



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program

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## توصيف مقررات

برنامج الصيدلة الاكلينيكية لائحة فارم دي

للعام الجامعي 2024/2023



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

المستوى الرابع		
no	اسم المقرر	كود المقرر
1	Pharmacology-III	PO 704
2	Medicinal Chemistry-I	PC 707
3	Advanced Drug Delivery Systems	PT 709
4	Clinical Pharmacy Practice	PP 703
5	Medical Microbiology	PM 704
6	Phytotherapy	PG 706
7	Medicinal Chemistry-II	PC 808
8	Advanced Pharmacotherapy and Therapeutics	PO 805
9	Clinical Pharmacokinetics	PP 804
10	Pharmacotherapy of Critical Care Patients	PP 805
11	Clinical Biochemistry	PB 804
12	Public Health and Preventive Medicine	PM 805
13	Quality Control and pharmaceutical analysis	PC 809
14	Elective Course	PE ---



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



بكالوريوس الصيدلة الإكلينيكية ( فارم دي – Pharm D )  
Course Specification  
Academic year: 2023/2024

Course name: Pharmacology 3 (PO 704)	اسم المقرر: فارماكولوجي 3
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific department: Pharmacology & Toxicology	الأدوية والسموم القسم العلمي:
Head of Department: Prof. Manar A. Nader	رئيس القسم: أ.د/ منار أحمد نادر
Course Coordinator: Prof. Tarek Mostafa	منسق المقرر: أ.د/ طارق مصطفى



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and Toxicology
Department supervising the course	Pharmacology and Toxicology
Program on which the course is given	<b>B. Pharm. (Clinical Pharmacy) (Pharm-D)</b>
Academic Level	Level 4, First semester, 2023-2024
Date of course specification approval	18/9/2023

## A. Basic Information: Course data:

Course Title	Pharmacology III
Course Code	PO 704
Prerequisite	Pharmacology II
Teaching credit Hours: Lecture	2
: Practical	1
Total Credit Hours	3

## B. Professional Information:

### 1. Course Aims:

On completion of the course, the student will be able to identify mechanism of action, pharmacological and side effects, therapeutic uses and contraindications of chemotherapeutic agents, drugs acting on immune and endocrine systems.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 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 basic actions and active physiologic sites of immune and endocrine systems
	1.1.4.2	List basic principles of antimicrobial agents
	1.1.4.3	Describe mode of action, pharmacological effects, and clinical uses of drugs acting on immune, endocrine systems and chemotherapeutics

### Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.4.5	2.4.5.1	Take the appropriate action when drug related risk factors, health problem or adverse reaction emerge.
2.4.7	2.4.7.1	Assess pharmacological approaches for managing immune disorders, endocrine dysfunction and infectious diseases
	2.4.7.2	Evaluate drug considerations in special population and patients particular health issues

### Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.4	3.1.4.1	Point out etiology, pathogenesis, laboratory diagnosis to suggest treatment of infections and certain immune and endocrine disorders as well as their prevention.
3.2.5	3.2.5.1	Provide education and counselling to patients and health care professionals about effective and safe medications



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Demonstrate knowledge and practices in the field of pharmacy and drug use
	4.1.2.2	Participate independently and collaboratively in the application of health services

### 3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Immunopharmacology: Introduction Immunopharmacology: abnormal immune response	2
2	Abnormal immune response Immunosuppressant agents	2
3	Antiviral drugs	2
4	Antiviral drugs	2
5	Diabetes Mellitus and antidiabetic drugs	2
6	Hypothalamus and Pituitary hormones	2
7	Thyroid hormones and Antithyroid drugs	2
8	Parathyroid hormones and Drugs affecting bone metabolism	2
9	Antibacterial drugs	2
10	Antibacterial drugs	2
11	Antifungal drugs	2
12	Anticancer drugs	2
13	Oral Contraceptives	2
14	Revision and quiz	2
15	Final written and oral exam	-
Week No.	Practical Topics	Practical credit hours
1.	Guidelines for good prescribing	1
2.	Immunopharmacology case (swollen hands)	1
3.	Immunopharmacology case (type I hypersensitivity case)	1
4.	Immunopharmacology case (scaly annular plaque)	1
5.	Herpes Virus case	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

6.	Obesity	1
7.	Polycystic Ovary disease	1
8.	Midterm exam	-
9.	Cushing Syndrome	1
10.	Antiprotozoal drugs	1
11.	Anthelmintic drugs	1
12.	Antimycobacterial drugs 1	1
13.	Antimycobacterial drugs 2	1
14.	Practical exam	1

#### 4- Teaching and Learning Methods:

	Teaching and learning Methods:	Week. No	K. elements to be addressed
4.1	<b>Computer aided learning:</b> Lectures using Data show, power Point presentations	1-14	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
4.2	<b>Hybrid learning:</b> Online learning through My mans "Mansoura university "	2,7,11	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
4.3	Self-learning	12,13	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
4.4	Practical session using data show and power point presentations	1-14	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
4.5	Class Activity	5, 9-12	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
4.6	<b>Collaborative learning:</b> Research assignments	5-8 9-11	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 4.1.2.1, 4.1.2.2



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 5- Student Assessment:

### a- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, , 3.2.5.1
2-Practical exam	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1, 4.1.2.2
3-Oral	1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1, 4.1.2.1
4- Periodical (Mid-term exam) / Course work	1.1.4.1, 1.1.4.2, 1.1.4.3, 2.4.5.1, 2.4.7.1, 2.4.7.2, 3.1.4.1, 3.2.5.1

### b. Assessment schedule

Assessment 1	Periodical (Mid-term/ Course work)	7-9 <sup>th</sup> week
Assessment 2	Tutorial exam	14 <sup>th</sup> week
Assessment 3	Written exam	Start from 15 <sup>th</sup> week
Assessment 4	Oral exam	Start from 15 <sup>th</sup> 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

Classroom	Data show- Computers, Internet.
Laboratory facilities	Data show- Computers, Internet, white board





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 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 Board Review 13 <sup>th</sup> edition Publisher: McGraw Hill Lange	Reference textbook
2.	Ritter J, Flower R, Henderson G, Loke YK, MacEwan D, Rang H (2020) Rang and Dale's pharmacology 9 <sup>th</sup> edition Publisher: Elsevier	Reference textbook
3.	Whalen K, Panavelil TA (2014) Lippincott Illustrated Reviews: Pharmacology, 6 <sup>th</sup> Edition Philadelphia: Lippincott Williams & Wilkins	Reference textbook
4.	Rollins D, Blumenthal D (2021), Workbook and case book for Goodman and Gilman's pharmacological basis of therapeutics 12 <sup>th</sup> edition Publisher: McGraw Hill Lange	Reference textbook
5	Electronic book prepared by staff members	Course notes
6	ACCP guidelines ( <a href="https://www.accp.com/">https://www.accp.com/</a> )	Internet sources
7	Egyptian Knowledge Bank ( <a href="https://www.ekb.eg/">https://www.ekb.eg/</a> )	Internet sources



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

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

Course contents / K. elements	Domain 1			Domain 2			Domain 3			Domain 4	
	1.1 .4. 1	1.1. 4.2	1.1. 4.3	2.4. 5.1	2.4. 7.1	2.4 .7. 2	3.1.4 .1	3.2. 5.1	4.1.2. 1	4.1 .2. 2	
Immunopharmacology: Introduction abnormal immune response Immunosuppressant agents	✓		✓	✓	✓	✓		✓			
Antiviral drugs Thyroid and antithyroid drugs Antidiabetic drugs Parathyroid Hormones and Drugs Affecting Bone Metabolism Adrenocorticosteroids	✓		✓	✓	✓	✓		✓	✓	✓	
Chemotherapeutics: Introduction Cell wall inhibitors, Inhibitors of protein synthesis, metabolism Inhibitors of Bacterial Nucleic acid Synthesis, Inhibitors of Bacterial Urinary Tract Antiseptics/antimicrobia ls Chemotherapy of tuberculosis Antifungal Drugs, Anticancer drugs		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Oral contraceptives	✓		✓	✓	✓	✓		✓	✓	✓	





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

**9-Matrix between course contents, methods of learning and assessment:**

Theoretical Part:		Teaching and Learning Methods					Assessment methods				
Course Contents		Lecture	Online lecture	Lab sessions	Research assignments	Class activity	Self-learning	Course Work	Practical/Tutorial	Written	Oral
		Immunopharmacology: Introduction		√						√	
Immunopharmacology: abnormal immune response		√						√		√	√
Abnormal immune response		√						√		√	√
Immunosuppressant agents		√						√		√	√
Antiviral drugs		√						√		√	√
Antiviral drugs		√	√					√		√	√

Diabetes Mellitus and antidiabetic drugs		√			√	√				√	√
Hypothalamus and Pituitary hormones		√			√					√	√
Thyroid hormones and Antithyroid drugs		√	√		√					√	√
Parathyroid hormones and Drugs affecting bone metabolism		√			√					√	√
Antibacterial drugs		√				√				√	√
Antibacterial drugs		√				√				√	√
Antifungal drugs		√	√			√				√	√
Anticancer drugs		√				√	√			√	√
Oral Contraceptives		√					√			√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

B) Practical Part:										
Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	Research	Class activity	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Guidelines for good prescribing			√				√	√		
Immunopharmacology case (swollen hands)			√				√	√		
Immunopharmacology case (type I hypersensitivity case)			√				√	√		
Immunopharmacology case (scaly annular plaque)			√				√	√		
Herpes Virus case			√				√	√		
Obesity			√				√	√		
Polycystic Ovary disease			√				√	√		
Cushing Syndrome			√				√	√		
Antiprotozoal drugs			√	√			√	√		
Antihelminthic drugs			√	√			√	√		
Antimycobacterial drugs 1			√	√			√	√		
Antimycobacterial drugs 2			√	√			√	√		

<b>Course Coordinator</b>	<b>Prof. Tarek Mostafa</b>
<b>Head of Department</b>	<b>Prof. Manar Ahmed Nader</b> 

Date: 18/9/2023



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



بكالوريوس الصيدلة الإكلينيكية ( فارم د – Pharm D )

### Course Specification

Academic year: **2023/2024**

Course Name: Medicinal Chemistry 1	اسم المقرر: كيمياء دوائية 1
Course Code: PC 707	كود المقرر PC 707
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific Department: Medicinal Chemistry	القسم العلمي: الكيمياء الدوائية
Head of Department: Prof. Dr. Mohammed Ahmed Ahmed Moustafa	رئيس القسم: أ.د/ محمد أحمد أحمد مصطفى
Course Coordinator: Prof. Dr. Mohammed Ahmed Ahmed Moustafa	منسق المقرر: أ.د/ محمد أحمد أحمد مصطفى



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Medicinal Chemistry
Department supervising the course	Medicinal Chemistry
Program on which the course is given	<b>B. Pharm. (PharmD) (Clinical Pharmacy)</b>
Academic Level	Fourth level, first semester, 2023-2024
Date of course specification approval	06/09/2023

### 1- Basic Information: Course data:

Course Title	Medicinal Chemistry 1
Course Code	PC 707
Prerequisite	Pharmaceutical Organic Chemistry 2
Teaching Hours: Lecture	2
Practical	1
Total Credit Hours	3

### 2- Course Aims:

#### This course enables the students to:

Medicinal chemistry I course aims to demonstrate the fundamental physicochemical properties affecting drug activity and metabolic fate of these drugs in relation to their chemical structure. Additionally, important medicinal chemistry aspects of chemotherapeutic agents, including essential chemical features, mode of action and therapeutic utilities are to be covered. The practical part of the course enables the students to visualize in silico drug structures and discuss certain case studies related to drugs used in therapy that are covered in the theoretical part.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 3- 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	Recognize in depth and breadth the basic principles of medicinal chemistry course as a part of applied pharmaceutical sciences in pharmacy curriculum.
1.1.2	1.1.2.1	Use non-proprietary names (scientific names) of drugs in professional practice.
1.1.4	1.1.4.1	Explain the molecular mode of action of drugs of different classes.
1.1.6	1.1.6.1	Apply medicinal chemistry principles to make informed decisions on drug use.
1.1.10	1.1.10.1	Classify the different drug classes and their role in management of various body disorders.

#### DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
2.3.2	2.3.2.1	Choose the proper procedure to handle chemotherapeutic agents.
2.4.3	2.4.3.1	Use principles of medicinal chemistry to contribute to decision-making processes to solve drug-related problems.





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### DOMAIN 3: PHARMACEUTICAL CARE

Program K. element no.	Course K. element no.	Course K. element
3.1.4	3.1.4.1	Propose the proper treatment for different body disorders according to patient condition.
3.2.1	3.2.1.1	Integrate fundamentals of medicinal chemistry of drugs including mode of action, therapeutic uses and untoward side effects.
3.2.5.	3.2.5.1	Use principles of medicinal chemistry to provide education and counselling to support patients and community about their care plan.
	3.2.5.2	Support patients and health care providers about the use of safe, effective and cheap medications.
3.2.6	3.2.6.1	Develop public awareness on rational use of drugs, drug abuse and misuse.

### DOMAIN 4: PERSONAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Participate independently and collaboratively in delivery of health services related to pharmacy practice.
4.2.1	4.2.1.1	Communicate verbally and nonverbally including software tools with patient other health care team and communities.
4.3.2	4.3.2.1	Participate in continuous professional development activities to update and advance learning needs.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 3- Course Contents

#### A) Theoretical part

Week No.	Topics	Credit Hours
1	Physicochemical Properties	2
2	Physicochemical Properties + Drug Metabolism	2
3	Drug Metabolism	2
4	$\beta$ -lactam	2
5	$\beta$ -lactam + Macrolides	2
6	Tetracyclines + Aminoglycoside + Amphenicol	2
7	Quinolones + Sulfonamides	2
8	Anti-tubercular and antiprotozoal Drugs	2
9	Anticancer agents	2
10	Anticancer agents	2
11	Antifungal agents	2
12	Antiviral agents	2
13	Self-Learning (Antimalarial, antiseptics and disinfectants)	2
14	<b>Revision and quiz</b>	2
15	<b>Final written and oral exam</b>	--



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## B) Practical part

Week No.	Topics	Practical Credit hours
1	-In silico drawing software: Introduction, draw chemical structure, color, rotate, background, draw scheme.	1
2	-In silico drawing software: Predicting some properties for a chemical structure, revision.	1
3	-Acid-base properties of drugs. -Hydrophilic and lipophilic characters. -Predicting the degree of ionization. Hydrogen bond.	1
4	-Hansch constant and Log p problems. -Drug metabolism.	1
5	-Types of drug receptor interactions. Physicochemical cases.	1
6	-Case study: Penicillin.	1
7	-Case study: Tetracyclines and Macrolides.	1
8	Midterm exam	-
9	-Case study: Quinolones.	1
10	-Case study: Sulfonamides and Antifungal drugs.	1
11	-Case study: Antiviral drugs.	1
12	-Case study: Anticancer drugs.	1
13	Revision	1
14	Computer + case exams	1

## 5- Teaching and Learning Methods:

	Teaching method	Week no.	K elements to be assessed
5.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"> <li>On line learning through My Mans "Mansoura university "as recorded – video lectures</li> <li>Inter active discussion through My Mans</li> </ul>	1-14	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.2	Self-learning	13	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.3	Practical session using chemicals and	1-14	1.1.1.1, 1.1.2.1, 1.1.4.1,



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

	laboratory equipment and/ or tutorials		1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.4	Class Activity: Group discussion offline and online.	1-11	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.5	Problem – based learning and brainstorming	1-11	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.6	Research assignments	1-11	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
5.7	Role play	1-11	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1

## 6- Student Assessment:

### a- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.3.2.1, 2.4.3.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
2-Practical exam	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
3-Oral	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 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, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 4.1.2.1, 4.2.1.1, 4.3.2.1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### b- Assessment schedule

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

### c- 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%

## 7- Facilities required for teaching and learning

Classroom	Data show, Computers, Internet, Platform
Laboratory facilities	Tutorial Class - Computer software (ChemBioOffice-Trial version)
Library	Textbooks



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

**8-Matrix:**

**Matrix 1. Course contents and course key elements**

**A) Theoretical part:**

Course contents	Outcomes													
	Domains / Key elements													
	Domain 1					Domain 2	Domain 3					Domain 4		
	1.1.1.1	1.1.2.1	1.1.4.1	1.1.6.1	1.1.10.1	2.4.3.1	3.1.4.1	3.2.1.1	3.2.5.1	3.2.6.1	3.2.5.2	4.1.2.1	4.2.1.1	4.3.2.1
Physicochemical Properties	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Physicochemical Properties + Drug Metabolism	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Drug Metabolism	√	√	√	√	√	√	√	√	√	√	√	√	√	√
β-lactam	√	√	√	√	√	√	√	√	√	√	√	√	√	√
β-lactam + Macrolides	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Tetracyclines + Aminoglycoside + Amphenicol	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Quinolones + Sulfonamides	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Anti-tubercular and antiprotozoal Drugs	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Anticancer agents	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Anticancer agents	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Antifungal agents	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Antiviral agents	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Self-Learning (Antimalarial, antiseptics and disinfectants)	√	√	√	√	√	√	√					√	√	√





