p- Assessment Methods:

Assessment Methods	Key elements to be assessed
1- Periodical (Mid-term exam / Course work)	(1.1.1.1), (1.1.1.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.1.1), (2.3.1.1), (3.2.3.1).
2- Practical exam using OSPE	(1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.1.1), (2.3.1.1), (3.2.3.1).
3- Written exam	(1.1.1.1), (1.1.1.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.1.1), (2.3.1.1), (3.2.3.1), (3.2.3.2)

4- Oral exam	**(1.1.1.1), (1.1.1.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.1.1), (2.3.1.1), (3.2.3.1), (3.2.3.2), (4.2.1.1).**

q- Assessment schedule:

Assessment 1	**Periodical (Mid-term/ Course work)**	**7-9th week**
Assessment 2	**Practical exam (OSPE)**	**16h week**
Assessment 3	**Written exam**	**Start from 17th week**
Assessment 4	**Oral exam**	**Start from 17th week**

r- Weighing of assessment:

1	**Periodical (Mid-term/ Course work)**	**15%**
2	**Practical exam**	**25%**
3	**Written exam**	**50%**
4	**Oral exam**	**10%**
Total		**100%**

14- Facilities required for teaching and learning.

- Classroom	Data show- Computers, Internet.
- Laboratory facilities	Microscopes- chemicals- glass wares- white board
- Library	Books

15- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Michael Heinrich, Joanne Barnes, Simon Gibbons and Elizabeth M. Williamson;"Fundamentals of pharmacognosy and phytochemistry"2nd edition 2012 Elsevier Ltd.	Essential Book
3.	Kerry Bone and Simon Mills," Principles and practice of phytotherapy" 2013 Elsevier Ltd.	Recommended Book
4.	Francesco Capasso, Timothy S. Gaginella, Giuliano Grandolini and Angelo A. Izzo;"Phytotherapy, a quick reference to herbal medicine" 2003, Springer-Verlag Berlin Heidelberg	Recommended Book

5.	Essential Oils Natural Remedies: The Complete A-Z Reference of Essential Oils for Health and Healing, Althea Press. 2015	Recommended Book
6.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg	Website

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents	Course Key elements											
	Domain 1					Domain 2		Domain 3		Domain 4		
	1.1.1.1	1.1.1.2	1.1.3.1	1.1.4.1	1.1.5.1	2.2.1.1	2.3.1.1	3.2.3.1	3.2.3.2	4.1.2.1	4.2.1.1	4.3.2.1
Introduction: Forms of complementary and alternative medicine which do not use medicinal plants, Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda. Herbal products regulation	√	√	√	√	√	√						
Important natural products used in phytotherapy of the gastrointestinal system			√	√	√	√	√	√	√			
Important natural products used in phytotherapy of the cardiovascular system			√	√	√	√	√	√				
Important natural products used in phytotherapy of the respiratory system and the endocrine system			√	√	√	√	√	√				
Important natural products used in phytotherapy of the musculoskeletal system and the			√	√	√	√	√	√				

reproductive system												
Important natural products used in phytotherapy of the central nervous system and the renal system			√	√	√	√	√	√				
Important natural products used in phytotherapy of the eye, the ear, nose and orthopharynx Supportive Therapies for Stress, Aging and Debility Herbal drugs used in obesity Nutrition in different diseases (**self-learning).**			√	√	√	√	√	√	√			√
Herbal drugs used in obesity (continue)			√	√	√	√	√	√	√			
Aromatherapy			√	√	√	√	√					
Aromatherapy			√	√	√	√	√					
Herb-drug interactions				√	√							
Herbal formulation and dosage forms					√		√					
Herbal formulation and dosage forms					√		√					

B) Practical part:

Course contents	**Course Key elements**											
	Domain 1					Domain 2		Domain 3		Domain 4		
	1.1.1.1	**1.1.1.2**	**1.1.3.1**	**1.1.4.1**	**1.1.5.1**	**2.2.1.1**	**2.3.1.1**	**3.2.3.1**	**3.2.3.2**	**4.1.2.1**	**4.2.1.1**	**4.3.2.1**
Identification of powdered:			√	√	√	√		√		√		

Leaves (Senna leaflets, Rosemary, Guajava); powdered Flowers (Clove and Chamomile); powdered Herbs (Peppermint and Thyme).												
Identification of powdered Seeds: (Linseed and Fenugreek); powdered Fruits: (Anise and Capsicum); powdered Roots and Rhizomes: Liquorice, Ginger and Rhubarb; powdered Barks: (Cinchona and Cassia).			√	√	√	√		√		√	√	
Scheme for identification of unknown medicinal herbal teas + Identification of unknown medicinal herbal teas			√	√	√	√		√		√	√	
Phytotherapy and diseases of body systems: Gastro Intestinal Tract (GIT) (case studies and group discussions).			√	√	√	√		√		√	√	
Phytotherapy and diseases of body systems: Cardiovascular system (CVS), Respiratory system (case studies and group discussions).			√	√	√	√		√		√	√	
Phytotherapy and diseases of body systems: Musculoskeletal system, Renal system, obesity, aging and stress (case studies and group discussions).			√	√	√	√		√		√	√	
Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis &			√	√	√	√		√		√	√	

bronchitis)												
Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis & bronchitis) (continue).			√	√	√	√		√		√	√	√
Aromatherapy: Case studies and Group Activity Presentations (Back Pain, Bloating & constipation, Colic)			√	√	√	√		√		√	√	√
Aromatherapy: Case studies and Group Activity Presentations (Body odor, Athlete's foot, Burn).			√	√	√	√		√		√	√	√
Identification of unknown medicinal herbal teas.							√			√	√	

Matrix 2. Between course contents, methods of learning, and assessment

A) Theoretical part:

Course Contents	Teaching and Learning methods							Assessment methods			
	Advanced Lecture	Online learning (My Mans)	Practical sessions	Self-learning	Collaborative learning: group discussions	Collaborative learning: research assignment	Case study	Corse Work	Practical/ Tutorial	Written	Oral
Introduction: Forms of complementary and alternative medicine which do not use medicinal plants, Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda. Herbal products regulation	√	√						√		√	√
Important natural products used in phytotherapy of the gastrointestinal system	√	√						√		√	√
Important natural products used in phytotherapy of the cardiovascular system	√	√						√		√	√
Important natural products used in phytotherapy of the respiratory system and the endocrine system	√	√					√	√		√	√
Important natural products used in phytotherapy of the musculoskeletal system and the reproductive system	√	√					√	√		√	√

Important natural products used in phytotherapy of the central nervous system and the renal system	√	√					√	√		√	√
Important natural products used in phytotherapy of the eye, the ear, nose and orthopharynx Supportive Therapies for Stress, Aging and Debility Herbal drugs used in obesity Nutrition in different diseases (**self-learning).**	√	√		√			√	√		√	√
Herbal drugs used in obesity (continue)	√	√					√			√	√
Aromatherapy	√	√					√			√	√
Aromatherapy	√	√					√			√	√
Herb-drug interactions	√	√								√	√
Herbal formulation and dosage forms	√	√								√	√
Herbal formulation and dosage forms	√	√								√	√

C) Practical part:

Course Contents	Teaching and Learning methods							Assessment methods			
	Advanced Lecture	Online learning (My Mans)	Practical sessions	Self-learning	Collaborative learning: group discussions	Collaborative learning: research	Case study	Corse Work	Practical/ Tutorial	Written	Oral