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 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
Physicochemical Properties	✓	✓	✓		✓	✓	✓
Physicochemical Properties + Drug Metabolism	✓	✓	✓		✓	✓	✓
Drug Metabolism	✓	✓	✓		✓	✓	✓
β-lactam	✓	✓	✓		✓	✓	✓
β-lactam + Macrolides	✓	✓	✓		✓	✓	✓
Tetracyclines + Aminoglycoside + Amphenicol	✓	✓	✓		✓	✓	✓
Quinolones + Sulfonamides	✓	✓	✓			✓	✓
Anti-tubercular and antiprotozoal Drugs	✓	✓	✓			✓	✓
Anticancer agents	✓	✓	✓			✓	✓
Anticancer agents	✓	✓	✓			✓	✓
Antifungal agents	✓	✓	✓			✓	✓
Antiviral agents	✓	✓	✓			✓	✓
Self-Learning (Antimalarial, antiseptics and disinfectants)			✓	✓		✓	✓





**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**





**Course specification**  
**2023- 2024**  
**Pharm D Program**

Course Contents	Teaching and Learning methods				Assessment methods Practical/Tutorial/Activity
	Hybrid learning	Comp. aided learning	Lab sessions	Self-learning	
-In silico drawing software: Introduction, draw chemical structure, color, rotate, background, draw scheme.	✓	✓	✓	✓	✓
-In silico drawing software: Predicting some properties for a chemical structure, revision.	✓	✓	✓	✓	✓
-Acid-base properties of drugs. -Hydrophilic and lipophilic characters. -Predicting the degree of Hydrogen bond.	✓	✓	✓	✓	✓
-Hansch constant and Log p problems. -Drug metabolism.	✓	✓	✓	✓	✓
-Types of drug receptor interactions. Physicochemical cases.	✓	✓	✓	✓	✓
-Case study: Penicillins.	✓	✓	✓	✓	✓
-Case study: Tetracyclines and Macrolides.	✓	✓	✓	✓	✓
-Case study: Quinolones.	✓	✓	✓	✓	✓
-Case study: Sulfonamides and Antifungal drugs.	✓	✓	✓	✓	✓
-Case study: Antiviral drugs.	✓	✓	✓	✓	✓
-Case study: Anticancer drugs.	✓	✓	✓	✓	✓
Revision	✓	✓	✓	✓	✓

## 9- List of References

No	Reference	Type
1	Electronic book "Medicinal Chemistry-2" prepared by staff members	Course notes
2	Recorded videos prepared by staff members	Videos on platform
3	"Foye's Principles of Medicinal Chemistry", 8 <sup>th</sup> Edition, (David A. Williams, Thomas L. Lemke & William O. Foye, Editors), Lippincott Williams & Wilkins, 2017.	Essential Book
4	"Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry" 12 <sup>th</sup> Edition, (J. H. Block and J. M. Beale Jr, Editors), Lippincott Williams & Wilkins, Philadelphia, PA, 2011.	Essential Book
5	"An Introduction to Medicinal Chemistry", 6 <sup>th</sup> Revised Edition, (Graham L. Patrick), Oxford University Press, USA, 2017.	Essential Book
6	"Fundamentals of Medicinal Chemistry", Kindle Edition, (Gareth Thomas), Wiley-Blackwell, 2013.	Essential Book
7	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/">http://www.google.com/</a> <a href="http://www.pubmed.com/">http://www.pubmed.com/</a> <a href="http://www.ekb.eg">http://www.ekb.eg</a>	Websites

<b>Course Coordinator</b>	<b>Prof. Dr. Mohammed Ahmed Ahmed Mostafa</b> 
<b>Head of Department</b>	<b>Prof. Dr. Mohammed Ahmed Ahmed Mostafa</b> 

Date: 06/09/2023



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



الإكلينيكية (فارم دي) بكالوريوس الصيدلة  
Pharm D-Clinical Pharmacy  
Course Specification  
Academic year: 2023/2024

<b>Course name:</b> Advanced Drug Delivery Systems	<b>اسم المقرر:</b> أنظمة توصيل دواء متقدمة
<b>Academic Level:</b> Forth level	<b>الرابع المستوى الأكاديمي :</b>
<b>Scientific department:</b> Pharmaceutics	<b>القسم العلمي :</b> الصيدلانيات
<b>Head of Department:</b> Prof. Dr. Irhan Ibrahim Abu Hashim	<b>رئيس القسم :</b> ارهان ابراهيم ابو هاشم ا.د/
<b>Course Coordinator:</b> Prof. Dr. Elham Abdelmonem El-said	<b>منسق المقرر :</b> ا.د/ الهام عبد المنعم السعيد محمد



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmaceutics
Department supervising the course	Pharmaceutics
Program on which the course is given	Bachelor's degree in pharmacy -PharmD (Clinical Pharmacy)
Academic Level	Forth level, First semester, 2023-2024
Date of course specification approval	20 <sup>th</sup> September 2023

### A. Basic Information: Course data:

Course Title	Advanced Drug Delivery Systems
Course Code	PT709
Prerequisite	---
Teaching credit Hours: Lecture	2
: Practical	---
Total Credit Hours	2

### B. Professional Information:

#### 1. Course Aims:

This course enables the students to:

- Gain comprehensive knowledge on novel and targeted drug delivery.
- Recognize the strategies required to transform proteins genes and other biotechnology driving compounds into therapeutic products.
- Know advanced therapy medicinal products such as gene therapy medicinal products, somatic cell therapy medicinal products, and tissue engineered products.
- Understand the application of polymers and excipients to solve problems concerning the optimization, of absorption, selective transport, and targeting.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 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
1.1.3	1.1.3.1	Explain the basis for the development of strategies to deliver therapeutic agents to specific target sites at rates appropriate for the optimization of therapeutics effect.
	1.1.3.2	Define the types, characteristics, formulation methods, and evaluation of the advanced drug delivery systems.
	1.1.3.3	Classify different techniques for the preparation of advanced drug delivery systems and their relevant basic principles, advantages, and disadvantages.

### Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.2.4	2.2.4.1	Use different techniques needed for the development, formulation, and evaluation of advanced drug delivery systems.
	2.2.4.2	Classify the modern systems in development of new trends to deliver drug molecules to specific target sites.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Illustrate novel strategies for targeting gene therapy medicinal products, somatic cell therapy medicinal products, and tissue engineered products.
3.2.1	3.2.1.1	Design advanced drug delivery systems using different polymers and excipients to maximize the pharmacological effects.

### 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 regarding the studied topics.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Targeted drug delivery: Definition, requirements, general concepts, and mechanisms	2
2	Introduction of gene therapy	2
3	Targeted drug delivery: Specific Location-Based Strategies (brain, skin, eye, lung, colon and intracellular)	2
4	Gene therapy medicinal products	2
5	Nanocarriers: definition, advantages, types (organic, inorganic and hybrid)	2
6	Somatic cell therapy medicinal products	2
7	Nanocarriers: functionalization, drug loading, targeting, and methods of preparation and	2
8	Tissue engineering medicinal products	2
9	Nanocarriers characterization techniques	2
10	Combined therapy medicinal products	2
11	Polymers used in the drug delivery systems: natural, semisynthetic, and synthetic and self-learning topic	2
12	Biotechnology products	2
13	Implants and self-learning topic	2
14	Revision and quiz	2
15	Final Written Exam	--



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

#### 4- Teaching and Learning Methods:

Teaching and learning Methods		Weeks No.	K. elements to be addressed
4.1	Computer-aided learning: a. Lectures using Data show, power point presentations. b. Hybrid learning <ul style="list-style-type: none"> <li>• Online learning through my Mans platform "Mansoura university"</li> <li>• Recorded video lectures</li> </ul>	1-14	1.1.3.1, 1.1.3.2, 1.1.3.3, 2.2.4.1, 2.2.4.2, 3.1.1.1, 3.2.1.1
4.3	Self-learning	11 and 13	4.1.2.1, 4.2.1.1, 4.3.2.1
4.4	Presentation	9 and 13	1.1.3.1, 2.2.4.1, 2.2.4.2, 3.2.1.1, 4.3.2.1
4.5	Advanced lecture- Group Discussion	3, 5, and 10	4.1.2.1, 4.2.1.1, 4.3.2.1

#### 5- Student Assessment:

##### d- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.3.1, 1.1.3.2, 1.1.3.3, 2.2.4.1, 2.2.4.2, 3.1.1.1, 3.2.1.1
2- Periodical (Mid-term exam) / Course work	1.1.3.1, 1.1.3.2, 1.1.3.3, 2.2.4.1, 2.2.4.2, 3.1.1.1, 3.2.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1

##### b. Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7-9 <sup>th</sup> week
Assessment 2	Written exam	Start from 15 <sup>th</sup> week





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### c. Weighing of assessments

1	Periodical (Mid-term) exam / Course work	25%
2	Practical examination and tutorial	---
3	Written exam	75%
4	Oral exam	---
Total		100%

### 6- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
-Library	Textbooks- Journals



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff members	Videos on platform
3.	Kamal Dua, Kylie A. Williams, Lisa G. Pont, Meenu Mehta, Michael Rathbone, Terezinha de Jesus Andreoli Pinto, Advanced Drug Delivery Systems in the Management of Cancer. Elsevier Science; 2021.	Essential textbook
4.	Mozafari M. Nanoengineered Biomaterials for Advanced Drug Delivery. Elsevier; 2020.	Recommended textbook
5.	Dua K, Mehta M, Pinto T de JA, Pont LG, Williams KA, Rathbone M. Advanced Drug Delivery Systems in the Management of Cancer. Elsevier; 2021.	Recommended textbook
6.	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/scholar/">http://www.google scholar.com/</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	websites



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 8- Matrix

### Matrix 1. Course content and course key elements

Course contents / K. elements	Domain 1			Domain 2		Domain 3		Domain 4		
	1.1 .3. 1	1.1 .3. 2	1.1 .3. 3	2.2 .4. 1	2.5 .4. 1	3.1 .1. 1	3.2 .1. 1	4.1 .2. 1	4.2 .1. 1	4.3 .2. 1
Targeted drug delivery: Definition, requirements, general concepts, and mechanisms										
Introduction of gene therapy	✓	✓			✓	✓				
Targeted drug delivery: Specific Location-Based Strategies (brain, skin, eye, lung, colon and intracellular)										
Gene therapy medicinal products	✓		✓	✓		✓	✓			
Nanocarriers: definition, advantages, types (organic, inorganic and hybrid)	✓	✓	✓	✓	✓	✓	✓			
Somatic cell therapy medicinal products		✓			✓					
Nanocarriers: functionalization, drug loading, targeting, and methods of preparation	✓	✓	✓	✓	✓	✓	✓			
Tissue engineering medicinal products	✓	✓			✓	✓				
Nanocarriers characterization techniques	✓	✓	✓	✓	✓	✓	✓			
Combined therapy medicinal products	✓		✓	✓		✓	✓			
Polymers used in the drug delivery systems: natural,			✓			✓	✓	✓	✓	✓



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

semisynthetic and synthetic and self-learning topic												
Biotechnology products		✓				✓						
Implants and self-learning topic	✓				✓	✓		✓		✓	✓	✓

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

Course contents	Teaching and Learning Methods					Assessment methods	
	Lecture	Hybrid learning	Advanced lecture Group Discussion	Presentation	Self-learning	Course Work	Written
Targeted drug delivery: Definition, requirements, general concepts, and mechanisms	✓						✓
Introduction of gene therapy	✓					✓	✓
Targeted drug delivery: Specific Location-Based Strategies (brain, skin, eye, lung, colon and intracellular)	✓		✓			✓	✓
Gene therapy medicinal products	✓					✓	✓
Nanocarriers: definition, advantages, types (organic, inorganic and hybrid)	✓		✓				✓
Somatic cell therapy medicinal products	✓	✓				✓	✓
Nanocarriers: functionalization, drug loading, targeting, and methods of preparation	✓	✓				✓	✓
Tissue engineering medicinal products	✓	✓				✓	✓



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Nanocarriers characterization techniques	✓	✓		✓		✓	✓
Combined therapy medicinal products	✓		✓				✓
Polymers used in the drug delivery systems: natural, semisynthetic, and synthetic and self-learning topic	✓				✓		✓
Biotechnology products	✓						✓
Implants and self-learning topic	✓			✓	✓		✓

<b>Course Coordinator</b>	Prof. Dr. Elham Abdelmonem El-said
	<b>Elham Abdelmonem</b>
<b>Head of Department</b>	Prof. Dr. Irhan Ibrahim Abu Hashim
	<i>Irhan Abu Hashim</i>

Date: 20 / 9 / 2023



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



## Course Specifications

بكالوريوس الصيدلة الإكلينيكية (فارم د-Pharm D)

Course Specification

Academic year: 2023-2024

Course Name: Clinical Pharmacy Practice	اسم المقرر: ممارسة الصيدلة الإكلينيكية
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific department: Clinical Pharmacy and Pharmacy Practice	القسم العلمي: الصيدلة الإكلينيكية والممارسة الصيدلانية
Head of Department: Prof. Dr. Mohamed E. E. Shams	رئيس القسم: أ.د/ محمد الحسيني السبيعي شمس
Course Coordinator: Dr. Moetaza Mahmoud Hassab	منسق المقرر: أ.م.د/ معتزة محمود حسب السيد



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Clinical Pharmacy and Pharmacy Practice
Department supervising the course	
Program on which the course is given	B. Pharm. (PharmD) (Clinical Pharmacy)
Academic Level	Fourth level, first semester, 2023-2024
Date of course specification approval	7 <sup>h</sup> September 2023

### 1- Basic Information: Course data

Course Title	Clinical Pharmacy Practice
Course Code	PP 703
Prerequisite	Registration
Credit Hours: Lecture	2
Tutorial	1
Total Credit Hours	3 (Credit Hours)

### 2- Course Aims

1. Scoping of clinical pharmacy and its objectives
2. Understanding the concept of clinical pharmacy and the role of clinical pharmacist
3. Providing patient care that optimizes the use of medication and promotes health
4. Maximizing the clinical effect of medicines, i.e. using the most effective treatment for each type of patient



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 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
1.1.4	1.1.4.1	Describe the appropriateness, effectiveness, and safety of different medications in specific individuals and populations to optimize patients' outcomes.
1.1.5	1.1.5.1	Recall the principles of basic pharmaceutical sciences to solve drug related problems in certain case scenarios.

#### DOMAIN 2: Professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.4.3	2.4.3.1	Formulate pharmaceutical care plans for management of several disorders and drug-related problems with reference to their particulate health problems and special considerations.





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### DOMAIN 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Adjust a dosage regimen based on the disease and drug history to optimize medication use.
3.2.2	3.2.2.1	Optimize drug use with respect to the principles of clinical pharmacy practice.
3.2.5	3.2.5.1	Provide education and counseling to patients, healthcare professionals and communities to achieve safe and cost-effective use of medicines

### DOMAIN 4: PERSONAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
4.2.1	4.2.1.1	Use verbal and non-verbal communication skills when dealing with patients and health professionals.
4.3.2	4.3.2.1	Practice self-learning to improve professional skills



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

#### 4- Course Contents

Week No.	Lecture Topics	Lecture Credit Hours
1	<b>Introduction of clinical pharmacy.</b> <i>(Prescription monitoring, prescribing advice to medical and nursing staff, medication errors and adverse drug reaction reporting, medication history-taking and medicines reconciliation, medicines formularies)</i>	2
2	<b>Patient medical history</b> <i>(Presenting complaint, History of presenting complaint Past medical history, Drug history, Family history, Social and personal history, Systems review)</i>	2
3	<b>Patient Management approach</b> <i>(Pharmaceutical care, Categories of drug therapy problems, steps of pharmaceutical care, Illustrative case studies)</i>	2
4	<b>Clinical problem solving</b> <i>Managing interactions (St John's Wort, hyperkalaemia, ibuprofen, and warfarin), advising how to use lamotrigine, choosing antibiotic therapy, drug-induced hypercalcaemia, clopidogrel for percutaneous coronary intervention, managing therapy by ciprofloxacin)</i>	2
5	<b>Drug usage process</b> <i>Identify drug-patient, drug-disease and drug-drug interactions, Administering and providing the medicines, Monitoring therapy, patient education, and evaluation.</i>	2
6	<b>Common drug overdose</b> <i>Role of the pharmacist, Treatment, Management, Valproic acid toxicity, Acetaminophen-Induced Hepatotoxicity, Digoxin toxicity.</i>	2
7	<b>Principles of special care populations</b> <b>A- Pregnancy</b>	2
8	<b>B- Pediatrics</b> • Acute Otitis Media (AOM)	2



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

9	<b>Pediatrics</b> • Acute Pharyngitis	2
10	<b>C- Geriatrics</b>	2
11	<b>Patient Management Approach of Various Clinical Disorders</b> A- Dermatological Disorder • <i>Tinea Pedis, Tinea Cruris &amp; Tinea Unguium</i>	2
12	B- Urinary Tract Infection • Upper UTI (Pyelonephritis), Lower UTI	2
13	The invaluable contributions of clinical pharmacy in nursing women and lactation (self-learning).	2
14	Revision and quiz	2
15	Theoretical and oral exam	-
<b>Week No.</b>	<b>Practical topics</b>	<b>Credit hours</b>
1	Patient Presentation / Adverse Drug Reactions Reporting	1
2	Case study: Upper Respiratory Tract Infections Acute Otitis Media (AOM)	1
3	Case study: Upper Respiratory Tract Infections Acute Pharyngitis	1
4	Case study: Dermatological Disorder <i>Tinea Pedis, Tinea Cruris &amp; Tinea Unguium</i>	1
5	Case study: Urinary Tract Infection	1
6	Obtaining a patient history	1
7	Paracetamol overdose	1
8	Midterm exam	-
9	Drug interactions I	1
10	Drug interactions II	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

11	Pharmacogenomics 1	1
12	Pharmacogenomics 2	1
13	Assignments and group project	1
14	Tutorial exam	1

## 5- Teaching and Learning Methods

5.1	Hybrid learning and computer aided learning: a. Online learning through My mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans c. Power point (PPT) presentations	Week 1-14
5.2	Tutorial sessions using patient case studies	Week 1-14
5.3	Self-learning	Week 9
5.4	Formative Assignments	Week 1-12
5.5	Class Activity Discussion / brainstorming / problem solving / role play.	Week 1-12

## 6- Student Assessment

### a- Assessment Methods

<b>1-Written exam</b>	To assess understanding, intellectual, professional skills
<b>2-Practical exam</b>	To assess professional and practical skills
<b>3-Oral</b>	To assess Knowledge, understanding, intellectual skills, Personal skills
<b>4-Formative Assessment</b>	To assess understanding, intellectual, professional skills



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

#### b- Assessment schedule

Assessment 1	Periodical exam and course work	7-9 <sup>th</sup> week
Assessment 2	Practical	14 <sup>th</sup> week
Assessment 3	Written	Start from 15 <sup>th</sup> week
Assessment 4	Oral	Start from 15 <sup>th</sup> week

#### c- 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%
<b>Total</b>		<b>100%</b>

### 7- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Library	Text books







Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

A) Theoretical Part:										
Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Introduction of clinical pharmacy	√		√						√	√
Patient medical history	√		√						√	√
Patient management approach	√		√	√					√	√
Clinical problem solving	√		√	√					√	√
Drug usage process	√		√	√					√	√
Common drug overdose	√		√	√			√		√	√
Principles of special care populations	√		√	√			√		√	√
A- Pregnancy										
B- Pediatrics										
• Acute Otitis Media	√		√	√			√		√	√
C- Pediatrics										
Acute Pharyngitis	√		√	√			√		√	√
D- Geriatrics	√		√	√					√	√
Dermatological Disorder	√		√	√					√	√
Urinary Tract Infection	√		√	√					√	√
The invaluable contributions of clinical pharmacy in nursing women and lactation						√			√	√





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

B) Practical Part:										
Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
• Patient Presentation / Adverse Drug Reactions Reporting			✓	✓	✓			✓		
• Case Study: Acute Otitis Media (AOM)			✓	✓	✓			✓		
• Case Study: Acute Pharyngitis			✓	✓	✓			✓		
• Case study: Dermatological Disorder Tinea Pedis, Tinea Cruris & Tinea Unguim			✓	✓	✓			✓		
• Case study: Urinary Tract Infection (UTI)			✓	✓	✓			✓		
Obtaining a patient history			✓	✓	✓			✓		
Paracetamol overdose			✓	✓	✓			✓		
Drug interactions I			✓	✓	✓			✓		
Drug interactions II			✓	✓	✓			✓		
Pharmacogenomics I			✓	✓	✓			✓		
Pharmacogenomics 2			✓	✓	✓			✓		
Assignments							✓			



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 9- List of References

No	Reference	Type
1	Lecture notes prepared by teaching staff	Course notes
2	H. Matt, V.Andrea, F. Annette, <i>et al.</i> Applied Therapeutics. The Clinical Use of Drugs. Eleventh edition. USA. Wolters Kluwer. 2018	Essential Book
3	Karen Shapiro, Bombatch C.,Garrett S. D, Veverka A., Brian S., Davis C., Drew A., Wellings F.. NAPLEX Course Book 2022 edition. USA. RxPREP, Inc.,2022.	Essential Book
4	Lexicomp, Dynamed Plus , Pubmed and BMJ best practice <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg/">https://www.ekb.eg/</a> .	Websites

<b>Course Coordinator</b>	<b>Dr. Moetaza Mahmoud Hassab</b>  <i>Moetaza Soliman</i>
<b>Head of Department</b>	<b>Prof. Dr. Mohamed El Houseiny E. Shams</b>  <i>Mohamed Elhousseiny</i>

Date: 7/9/2023



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Medical Microbiology	اسم المقرر: الميكروبيولوجيا الطبية
Academic Level: level 4	الرابع المستوى الأكاديمي :
Scientific department: Microbiology and Immunology	القسم العلمي : الميكروبيولوجي والمناعة
Head of Department: Prof. El-Sayed E. Habib	رئيس القسم: السيد الشربيني حبيب/ا. د.
Course Coordinator: Prof. Rasha F. Barwa	منسق المقرر: ا.د/ رشا محمد فتحى بروه



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

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	B. Pharm. (PharmD) (Clinical Pharmacy)
Academic Level	Fourth level , first semester, 2023-2024
Date of course specification approval	10/9/ 2023

**A. Basic Information: Course data:**

Course Title	Medical Microbiology
Course Code	PM 704
Prerequisite	General Microbiology and Immunology
Teaching credit Hours: Lecture	2
: Practical	1
Total Credit Hours	3

**B. Professional Information:**

**1. Course Aims:**

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

To provide students with knowledge concerning etiology, pathogenesis and clinical manifestation of the most common bacteria and fungi causing infectious disease in human beings.

To enable students to understand the method of transmission of infectious diseases and diagnose disease based on clinical laboratory data

To describe the control measures and discuss the treatment of disease.

To enable students to understand the immunological diseases and disorders in immunity including hypersensitivity, immuno-deficiency disorders, autoimmunity and auto-immune diseases and organ transplantation.



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

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	List the most common bacteria and fungi of medical importance.
1.1.2	1.1.2.1	Define medical terms related to medical microbiology.
1.1.5	1.1.5.1	Describe pathogenesis, clinical pictures, complications of the most common infectious diseases caused by bacteria and fungi.
1.1.6	1.1.6.1	Outline principle of treatment and prevention and control of common bacterial and fungal diseases.
1.1.7	1.1.7.1	Recognize the scientific basis of the conventional and up-to-date diagnostic procedures needed to carry out accurate diagnosis of bacterial and fungal and immunological diseases with emphasis on their prioritization in management plans.

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.4.5	2.4.5.1	Integrate the most important signs and symptoms of important bacterial and fungal diseases and the laboratory test findings into a meaningful diagnostic significance (using case study)
	2.4.5.2	Apply systemic thinking and personal judgment for differential diagnosis with prioritization of the common possibilities for each bacterial and fungal diseases
	2.4.5.3	Express systemic thinking and personal judgment for differential diagnosis of the immunological diseases and disorders.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### Domain 3: Pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.3	3.1.3.1	Record the growth on different media and perform laboratory tests for identification of the causative agents of infectious diseases
3.1.4	3.1.4.1	Record the common diseases caused by bacteria and fungi of medical interest as regards etiology, pathogenesis, clinical features and methods of combat.
	3.1.4.2	Outline the characters, laboratory diagnosis and treatment of immunological diseases and disorders.

### Domain 4: Personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Develop decision-making activities with other team members and apply effective time management skills.
4.2.1	4.2.1.1	Use clear language and communication when dealing with patients and other health team and communities
4.3.2	4.3.2.1	Commit self-development and self-learning



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 3- Course Contents

Week No.	Lecture topics	Lecture credit Hours
1	Introduction: Pathogenesis of bacterial infection and virulence factors	2
2	Lactose fermenter Gram negative bacilli: E. coli and Klebsiella Non lactose fermenter Gram negative bacilli: Yersinia	2
3	Non lactose fermenter Gram negative bacilli: Salmonella- -Sigella- and Pseudomonas and Proteus	2
4	Gram positive cocci: Staphylococci -hemolytic streptococci	2
5	Gram positive cocci: Non-Hemolytic streptococci Acid fast bacteria: Mycobacterium tuberculosis and Mycobacterium leprae	2
6	Spore forming aerobic bacilli: Bacillus species Spore forming anaerobic bacilli: Clostridium (anaerobic) species	2
7	Non Spore forming bacilli: Corynebacterium and Listeria Curved and comma shape Gram negative bacteria: Vibrio and Helicobacter	2
8	Spirochetes: Treponema pallidum Gram-negative diplococcic: Neisseria	
9	Coccobacilli bacteria: Haemophilus influenzae, Bordetella pertussis- Brucella	2
10	Obligate intracellular bacteria: Rickettsia, Chlamydia, Coxiella Cell wall less bacteria: Mycoplasma	2
11	Fungal diseases: Superficial, cutaneous, subcutaneous, and systemic disease	2
12	Immunological diseases: Autoimmunity and auto-immune diseases - Hypersensitivity	2
13	Immunological diseases: immune-deficiency disorders and organ transplantation.	2
14	Revision and quiz	2
15	Start of Final written and oral exam	-



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Week No.	Practical topics	Practical credit hours
1	Introduction, Differential media, streaking for isolation	1
2	Lab methods for diagnosis of E. coli	1
3	Lab methods for diagnosis of Klebsiella and Proteus	1
4	Lab methods for diagnosis of Pseudomonas	1
5	Lab methods for diagnosis of Shigella and Salmonella	1
6	Lab methods for diagnosis of Brucella Lab methods for diagnosis of Helicobacter	
7	Identification of unknown Gram negative rods	1
8	Midterm exam	-
9	Lab methods for diagnosis of Staphylococci	1
10	Lab methods for diagnosis of Streptococci	1
11	Identification of unknown Gram positive cocci	1
12	Lab methods for Fungi identification	1
13	Revision	1
14	Practical exam	1





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

#### 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), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.1.1), (3.1.4.1), (3.1.4.2), (4.2.1.1)
4.2	Distance learning: On line learning through My mans "Mansoura university "	1-11	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.1.1), (3.1.4.1), (3.1.4.2), (4.2.1.1)
4.3	Practical works and tutorials	1-14	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.3.1)
4.4	Self-learning	2&7	(4.1.1.1), (4.1.2.1), (4.3.2.1)
4.5	Collaborative learning: Research Project	2-10	(1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.3.1), (3.1.4.1), (4.1.1.1), (4.2.1.1)
4.6	collaborative learning: Role play	3,4,5,8,9,10	(1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.3.1), (3.1.4.1), (4.1.1.1), (4.2.1.1)
4.7	Case study	2-6&8-10	(1.1.5.2), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.3.1), (3.1.4.1), (4.1.1.1), (4.2.1.1)
4.8	العروض التوضيحية Demos	1-13	(1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.3.1), (3.1.4.1), (4.2.1.1)



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

### 5- Student Assessment:

#### Assessment Methods:

1- Periodical (Mid-term exam) / Course work	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.3.1), (3.1.4.1)
2-Practical exam using OSPE	(1.1.7.1), (2.4.5.1), (2.4.5.2), (3.1.3.1)
3-Written exam	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.1.1), (3.1.4.1), (3.1.4.2)
4-Oral	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.6.1), (1.1.7.1), (2.4.5.1), (2.4.5.2), (2.4.5.3), (3.1.1.1), (3.1.4.1), (3.1.4.2), (4.2.1.1)

#### Assessment schedule

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



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

### 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	Cornelissen, C. N., Fisher, B. D., Harvey, R. A., & Harvey, R. A. (2013). Lippincott's illustrated reviews: Microbiology. 3rd edition, Philadelphia: Lippincott Williams & Wilkins.	Essential Book
3.	Surinder Kumar (2016): Essentials of Microbiology. First Edition. Jaypee Brothers Medical Publishers	eBook
4.	Levinson, W. (2014). Review of Medical microbiology & immunology Thirteenth Edition	eBook
5.	Sherris & Ryan,s (2022): Medical microbiology. Eighteenth edotion, McGraw Hill	eBook
6.	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/">http://www.google.com/</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> Centers for Disease Control and Prevention. <a href="https://0810fd8j4-1104-y-https-www-clinicalkey-com.mplbci.ekb.eg/#!/content/3-s2.0-B9780323673204000523">https://0810fd8j4-1104-y-https-www-clinicalkey-com.mplbci.ekb.eg/#!/content/3-s2.0-B9780323673204000523</a> <a href="https://0810ed95d-1104-y-https-onlinelibrary-wiley-com.mplbci.ekb.eg/doi/chaptrepub/10.1002/9781119998648.ch15">https://0810ed95d-1104-y-https-onlinelibrary-wiley-com.mplbci.ekb.eg/doi/chaptrepub/10.1002/9781119998648.ch15</a> <a href="https://0810fd8jd-1104-y-https-www-clinicalkey-com.mplbci.ekb.eg/service/content/pdf/watermarked/3-s2.0-B9780323930383002318.pdf?locale=en_US&amp;searchIndex=">https://0810fd8jd-1104-y-https-www-clinicalkey-com.mplbci.ekb.eg/service/content/pdf/watermarked/3-s2.0-B9780323930383002318.pdf?locale=en_US&amp;searchIndex=</a> <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4600970/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4600970/</a>	Websites



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

8- Matrix of knowledge and skills of the course  
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. 5.1	1.1. 6.1	1.1.7 .1	2.4. 5.1	2.4. 5.2	2.4.5.3	3.1.3 .1	3.1. 4.1	3.1. 4.2	4.1.1 .1	4.1.2 .1	4.3.2 .1
Introduction: Pathogenesis of bacterial infection and virulence factors	√	√											√	
Lactose fermenter Gram negative bacilli: E. coli and Klebsiella			√	√	√	√	√		√	√		√	√	√
Non lactose fermenter Gram negative bacilli: Yersinia														
Non lactose fermenter Gram negative bacilli: Salmonella- - Sigella- and			√	√	√	√	√		√	√		√	√	



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Pseudomonas and Proteus															
Gram positive cocci: Staphylococci - hemolytic streptococci			√	√	√	√	√		√	√		√	√		
Gram positive cocci: Non-Hemolytic streptococci Acid fast bacteria: Mycobacterium tuberculosis and Mycobacterium leprae			√	√	√		√		√	√		√	√		
Spore forming aerobic bacilli: Bacillus species Spore forming anaerobic bacilli: Clostridium (anaerobic) species			√	√	√	√	√		√	√		√	√		



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Non Spore forming bacilli: Corynebacterium and Listeria Curved and comma shape Gram negative bacteria: Vibrio and Helicobacter			√	√	√		√			√	√		√	√	√
Spirochetes: Treponema pallidum Gram-negative diplococcic: Neisseria			√	√	√		√			√	√		√	√	
Cocccobacilli bacteria: Haemophilus influenzae, Bordetella pertussis- Brucella			√	√	√		√			√	√		√	√	
Obligat intracellular			√	√	√		√			√	√		√	√	



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

bacteria: Rickettsia, Chlamydia, Coxiella Cell wall less bacteria: Mycoplasma															
Fungal infections			√	√	√		√			√	√		√	√	
Immunological diseases and disorders: hypersensitivity diseases					√			√		√	√	√	√	√	
Immunological diseases and disorders: immunodeficiency diseases					√			√		√	√	√	√	√	
Practical topics															
Introduction, Differential media, streaking for					√			√		√			√	√	







Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Identification of unknown Gram negative rod					√			√				√	√	
Lab methods for diagnosis of Staphylococci					√	√	√		√	√		√	√	
Lab methods for diagnosis of Streptococci					√	√	√		√	√		√	√	
Identification of unknown Gram positive cocci					√		√		√			√	√	
Lab methods for Fungi identification					√		√		√			√	√	
Revision					√		√		√					



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

Matrix 2. Between course contents, learning methods and assessment

A) Theoretical Part:													
Week No.	Course Contents	Teaching and Learning Methods						Assessment methods					
		Advanced lecture	On line learning	Self-learning	Collaborative learning:	Collaborative learning: Role	Case study	العروض التوضيحية Demos	Corse Work	Corse Work	Practical/sheet	Written	Oral
1	Introduction: Pathogenesis of bacterial infection and virulence factors	✓								✓		✓	✓
2	Lactose fermenter Gram negative bacilli: E. coli and Klebsiella Non lactose fermenter Gram negative bacilli: Yersinia	✓		✓	✓				✓	✓		✓	✓
3	Non lactose fermenter Gram negative bacilli: Salmonella- -Sigella- and Pseudomonas and Proteus	✓			✓			✓	✓	✓		✓	✓
4	Gram positive cocci: Staphylococci - hemolytic streptococci	✓			✓			✓	✓	✓		✓	✓