Identification of powdered: Leaves (Senna leaflets, Rosemary, Guajava); powdered Flowers (Clove and Chamomile); powdered Herbs (Peppermint and Thyme).		√	√		√				√		
Identification of powdered Seeds: (Linseed and Fenugreek); powdered Fruits: (Anise and Capsicum); powdered Roots and Rhizomes: Liquorice, Ginger and Rhubarb; powdered Barks: (Cinchona and Cassia).		√	√		√				√		
Scheme for identification of unknown medicinal herbal teas + Identification of unknown medicinal herbal teas		√	√		√				√		
Phytotherapy and diseases of body systems: Gastro Intestinal Tract (GIT) (case studies and group discussions).		√	√		√		√		√		
Phytotherapy and diseases of body systems: Cardiovascular system (CVS), Respiratory system (case studies and group discussions).		√	√		√		√		√		

Phytotherapy and diseases of body systems: Musculoskeletal system, Renal system, obesity, aging and stress (case studies and group discussions).		√	√		√		√		√		
Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis & bronchitis)		√	√		√		√		√		
Aromatherapy: Case studies and Group Activity Presentations (Tension headache, Asthma & allergies, Sinusitis & bronchitis) (continue)		√	√		√		√		√		
Aromatherapy: Case studies and Group Activity Presentations (Back Pain, Bloating & constipation, Colic)		√	√		√	√	√		√		
Aromatherapy: Case studies and Group Activity Presentations (Body odour, Athlete's foot, Burn).		√	√		√	√	√		√		
Identification of unknown medicinal herbal teas.		√	√		√				√		

Course Coordinator	**Prof. Amal A. A. Sallam**
Head of Department	**Prof. Mahmoud F. Elsebai**

Approval Date: …/9/2023

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

بكالوريوس الصيدلة (فارم د –Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Therapeutics	**اسم المقرر :علاجيات**
Academic Level: 4	**المستوى الأكاديمي : الرابع**
Scientific department: Pharmacology & Toxicology	**القسم العلمي : الادويه والسموم**
Head of Department: Prof Dr Manar A Nader	**رئيس القسم :أ.د/ منار احمد نادر**
Course Coordinator: Prof Dr Manar A Nader	**منسق المقرر : :أ.د/ منار احمد نادر**

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Pharmacology & Toxicology**
Department supervising the course	**Pharmacology & Toxicology**
Program on which the course is given	**Bachelor in Pharmacy - Pharm D**
Academic Level	**Fourth**
Date of course specification approval	**18th September 2023**

A. Basic Information: Course data:

Course Title	**Therapeutics**
Course Code	**PH-427**
Prerequisite	**Pharmacology 1**
Teaching Hours: Lecture	**1**
Teaching Credit Hours: Practical/ tutorial	**1**
Total Credit Hours	**2 (Credit H)**

B. Professional Information:

1. Course Aims:

On completion of the course, the student will be able to describe treatment approach to various diseases, describe possible non-pharmacologic treatment, describe pharmacologic treatment options according to recent guidelines, select proper management for special population and describe appropriate monitoring for effectiveness and managing drug side effects

2- Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

(1.1.5)	**1.1.5.1**	**Identify information from fundamental sciences to solve therapeutic problems.**
(1.1.7)	**1.1.7.1**	**Use and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.**
(1.1.8)	**1.1.8.1**	**Retrieve health informatics to improve the quality of health and nutritional care, manage resources and optimize patient safety and understand metabolic disorders.**

Domain 2: professional and ethical practice

(2.4.3)	2.4.3.1	Recognize and solve any identified medicine-related and pharmaceutical care problems.
(2.4.5)	2.4.5.2	Take appropriate action when signs, symptoms and risk factors that relate to medical or health problems that fall into the scope of practice of other health professionals are encountered.

Domain 3: pharmaceutical care

(3.2.1)	3.2.1.1	Apply the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.
(3.2.2)	3.2.2.1	Utilize the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices
3.2.5	3.2.5.1	Manipulate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.
3.2.7	3.2.7.1	Identify the occurrence of a medication incident, adverse drug event and respond effectively to alleviate harm and prevent reoccurrence.

Domain 4: personal practice

(4.3.1)	4.3.1.1	Develop actual plans to manage and improve self-practice of pharmacy.
(4.3.2)	4.3.2.1	Adopt ethics of continuing professional development including assessing own learning needs and developing a plan to meet these needs.

Course Contents

Week No	Topics	No. of hours
1	Pharmacotherapy of CVS (HTN)	1
2	Pharmacotherapy of CVS (HTN)	1
3	Pharmacotherapy of CVS (HTN)	1
4	Pharmacotherapy of CVS (HF)	1
5	Pharmacotherapy of CVS (HF)	1
6	Pharmacotherapy of CVS (HF)	1
7	Pharmacotherapy of GIT (Peptic ulcer)	1
8	Pharmacotherapy of GIT (GERD)	1
9	Pharmacotherapy of diabetes	1
10	Pharmacotherapy of diabetes	1
11	Pharmacotherapy of obesity	1

12	Pharmacotherapy of pulmonary system (bronchial asthma)	1
13	Pharmacotherapy of pulmonary (COPD) system (part 1)	1
14	Pharmacotherapy of pulmonary (COPD) system (part 2) (self learning)	1
15	Compensatory and alternative lecture	1
16	Revision and quiz	1
Starting from 17	Oral and written exam	-
	Practical/Tutorial topics	
1	Pharmacotherapy of CVS- case study angina	1
2	Pharmacotherapy of CVS - case study hypotension	1
3	Pharmacotherapy of CVS- case study MI	1
4	Pharmacotherapy of CVS- case study hypertensive emergency	1
5	Pharmacotherapy of GIT- case study IBS	1
6	Pharmacotherapy of GIT- case study (Nausea & vomiting)	1
7	Pharmacotherapy of GIT- case study (Constipation & Diarrhea)	1
8	Pharmacotherapy of diabetes - case study diabetic ketoacidosis	1
9	Pharmacotherapy of PCOS - case study	1
10	Pharmacotherapy of pituitary disorder case study	1
11	Pharmacotherapy of pulmonary system case study allergic rhinitis (part 1)	1
12	Pharmacotherapy of pulmonary system case study allergic rhinitis (part 2)	1
13	Pharmacotherapy of CNS (part 1)	1
14	Pharmacotherapy of CNS (part 2)	1
15	Revision and activity	
16	Tutorial Exam	-

Teaching and Learning Methods:

Teaching and Learning Method		Week number	K. elements to be addressed
4.1	Advanced lectures:	1-16	1.1.5.1, 1.1.7.1,

	Lectures using Data show, power Point presentations Brain storming Group discussion		1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.7.1
4.2	Hybrid learning Online learning through my Mans "Mansoura university " Interactive discussion through My Mans	1-16	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.7.1, 4.1.1.1, 4.3.1.1
4.3	Self-learning	14	4.1.1.1, 4.3.1.1
4.4	Tutorial classes provided with data shows and white boards for data presentation	1-16	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.9.1, 4.1.1.1, 4.3.1.1
4.5	Case study- problem solving	1-16	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.9.14.1.1.1, 4.3.1.1
4.6	Collaborative learning: research project	2-12	2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.9.14.1.1.1, 4.3.1.1