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

5	Gram positive cocci: Non-Hemolytic streptococci Acid fast bacteria: Mycobacterium tuberculosis and Mycobacterium leprae	✓			✓			✓	✓			✓	✓
6	Spore forming aerobic bacilli: Bacillus species Spore forming anaerobic bacilli: Clostridium (anaerobic) species	✓			✓			✓	✓		✓		✓
7	Non Spore forming bacilli: Corynebacterium and Listeria Curved and comma shape Gram negative bacteria: Vibrio and Helicobacter	✓		✓	✓			✓	✓			✓	✓
8	Spirochetes: Treponema pallidum Gram-negative diplococcic: Neisseria	✓	✓		✓			✓	✓			✓	✓
9	Cocci bacilli bacteria: Haemophilus influenzae, Bordetella pertussis- Brucella	✓			✓			✓	✓			✓	✓
10	Obligate intracellular bacteria: Rickettsia, Chlamydia, Coxiella Cell wall less bacteria: Mycoplasma	✓			✓			✓	✓			✓	✓
11	Fungal diseases	✓						✓				✓	✓



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

12	Immunological disorders: Hypersensitivity, Autoimmunity and auto-immune diseases	✓						✓				✓	✓
13	Immunological diseases: immune-deficiency disorders and organ transplantation	✓	✓	✓				✓				✓	✓



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

B) Practical Part:											
Course Contents	Teaching and Learning Methods							Assessment methods			
	Practical works and tutorials	On line learning	Self-learning	Collaborative learning: Research	Collaborative learning: Role play	Case study	العروض التوضيحية Demos	Corse Work	Sheet	Practical exam	
Introduction, Differential media, streaking for isolation	✓	✓						✓	✓	✓	
Lab methods for diagnosis of E. coli	✓	✓			✓	✓	✓	✓	✓	✓	
Lab methods for diagnosis of Klebsiella and Proteus	✓	✓					✓	✓	✓	✓	
Lab methods for diagnosis of Pseudomonas	✓	✓			✓		✓	✓	✓	✓	
Lab methods for diagnosis of Shigella and Salmonella	✓	✓			✓	✓	✓	✓	✓	✓	
Lab methods for diagnosis of Brucella Lab methods for diagnosis of Helicobacter	✓	✓					✓	✓		✓	
Identification of unknown Gram negative rod	✓	✓						✓	✓	✓	



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

Lab methods for diagnosis of Staphylococci	✓	✓			✓	✓	✓	✓	✓	✓
Lab methods for diagnosis of Streptococci	✓	✓			✓	✓	✓	✓	✓	✓
Identification of unknown Gram positive cocci	✓	✓					✓	✓	✓	✓
Lab methods for Fungi identification	✓	✓					✓	✓	✓	✓
Revision	✓	✓						✓		

Course Coordinator	Prof. Rasha Barwa <i>Rasha Barwa</i>
Head of Department	Prof. El-Sayed E. Habib <i>[Signature]</i>

Date: 10 /9 /2023



Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program



Course specification  
2023- 2024



بكالوريوس الصيدلة الإكلينيكية (فارم دي)

Pharm D-Clinical Pharmacy

Course Specification

Academic year: 2023/2024

<b>Course name:</b> Phytotherapy	اسم المقرر : العلاج بالأعشاب
<b>Academic Level:</b> fourth level	المستوى الأكاديمي : الرابع
<b>Scientific department:</b> Pharmacognosy	القسم العلمي : العقاقير
<b>Head of Department:</b> Prof. Dr. Mahmoud Fahmy Elsebaie	رئيس القسم : ا.د/ محمود فهمي السباعي
<b>Course Coordinator:</b> Prof. Dr. Ahmed Abu El-Ghait Ahmed Gohar	منسق المقرر : ا.د/ أحمد ابو الغيط أحمد جوهر

University	Mansoura
Faculty	Pharmacy



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

<b>Department offering the course</b>	Pharmacognosy
<b>Department supervising the course</b>	Pharmacognosy
<b>Program on which the course is given</b>	<b>B. Pharm. (Clinical Pharmacy) (PharmD)</b>
<b>Academic Level</b>	Level 4, First semester, 2023-2024
<b>Date of course specification approval</b>	

### **A. Basic Information: Course data:**

<b>Course Title</b>	Phytotherapy
<b>Course Code</b>	PG-706
<b>Prerequisite</b>	Phytochemistry-II
<b>Teaching credit Hours: Lecture</b>	2
<b>Practical</b>	1
<b>Total Credit Hours</b>	3

### **B. Professional Information:**

#### **1. Course Aims:**

This course enables the students to:

- Obtain the systematic approach for herbal prescribing through a comparative study of both traditional and scientifically based uses of herbal drugs in treatment of various clinical disorders.
- Know how botanicals may normalize an altered function.
- Be aware of the possible mode of action of the herbal drugs based on experimental and clinical pharmacological studies
- Understand the basis of complementary and alternative medicine with emphasis on herbal remedies, nutritional supplement and aromatherapy and their effect on maintaining the optimum health and prevention of chronic diseases.





Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program

Course specification  
2023- 2024

## 1- 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	Recognize the concept of phytotherapy, complementary and alternative medicine
1.1.3	1.1.3.1	Identify the principles and methods of quality control of herbal drugs and formulations
1.1.4	1.1.4.1	Explain the mechanism of action, therapeutic uses and adverse drug reactions of plants used in phytotherapy
1.1.5	1.1.5.1	Select drugs from natural origin to be used for treatment of diseases of the different systems.

### 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 the quality control from herbal aspects, sampling, structural , physical and analytical standards, purity, safety and adulteration of drugs and their detection.
2.3.1	2.3.1.1	Apply different qualitative and quantitative analytical, chemical, microscopical and biological methods for the quality control of herbal drugs and formulations



Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program

Course specification  
2023- 2024

### Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.2.3	3.2.3.1	Integrate best available evidence for application of complementary medicine; phytotherapy, aromatherapy, and nutraceuticals.

### 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.
4.3.2	4.3.2.1	Practice self-learning to improve professional skills.



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

## 2- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Introduction and Principles of Phytotherapy	2
2	Pharmacokinetics and Pharmacodynamics of some herbal active constituents	2
3	The gastrointestinal system (Drug acting on GIT)	2
4	The gastrointestinal system (Drug acting on liver and gall bladder)	2
5	Homeopathies and aromatherapy	2
6	The cardiovascular system	2
7	The respiratory system	2
8	The renal system	2
9	The central nervous system	2
10	Obesity and herbal drugs	2
11	Basis of complementary and alternative medicine: Nutritional supplements and Nutraceuticals including herb-drug interactions	2
12	Continue: Nutritional supplements and Nutraceuticals including herb-drug interactions	2
13	Self-learning topic and discussion (1-Problems encountered in herbal drug therapy)	2
14	Revision and quiz	2
15	Final written and oral exam	-
Week No.	Practical Topics	Practical / Tutorial credit hours
1	Introduction: Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda	1
2	Extraction methods & apparatus	1
3	Peptic ulcer assay+ Session report and open discussion	1
4	Anti-inflammatory assay+ Session report and open discussion	1
5	Analgesic assay + Session report and open discussion	1
6	ABTS Anti-oxidant assay+ + Session report and open discussion	1



**Mansoura University**  
**Faculty of Pharmacy**  
**Pharm D-Clinical Pharmacy Program**

**Course specification**  
**2023- 2024**

7	Brine shrimp Cytotoxic assay+ Session report and open discussion	1
8	Midterm exam	-
9	Herbal drugs + Case studies + Session report and open discussion	1
10	Herbal drugs + Case studies + Session report and open discussion	1
11	Herbal drugs + Case studies + Session report and open discussion	1
12	Herbal drugs + Case studies	1
13	Herbal drugs + Case studies	1
14	<b>Sheet and Practical exam</b>	1

**3-Teaching and Learning Methods:**

	Teaching and Learning Methods	Week No.	K elements to be assessed
5.1	Computer aided learning: a. Online learning through My mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans • PowerPoint presentation	1-14	1.1.1.1., 1.1.3.1, 1.1.4.1, 1.1.5.1, 3.2.3.1
5.2	Practical session using laboratory equipment and through platform	1-14	2.2.1.1, 2.3.1.1, 4.1.2.1
5.3	Self-learning	13	4.1.2.1, 4.3.2.1
5.4	Class Activity: Group discussion offline and online.	8	4.1.2.1, 4.2.11
5.5	Research assignments	9-10	4.1.2.1, 4.3.2.1
5.6	Case study	9-10	4.1.2.1, 4.3.2.1
5.7	Demos	1-12	4.1.2.1, 4.3.2.1



Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program

Course specification  
2023- 2024

## 5- Student Assessment:

### e- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1., 1.1.3.1, 1.1.4.1, 1.1.5.1, 3.2.3.1
2-Practical exam OSPE	2.2.1.1, 2.3.1.1, 4.1.2.1
3-Oral	1.1.1.1, 1.1.3.1, 1.1.4.1, 1.1.5.1, 3.2.3.1,4.2.1.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1., 1.1.4.1, 1.1.5.1, 1.1.3.1

### b. Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7 <sup>th</sup> -9 <sup>th</sup> week
Assessment 2	Practical examination and tutorial	14 <sup>th</sup> week
Assessment 3	Written exam	Start from 15 <sup>th</sup> week
Assessment 4	Oral exam	Start from 15 <sup>th</sup> 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	Data show- Computers, Internet.
- Laboratory facilities	Equipment and glassware.





**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

<b>Basis of complementary and alternative medicine: Nutritional supplements and Nutraceuticals including herb-drug interactions</b>	✓	✓	✓	✓		✓	✓		✓		✓	✓	
<b>Continue: Nutritional supplements and Nutraceuticals including herb-drug interactions</b>	✓	✓	✓	✓		✓	✓		✓		✓	✓	
<b>Self-learning topic and discussion (1-Problems encountered in herbal drug therapy)</b>	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓
<b>Practical Topics</b>													
<b>Introduction: Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda</b>						✓	✓		✓		✓	✓	
<b>Extraction methods &amp; apparatus</b>						✓	✓		✓		✓	✓	
<b>Peptic ulcer assay+ Session report and open discussion</b>						✓	✓		✓		✓	✓	
<b>Anti-inflammatory assay+</b>						✓	✓		✓		✓	✓	



**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

Session report and open discussion												
Analgesic assay + Session report and open discussion					✓	✓		✓		✓	✓	
ABTS Anti-oxidant assay+ + Session report and open discussion					✓	✓		✓		✓	✓	
Brine shrimp Cytotoxic assay+ Session report and open discussion					✓	✓		✓		✓	✓	
Herbal drugs + Case studies + Session report and open discussion					✓	✓		✓		✓	✓	✓
Herbal drugs + Case studies + Session report and open discussion					✓	✓		✓		✓	✓	✓
Herbal drugs + Case studies + Session report and open discussion					✓	✓		✓		✓	✓	✓
Herbal drugs + Case studies					✓	✓		✓		✓	✓	✓
Herbal drugs + Case studies					✓	✓		✓		✓	✓	✓





**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

**C. Matrix 2 between course contents, learning methods and assessment**

A) Theoretical Part:											
Course Contents	Assessment methods						Assessment methods				
	Lecture	Hybrid learning	Comp. aided learning	Class activity	العروض التوضيحية Demos	Self-learning	Course Work	Course Work (mid-term Exam)	Practical	Written	Oral
Introduction and Principles of Phytotherapy	✓	✓	✓		✓		✓	✓		✓	✓
Pharmacokinetics and Pharmacodynamics of some herbal active constituents	✓	✓	✓		✓		✓	✓		✓	✓
The gastrointestinal system (Drug acting on GIT)	✓	✓	✓		✓		✓	✓		✓	✓
The gastrointestinal system (Drug acting on liver and gall bladder)	✓	✓	✓		✓		✓	✓		✓	✓
Homeopathies and aromatherapy	✓	✓	✓		✓		✓			✓	✓



**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

<b>The cardiovascular system</b>	✓	✓	✓		✓		✓			✓	✓
<b>The respiratory system</b>	✓	✓	✓		✓					✓	✓
<b>The renal system</b>	✓	✓	✓	✓	✓					✓	✓
<b>The central nervous system</b>	✓	✓	✓		✓					✓	✓
<b>Obesity and herbal drugs</b>	✓	✓	✓		✓					✓	✓
<b>Basis of complementary and alternative medicine: Nutritional supplements and Nutraceuticals including herb-drug interactions</b>	✓	✓	✓		✓					✓	✓
<b>Continue: Nutritional supplements and Nutraceuticals including herb-drug interactions</b>	✓	✓	✓		✓					✓	✓
<b>Self-learning topic and discussion (1-Problems encountered in herbal drug therapy)</b>	✓	✓	✓			✓				✓	✓



**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

<b>B) Practical Part:</b>										
<b>Course Contents</b>	<b>Teaching and Learning Methods</b>						<b>Assessment methods</b>			
	Lecture	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Course Work	Practical exam	written	Oral
<b>Introduction: Traditional Systems of Herbal Medicine, Traditional Chinese Medicine (TCM), Ayurveda</b>			✓		✓			✓		
<b>Extraction methods &amp; apparatus</b>			✓		✓			✓		
<b>Peptic ulcer assay+ Session report and open discussion</b>			✓		✓			✓		
<b>Anti-inflammatory assay+ Session report and open discussion</b>			✓		✓			✓		
<b>Analgesic assay + Session report and open discussion</b>			✓		✓			✓		
<b>ABTS Anti-oxidant assay+ + Session report and open discussion</b>			✓		✓			✓		



**Mansoura University  
Faculty of Pharmacy  
Pharm D-Clinical Pharmacy Program**

**Course specification  
2023- 2024**

<b>Brine shrimp Cytotoxic assay+ Session report and open discussion</b>			✓		✓			✓		
<b>Herbal drugs + Case studies + Session report and open discussion</b>			✓		✓			✓		
<b>Herbal drugs + Case studies + Session report and open discussion</b>			✓		✓			✓		
<b>Herbal drugs + Case studies + Session report and open discussion</b>			✓		✓			✓		
<b>Herbal drugs + Case studies</b>			✓		✓			✓		
<b>Herbal drugs + Case studies</b>			✓		✓			✓		



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

## 8- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff members	Videos on platform
3.	Michael Heinrich, Joanne Barnes, José Prieto-Garcia, Simon Gibbons, Elizabeth M. Williamson Fundamentals of pharmacognosy and phytochemistry 3rd Edition - November 24, 2017	Book
4.	- Kerry Bone and Simon Mills,” Principles and practice of phytotherapy”, 2013 Elsevier Ltd.	Book
5.	- Phytotherapies: Efficacy, Safety, and Regulation edited by Iqbal Ramzan, 2015	Book
6.	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/scholar/">http://www.google scholar.com/</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	websites

<b>Course Coordinator</b>	<b>Prof. Dr.</b> Ahmed Abu El-Ghait Ahmed Gohar
<b>Head of Department</b>	<b>Prof. Dr.</b> Mahmoud Fahmy Elsebaie

Date:6 / 09 / 2023



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program



بكالوريوس الصيدلة الإكلينيكية ( فارم د – Pharm D )

### Course Specification

Academic year: 2023/2024

<b>Course name:</b> Medicinal Chemistry-II	اسم المقرر: كيمياء دوائية-2
<b>Academic Level:</b> Level 4	المستوى الأكاديمي: الرابع
<b>Scientific department:</b> Medicinal Chemistry	القسم العلمي: الكيمياء الدوائية
<b>Head of Department:</b> Prof. Dr. Mohamed Ahmed Ahmed Mostafa	رئيس القسم: أ.د/ محمد أحمد أحمد مصطفى
<b>Course Coordinator:</b> Prof. Dr. Mohamed Ahmed Ahmed Mostafa	منسق المقرر: أ.د/ محمد أحمد أحمد مصطفى



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Medicinal Chemistry
Department supervising the course	Medicinal Chemistry
Program on which the course is given	<b>B. Pharm. (PharmD)</b>
Academic Level	Fourth level, second semester, 2023-2024
Date of course specification approval	<b>6-9-2023</b>

#### **A. Basic Information: Course data:**

Course Title	<b>Medicinal Chemistry-II</b>
Course Code	<b>PC 808</b>
Prerequisite	<b>Medicinal Chemistry-I</b>
Teaching Hours: Lecture	<b>2</b>
Practical	<b>1</b>
Total Credit Hours	<b>3</b>

#### **B. Professional Information:**

##### **4- Course Aims:**

**This course enables the students to:**

Medicinal chemistry II course is a continuation of studying medicinal chemistry aspects of other classes of drugs not covered in the medicinal chemistry course I, including drugs acting on central nervous system, cardiovascular drugs, steroidal hormones and analgesics. The practical part of the course provides the students with advanced in silico studies of drugs, in addition to discussion of certain case studies related to drugs covered in the theoretical part.



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

## 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	Recognize in depth and breadth the basic principles of medicinal chemistry course as a part of applied pharmaceutical sciences in pharmacy curriculum.
1.1.2	1.1.2.1	Use non-proprietary names (scientific names) of drugs in professional practice.
1.1.4	1.1.4.1	Explain the molecular mode of action of drugs of different classes.
1.1.6	1.1.6.1	Apply medicinal chemistry principles to make informed decisions on drug use.
1.1.10	1.1.10.1	Classify the different drug classes and their role in management of various body disorders.

### DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
2.4.3	2.4.3.1	Use principles of medicinal chemistry to contribute to decision-making processes to solve drug- related problems.

### DOMAIN 3: PHARMACEUTICAL CARE

Program K. element no.	Course K. element no.	Course K. element
3.1.4	3.1.4.1	Propose the proper treatment for different body disorders according to patient condition.
3.2.1	3.2.1.1	Integrate fundamentals of medicinal chemistry of drugs including mode of action, therapeutic uses and untoward side effects.
3.2.5	3.2.5.1	Use principles of medicinal chemistry to provide education and counseling to support patients and community about their care plan.





Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

3.2.5	3.2.5.2	Support patients and health care providers about the use of safe, effective and cheap medications.
3.2.6	3.2.6.1	Develop public awareness on rational use of drugs, drug abuse and misuse.

#### DOMAIN 4: PERSONAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Participate independently and collaboratively in delivery of health services related to pharmacy practice.
4.2.1	4.2.1.1	Communicate verbally and nonverbally including software tools with patient other health care team and communities.
4.3.2	4.3.2.1	Participate in continuous professional development activities to update and advance self-learning needs.

### 3- Course Contents

Week No.	Topics	Credit Hours
1	CVS (part 1): Antihypertensive drugs	2
2	CVS (part 2): Diuretics	2
3	Introduction to steroidal hormones & Male Sex Hormones	2
4	Female Sex Hormones (estrogens & antiestrogens) + Adrenocorticosteroids (part 1)	2
5	Adrenocorticosteroids (part 2) & Sedative & Hypnotics (Barbiturates)	2
6	Anti-Histaminics +	2
7	Proton Pump Inhibitors	2
8	CVS (part 3): Antianginal & Anticoagulant drugs	2
9	NSAID Analgesics	2
10	Narcotic Analgesics	2
11	Anxiolytics & CNS stimulants	2
12	Antipsychotic drugs	2
13	Tricyclic antidepressants drugs	2
14	Self-learning: Antiarrhythmic & Antihyperlipidemic drugs	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	Final written and oral exams	-



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

Week No.	Practical topics	Practical Credit hours
1	1 <sup>st</sup> 3D visualization software section (intro, measurement, charge calculation , energy minimization & overlay)	1
2	2 <sup>nd</sup> 3D visualization software section (Stereochemistry, Dihedral chart & deviation from plane)	1
3	1 <sup>st</sup> molecular modeling software section (intro, drawing, measurement, energy minimization & charge calculation)	1
4	2 <sup>nd</sup> molecular modeling software section (Lipinski rule & flexible alignment)	1
5	3D visualization and modeling software revision	1
6	Hormone Case studies 1	1
7	Hormone Case studies 2	1
8	Mid-term exam	-
9	Glucocorticoid case studies	1
10	NSAID case studies	1
11	Narcotic analgesics case studies	1
12	CVS case studies	1
13	CNS case studies 1	1
14	CNS case studies 2	1
15	Revision and activity	1
16	Sheet & Practical exam (OSPE)	1

#### 4- Teaching and Learning Methods:

	Teaching method	Week no.	K elements to be assessed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"> <li>On line learning through My Mans "Mansoura university "as recorded – video lectures</li> <li>Inter active discussion through My Mans</li> </ul>	1-6 & 8-16	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.2	Self-learning	14	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1,



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

			4.1.2.1, 4.2.1.1, 4.3.2.1
4.3	Practical session using chemicals and laboratory equipment and/ or tutorials	1-6 & 8-16	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.4	Class Activity: Group discussion offline and online.	12	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.5	Problem – based learning and brainstorming	1-6 & 8-14	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.6	Research assignments	12	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
4.7	Role play	13	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1

## 5- Student Assessment:

### f- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.2.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
2-Practical exam	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.1.4.1, 3.2.1.1, 3.2.5.1, 3.2.6.1, 3.2.5.2, 4.1.2.1, 4.2.1.1, 4.3.2.1
3-Oral	1.1.1.1, 1.1.2.1, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.2.1.1, 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, 1.1.4.1, 1.1.6.1, 1.1.10.1, 2.4.3.1, 3.2.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

### g- Assessment schedule

Assessment 1	Periodical (Mid-term exam) / course work	7 <sup>th</sup> – 9 <sup>th</sup> week
Assessment 2	Practical examination and tutorial	16 <sup>th</sup> week
Assessment 3	Written exam	Starting from 17 <sup>th</sup> week
Assessment 4	Oral exam	Starting from 17 <sup>th</sup> week

### h- 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, Internet, Platform
Laboratory facilities	Computer software (molecular modelling and insilico drawing softwares)
Library	Books



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

## 7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff 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, 2011	Book
5.	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/">http://www.google.com/</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	websites



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

### 8- Matrix of knowledge and skills of the course

Course contents	Course Key Elements													
	Domain: 1					Domain: 2	Domain: 3					Domain: 4		
	1.1.1.1	1.1.2.1	1.1.4.1	1.1.6.1	1.1.10.1	2.4.3.1	3.1.4.1	3.2.1.1	3.2.5.1	3.2.5.2	3.2.6.1	4.1.2.1	4.2.1.1	4.3.2.1
<b>A) Theoretical part</b>														
CVS (part 1): Antihypertensive drugs	√				√	√		√						
CVS (part 2): Diuretics		√	√			√		√						
Introduction to steroidal hormones & Male Sex Hormones		√	√		√			√						
Female Sex Hormones (estrogens & antiestrogens) + Adrenocorticosteroids (part 1)	√	√			√			√						
Adrenocorticosteroids (part 2) & Sedative & Hypnotics (Barbiturates)	√	√		√	√									
Anti-Histaminics		√	√	√	√									
Proton Pump Inhibitors		√	√	√	√									
CVS (part 3): Antianginal & Anticoagulant drugs		√	√											



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

Course contents	Course Key Elements													
	Domain: 1					Domain: 2	Domain: 3					Domain: 4		
	1.1.1.1	1.1.2.1	1.1.4.1	1.1.6.1	1.1.10.1	2.4.3.1	3.1.4.1	3.2.1.1	3.2.5.1	3.2.5.2	3.2.6.1	4.1.2.1	4.2.1.1	4.3.2.1
NSAID Analgesics		√	√	√		√		√						
Narcotic Analgesics		√	√	√		√		√						
Anxiolytics & CNS stimulants		√	√					√						
Antipsychotic drugs &	√	√		√	√			√						
Tricyclic antidepressants drugs	√	√		√	√			√						
Self-learning: Antiarrhythmic & Antihyperlipidemic drugs												√	√	√
1 <sup>st</sup> 3D visualization software section (intro, measurement, charge calculation, energy minimization & overlay)	√	√	√	√	√	√				√	√	√	√	√
2 <sup>nd</sup> 3D visualization software section (Stereochemistry, Dihedral chart &	√	√	√	√	√	√				√	√	√	√	√



Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

Course contents	Course Key Elements													
	Domain: 1					Domain: 2	Domain: 3					Domain: 4		
	1.1.1.1	1.1.2.1	1.1.4.1	1.1.6.1	1.1.10.1	2.4.3.1	3.1.4.1	3.2.1.1	3.2.5.1	3.2.5.2	3.2.6.1	4.1.2.1	4.2.1.1	4.3.2.1
deviation from plane)														
1 <sup>st</sup> molecular modeling software section (intro, drawing, measurement, energy minimization & charge calculation)	√	√	√	√	√	√				√	√	√	√	√
2 <sup>nd</sup> molecular modeling software section (Lipinski rule & flexible alignment)	√	√	√	√	√	√				√	√	√	√	√
3D visualization and modeling software revision	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hormone Case studies 1	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hormone Case studies 2	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Glucocorticoid case studies	√	√				√	√	√	√	√	√	√	√	√
NSAID case studies	√	√				√	√	√	√	√	√	√	√	√





Mansoura University  
Faculty of Pharmacy



Course specification  
2023/2024  
Pharm D Program

Course contents	Course Key Elements													
	Domain: 1					Domain: 2	Domain: 3					Domain: 4		
	1.1.1.1	1.1.2.1	1.1.4.1	1.1.6.1	1.1.10.1	2.4.3.1	3.1.4.1	3.2.1.1	3.2.5.1	3.2.5.2	3.2.6.1	4.1.2.1	4.2.1.1	4.3.2.1
Narcotic analgesics case studies	√	√				√	√	√	√	√	√	√	√	√
CVS case studies	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CNS case studies1	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CNS case studies2	√	√	√	√	√	√	√	√	√	√	√	√	√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

## 9- 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	Interactive Discussion sessions	Videos	Self-learning	Mid-term	Practical/Tutorial	Written	Oral
CVS (part 1): Antihypertensive drugs	√						√		√	√
CVS (part 2): Diuretics	√						√		√	√
Introduction to steroidal hormones & Male Sex Hormones	√						√		√	√
Female Sex Hormones (estrogens & antiestrogens) + Adrenocorticosteroids (part 1)	√			√	√		√		√	√
Adrenocorticosteroids (part 2) & Sedative & Hypnotics (Barbiturates)	√								√	√
Anti-Histaminics	√	√							√	√
Proton Pump Inhibitors	√	√							√	√
CVS (part 3): Antianginal & Anticoagulant drugs	√			√	√				√	√
NSAID Analgesics	√	√							√	√
Narcotic Analgesics	√								√	√
Anxiolytics & CNS stimulants	√	√							√	√
Antipsychotic drugs	√			√	√				√	√
Tricyclic antidepressants	√	√							√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

drugs										
Self-learning: Antiarrhythmic & Antihyperlipidemic drugs				√	√	√			√	√

**B) Practical Part:**

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	Interactive Discussion sessions	Videos	Self-learning	Mid-term	Practical/Tutorial	Written	Oral
1 <sup>st</sup> 3D visualization software section (intro, measurement, charge calculation , energy minimization & overlay)			√	√	√			√		
2 <sup>nd</sup> 3D visualization software section (Stereochemistry, Dihedral chart & deviation from plane)			√	√	√			√		
1 <sup>st</sup> molecular modeling software section (intro, drawing, measurement, energy minimization & charge calculation)			√	√	√			√		
2 <sup>nd</sup> molecular modeling software section (Lipinski rule & flexible alignment)			√	√	√			√		
3D visualization and modeling software revision			√	√	√			√		
Hormone Case studies1			√	√	√			√		





**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**  
**Pharm D Program**

Hormone Case studies2			√	√	√			√		
Glucocorticoid case studies			√	√	√			√		
NSAID case studies			√	√	√			√		
Narcotic analgesics case studies			√	√	√			√		
CVS case studies			√		√			√		
CNS case studies1			√		√			√		
CNS case studies2			√		√			√		

<b>Course Coordinator</b>	<b>Prof. Dr. Mohamed Ahmed Ahmed Mostafa</b> 
<b>Head of Department</b>	<b>Prof. Dr. Mohamed Ahmed Ahmed Mostafa</b> 

**Date: 6-9-2023**



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program



بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)  
Course Specification  
Academic year: 2023/2024

<b>Course name:</b> 48- Advanced Pharmacotherapy and Therapeutics (PO 805)	<b>اسم المقرر:</b> علاج دوائي متقدم وعلاجات
<b>Academic Level:</b> Level Four	<b>المستوى الأكاديمي:</b> المستوى الرابع
<b>Scientific department:</b> Pharmacology and toxicology	<b>القسم العلمي:</b> الأدوية والسموم
<b>Head of Department:</b> Prof. Dr. Manar Ahmed Nader	<b>رئيس القسم:</b> إ.د/ منار أحمد نادر
<b>Course Coordinator:</b>	<b>منسق المقرر:</b>



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacology and toxicology
Department supervising the course	Pharmacology and toxicology
Program on which the course is given	<b>B. Pharm. (Clinical Pharmacy) (Pharm-D)</b>
Academic Level	Level 4, second semester, 2023-2024
Date of course specification approval	18 <sup>th</sup> September 2023

### A. Basic Information: Course data:

Course Title	Advanced Pharmacotherapy and Therapeutics
Course Code	PO 805
Prerequisite	Pharmacology III
Teaching credit Hours: Lecture	2
: Practical	1
Total Credit Hours	3

### B. Professional Information:

#### 1. Course Aims:

This course enables the students to:

- Identify selected diseases based on knowledge of given symptoms and laboratory values
- State investigations that are of value for the diagnosis and monitoring of drug therapy in selected disease areas
- Choose and justify appropriate drug and treatment duration to a given patient with regard to age, organ functions and drug pharmacokinetics, pharmacodynamics and toxicity



- Evaluate abnormalities in common laboratory values and explain related physiology, drug treatment and/or disease
- Extract information from medical records
- Identify, evaluate and respond to basic drug-related problems from patient records
- Motivate action, choose appropriate non-pharmacological treatment with regard to the given patient and current recommendations.

## 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
1.1.5	1.1.5.1	Apply physiology and pathophysiology principles to solve human health problems
1.1.10	1.1.10.1	Define critical understanding of pharmacology and drug use in managing various organ dysfunction

### Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.4.3	2.4.3.1	Make decisions for recognized drug-related and pharmaceutical care problems
2.4.7	2.4.7.1	Recommend pharmacological and non-pharmacological systemic approaches for management of disorders affecting different body organs
	2.4.7.2	Select suitable care plans for patients with special consideration to their particular health issues



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.2.7	3.2.7.1	Demonstrate the adverse drug event and consult healthcare team about the proposed care plan to alleviate adverse effect of different medication

### Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share decisions with pharmacy and non-pharmacy team members with effective time management skills
4.3.1	4.3.1.1	Plan strategies to fulfil workplace pharmaceutical needs





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

### 3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Introduction for pharmacotherapy, Pharmacotherapeutic approaches: non-Pharmacologic treatment Lifestyle modification and Surgical intervention	2
2	Therapeutic Applications: complications in pregnancy	2
3	Therapeutic Applications: children disorder (otitis media- febrile seizures)	2
4	Therapeutic Applications: obesity	2
5	Therapeutic Applications: pain management	2
6	Therapeutic Applications: headache	2
7	Therapeutic Applications: ADHD	2
8	Therapeutic Applications: Hepatobiliary disorder	2
9	Therapeutic Applications: eat disorder	2
10	Therapeutic Applications: children disorder (respiratory syncetial viral infection)	2
11	Therapeutic Applications: children disorder (sepsis)	2
12	Therapeutic Applications: children disorder (meningitis)	2
13	Therapeutic Applications: Autoimmune diseases	2
14	Therapeutic Applications: Immune disorders ( <b>self-learning</b> )	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	<b>Final theoretical and oral exam</b>	-



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

Week No.	Tutorial Topics	Practical credit hours
1.	Care plan	1
2.	Therapeutic Applications: Pregnancy complications case study	1
3.	Therapeutic Applications: Bacterial infection case study	1
4.	Therapeutic Applications: Obesity case study	1
5.	Therapeutic Applications: Headache case study	1
6.	Therapeutic Applications: Pain management case study	1
7	Therapeutic Applications: Children disorder case study 1	1
8	Mid-term exam	-
9	Therapeutic Applications: Children disorder case study 2	1
10	Therapeutic Applications: ADHD case study	1
11	Therapeutic Applications: Eat disorder case study	1
12	Therapeutic Applications: Hepatobiliary disorder case study 1	1
13	Therapeutic Applications: Hepatobiliary disorder case study 2	1
14	Therapeutic Applications: Systemic lupus erythmatosus case study	1
15	<b>Revision and activity</b>	1
16	<b>Tutorial exam</b>	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

#### 4- Teaching and Learning Methods:

Teaching and Learning Method		Week number	K. elements to be addressed
4.1	<b>Advanced lectures:</b> <ul style="list-style-type: none"> <li>Lectures using Data show, power Point presentations</li> <li>Brain storming</li> <li>Group discussion</li> </ul>	1-16	1.1.5.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 2.4.7.2, 3.2.7.1, 4.1.1.1, 4.3.1.1
4.2	Hybrid learning <ul style="list-style-type: none"> <li>Online learning through my Mans "Mansoura university "</li> <li>Interactive discussion through My Mans</li> </ul>	1-12	1.1.5.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 2.4.7.2, 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	2.4.3.1, 2.4.7.1, 2.4.7.2, 3.2.7.1
4.5	Case study- problem solving	1-11	2.4.3.1, 2.4.7.1, 2.4.7.2, 3.2.7.1
4.6	Collaborative learning: research project	2-11	2.4.3.1, 2.4.7.1, 2.4.7.2, 3.2.7.1

#### 5- Student Assessment:

##### i- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.5.1, 1.1.10.1, 2.4.3.1, 2.4.7.1, 2.4.7.2
2-Tutorial exam	2.4.7.1, 2.4.7.2, 3.2.7.1
3-Oral	4.1.1.1, 4.3.1.1
4- Periodical (Mid-term exam) / Course work	1.1.5.1, 1.1.10, 2.4.3.1, 2.4.7.1, 2.4.7.2



### b. Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7 <sup>th</sup> -9 <sup>th</sup> week
Assessment 2	Practical examination and tutorial	16week
Assessment 3	Written exam	Start from 17 <sup>th</sup> week
Assessment 4	Oral exam	Start from 17 <sup>th</sup> week