5- Student Assessment:

Assessment Methods:

1-Written exam	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.9.1
2-Practical/Tutorial exam	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 3.2.1.1, 3.2.2.1, 3.2.5.1, 3.2.9.1
3-Oral	1.1.5.1, 1.1.7.1, 1.1.8.1, 2.4.3.1, 2.4.5.1, 4.3.1.1, 4.3.2.1

Assessment schedule

Assessment 1	Mid-term	7th – 9th week
Assessment 2	Practical/Tutorial	16th week
Assessment 3	Written	Starting from 17th week
Assessment 4	Oral	Starting from 17th week
Other assessment		

Weighing of assessments

1	Mid-term examination	15%
	Practical examination & Semester work	25%
2	Final-term examination	50%
3	Oral examination	10%
Total		100%

6 Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Data show- Computers, Internet

7- List of References

No	Reference	Type
1	Electronic book prepared by staff members	Course notes
2	Michael Katz, Kathryn R. Matthias, Marie Chisholm-Burns (2019)Pharmacotherapy Principle and Practice 5th edition McGraw Hill Professional	Book
3	Wells, Barbara; DiPiro, Joseph; Schwinghammer, Terry; and DiPiro, Cecily. Pharmacotherapy Handbook, 11/E. New York: McGraw-Hill Education, 2020.	Book
4	Schwinghammer, T. L., & DiPiro, J. T. (2002). Pharmacotherapy casebook: A patient-focused approach. New York: McGraw-Hill, Medical Pub. Division.	Book
5.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg	Websites

8- Matrix of knowledge and skills of the course

Theoretical Part

Course contents	Outcomes Domains / Key elements										
	Domain 1			**Domain 2**		**Domain 3**				**Domain 4**	
	1.1.5.1	**1.1.7.1**	**1.1.8.1**	**2.4.3.1**	**2.4.5.1**	**3.2.1.1**	**3.2.2.1**	**3.2.5.1**	**3.2.7.1.**	**4.3.1.1**	**4.3.2.1**
Pharmacotherapy of CVS (HTN)	√	√	√	√	√	√	√	√			
Pharmacotherapy of CVS (HTN)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS (HTN)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS (HF)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS (HF)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS (HF)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of GIT (Peptic ulcer)	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of GIT (GERD)	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of diabetes	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of diabetes	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of obesity	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of pulmonary	√	√	√	√	√	√	√	√	√	√	√

system (bronchial asthma)											
Pharmacotherapy of pulmonary (COPD) system (part 1)	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of pulmonary (COPD) system (part 2) (self learning)	√	√	√	√	√	√	√	√	√	√	√

Practical Part

Course contents	Outcomes Domains / Key elements										
	Domain 1			**Domain 2**		**Domain 3**				**Domain 4**	
	1.1.5.1	**1.1.7.1**	**1.1.8.1**	**2.4.3.1**	**2.4.5.1**	**3.2.1.1**	**3.2.2.1**	**3.2.5.1**	**3.2.7.1.**	**4.3.1.1**	**4.3.2.1**
Pharmacotherapy of CVS- case study angina	√	√	√	√	√	√	√	√			
Pharmacotherapy of CVS- case study hypotension	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS- case study MI	√	√	√	√	√	√	√	√	√		
Pharmacotherapy of CVS- case study hypertensive emergency	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of GIT- case study IBS	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of GIT- case study (Nausea & vomiting)	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy	√	√	√	√	√	√	√	√	√	√	√

of GIT- case study (Constipation & Diarrhea)											
Pharmacotherapy of diabetes - case study diabetic ketoacidosis	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of PCOS - case study	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of pituitary disorder case study	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of pulmonary system case study allergic rhinitis	√	√	√	√	√	√	√	√	√	√	√
Pharmacotherapy of CNS	√	√	√	√	√	√	√	√	√	√	√

Matrix 2. Between course contents, methods of learning, and assessment

A)Theoretical part

Course Contents	Teaching and Learning methods						Assessment methods			
	Advanced Lecture	Hybrid learning	Collaborative learning	Self-learning	Lab section		Corse Work	Practical/ Tutorial	Written	Oral
Pharmacotherapy of CVS (HTN)	✓						✓		✓	✓
Pharmacotherapy of CVS (HTN)	✓						✓		✓	✓
Pharmacotherapy of CVS (HTN)	✓						✓		✓	✓
Pharmacotherapy of CVS (HF)	✓						✓		✓	✓
Pharmacotherapy of CVS (HF)	✓								✓	✓
Pharmacotherapy of CVS (HF)	✓	✓							✓	✓

Pharmacotherapy of GIT (Peptic ulcer)	✓								✓	✓
Pharmacotherapy of GIT (GERD)	✓								✓	✓
Pharmacotherapy of diabetes	✓								✓	✓
Pharmacotherapy of diabetes	✓								✓	✓
Pharmacotherapy of obesity									✓	✓
Pharmacotherapy of pulmonary system (bronchial asthma)	✓								✓	✓
Pharmacotherapy of pulmonary (COPD) system (part 1)		✓		✓					✓	✓
Pharmacotherapy of pulmonary (COPD) system (part 2) (self learning)		□		□					□	□

Practical part

Course Contents	Teaching and Learning methods					Assessment methods			
	Advanced Lecture	Hyprid learning	Collaborative learning	Case study	Lab section	Corse Work	Practical/ Tutorial	Written	Oral
Pharmacotherapy of CVS- case study angina		✓		✓	✓		✓		
Pharmacotherapy of CVS- case study hypotension		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of CVS- case study MI		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of CVS- case study hypertensive emergency		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of GIT- case study IBS		✓	✓	✓	✓	✓	✓		

Pharmacotherapy of GIT- case study (Nausea & vomiting)		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of GIT- case study (Constipation & Diarrhea)		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of diabetes - case study diabetic ketoacidosis		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of PCOS - case study		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of pituitary disorder case study		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of pulmonary system case study allergic rhinitis		✓	✓	✓	✓	✓	✓		
Pharmacotherapy of CNS		□	□	□	□	□	□		

Course Coordinator	**Prof Dr Manar A Nader**
Head of Department	**Prof Dr Manar A Nader**

Date: 18 / 9 / 2023

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmaceutical Technology II	**اسم المقرر: تكنولوجيا صيدلية -2**
Academic Level: Level 4	**المستوى الأكاديمي: الرابع**
Scientific department: Pharmaceutics	**القسم العلمي: الصيدلانيات**
Head of Department: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**رئيس القسم:** **أ.د/ ارهان إبراهيم ابو هاشم**
Course Coordinator: **Prof. Dr. Elham Abdelmonem Elsaid Mohamed**	**منسق المقرر:** **أ.د/الهام عبد المنعم السعيد**

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmaceutics
Department supervising the course	Pharmaceutics
Program on which the course is given	**B. Pharm. (Pharm D)**
Academic Level	Fourth level, second semester, 2023-2024
Date of course specification approval	20th September 2023

Course Title	**Pharmaceutical Technology II**
Course Code	**PT 429**
Prerequisite	**Pharmaceutics 1**
Teaching Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**3 (Credit H)**

Basic Information: Course data:

9- Course Aims: 1-

Overall aims of course are to develop basic understanding in the area of pharmaceutical manufacturing and additionally, it helps the student understand the basic principles of unit operations in manufacturing of dosage forms.