### c. Weighing of assessments

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

## 6- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Data show- Computers, internet, white board

## 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	Pharmacotherapy Handbook; Terry L. Schwinghammer; Joseph T. DiPiro; Vicki Ellingrod; Cecily V. DiPiro. McGraw Hill / Medical; 11th ed. (2021).	Book



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024  
Pharm D Program

4	Schwinghammer's Pharmacotherapy Casebook: A Patient-Focused Approach; Terry L. Schwinghammer; Julia M. Koehler; Jill S. Borchert; Douglas Slain; Sharon K. Park. McGraw Hill / Medical; 12 <sup>th</sup> ed. (2023).	Book
5	<a href="http://www.sciencedirect.com">http://www.sciencedirect.com</a> <a href="http://www.google.com">http://www.google.com</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a> ACCP guidelines ( <a href="https://www.accp.com/">https://www.accp.com/</a> )	websites



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

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

Course contents / K. elements	Domain 1		Domain 2			Domain 3	Domain 4	
	1.1.5.1	1.1.10	2.4.3.1	2.4.7.1	2.4.7.2	3.2.7.1	4.1.1.1	4.3.1.1
<b>A)Theoretical part</b>								
Introduction for pharmacotherapy, Pharmacotherapeutic approaches: non-Pharmacologic treatment Lifestyle modification and Surgical intervention	✓	✓						
Therapeutic Applications: complications in pregnancy	✓	✓	✓	✓	✓	✓		
Therapeutic Applications: ADHD	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: Hepatobillary disorder	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: eat disorder			✓	✓	✓	✓	✓	✓
Therapeutic Applications: children disorder (respiratory syncetial viral infection)	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: children disorder (sepsis)	✓	✓	✓	✓	✓	✓	✓	✓



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Therapeutic Applications: children disorder (meningitis)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: Autoimmune diseases	✓	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: Immune disorders ( <b>self-learning</b> )	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Course contents / K. elements</b>	<b>Domain 1</b>		<b>Domain 2</b>			<b>Domain 3</b>	<b>Domain 4</b>		
	<b>1.1.5.1</b>	<b>1.1.10</b>	<b>2.4.3.1</b>	<b>2.4.7.1</b>	<b>2.4.7.2</b>	<b>3.2.7.1</b>	<b>4.1.1.1</b>	<b>4.3.1.1</b>	
<b>B)Practical part</b>									
Care plan	✓	✓							
Therapeutic Applications: Pregnancy complications case study	✓	✓	✓	✓	✓	✓			
Therapeutic Applications: Bacterial infection case study	✓	✓	✓	✓	✓	✓			
Therapeutic Applications: Obesity case study	✓	✓	✓	✓	✓	✓			
Therapeutic Applications: Headache case study	✓	✓	✓	✓	✓	✓	✓	✓	✓
Therapeutic Applications: Pain management case study	✓	✓	✓	✓	✓	✓	✓	✓	✓



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Therapeutic Applications: Children disorder case study 1	✓	✓			✓	✓	✓		✓	✓	✓
Therapeutic Applications: Children disorder case study 2	✓	✓			✓	✓	✓		✓	✓	✓
Therapeutic Applications: ADHD case study					✓	✓	✓		✓	✓	✓
Therapeutic Applications: Eat disorder case study	✓	✓			✓	✓	✓		✓	✓	✓
Therapeutic Applications: Hepatobillary disorder case study 1	✓	✓			✓	✓	✓		✓	✓	✓
Therapeutic Applications: Hepatobillary disorder case study 2	✓	✓			✓	✓	✓		✓	✓	✓
Therapeutic Applications: Systemic lupus erythmatosus case study	✓	✓			✓	✓	✓		✓	✓	✓





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

**9- Matrix between course content, method of learning and assessment:**

A)Theoretical part:										
Course contents	Teaching and learning methods						Assessment methods			
	Advanced Lectures	Hybrid learning	Lab sessions	Self-learning	Collaborative learning	Case study	Course work	Practical/tutorial	Written	Oral
Introduction for pharmacotherapy, Pharmacotherapeutic approaches: non-Pharmacologic treatment Lifestyle modification and Surgical intervention	✓						✓		✓	✓
Therapeutic Applications: complications in pregnancy	✓						✓		✓	✓
Therapeutic Applications: children disorder (otitis media-febrile seizures)	✓	✓					✓		✓	✓
Therapeutic Applications: obesity	✓						✓		✓	✓
Therapeutic Applications: pain management	✓								✓	✓
Therapeutic Applications: headache	✓	✓							✓	✓
Therapeutic Applications: ADHD	✓								✓	✓



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Therapeutic Applications: Hepatobiliary disorder	✓								✓	✓
Therapeutic Applications: eat disorder	✓								✓	✓
Therapeutic Applications: children disorder (respiratory syncetial viral infection)	✓	✓							✓	✓
Therapeutic Applications: children disorder (sepsis)	✓								✓	✓
Therapeutic Applications: children disorder (meningitis)	✓								✓	✓
Therapeutic Applications: Autoimmune diseases	✓								✓	✓
Therapeutic Applications: Immune disorders (self-learning)	✓			✓					✓	✓

**B) Titorial part:**

Course contents	Teaching and learning methods						Assessment methods			
	Lectures	Hybrid learning	Lab sessions	Self-learning	Collaborative	Case study	Course work	Practical/tutoria	Written	Oral
Care plan		✓	✓			✓		✓		
Therapeutic Applications: Pregnancy complications case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Bacterial infection case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Obesity case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Headache case study		✓	✓		✓	✓	✓	✓		



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Therapeutic Applications: Pain management case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Children disorder case study 1		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Children disorder case study 2		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: ADHD case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Eat disorder case study		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Hepatobillary disorder case study1		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Hepatobillary disorder case study2		✓	✓		✓	✓	✓	✓		
Therapeutic Applications: Systemic lupus erythmatosus case study		✓	✓				✓	✓		

<b>Course Coordinator</b>	
<b>Head of Department</b>	<b>Prof. Dr. Manar A Nader</b> 

**Date: 18 / 9 / 2023**



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024



بكالوريوس الصيدلة الإكلينيكية (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 و الممارسة الصيدلانية
<b>Head of Department:</b> <b>Prof. Dr/ Mohamed El-Husseiny Shams</b>	<b>رئيس القسم:</b> أ.د/ محمد الحسيني شمس
Course Coordinator: Dr. Moetaza Mahmoud Hassab	<b>منسق المقرر:</b> أ.م.د/ معتز محمد حسب السيد



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

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	B. Pharm. (PharmD) (Clinical Pharmacy)
Academic Level	Fourth level, second semester, 2023-2024
Date of course specification approval	07/09/2023

Basic Information: Course data:

Course Title	Clinical Pharmacokinetics
Course Code	PP 804
Prerequisite	Biopharmaceutics and pharmacokinetics
Credit Hours: Lecture	2
Tutorial	1
Total Credit Hours	(Credit H)

Course Aims:

Introduce the models of linear and dose-dependent systems in pharmacokinetics  
Pharmacokinetic applications in therapeutic drug monitoring and patient care  
Specific drugs and disease states, effects of age and concomitant drug administration  
Dose Adjustment according to patient characteristics



### Course Learning Outcomes

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

#### Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.9	1.1.9.1	Recognize pharmacokinetic calculations essential for optimization of dosage regimens.

#### Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Adjust the dosage regimen in different special patient populations to optimize the medication use.
3.2.5	3.2.5.1	Advise healthcare professionals about the optimum dosing regimens for different medications with special attention paid to the drugs with narrow therapeutic index

#### 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



Course content

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)	2
3	Pharmacokinetics after Oral administration (Determination of the absorption rate constant: The method of residuals, Lag Time, The maximum (peak) drug plasma concentration, The time of maximum drug concentration, The area under the plasma concentration-time curve)	2
4	Bioavailability and bioequivalence (Types of bioavailability, bioequivalence, calculation of bioavailability. factors affecting bioavailability, methods, and criteria for bioavailability testing)	2
5	Nonlinear 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
6	Pharmacokinetics in case of kidney disease (Dosage adjustment in pediatric patients, The effect of renal disease on the elimination of drugs, Dosage adjustment in cases of partial or total renal failure)	2
7	Pharmacokinetics in case of liver disease (The effect of liver disease on the total body clearance, dose adjustment according to Child Pugh score)  Therapeutic drug Monitoring: Aminoglycosides	1



	Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study	
8	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
9	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
10	Therapeutic drug Monitoring: Theophylline Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study	2
11	Therapeutic drug Monitoring: 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
12	Therapeutic drug Monitoring: Cyclosporin Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study	2
13	Therapeutic drug Monitoring: Lithium (Self-learning) (Rationale for therapeutic drug monitoring, Pharmacokinetic profile (ADME), Clinical case study, Equation resource and examples)	2
14	Therapeutic drug Monitoring: Carbamazepine Clearance, Determination of dose regimen, volume of distribution in different disease conditions, Pharmacokinetic profile (ADME) Clinical case study	2





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	Start of final theoretical and oral exam	-

#### B) Tutorial part

Week No.	Tutorial topics	Credit hours
1	Pharmacokinetics after IV bolus administration	1
2	Pharmacokinetics after Oral administration	1
3	Bioavailability	1
4	Pharmacokinetics after IV infusion	1
5	Multiple dose administration (IV and oral)	1
6	Pharmacokinetics in case of kidney disease	1
7	Pharmacokinetics in case of liver disease	1
8	Mid-term exam	-
9	Non-linear pharmacokinetics	1
10	Therapeutic drug Monitoring: Theophylline	1
11	Therapeutic drug Monitoring: Digoxin	1
12	Therapeutic drug Monitoring: Cyclosporin	1
13	Therapeutic drug Monitoring: Aminoglycosides	1
14	Therapeutic drug monitoring of vancomycin (Group project)	1
15	Revision and activity	1
16	Sheet / and Tutorial exam (OSCE)	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Teaching and learning method

	Teaching and Learning Methods	Week no.	K. elements to be assessed
5.1	Computer aided learning: Lectures using Data show, power Point presentations Distance learning Online learning through Mymans "Mansoura university "as recorded – video lectures Inter active discussion through My Mans	Week 1-16	1.1.9.1, 3.1.1.1, 3.2.5.1
5.2	Self-learning	Week 13	4.3.2.1
5.3	Practical sessions using tutorials	Week 1-16	3.1.1.1, 3.2.5.1, 4.3.2.1
5.4	Class Activity: Discussion / Brainstorming / problem solving	Week 1-13	3.1.1.1, 3.2.5.1, 4.3.2.1

Student Assessment:

Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.9.1, 3.1.1.1, 3.2.5.1, 4.3.2.1
2-Tutorial exam (OSCE)	3.1.1.1, 3.2.5.1, 4.3.2.1
3-Oral	3.1.1.1, 3.2.5.1, 4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.9.1, 3.1.1.1, 3.2.5.1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7-9th week
Assessment 2	Tutorial examination (OSCE)	16week
Assessment 3	Written exam	Start in 17th week
Assessment 4	Oral exam	Start in 17th week

### Weighing of assessments

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

### Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Library	Books

### List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff members	Videos on platform
3.	Clinical Pharmacokinetics, 6th Edition (2017).	Essential Book
4.	Applied Biopharmaceutics and Pharmacokinetics, 7th Edition by Leon Shargel , Andrew Yu (2015)	Essential Book



5.	Lexicomp, Dynamed Plus and BMJ best practice <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="https://scholar.google.com/">https://scholar.google.com/</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	Websites
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### Matrix of knowledge and skills of the course

Course contents	Outcomes Domains / Key elements			
	Domain 1	Domain 3		Domain 4
	1.1.9.1	3.1.1.1	3.2.5.1	4.3.2.1
<b>Theoretical Part</b>				
Review of Pharmacokinetics ADME processes	√			
Pharmacokinetics after IV bolus administration	√			
Pharmacokinetics after Oral administration	√			
Bioavailability and bioequivalence	√		√	
Nonlinear pharmacokinetics	√	√	√	
Pharmacokinetics in case of kidney disease	√	√	√	
Pharmacokinetics in case of liver disease Therapeutic drug Monitoring: Aminoglycosides	√	√	√	
Pharmacokinetics after IV infusion	√		√	√
Multiple dose administration (IV and oral)	√	√	√	√



Course contents	Outcomes Domains / Key elements			
	Domain 1	Domain 3		Domain 4
Therapeutic drug Monitoring: Theophylline	√	√	√	√
Therapeutic drug Monitoring: Digoxin	√	√	√	√
Therapeutic drug Monitoring: Cyclosporin	√	√	√	
Therapeutic drug Monitoring: Lithium (Self-learning)		√	√	
Therapeutic drug Monitoring: Carbamazepine		√	√	√

Course contents	Outcomes Domains / Key elements			
	Domain 1	Domain 3		Domain 4
	1.1.9.1	3.1.1.1	3.2.5.1	4.3.2.1
<b>Practical Part</b>				
Pharmacokinetics after IV bolus administration		√	√	
Pharmacokinetics after Oral administration		√	√	
Bioavailability		√	√	
Pharmacokinetics after IV infusion		√	√	
Multiple dose administration (IV and oral)		√	√	
Pharmacokinetics in case of kidney disease		√	√	
Pharmacokinetics in case of liver disease		√	√	
Non-linear pharmacokinetics		√	√	
Therapeutic drug Monitoring:		√	√	



Course contents	Outcomes Domains / Key elements			
	Domain 1	Domain 3		Domain 4
Theophylline				
Therapeutic drug Monitoring: Digoxin		√	√	
Therapeutic drug Monitoring: Cyclosporin		√	√	
Therapeutic drug Monitoring: Aminoglycosides		√	√	√
Therapeutic drug monitoring of vancomycin (Group project)		√	√	√

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

**A) Theoretical Part:**

Course Contents	Teaching and Learning Methods							Assessment methods			
	Lecture	Hybrid	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Review of Pharmacokinetics ADME processes	√	√	√		√					√	√
Pharmacokinetics after IV bolus administration	√	√	√		√					√	√
Pharmacokinetics after Oral administration	√	√	√		√					√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program

Course specification  
2023- 2024

Bioavailability and bioequivalence	√	√	√		√					√	√
Nonlinear pharmacokinetics	√	√	√		√			√		√	√
Pharmacokinetics in case of kidney disease	√	√	√		√			√		√	√
Pharmacokinetics in case of liver disease Therapeutic drug Monitoring: Aminoglycosides	√	√	√		√			√		√	√
Pharmacokinetics after IV infusion	√	√	√		√			√		√	√
Multiple dose administration (IV and oral)	√	√	√		√			√		√	√
Therapeutic drug Monitoring: Theophylline	√	√	√		√					√	√
Therapeutic drug Monitoring: Digoxin	√	√	√		√					√	√
Therapeutic drug Monitoring: Cyclosporin	√	√	√		√					√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Therapeutic drug Monitoring: Lithium (Self-learning)	√	√	√		√		√			√	√
Therapeutic drug Monitoring: Carbamazepine	√	√	√		√					√	√





	Teaching and Learning Methods							Assessment methods			
	Lecture	Hybrid learning	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Course Work	Practical/Tutorial	Written	Oral
Pharmacokinetics after IV bolus administration				√	√				√		
Pharmacokinetics after Oral administration				√	√				√		
Bioavailability				√	√				√		
Pharmacokinetics after IV infusion				√	√				√		
Multiple dose administration (IV and oral)				√	√				√		
Pharmacokinetics in case of kidney disease				√	√	√			√		
Pharmacokinetics in case of liver disease				√	√	√			√		
Non-linear pharmacokinetics				√	√	√			√		
Therapeutic drug Monitoring: Theophylline				√	√	√			√		
Therapeutic drug Monitoring: Digoxin				√	√	√			√		
Therapeutic drug Monitoring: Cyclosporin				√	√	√			√		



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Therapeutic drug Monitoring: Aminoglycosides				√	√	√	√		√		
Therapeutic drug monitoring of vancomycin (Group project)				√	√	√	√		√		
Course Coordinator	Assoc. Prof. Dr. Moetaza Mahmoud Soliman										
	<i>Moetaza Soliman</i>										
Head of Department	Prof. Dr. Mohamed Elhousseiny Shams <i>Mohamed Elhousseiny</i>										
	Date: 07/09/ 2023										



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024



Pharm D- (فارم د) بكالوريوس الصيدلة الإكلينيكية

Course Specification

Academic year: 2023/2024

Course name: Pharmacotherapy of critical care	اسم المقرر: العلاج الدوائي لمرضى العناية الحرجة
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific department: Clinical Pharmacy & Pharmacy Practice	القسم العلمي: الصيدلة الإكلينيكية و الممارسة الصيدلانية
Head of Department: Prof.Dr. Mohamed Shams	رئيس القسم : أ.د/ محمد الحسيني السبيعي شمس
Course Coordinator: Dr. Noha Osama Mansour	منسق المقرر : د. نهي أسامة منصور



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

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	B. Pharm. (PharmD) (Clinical Pharmacy)
Academic Level	Fourth level, second semester, 2022-2024
Date of course specification approval	07/09/2023

Basic Information: Course data:

Course Title	Pharmacotherapy of critical care patients
Course Code	PP 805
Prerequisite	Pharmacology-III
Credit Hours: Lecture	1
Tutorial	1
Total Credit Hours	2 (Credit H)

Course Aims:

The course aims at educating students about the role of clinical pharmacist in ICU and, knowledge about most common conditions in ICU such as sepsis, septic shock, intracranial hemorrhage, surgical antibiotic prophylaxis, stress ulcer prophylaxis and treatment, and acid -base disorders.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### Course Learning Outcomes

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

#### Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	List fundamental activities of clinical pharmacist in intensive care unit (ICU)
1.1.4	1.1.4.1	Recognize the knowledge about antibiotics, antiplatelets, analgesics, antiacids used in critical care patients.
1.1.7	1.1.7.1	Outline evidence-based guidelines, that is important in critical care patient management.

#### Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.1.3	2.1.3.1	Apply FAST-HUG approach on critical care patients.
2.4.3	2.4.3.1	Formulate pharmaceutical care plans for management of several disorders in critical care setting disorders and drug-related problems with reference to their particulate health problems and special considerations.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Apply a suitable protocol for prophylaxis of stress ulcer in ICU patients.
3.2.5	3.2.5.1	Adjust antibiotic regimen according to type of surgery and other patients' factors.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Participate in case presentation and discuss treatment plan with colleagues to improve presentation and communication skills.
4.3.2	4.3.2.1	Search pertaining literature to prepare topic about treatment of venous thromboembolism to improve searching skills.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## Course content

### A) Theoretical part

Week No.	Lecture Topics	Lecture Credit Hours
1	Introduction to critical care. Levels of care. Fast Hug mnemonics.	1
2	Stress ulcer prophylaxis Pathophysiology. Risk factors. Management.	1
3	Enteral nutrition.	1
4	Parenteral nutrition	1
5	Sepsis and septic shock Pathophysiology. Diagnosis Surviving Sepsis Campaign Guidelines for Sepsis and Septic Shock	1
6	Sepsis and Septic shock management. Vasopressor support. Antibiotic recommendations. Additional therapies.	1
7	Fluids (part 1)	1
8	Fluids (part 2)	1



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

9	Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-1 Clinical presentation Risk factors. Classes of anticoagulants. Heparin induced thrombocytopenia.	1
10	Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-2 Warfarin Treatment guidelines for VTE. Prophylaxis of VTE.	1
11	Electrolytes Acid–base chemistry and buffer system Arterial blood gas analysis.	1
12	Acid -base disorders Metabolic acid- base disorders. Respiratory acid–base disorders	1
13	Hemodialysis: Hemodialysis mechanism(Self learning) Hemodialysis complications and management	1
14	Peritoneal dialysis mechanism Prevention of Peritonitis and Catheter Exit-site Infections	1





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

15	Compensatory and alternative lecture	1
16	Revision and quiz	1
17	Start of final theoretical exam	-

#### B) Tutorial part

Week No.	Tutorial topics	Credit hours
1	Flow rate calculation	1
2	ICU patient's sheet & hemodynamics	1
3	Total parenteral nutrition	1
4	Total parenteral nutrition case study	1
5	Dosing in ICU	1
6	Case study: Stress Ulcer prophylaxis	1
7	Case presentation: Sepsis & septic shock	1
8	Mid-term exam	-
9	Case presentation: Fluids	1
10	Case presentation: Acid -base disorders	1
11	Case presentation: Thromboembolic treatment & prophylaxis in ICU part1	1
12	Case presentation: Thromboembolic treatment & prophylaxis in ICU part2	1
13	Case presentation: Hemodialysisdialysis	1
14	Case presentation: peritoneal dialysis (group project)	1
15	Revision and activity	1
16	Tutorial Exam (OSCE)	1



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

**Teaching and learning method**

	Teaching and Learning Methods	Week no.	K. elements to be assessed
5.1	Hybrid learning and Computer aided learning: a. Online learning through Mymans "Mansoura University" as recorded – video lectures b. Inter active discussion through My Mans c. Power point (PPT) presentations	Week 1-16	1.1.1.1/ 1.1.4.1/ 1.1.7.1/ 3.1.1.1/ 3.2.5.1
5.2	Practical sessions using tutorials	Week 1-16	2.1.3.1/ 2.4.3.1/ 3.1.1.1/ 3.2.5.1
5.3	Self-learning	Week 13	4.3.2.1
5.5	Class Activity Discussion / Brainstorming / problem solving	Week 1-14	4.1.1.1/ 4.3.2.1

Student Assessment:

Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1/ 1.1.4.1/ 1.1.7.1/ 3.1.1.1/ 3.2.5.1
2-Tutorial exam (OSCE)	2.1.3.1/ 2.4.3.1/ 3.1.1.1/ 3.2.5.1
3-Oral	1.1.1.1/ 1.1.4.1/ 1.1.7.1/ 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/ 1.1.4.1/ 1.1.7.1/3.1.1.1/ 3.2.5.1

Assessment schedule

Assessment 1	Periodical / Course work	7-9th week
Assessment 2	Tutorial examination (OSCE)	16th week
Assessment 3	Written exam	Start in 17th week



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Assessment 4	Oral exam	Start in 17th week
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### Weighing of assessments

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

### Facilities required for teaching and learning\

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	Data show – computers, internet, round tables
Hospital	Intensive care unit rounds
Library	Reference books

### List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff members	Videos on platform
3.	Clinical Pharmacokinetics, 7th Edition (2022).	Essential Book
4.	Applied Biopharmaceutics and Pharmacokinetics, 7th Edition by Leon Shargel , Andrew Yu (2015)	Essential Book



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

5.	Lexicomp, Dynamed Plus and BMJ best practice <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="https://scholar.google.com/">https://scholar.google.com/</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	Websites
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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	1.1.4.1	1.1.7.1	2.1.3.1	2.4.3.1	3.1.1.1	3.2.5.1	4.1.1.1	4.3.2.1	
Theoretical part										
Introduction to critical care. Levels of care. Fast Hug mnemonics.	√			√	√					
Stress ulcer prophylaxis Pathophysiology. Risk factors. Management.		√	√				√			
Enteral nutrition.			√		√		√			
Parenteral nutrition		√	√		√		√			
Sepsis and septic shock Pathophysiology. Diagnosis Surviving Sepsis Campaign Guidelines for Sepsis and Septic Shock		√	√		√		√			
Sepsis and		√	√		√		√			



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Septic shock management. Vasopressor support. Antibiotic recommendations. Additional therapies.										
Fluids (part 1)		√	√		√		√	√		
Fluids (part 2)		√	√		√		√			
Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-1 Clinical presentation Risk factors. Classes of anticoagulants. Heparin induced thrombocytopenia.		√	√		√		√	√		
Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-2 Warfarin Treatment			√		√					



**Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program**



**Course specification  
2023- 2024**

guidelines for VTE. Prophylaxis of VTE.										
Electrolytes Acid–base chemistry and buffer system Arterial blood gas analysis.			√		√	√				
Acid -base disorders Metabolic acid-base disorders. Respiratory acid–base disorders		√	√		√		√	√		
Hemodialysis: Hemodialysis mechanism(Self learning) Hemodialysis complications and management		√	√		√		√	√		
Peritoneal dialysis mechanism Prevention of Peritonitis and Catheter Exit-site Infections		√	√		√		√	√		



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Course contents	Outcomes Domains / Key elements									
	Domain 1			Domain 2		Domain 3		Domain 4		
	1.1.1. 1	1.1.4. 1	1.1.7. 1	2.1.3. 1	2.4.3. 1	3.1.1. 1	3.2.5. 1	4.1.1. 1	4.3.2. 1	
Practical part										
Flow rate calculation		√	√		√	√	√			
ICU patient's sheet & hemodynamics		√	√		√	√	√			
Total parenteral nutrition		√	√		√	√	√			
Total parenteral nutrition case study		√	√		√	√	√			
Dosing in ICU		√	√		√	√	√	√		
Case study: Stress Ulcer prophylaxis		√	√		√	√	√	√		
Case presentation: Sepsis & septic shock		√	√		√	√	√	√		
Case presentation: Fluids		√	√		√	√	√	√		
Case presentation: Acid -base disorders		√	√		√	√	√	√		





**Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program**



**Course specification  
2023- 2024**

Case presentation: Thromboembolic treatment & prophylaxis in ICU part1		√	√			√	√	√	√	
Case presentation: Thromboembolic treatment & prophylaxis in ICU part2		√	√			√	√	√	√	
Case presentation: Hemodialysisdial ysis		√	√			√	√	√	√	
Case presentation: peritoneal dialysis (group project)		√	√			√	√	√	√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

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

A) Theoretical Part:											
Course Contents	Teaching and Learning Methods							Assessment methods			
	Lecture	Hybrid learning	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Introduction to critical care. Levels of care. Fast Hug mnemonics.	√	√	√		√			√		√	√
Stress ulcer prophylaxis Pathophysiology. Risk factors. Management.	√	√	√		√			√		√	√
Enteral nutrition.	√	√	√		√			√		√	√
Parenteral nutrition	√	√	√		√			√		√	√
Sepsis and septic shock Pathophysiology. Diagnosis Surviving Sepsis Campaign Guidelines for Sepsis and Septic Shock	√	√	√		√			√		√	√



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Sepsis and Septic shock management. Vasopressor support. Antibiotic recommendations. Additional therapies.	√	√	√		√			√		√	√
Fluids (part 1)	√	√	√		√			√		√	√
Fluids (part 2)	√	√	√		√					√	√
Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-1 Clinical presentation Risk factors. Classes of anticoagulants. Heparin induced thrombocytopenia.	√	√	√		√					√	√
Treatment and prophylaxis of deep venous thrombosis Risk factors for VTE-2 Warfarin Treatment guidelines for VTE. Prophylaxis of VTE.	√	√	√		√					√	√
Electrolytes Acid–base chemistry and buffer system Arterial blood gas analysis.	√	√	√		√					√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Acid -base disorders Metabolic acid- base disorders. Respiratory acid–base disorders	√	√	√		√					√	√
Hemodialysis: Hemodialysis mechanism(Self learning) Hemodialysis complications and management	√	√	√		√			√		√	√
Peritoneal dialysis mechanism Prevention of Peritonitis and Catheter Exit-site Infections	√	√	√		√					√	√

**B) Practical Part:**

	Teaching and Learning Methods							Assessment methods			
	Lecture	Hybrid learning	Online lecture	Lab sessions	Problem solving	Case Study	Self-learning	Course Work	Practical/Tutorial	Written	Oral
Flow rate calculation				√	√				√		
ICU patient’s sheet & hemodynamics				√	√				√		
Total parenteral nutrition				√	√				√		
Total parenteral nutrition case study				√	√				√		



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Dosing in ICU				√	√				√		
Case study: Stress Ulcer prophylaxis				√	√	√			√		
Case presentation: Sepsis & septic shock				√	√	√			√		
Case presentation: Fluids				√	√	√			√		
Case presentation: Acid - base disorders				√	√	√			√		
Case presentation: Thromboembolic treatment & prophylaxis in ICU part1				√	√	√			√		
Case presentation: Thromboembolic treatment & prophylaxis in ICU part2				√	√	√			√		
Case presentation: Hemodialysisdialysis				√	√	√			√		
Case presentation: peritoneal dialysis (group project)				√	√	√	√		√		

Date: 07/ 09/ 2023

Course Coordinator	Dr. Noha Osama Mansour <i>Noha Osama</i>
Head of Department	Prof. Dr. Mohamed Elhusseiny Shams <i>Mohamed Elhusseiny</i>



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024



بكالوريوس الصيدلة الإكلينيكية (فارم دي – Pharm D)

## Course Specification

Academic year: 2023/2024

Course name: Clinical Biochemistry	اسم المقرر: <b>كيمياء حيوية إكلينيكية</b>
Academic Level: <b>Level 4</b>	المستوى الأكاديمي: <b>الرابع</b>
Scientific department: <b>Biochemistry</b>	القسم العلمي: <b>Biochemistry</b>
Head of Department: Ass. Prof. Noha M.H Abdel-Rahman	رئيس القسم: : ا.م.د/ نهى منصور حسن عبدالرحمن
Course Coordinator:	منسق المقرر



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

<b>University</b>	Mansoura
<b>Faculty</b>	Pharmacy
<b>Department offering the course</b>	Biochemistry
<b>Department supervising the course</b>	Biochemistry
<b>Program on which the course is given</b>	<b>B. Pharm. (Clinical Pharmacy) (PharmD)</b>
<b>Academic Level</b>	Level <b>four</b> , <b>Second Semester</b> , 2023-2024
<b>Date of course specification approval</b>	16/9/2023

### A. Basic Information: Course data:

<b>Course Title</b>	Clinical Biochemistry
<b>Course Code</b>	PB 804
<b>Prerequisite</b>	Biochemistry-2
<b>Teaching credit hours: Lecture</b>	2
<b>: Practical/ Tutorial</b>	1
<b>Total Credit Hours</b>	3

### B. Professional Information:

#### 1.Course Aims:

This course enables the students to:

- Understand the functional state of: Liver, Kidney, Heart, Bone, Pulmonary and GIT in health and disease.
- Understand the disorders of proteins, amino acids, lipids and carbohydrate metabolism.
- Gain an understanding of the different laboratory diagnostic tests of (liver – kidney – heart), types and lab differentiation of hyperlipidemia.
- Learn about some Endocrine disorders by studying (classification of hormones – mechanisms of action – dysfunction).



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

- Be aware of the value of measuring plasma proteins, albumin/globulin ratio, tumor markers, 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.

## 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, Bone, Pulmonary and GIT in health and disease state.
	1.1.1.2	Differentiate different disorders of proteins, amino acids, lipids, carbohydrates, Porphyrin and iron metabolism as well as 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 health care 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	Formulate pharmaceutical care plans for management of several disorders and drug-related problems with reference to their particulate health problems and special considerations.
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.





**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

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	Utilize etiology, epidemiology, pathogenesis, laboratory diagnosis, and clinical features to suggest the proper preventive strategies for various infections/diseases.
3.2.5	3.2.5.1	Provide education and counseling to patients, healthcare professionals and communities to achieve safe and cost-effective use of medicines.

**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.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### 3- Course Contents:

#### A. Theoretical part:

Week No.	Topics	Lecture credit Hours
1	Introduction and handling, preservation, storage and analysis of biological samples	2
2	Liver disease and Liver function Tests.	2
3	Pancreatic disease Recent diagnostic biomarkers, Self learning	2
4	Blood analysis and CBC	2
5	Kidney and abnormalities of urine analysis-1	2
6	Kidney and abnormalities of urine analysis-2	2
7	Tumor markers.	2
8	Pituitary diseases	2
9	Thyroid disorders	2
10	Heart and Bone	2
11	Plasma proteins+ A/Gratio &lab differentiation of hyperlipidemia	2
12	Electrolytes, blood gases, acid-base balance	2
13	Endocrine testing protocol	2
14	Endocrine testing protocol (continue)	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	<b>Final Theoretical and oral exam</b>	-



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## B. Practical part:

Week No.	Practical Topics	Practical credit hours
1.	Patient Sample collection and the use of laboratory.	1
2.	Laboratory Diagnosis of Diabetes Mellitus/case study.	1
3.	Oral Glucose Tolerance Test	1
4	Complications of Diabetes Mellitus.	1
5	Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus.	1
6	Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus case study.	1
7	Tests for Evaluation of Liver Function (Total protein, ALT, AST)	1
8	Mid-term exam	-
9	Tests for Evaluation of Liver Function (Total protein, ALT, AST) case study	1
10	Determination of serum bilirubin (total and direct).	1
11	Determination of serum bilirubin (total and direct) case study.	1
12	Acute myocardial infarction and bone metabolism disorder/case study.	1
13	Diagnosis of renal dysfunction.	1
14	Tumor markers/case study.	1
15	Revision and activity	1
16	Practical exam (colorimetry) applying OSPE/ OSCE	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

#### 4- Teaching and Learning Methods:

No	Teaching and Learning Methods	week	K. elements to be addressed
4.1	Lectures	1-16	1.1.1.1, 1.1.4.1, 2.4.3.1, 3.1.1.1
4.2	Practical sessions	1-16	1.1.5.1, 1.1.6, 2.1.2.1, 2.5.2.1, 3.1.3.1, 4.1.2.1
4.3	Hybrid learning: a. Online learning through My Mans “Mansoura university” as recorded – video lectures b. Interactive discussion through My Mans	1-14	1.1.1.1, 1.1.1.2, 1.1.4.1, 1.1.5.1, 2.1.2.1, 2.4.3.1 2.4.5.1 2.5.2.1 2.5.3.1
4.4	Self-learning	3	4.1.2.1
4.5	Practical work and tutorials	1-13	1.1.6.1, 2.3.1.1, 2.3.2.1, 3.1.3.1
4.7	Presentation	4,5,6,7	4.2.1.1 4.2.2.1
4.9	Case study	2,4,5,6,8, 10, 11	2.5.2.1, 3.2.5.1