2- Course Learning Outcomes

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.7	1.1.7.1	Identify the different unit operations in pharmaceutical industry
	1.1.7.2	Recognize the basics of dosage form manufacture and design.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.3	2.2.3.1	Generate skills to use tools in pharmaceutical manufacturing in proceeding in industry of pharmaceutical products.
2.3.3	2.3.3.1	Adopt the ability of rational proceeding in industry through proper usage of products.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Identify problems and participate with other team members and apply effective time management skills.
4.2.2	4.2.2.1	Adopt qualifications to start a career in the pharmaceutical manufacturing.
4.3.2	4.3.2.1	Practice self-learning to improve professional skills.

3- Course Contents

Week No.	Topics	Lecture Hours
1	Particle size analysis (Direct methods)	2
2	Particle size analysis (Indirect methods) and self-learning	2
3	Scale up of pharmaceutical products (Requirements , Challenges, and Pilot Plant) and self-learning	2
4	Scale up of pharmaceutical solid products	2
5	Particle size separation	2
6	Particle size reduction (Significance and mechanisms)	2
7	Particle size reduction (Equipment and factors affecting)	2
8	Pharmaceutical packaging (Function, requirements, and types)	2
9	Pharmaceutical packaging (Factors affecting and materials)	2
10	Particle size enlargement (Principle and significance)	2
11	Particle size enlargement (Equipment)	2
12	Container and closure system	2
13	Quality by design	2
14	Scale up of pharmaceutical semisolid, and liquids products	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	**Final and Oral Exams**	---
Week No.	**Practical topics**	**Credit hours**
1	Introduction	1
2	Sieving	1
3	Problems on sieving	1
4	Microscopy	1
5	Introduction of powder flow properties & powder flow rate	1
6	Problems on the microscope and powder flow properties.	1
7	Carr's index & Hausner's ratio	1
8	Midterm exam	-

9	Angle of repose	1
10	Problems on the Carr's index	1
11	Quality control of suppository (weight uniformity, hardness, melting point, melting range and liquefaction time tests)	1
12	Quality control of suppository (penetration, content uniformity)	1
13	Quality control of suppository (dissolution rate tests, and problems)	1
14	Problems on Hausner's ratio	1
15	Revision and activity	1
16	Practical Exam	1

4- Teaching and Learning Methods:

Teaching and Learning Methods		weeks	K. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Hybrid learning Online learning through my mans "Mansoura university" as recorded video lectures and labs • Interactive discussion through My Mans	1-16	1.1.7.1,1.1.7.2 2.2.3.1, 2.3.3.1
4.2	Practical sessions using tutorials	1-16	2.2.3.1, 2.3.3.1
4.3	Self-learning	2, 3	4.3.2.1
4.4	Presentations	7, 9, 10, 11, 12	2.2.3.1, 2.3.3.1
4.5	Practical Assignments	3, 9, 11	1.1.7.1, 4.1.2.1
4.6	Class Activity (Problem solving)	3, 6, 9	4.1.2.1

5- Student Assessment:

i. Assessment Methods:

1-Written exam	1.1.7.1/1.1.7.2/2.3.3.1/2.2.3.1
2-Practical exam	2.2.3.1/4.1.2.1/4.2.2.1
3-Oral	1.1.7.2/2.3.3.1/2.2.3.1/4.1.2.1/4.3.2.1
4-Mid term exam	1.1.7.1/1.1.7.2/2.3.3.1/2.2.3.1

ii. Assessment schedule

Assessment 1	**Mid-term**	7-9th week
Assessment 2	**Practical**	16th week
Assessment 3	**Written**	Starts at 17th week
Assessment 4	**Oral**	Starts at 17th week

iii. Weighing of assessments

1	**Mid-term examination**	15%
2	**Practical examination & Semester work**	25%
3	**Final-term examination**	50%
4	**Oral examination**	10%
Total		100%

6- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Library	Books and Pharmacopoeia

7- List of References

No	Reference	Type
1.	Electronic theoretical course Notes prepared by staff members	**Course notes**
2.	Recorded practical videos prepared by stuff members	**Videos on**
3.	The theory and practice of industrial pharmacy 2nd Ed., lea & Febiger,	**Essential**
4.	Handbook of Pharmaceutical Manufacturing Formulations 2nd Ed.,, Sarfaraz K. Niazi (2009)	**Recommended textbook**
5.	QUALITY, Pharmaceutical Engineering Series, Kate McCormick, Butterworth-Heinemann, London, (2002).	**Recommended textbook**
6.	http://www.sciencedirect.com http://www.google.com http://www.pubmed.com http://www.ekb.eg	**Websites**

8- Matrix of knowledge and skills of the course (Course contents and course key elements)

Course contents (Theoretical part)	Course Key Elements				
	Domain 1		Domain 2		Domain 4

	1.1.7.1	1.1.7.2		2.2.3.1	2.3.3.1		4.1.2.1	4.2.2.1	4.3.2.1
Particle size analysis (Direct methods)	√	√							
Particle size analysis (Indirect methods) and self-learning	√	√						√	√
Scale up of pharmaceutical products (Requirements, Challenges, and Pilot Plant) and self-learning	√			√	√		√	√	
Scale up of pharmaceutical solid, semisolid, and liquids products	√			√	√				
Particle size separation				√	√				
Particle size reduction (Significance and mechanisms)				√	√				
Particle size reduction (Equipment and factors affecting)	√			√	√			√	
Pharmaceutical packaging (Function, requirements, and types)	√	√		√					
Pharmaceutical packaging (Factors affecting and materials)	√			√				√	
Particle size enlargement (Principle and significance)	√			√			√		
Particle size enlargement (Equipment)	√	√							√
Container and closure system	√	√			√		√		

Quality by design	√	√			√			√	
Scale up of pharmaceutical semisolid, and liquids products	√			√	√		√	√	
Course contents (Practical part)	**Course Key Elements**								
	Domain 1			**Domain 2**			**Domain 4**		
	1.1.7.1	**1.1.7.2**		**2.2.3.1**	**2.3.3.1**		**4.1.2.1**	**4.2.2.1**	**4.3.2.1**
Introduction	√			√					√
Sieving	√	√					√		
Problems on sieving				√	√				√
Microscopy	√			√					
Introduction of powder flow properties & powder flow rate	√	√		√					√
Problems on the microscope and powder flow properties.				√	√			√	
Carr's index & Hausner's ratio	√	√		√					√
Angle of repose	√	√		√			√		
Problems on the Carr's index, and angle of repose				√	√			√	
Quality control of suppository (weight uniformity, hardness, melting point, melting range and liquefaction time tests)	√	√		√					√
Quality control of suppository (penetration, content uniformity, dissolution rate tests, and problems)	√	√		√					√
Problems on Hausner's ratio				√	√			√	

Matrix between course contents, methods of learning and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods				Assessment methods		
	Advanced Lecture	Hybrid learning	Self-learning	Presentations	Periodical / Course work - midterm	Written	Oral
Particle size analysis (Direct methods)	√				√	√	√
Particle size analysis (Indirect methods) and self-learning	√		√		√	√	√
Scale up of pharmaceutical products (Requirements, Challenges, and Pilot Plant) and self-learning	√		√		√	√	√
Scale up of pharmaceutical solid, semisolid, and liquids products	√				√	√	√
Particle size separation	√					√	√
Particle size reduction (Significance and mechanisms)	√	√				√	√
Particle size reduction (Equipment and factors affecting)	√	√		√		√	√
Pharmaceutical packaging (Function, requirements, and types)	√	√					
Pharmaceutical packaging (Factors affecting and materials)	√	√		√		√	√
Particle size enlargement (Principle and significance)	√			√		√	√
Particle size enlargement (Equipment)	√			√		√	√
Container and closure system	√			√		√	√
Quality by design	√					√	√
Scale up of pharmaceutical semisolid, and liquids products	√			√	√		√

B) Practical Part:

Course Contents	Teaching and Learning Methods				Assessment methods
	Lab sessions	Hybrid learning	Problem solving	Practical Assignments	Practical/Tutorial
Introduction	√	√			√
Sieving	√	√			√
Problems on sieving	√	√	√	√	√
Microscopy	√	√			√
Introduction of powder flow properties & powder flow rate	√	√			√
Problems on the microscope and powder flow properties.	√	√	√		√
Carr's index	√	√			√
Angle of repose	√	√			√
Problems on the Carr's index, Hausner's ratio and angle of repose	√	√	√	√	√
Quality control of suppository (weight uniformity, hardness, melting point, melting range and liquefaction time tests)	√	√			√
Quality control of suppository (penetration, content uniformity, dissolution rate tests, and problems)	√	√		√	√
Hausner's ratio	√	√			√

Course Coordinator	**Prof .Dr. Elham Abdelmonem Elsaid Mohamed**
Head of Department	**Prof. Dr. Irhan Ibrahim Abu Hashim**

Date: 20th September 2023

بكالوريوس الصيدلة فارم د **Pharm D**

Course Specification

Academic year: 2023/2024

Course name: Community Pharmacy Practice	**اسم المقرر: ممارسه صيدلية مجتمعية**
Academic Level: 4	**المستوى الأكاديمي: الرابع**
Scientific department: Clinical Pharmacy and Pharmacy Practice	**القسم العلمي: الصيدلة الإكلينيكية والممارسة الصيدلية**
Head of Department: **Prof. Mohammed El-Houseiny Shams**	**رئيس القسم:** **أ.د/ محمد الحسيني شمس**
Course Coordinator: Dr. Moetaza M. Soliman	**منسق المقرر: أ.م.د /معتزه محمود سليمان**

Course specification
2022- 2023
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Clinical Pharmacy and Pharmacy Practice**
Department supervising the course	**----------**
Program on which the course is given	**Bachelors in pharmacy (Pharm D bylaw)**
Academic Level	**Fourth level, Second Semester 2023-2024**
Date of course specification approval	**7th September 2023**

A. Basic Information: Course data:

Course Title	**Community Pharmacy Practice**
Course Code	**PP 426**
Prerequisite	**Registration**
Credit Hours: Lecture	**2**
Teaching Credit Hours: Tutorial	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

1. Course Aims:

The course affords students with fundamentals of evidence-based use for OTC medicines in the community pharmacy settings. The course also familiarizes the students with concepts of patient counseling and pharmaceutical care. Other aims include, providing the students with essential competencies to promote the public health role of the pharmacist in the community pharmacy settings.

Course Key elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	**1.1.1.1**	Differentiate between simple ailments and major diseases.
1.1.4	**1.1.4.1**	Outline the different pharmacological and non-pharmacological response options for minor ailment in the community pharmacy.
1.1.5	**1.1.5.1**	Design an individualized optimum therapeutic plan for management of minor illness using over the counter drugs.
1.1.9	**1.1.9.1**	Understand clinical calculations essential for pharmacy practice.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.1.4	**2.1.4.1**	Identify patient cases that requires referral without dispensing OTC medicines.

DOMAIN 3: Pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.2.5	**3.2.5.1**	Practice professional patient counseling to optimize outcomes of pharmaceutical care plan in collaboration with healthcare professional.
3.2.6	**3.2.6.1**	Promote public understanding of important vaccinations and self-monitoring of chronic diseases.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share in decision making activities within the settings of community pharmacy
4.2.1	4.2.1.1	Practice clear communication with patients and health care team
4.3.2	4.3.2.1	Apply self-learning to improve professional skills

2. Course Contents

A. Theoretical part

Week No.	Topics	Hours
1	**Women's Health part 1: Cystitis, Premenstrual syndrome** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, practical points, and patient counselling tips).**	2
2	**Women's Health part 2: Dysmenorrhoea, Menorrhagia** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (very common side effects, Drug interactions of note, practical points, and patient counselling tips).**	2
3	**Women's Health part 3: Hormonal contraception** **Specific questions to ask the patient, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (very common side effects, Drug interactions of note, practical points, and patient counselling tips).**	2
4	**Childhood Conditions part 1: Chickenpox, Infantile colic, napkin dermatitis** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (very common side effects, Drug interactions of note, practical points, and patient counselling tips.**	2

5	**Childhood Conditions part 2: Head lice, Threadworm** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (very common side effects, Drug interactions of note, practical points, and patient counselling tips.**	**2**
6	**Skin Conditions part 1: Acne and Scabies** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.**	**2**
7	**Skin Conditions part 2: Dandruff, Athlete's foot** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.**	**2**
8	**Skin Conditions part 3: Psoriasis** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.**	**2**
9	**OTC medications for gastrointestinal diseases (part 1) Mouth ulcers, Heartburn, Indigestion** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.**	2
10	**OTC medications for gastrointestinal diseases (part 2)** **Diarrhea, and constipation** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.**	2
11	**OTC medications for painful conditions** **Headache - Musculoskeletal problems** **Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips**	2
12	**OTC medications for respiratory diseases** **Common Cold& Flu, Sore Throats and Cough** Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children,	2

	very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips.	
13	**Specific product recommendation** **Smoking cessation - Obesity Management- Motion sickness** Practical prescribing and product selection, practical points, and patient counselling tips, Summary of medicines (very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding).	2
14	**Eye and Ear Problems (self-learning)** Etiology, Specific questions to ask the patient, Conditions to eliminate, trigger points indicative of referral, Evidence base for over-the-counter medications, Practical prescribing: Summary of medicines (Use in children, very common side effects, Drug interactions of note, Patients in whom care is exercised, use in Pregnancy & breastfeeding, practical points, and patient counselling tips	2
15	**Compensatory and alternative lecture**	2
16	**Revision and quiz**	2
17	**Final written and oral exam**	……

B. Practical part

Week No.	Tutorial topics	Hours
1	Case study: Cystitis, Premenstrual syndrome	1
2	Case study: Dysmenorrhoea, Menorrhagia	1
3	Case study: Chickenpox, Infantile colic, napkin dermatitis	1
4	Case study: Head lice, Threadworm	1
5	Case study: Acne and Scabies	1
6	Case study: Dandruff, Athlete's foot psoriasis	1
7	Case presentation: Common cold & Flu - Cough	1
8	Midterm exam	-
9	Hands-on use of mobile applications for community pharmacists	1
10	Case Presentation: GERD – Indigestion - Mouth Ulcers	1
11	Case Presentation: Diarrhea	1
12	Case Presentation: Constipation	1
13	Specific product recommendation :Smoking cessation	1
14	Specific product recommendation :Obesity management	1
15	**Revision and quiz**	1
16	**Sheet (tutorial) exam**	1

4-Teaching and Learning Methods:

	Teaching and Learning Methods	week	k. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning ● Online learning through My Mans "Mansoura university "as recorded – video lectures ● Inter active discussion through My Mans	1-16	1.1.1.1,1.1.4.1,1.1.5.1, 2.1.4.1, 3.2.5.1, 3.2.6.1
4.2	Tutorial sessions	1-7 9-16	1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.5.1, 3.2.6.1, 4.1.1.1, 4.2.1.1, 4.3.2.1
4.3	Self-learning	14	3.2.5.1, 3.2.6.1, 4.1.1.1, 4.2.1.1, 4.3.2.1
4.4	Class Activity: Group discussion offline or online	1-7 9-14	3.2.5.1, 3.2.6.1, 4.1.1.1, 4.2.1.1, 4.3.2.1

3. **Student Assessment:**

a- Assessment Methods:

1-Written exam	1.1.1.1, 1.1.4.1, 1.1.5.1, 2.1.4.1, 3.2.5.1, 3.2.6.1
2- Sheet exam	1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.5.1, 3.2.6.1, 4.1.1.1, 4.2.1.1, 4.3.2.1
3-Oral	1.1.1.1, 1.1.4.1, 1.1.5.1, 1.1.9.1, 2.1.4.1, 3.2.5.1, 3.2.6.1,4.1.1.1, 4.2.1.1, 4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1, 1.1.4.1, 1.1.5.1, 2.1.4.1, 3.2.5.1

b- Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7^{th} – 9^{th} week
Assessment 2	Practical (sheet) examination	16^{th} week
Assessment 3	Written exam	Starting from 17^{th} week
Assessment 4	Oral exam	Starting from 17^{th} week

c- Weighing of assessments

1	**Periodical (Mid-term exam) / Course work**	15%
2	**Sheet examination**	25%

3	**Final-term examination**	50%
4	**Oral examination**	10%
Total		100%

4. Facilities required for teaching and learning

Classroom	**Data show- Computers, Internet, Platform**
Library	**Books and mobile applications**

6. List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by stuff members	Videos on platform
3.	Symptoms in the pharmacy; a Guide to the Management of Common Illness edited by Alison Blenkinsopp, Paul Paxton, and John Blenkinsopp, 8th edition, 2018	Essential Book
4.	• https://www.ekb.eg/. • https://go.wolterskluwer.com/lexicomp-drug-references-int-b.html?utm_source=google&utm_medium=cpc&utm_campaign=ALL_Lexicomp_INT_Brand&utm_content=001-ETA-Brand_Exact&utm_term=lexicomp&gclid=CjwKCAjwhuCKBhADEiwA1HegOa3V40mlNyAwkxXqqD-MhuJqRWNSUDOi7AlREiUFqTghXadDjRSaGBoC2GcQAvD_BwE • https://accesspharmacy.mhmedical.com/	Websites

7. Matrix of knowledge and skills of the course

A. Theoretical part

Domains	Domain 1				Domain 2	Domain 3		Domain 4		
Course contents	1.1.1.1	1.1.4.1	1.1.5.1	1.1.9.1	2.1.4.1	3.2.5.1	3.2.6.1	4.1.1.1	4.1.1.1	4.3.2.1
Women's Health part 1: Cystitis, Premenstrual syndrome	√	√	√	√	√	√		√	√	√
Women's Health part 2: Dysmenorrhoea, Menorrhagia	√	√	√	√	√	√		√	√	√
Women's Health part 3: Hormonal contraception	√	√	√	√	√	√		√	√	√
Childhood Conditions part 1: Chickenpox, Infantile colic, napkin dermatitis	√	√	√	√	√	√		√	√	√
Childhood Conditions part 2: Head lice, Threadworm	√	√	√	√	√	√		√	√	√
Skin Conditions part 1: Acne and Scabies	√	√	√	√		√	√	√	√	√
Skin Conditions part 2: Dandruff, Athlete's foot	√	√	√	√						
Skin Conditions part 3: Psoriasis	√	√	√	√						
OTC medications for gastrointestinal diseases (part 1) Mouth ulcers, Heartburn, Indigestion	√	√	√	√						
OTC medications for gastrointestinal diseases (part	√	√	√	√	√	√		√	√	√

2) Diarrhea, and constipation												
OTC medications for painful conditions Headache - Musculoskeletal problems	√	√	√	√		√		√			√	√	√
OTC medications for respiratory diseases Common Cold& Flu, Sore Throats and Cough	√	√	√	√		√		√			√	√	√
Specific product recommendation Smoking cessation - Obesity Management- Motion sickness	√	√	√	√		√		√					√
Eye and Ear Problems (self-learning)	√	√	√	√		√		√					√

B. Tutorial part

Domains	**Domain 1**					**Domain 2**		**Domain 3**			**Domain 4**		
Course contents	**1.1.1.1**	**1.1.4.1**	**1.1.5.1**	**1.1.9.1**		**2.1.4.1**		**3.2.5.1**	**3.2.6.1**		**4.1.1.1**	**4.1.1.1**	**4.3.2.1**
Case study: Cystitis, Premenstrual syndrome	√	√	√	√		√		√	√		√	√	√
Case study: Dysmenorrhoea, Menorrhagia	√	√	√	√		√		√	√		√	√	√
Case study: Chickenpox, Infantile colic, napkin dermatitis	√	√	√	√		√		√	√		√	√	√
Case study: Head lice, Threadworm	√	√	√	√		√		√	√		√	√	√

Case study: Acne and Scabies	√	√	√	√		√		√	√		√	√	√
Case study: Dandruff, Athlete's foot psoriasis	√	√	√	√		√		√	√		√	√	√
Case presentation: Common cold & Flu - Cough	√	√	√	√		√		√	√		√	√	√
Hands-on use of mobile applications for community pharmacists	√	√	√	√		√		√	√		√	√	√
Case Presentation: GERD – Indigestion -Mouth Ulcers	√	√	√	√		√		√	√		√	√	√
Case Presentation: Diarrhea	√	√	√	√		√		√	√		√	√	√
Case Presentation: Constipation	√	√	√	√		√		√	√		√	√	√
Specific product recommendation : Smoking cessation - Obesity management Group Project	√	√	√	√		√		√	√		√	√	√
Tutorial Exam	√	√	√	√		√		√	√		√	√	√

Matrix 2. between course contents, methods of learning and assessment

A) Theoretical Part:		
Course Contents	**Teaching and Learning Methods**	**Assessment methods**

	Lecture	Online lecture	Tutorial sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/ Tutorial	Written	Oral
Women's Health part 1: Cystitis, Premenstrual syndrome	√				√		√		√	√
Women's Health part 2: Dysmenorrhoea, Menorrhagia	√				√		√		√	√
Women's Health part 3: Hormonal contraception	√				√		√		√	√
Childhood Conditions part 1: Chickenpox, Infantile colic, napkin dermatitis	√				√		√		√	√
Childhood Conditions part 2: Head lice, Threadworm	√				√		√		√	√
Skin Conditions part 1: Acne and Scabies	√				√		√		√	√
Skin Conditions part 2: Dandruff, Athlete's foot	√				√		√		√	√
Skin Conditions part 3: Psoriasis	√				√		√		√	√
OTC medications for gastrointestinal diseases (part 1) Mouth ulcers, Heartburn, Indigestion	√				√		√		√	√
OTC medications for gastrointestinal diseases (part 2) Diarrhea, and constipation	√				√		√		√	√
OTC medications for painful conditions Headache - Musculoskeletal problems	√				√		√		√	√
OTC medications for respiratory diseases Common Cold& Flu, Sore Throats and Cough	√				√		√		√	√

Specific product recommendation Smoking cessation - Obesity Management- Motion sickness	√						√		√	√
Eye and Ear Problems (self-learning)	√					√	√		√	√

B) Tutorial Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Tutorial sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Case study: Cystitis, Premenstrual syndrome			√		√			√		
Case study: Dysmenorrhoea, Menorrhagia			√		√			√		
Case study: Chickenpox, Infantile colic, napkin dermatitis			√		√			√		
Case study: Head lice, Threadworm			√		√			√		
Case study: Acne and Scabies			√		√			√		
Case study: Dandruff, Athlete's foot psoriasis			√		√			√		

Case presentation: Common cold & Flu - Cough			√		√			√		
Hands-on use of mobile applications for community pharmacists			√					√		
Case Presentation: GERD – Indigestion -Mouth Ulcers			√					√		
Case Presentation: Diarrhea			√					√		
Case Presentation: Constipation			√					√		
Specific product recommendation : Smoking cessation - Obesity management **Group project presentation**			√					√		
Tutorial exam			√					√		

Course Coordinator	**Dr. Moetaza Mahmoud Hassab** Moetaza Soliman
Head of Department	**Professor Mohamed El-Houseiny Shams** Mohamed El-Houseiny Shams

Date: 7 /9/2023

بكالوريوس الصيدلة (فارم دي – Pharm D)

Course Specification

Academic year: 2023/2024

Course Name: Medicinal Chemistry-2	**اسم المقرر** : كيمياء دوائية-2
Academic Level: level 4	الرابع **المستوى الأكاديمي** :
Scientific Department: Medicinal Chemistry	**القسم العلمي** : الكيمياء الدوائية
Head of Department: Prof. Dr. Mohamed Ahmed Moustafa	**رئيس القسم :** أ.د/ محمد أحمد مصطفى
Course Coordinator: Ali A. El-Emam	**منسق المقرر :** أ.د/ علي عبد الرحمن الإمام

University	Mansoura
Faculty	Pharmacy
Department offering the course	Medicinal Chemistry
Department supervising the course	Medicinal Chemistry
Program on which the course is given	Bachelor in Pharmacy- Pharm D
Academic Level	Level 4, Second Semester, 2023/2024
Date of course specification approval	6/9/2023

A. Basic Information: Course data:

Course Title	Medicinal Chemistry-2
Course Code	PD 422
Prerequisite	Organic Chemistry III
Teaching Credit Hours: Lecture	2
: Practical	1
Total Credit Hours	3

B. Professional Information:

1 . Course Aims:

This course enables the students to:

- Review the action of drug members on the central nervous system, hormones and related drugs, prostaglandins, analgesics, antihistaminics, and gastrointestinal drugs.
- Comprehend the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.

2- Course Key Elements:

Upon completing the course, the student will be able to dominate the following key elements

Domain 1- fundamental knowledge

Program K. Element No.	Course K. Element No.	Course K. Element
1.1.1	1.1.1.1	Recognize in-depth and breadth knowledge of medicinal chemistry course as one of the applied pharmaceutical sciences of the program.
1.1.2	1.1.2.1	Outline different topics of medicinal chemistry including drug efficacy, affinity, binding with the receptors, isosterism, bio-isosterism and prodrugs.
	1.1.2.2	Recognize international non-proprietary names (generic names) of drugs.
1.1.4	1.1.4.1	Recognize different properties of drugs, including molecular mechanism of action, clinical uses, drug interactions, contra-indications, adverse drug reactions (ADRs) and structure-activity relationship (SAR).
1.1.7	1.1.7.1	Manipulate knowledge gained in medicinal chemistry to provide information about drug production and proper use of drugs.

Domain 2: Professional and Ethical Practice

Program K. Element No.	Course K. Element No.	Course K. Element
2.5.3	2.5.3.1	Adapt concepts of medicinal chemistry used in the systematic approach applied in drug development.

Domain 3: Pharmaceutical Care

Program K. Element No.	Course K. Element No.	Course K. Element
3.2.1	3.2.1.1	Adapt principles of medicinal chemistry and pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions.
3.2.5	3.2.5.1	Apply medicinal chemistry aspects of drugs to support the patients, and community in making informed decisions about their care plan including OTC preparations.

Domain 4: Personal Practice:

Program K. Element No.	Course K. Element No.	Course K. Element
4.1.2	4.1.2.1	Appraise information, analyze data, identify problems and present solutions

		depending on medicinal chemistry aspects.
	4.1.2.2	Participate collaboratively and independently as drug chemistry expert within healthcare team.
4.2.1	4.2.1.1	Communicate effectively in a proper scientific language by verbal and written means in the field of health care regarding the studied topics.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development and life-long learning.

3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Introduction to steroidal hormones + Male Sex Hormones	2
2	Female Sex Hormones (estrogens & antiestrogens)	2
3	Female Sex Hormones (progestogens and antiprogestogens) + Narcotic Analgesics (part 1)	2
4	Narcotic Analgesics (part 2)	2
5	Non-Steroidal Anti-Inflammatory Drugs (part 1)	2
6	Adrenocorticosteroids	2
7	Non-Steroidal Anti-Inflammatory Drugs (part 2)	2
8	Anti-Hitsaminics (H_1& H_2) + Proton Pump Inhibitors	2
9	General Anesthetics, Sedative & Hypnotics	2
10	Anticonvulsants & Antipsychotics	2
11	• Neurodegenerative Disorders Parkinsons's (Part I)	2
12	• Neurodegenerative Disorders Alzheimer's (Part II)	2
13	• Neurodegenerative Disorders Alzheimer's (Part III)	2
14	Prostaglandins (PGs-self learning)	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
Starting 17	**Final Written and Oral Exam**	--

Week No.	Practical topics	Practical credit hours
1.	*In silico* drawing software (Introduction)	1
2.	*In silico* drawing software (Drawing full scheme)	1
3.	*In silico* drawing software (NMR predication + Physicochemical properties calculation)	1
4.	*In silico* drawing software (Applications using software + revision)	1
5.	*In silico* drawing software Revision	1
6.	Hormones case studies	1
7.	Narcotic analgesics case studies	1
8.	Midterm exam	-
9.	NSAIDs case studies	1
10.	CNS case studies – part 1	1
11.	CNS case studies – part 2	1
12.	Mixed Cases– part 1	1
13.	Mixed Cases– part 2	1
14	Mixed Cases– part 3	1
15	Revision and activity	1
16	**Sheet & Practical exam**	--

4- Teaching and learning Methods:

No.	Teaching and learning Methods	Week No.	K. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data Show, Power Point Presentations b. Distance learning • Online learning through My Mans "Mansoura University "as recorded – video lectures • Interactive discussion through My Mans	1-16	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.5.1
4.2	Self-learning	14	4.3.2.1
4.3	Practical session using computer software (Insilico drawing software) and tutorials	1-16	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 4.1.2.1,

4.4	Class Activity: Group discussion offline and online.	1-9	1.1.1.1,1.1.2.1, 1.1.2.2,1.1.4.1, 1.1.7.1,2.5.3.1, 3.2.1.1,4.1.2.1,
4.5	Problem – based learning and brainstorming	1-9	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 4.1.2.1,
4.6	Research assignments	14	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 4.1.2.1,

5- Student Assessment:

s- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1
2-Practical exam	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 1.1.7.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
3-Oral	1.1.1.1, 1.1.2.1, 1.1.2.2, 1.1.4.1, 2.5.3.1, 3.2.1.1, 3.2.5.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1, 1.1.2.1, 1.1.2.2, 4.1.2.1

b. Assessment schedule

Assessment 1	Periodical (Mid-term exam)	7-9th week
Assessment 2	Practical examination and tutorial	16th week
Assessment 3	Written exam	Starting from 17th week
Assessment 4	Oral exam	Starting from 17th week

c. Weighing of assessments

1	Periodical (Mid-term) exam / Course work	15%
2	Practical examination and tutorial	25%
3	Final-term written examination	50%
4	Oral examination	10%
Total		100%

6-Facilities required for teaching and learning

-Class room	**New Computers and Internet facilities.**
- Laboratory facilities	**Computer software (In silico drawing software) and white**
- Library	**-----**

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	**Course notes**
2.	Recorded videos prepared by stuff members	**Videos on platform**
3.	"Foye's Principles of Medicinal Chemistry", 8th edition, (David A. Williams, Thomas L. Lemke & William O. Foye, Editors), Lippincott Williams & Wilkins, 2017	**Book**
4.	"Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, (J. H. Block and J. M. Beale Jr, Editors), Lippincott Williams & Wilkins, Philadelphia, PA, 2013	**Book**
5.	http://www.sciencedirect.com/ http://www.googlescholar.com/ http://www.pubmed.com https://www.ekb.eg	**websites**

8- Matrix of course content versus course k. elements:

Course contents	Course Key Elements											
	Domain: 1					Domain: 2	Domain: 3		Domain: 4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.4.1	1.1.7.1	2.5.3.1	3.2.1.1	3.2.5.1	4.1.2.1	4.1.2.2	4.2.1.1	4.3.2.1
A) Theoretical part												
Introduction to steroidal hormones + Male Sex Hormones		√			√	√	√	√				
Female Sex Hormones (estrogens & antiestrogens)			√	√		√		√				
Female Sex Hormones (progestogens and antiprogestogens) + Narcotic Analgesics (part 1)	√		√	√				√				
Narcotic Analgesics (part 2)	√		√				√	√				
Non-Steroidal Anti-Inflammatory Drugs (part 1)	√		√				√	√				
Adrenocorticosteroids	√		√	√		√	√	√				
Non-Steroidal Anti-Inflammatory Drugs (part 2)	√		√	√		√	√	√				
Anti-Hitsaminics (H_1& H_2) + Proton Pump Inhibitors			√	√		√	√	√				
General Anesthetics, Sedative & Hypnotics			√	√		√	√	√	√			
Anticonvulsants & Antipsychotics			√	√		√	√	√	√			
• Neurodegenerative Disorders □ Parkinsons's (Part I)		√	√			√	√	√				

Course contents	Course Key Elements											
	Domain: 1					Domain: 2	Domain: 3		Domain: 4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.4.1	1.1.7.1	2.5.3.1	3.2.1.1	3.2.5.1	4.1.2.1	4.1.2.2	4.2.1.1	4.3.2.1
• Neurodegenerative Disorders Alzheimer's (Part II)		√	√			√	√	√				
• Neurodegenerative Disorders Alzheimer's (Part III)		√	√			√	√	√				
Prostaglandins (PGs-self learning)									√	√	√	√
B) Practical part												
In silico drawing software (Introduction)	√	√	√	√		√	√	√	√		√	√
In silico drawing software (Drawing full scheme)	√	√		√		√	√	√	√		√	√
In silico drawing software (NMR predication + Physicochemical properties calculation)	√	√		√		√	√	√	√		√	√
In silico drawing software (Applications using software + revision)	√	√		√		√	√	√	√		√	√
In silico drawing software Revision	√		√			√	√	√		√		√
Hormones case studies	√	√			√	√	√	√		√		√
Narcotic analgesics case studies	√		√		√	√	√	√		√		√
NSAIDs case studies	√	√		√	√	√	√	√		√		√
CNS case studies – part 1	√	√		√	√	√	√	√		√		√

Course contents	Course Key Elements											
	Domain: 1					Domain: 2	Domain: 3		Domain: 4			
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.4.1	1.1.7.1	2.5.3.1	3.2.1.1	3.2.5.1	4.1.2.1	4.1.2.2	4.2.1.1	4.3.2.1
CNS case studies – part 2	√	√		√	√	√	√	√				
Mixed Cases (part I)	√	√	√	√		√	√	√	√		√	√
Mixed Cases (part II), part (III)	√	√	√	√		√	√	√	√		√	√

9- Matrix 2. between course contents, methods of learning and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Computer aided learning	Practical session using computer software and tutorials	Class Activity	Problem – based learning and brainstorming	Research assignments	Self-learning	Mid-term	Practical/Tutorial	Written	Oral
Introduction to steroidal hormones + Male Sex Hormones	√						√		√	√
Female Sex Hormones (estrogens & antiestrogens)	√						√		√	√
Female Sex Hormones (progestogens and antiprogestogens) + Narcotic Analgesics (part 1)	√						√		√	√
Narcotic Analgesics (part 2)	√		√	√	√		√		√	√
Non-Steroidal Anti-Inflammatory Drugs (part 1)	√								√	√
Adrenocorticosteroids	√								√	√
Non-Steroidal Anti-Inflammatory Drugs (part 2)	√		√	√	√				√	√
Anti-Hitsaminics (H_1& H_2) + Proton Pump Inhibitors	√								√	√
General Anesthetics, Sedative & Hypnotics	√								√	√

Anticonvulsants & Antipsychotics	√								√	√
• Neurodegenerative Disorders Parkinsons's (Part I)	√		√	√	√				√	√
• Neurodegenerative Disorders Alzheimer's (Part II)	√								√	√
• Neurodegenerative Disorders Alzheimer's (Part III)	√								√	√
Prostaglandins (PGs-self learning)				√	√	√			√	√

B) Practical Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Computer aided learning	Practical session using computer software and tutorials	Class Activity	Problem – based learning and brainstorming	Research assignments	Self-learning	Mid-term	Practical/Tutorial	Written	Oral
In silico drawing software (Introduction)		√						√		
In silico drawing software (Drawing full scheme)		√						√		
In silico drawing software (NMR predication + Physicochemical properties calculation)		√						√		
In silico drawing software (Applications using software + revision)		√	√	√	√			√		
In silico drawing software Revision		√						√		
Hormones case studies		√						√		
Narcotic analgesics case studies		√	√	√	√			√		

NSAIDs case studies		√						√		
CNS case studies – part 1		√						√		
CNS case studies – part 2		√						√		
Mixed Cases (Part I)		√	√	√	√			√		
Mixed Cases (Part II), (Part III)		√	√	√	√			√		

Course Coordinator	**Prof. Dr. Ali A. Elemam**
Head of Department	**Prof. Dr. Mohamed Ahmed Moustafa**

Date: 6/9/2023