#### 5- Student Assessment:

##### j- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1, 1.1.1.2, 1.1.5.1, 2.4.7.1, 3.1.4.1
2-Practical exam applying OSPE/ OSCE	1.1.3.1, 2.3.1.1, 2.3.2.1, 3.1.3.1, 3.1.4.1
3-Oral exam	1.1.1.1, 1.1.1.2, 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, 2.4.7.1, 3.1.4.1, 4.1.2.1, 4.2.1.1, 4.2.2.1, 4.3.2.1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### b. Assessment schedule

Assessment 1	Periodical (Mid-term Exam)/Course work	7 <sup>th</sup> -9 <sup>th</sup> week
Assessment 2	Practical examination and tutorial applying OSPE/ OSCE	16 <sup>th</sup> week
Assessment 3	Written exam	Start from 17 <sup>th</sup> week
Assessment 4	Oral exam	Start from 17 <sup>th</sup> week

### c. Weighing of assessments

1	Periodical (Mid-term) exam/Course work	15%
2	Practical examination and tutorial	25%
3	Final-term 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



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by staff members	Videos on platform
3.	Clinical Chemistry, William Marshall, Marta Lapselky, Andrew Day, 8 <sup>th</sup> edition, 2016.	Books
4.	Lippincott Illustrated Reviews: Biochemistry 8 <sup>th</sup> Edition, November 7, 2021.	Books
5.	<a href="https://www.ncbi.nlm.nih.gov/books/NBK459183/">https://www.ncbi.nlm.nih.gov/books/NBK459183/</a>	websites



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### Matrix 1. Course contents and course key elements

Course contents	Course Key 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	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	2.3.1.1	4.3.2.1
A) Theoretical part																					
Introduction and handling, preservation, storage and analysis of biological samples		✓		✓	✓				✓	✓		✓		✓							
Liver disease and Liver function Tests.		✓		✓	✓				✓	✓		✓		✓							
Pancreatic disease	✓	✓	✓	✓					✓	✓	✓			✓	✓						



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Recent diagnostic biomarkers, Self learning																							
Blood analysis and CBC.	✓	✓	✓	✓					✓	✓	✓			✓	✓								
Kidney and abnormalities of urine analysis-1	✓			✓			✓			✓				✓			✓						
Kidney and abnormalities of urine analysis-2	✓	✓	✓	✓					✓	✓		✓		✓		✓							
Tumor markers																							
Pituitary diseases	✓	✓	✓	✓					✓	✓		✓		✓		✓							





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Thyroid disorders	✓	✓	✓	✓			✓		✓			✓				✓		✓					
Heart and Bone																							
Plasma proteins+ A/Gratio &lab differentiation of hyperlipidemia	✓	✓		✓					✓	✓				✓	✓	✓							
Electrolytes, blood gases, acid-base balance	✓	✓							✓	✓				✓			✓		✓		✓		✓
Endocrine testing protocol and (continue)	✓	✓	✓		✓		✓		✓		✓		✓			✓	✓		✓		✓		✓



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Course contents	Course Key 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	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	2.3.1. 1	4.3.2. 1
<b>B) Practical part</b>																					
Patient Sample collection and the use of laboratory.			✓	✓		✓	✓	✓						✓	✓						
Laboratory Diagnosis of Diabetes Mellitus/case study	✓		✓	✓	✓			✓		✓	✓	✓		✓							
Oral Glucose Tolerance Test/Complications of Diabetes Mellitus			✓		✓					✓	✓		✓	✓							



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus		✓	✓	✓					✓	✓					✓	✓				
Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus/case study.		✓	✓	✓					✓	✓					✓	✓				
Tests for Evaluation of Liver Function (Total protein, ALT, AST)	✓	✓	✓		✓				✓			✓	✓			✓	✓			
Tests for Evaluation of Liver Function (Total protein,	✓	✓	✓		✓				✓			✓	✓			✓	✓			



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

ALT, AST)/case study																				
Determination of serum bilirubin (total and direct)	✓			✓	✓		✓		✓	✓			✓	✓			✓	✓		
Determination of serum bilirubin (total and direct) case study	✓			✓	✓		✓		✓	✓			✓	✓			✓	✓		
Acute myocardial infarction and bone metabolism disorder/case study.	✓		✓	✓					✓			✓			✓	✓	✓			
Diagnosis of renal dysfunction	✓		✓	✓				✓	✓				✓	✓		✓				
Tumor markers/case study			✓	✓								✓			✓		✓	✓		



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

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

<b>A) Theoretical Part:</b>										
<b>Course Contents</b>	<b>Teaching and Learning Methods</b>						<b>Assessment methods</b>			
	Lecture	Online lecture	Lab sessions	presentation	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Introduction and handling, preservation, storage and analysis of biological samples	√	√							√	√
Liver disease and Liver function Tests	√	√							√	√
Pancreatic disease Recent diagnostic biomarkers, Self learning	√	√				√	√		√	√
Blood analysis and CBC.	√	√		√			√		√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Kidney and abnormalities of urine analysis-1	√	√		√					√	√
Kidney and abnormalities of urine analysis-2	√	√		√			√		√	√
Tumor markers	√	√		√			√		√	√
Pituitary diseases	√	√					√		√	√
Thyroid disorders	√	√							√	√
Heart and Bone	√	√							√	√
Plasma proteins+ A/Gratio &lab differentiation of hyperlipidemia	√	√			√				√	√
Electrolytes, blood gases, acid-base balance	√	√							√	√
Endocrine testing protocol and (continue)	√	√							√	√
<b>B) Practical Part:</b>										



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Course Contents	Teaching and Learning Methods						Assessment methods			
	Lecture	Online lecture	Lab sessions	presentation	Case Study	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Patient Sample collection and the use of laboratory.			√					√		
Laboratory Diagnosis of Diabetes Mellitus/case study			√		√			√		
Oral Glucose Tolerance Test/Complications of Diabetes Mellitus			√					√		
Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus.			√		√			√		
Mineral disturbance in diabetes and clinical cases on Diabetes Mellitus/case study.			√		√			√		
Tests for Evaluation of Liver Function (Total protein, ALT, AST)			√		√			√		
Tests for Evaluation of Liver Function (Total protein, ALT, AST)/case study			√		√			√		
Determination of serum bilirubin (total and direct)			√		√			√		




**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Determination of serum bilirubin (total and direct) /case study			√		√			√		
Acute myocardial infarction and bone metabolism disorder/case study.			√					√		
Diagnosis of renal dysfunction			√		√			√		
Tumor markers/case study			√					√		

<b>Course Coordinator</b>	
<b>Head of Department</b>	

**Date: 16/9/ 2023**





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024



الإكلينيكية ( فارم دي – بكالوريوس الصيدلة )  
**Pharm D**  
**Course Specification**  
**Academic year: 2023/2024**

<b>Course name:</b> Public Health and Preventive Medicine	الصحة العامة و الطب : اسم المقرر الوقائي
<b>Academic Level:</b> level four	الرابع : المستوى الأكاديمي
<b>Scientific department:</b> Microbiology & Immunology	الميكروبيولوجي والمناعة : القسم العلمي
<b>Head of Department:</b> Prof. El Sayed El Sherbini Habib	رئيس القسم : أ.د/ السيد الشربيني حبيب
<b>Course Coordinator:</b> To be nominated	منسق المقرر : سيتم ترشيحه



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	Microbiology & Immunology
Program on which the course is given	B. Pharm. (Clinical Pharmacy) (PharmD)
Academic Level	Fourth level, second semester, 2023-2024
Date of course specification approval	10 <sup>th</sup> September , 2023

## A. Basic Information: Course data:

<b>Course Title</b>	<b>Public Health and Preventive Medicine</b>
<b>Course Code</b>	<b>PM 805</b>
<b>Prerequisite</b>	<b>Medical Microbiology</b>
<b>Teaching credit Hours: Lecture</b>	2
<b>: Practical</b>	-
<b>Total Credit Hours</b>	2

## B. Professional Information:

### 1.Course Aims:

This course enables the students to:

1. Discuss the fundamentals of Public Health.
2. Provide the students with the basic information about epidemiology, etiology, risk factors, risk groups, control and prevention. Management of healthcare services is given special attention.
3. Provide the students with the basic information about promoting, maintaining health and preventing diseases.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 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	Recall the basic Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences.
1.1.5	1.1.5.1	Utilize different principles and health problems related to different fields of life to improve health.
1.1.6	1.1.6.1	Analyze available information principles and health problems related to different fields of life to prevent and minimize different health problems.

### Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.1.1	2.1.1.1	Utilize the knowledge regarding maternal, child and patient health to prevent expected diseases complications.
2.1.3	2.1.3.1	Cooperate professionally with health care team members to prevent and/or prevent diseases.
2.4.3	2.4.3.1	Apply the most appropriate preventive measures in cooperation with different members of the health care team to improve patients' health and avoid disease complications.

### Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.2	3.1.2.1	Develop appropriate methods of infection control to limit infections and promote public health awareness.
3.1.4	3.1.4.1	Formulate a systemic approach for the laboratory diagnosis of common



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

		infectious clinical conditions and select the most appropriate and cost effective tool leading to the identification of the causative organism.
3.2.6	3.2.6.1	Perform awareness campaigns on the safe use of drugs, vaccines, and antibiotic resistance development as well as air pollution to minimize patient exposure and reducing environmental contamination

#### Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Participate in decision making required for solving different health problems.
4.1.2	4.1.2.1	Develop solutions and preventive measures to avoid diseases or minimize the related complications
4.2.1	4.2.1.1	Use the correct medical terms related to different diseases when dealing with different members of the community.

### 3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	Introduction to public health	2
2	Epidemiology	2
3	Food- borne diseases	2
4	Water-borne diseases	2
5	Occupational diseases	2
6	Immunization	2
7	Maternal Health	2
8	Child health	2
9	Nosocomial or Health-care associated Infections	2
10	Contact Diseases	2



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

11	Zoonosis	2
12	Airborne Diseases	2
13	Non-communicable diseases	2
14	Measures for infection prevention	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	Start of Final written and oral exam	-

#### 4- Teaching and Learning Methods:

Teaching and learning method		Week No.	K. elements to be addressed
5.1	Computer aided learning: a. Lectures using Data show, PowerPoint presentations b. Distance learning <ul style="list-style-type: none"> <li>Online learning through my mans "Mansoura university "as recorded /video lectures.</li> <li>Interactive discussion through My Mans</li> </ul>	1-16	1.1.1.1, 1.1.5.1, 1.1.6.1, 2.1.1.1, 2.4.3.1,
5.2	Self-learning	13	3.1.2.1, 3.1.4.1, 3.2.6.1, 4.1.1.1, 4.1.2.1, 4.2.1.1
5.3	Quizzes	1-14	3.1.2.1, 3.1.4.1, 3.2.6.1, 4.1.1.1, 4.1.2.1, 4.2.1.1
5.4	Research assignments	6, 12	3.1.2.1, 3.1.4.1, 3.2.6.1, 4.1.1.1, 4.1.2.1, 4.2.1.1

#### 5- Student Assessment:

##### a- Assessment Methods:

Assessment Methods	K elements to be assessed
1- Periodical (Mid-term exam)/ Course work	1.1.1.1, 1.1.5.1, 1.1.6.1, 2.1.1.1, 2.4.3.1, 3.1.2.1, 3.1.4.1, 3.2.6.1, 4.1.1.1, 4.1.2.1, 4.2.1.1
2-Final written exam	1.1.1.1, 1.1.5.1, 1.1.6.1, 2.1.1.1, 2.1.3.1, 2.4.3.1, 3.1.2.1, 3.1.4.1, 3.2.6.1, 4.1.1.1, 4.1.2.1, 4.2.1.1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### b. Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7 <sup>th</sup> week
Assessment 2	Written exam	Starting from 17 <sup>th</sup> week

### c. Weighing of assessments

Assessment 1	Periodical (Mid-term exam)	25 %
Assessment 2	Final-written examination	75 %
Total		100 %

## 6- Facilities required for teaching and learning

Classroom	Data show, Computers, Internet.
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Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 7- List of References

No	Reference	Type
1.	Course notes prepared by the department staff members.	Course notes
2.	Detels, R., Beaglehole, R., Lansang, M.A. and Gulliford, M., 2011. <i>Oxford textbook of public health</i> . Oxford University Press.	Book
3.	Mitchell, Amber Hogan, 2020. Preventing Occupational Exposures to Infectious Disease in Health Care. A practical guide. Springer press.	Book
4.	Pinger, R.R. and Seabert, D., 2016. <i>An introduction to community &amp; public health</i> . Jones & Bartlett Learning.	Book
5.	Edelman, C.L., Mandle, C.L. and Kudzma, E.C., 2017. <i>Health promotion throughout the life span-e-book</i> . Elsevier Health Sciences.	Book
6.	Perry, S.E., Hockenberry, M.J., Alden, K.R., Lowdermilk, D.L., Cashion, M.C. and Wilson, D., 2017. <i>Maternal Child Nursing Care-E-Book</i> . Mosby.	Book
7.	Kasenga, F. ed., 2016. <i>Epidemiology of Communicable and Non-Communicable Diseases: Attributes of Lifestyle and Nature on Humankind</i> . BoD–Books on Demand.	Book
8.	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a> <a href="http://www.google.com/scholar/">http://www.google scholar.com/</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a> <a href="https://www.ekb.eg">https://www.ekb.eg</a>	Websites



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

**Matrix 1: Course content and course key elements:**

Course contents	Study Week	Course Key Elements											
		Domain 1			Domain 2			Domain 3			Domain 4		
		1.1.1.1	1.1.5.1	1.1.6.1	2.1.1.1	2.1.3.1	2.4.3.1	3.1.2.1	3.1.4.1	3.2.6.1	4.1.1.1	4.1.2.1	4.2.1.1
Introduction to public health	1	√	√	√			√	√		√			
Epidemiology	2	√	√	√			√	√		√			
Food- borne diseases	3		√	√			√	√		√			
Water-borne diseases	4		√	√			√	√		√			
Occupational diseases	5		√	√			√	√		√	√	√	√
Immunization	6		√	√	√		√	√	√	√	√	√	√
Maternal health	7		√	√	√		√	√		√	√	√	√
Child health	8		√	√	√		√	√		√	√	√	√
Nosocomial or Health-care associated Infections	9		√	√	√	√	√	√		√	√	√	√





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

<b>Contact Diseases</b>	<b>10</b>		√	√			√	√		√	√	√	√
<b>Zoonosis</b>	<b>11</b>		√	√			√	√		√	√	√	√
<b>Airborne Diseases</b>	<b>12</b>		√	√			√	√		√	√	√	√
<b>Non-communicable diseases</b>	<b>13</b>		√	√			√	√		√	√	√	√
<b>Measures for infection prevention</b>	<b>14</b>		√	√			√	√		√	√	√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

**Matrix 2: between course content, methods of learning and assessment**

Course contents	Teaching and learning methods					Assessment methods	
	Lecture	Online lecture	ch assign	Quizze s	Self-learnin g	Course Work	Written
<b>Introduction to public health</b>	√			√		√	√
<b>Epidemiology</b>	√			√		√	√
<b>Food- borne diseases</b>	√			√		√	√
<b>Water-borne diseases</b>	√			√		√	√
<b>Occupational diseases</b>	√			√			√
<b>Immunization</b>	√		√	√			√
<b>Maternal health</b>	√			√			√
<b>Child health</b>	√			√			√
<b>Nosocomial or Health-care associated Infections</b>	√			√			√
<b>Contact Diseases</b>	√			√			√
<b>Zoonosis</b>	√			√			√
<b>Airborne Diseases</b>	√		√	√			√
<b>Non-communicable diseases</b>	√	√		√	√		√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Measures for infection prevention	√	√		√	√		√
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Course Coordinator	To be nominated
Head of Department	Prof. Dr. El Sayed E. Habib
Date: 10/9/2023	



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024



بكالوريوس الصيدلة الإكلينيكية ( فارم د – Pharm D )

## Course Specification

Academic year: 2023/2024

Course name: Quality Control and Pharmaceutical Analysis	اسم المقرر: التحليل الصيدلي والرقابة النوعية
Academic Level: Level 4	المستوى الأكاديمي: الرابع
Scientific Department: Pharmaceutical Analytical Chemistry	القسم العلمي: كيمياء تحليلية صيدلانية
Head of Department: Prof. Dr. Jenny Jeehan Mohamed Ahmed Nasr	رئيس القسم: أ.د/ جيني جيهان محمد أحمد نصر
Course Coordinator: To be nominated	منسق المقرر:



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

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	Pharm D-Clinical Pharmacy Program
Academic Level	Fourth level, second semester, 2023-2024
Date of course specification approval	10 September, 2023

### A. Basic Information: Course data:

Course Title	Quality control and Pharmaceutical Analysis
Course Code	PC 809
Prerequisite	Pharmaceutical analytical chemistry II
Teaching Hours: Lecture	2
Practical	1
Total Credit Hours	3 (Credit H)

### B. Professional Information:

#### 1. Course Aims: This course enables students to

1. Give the principle and overall definition of quality control, chemical impurities, types and its control, sampling, documentation, recording procedures and Pharmacopoeias monographs.



**Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program**



**Course specification  
2023- 2024**

2. Recognizing different methods of analysis, assay tolerances, stability testing of pharmaceuticals (ICH Guidelines), stability indicating assay methods (SIAM).
3. Knowing validation of stability indicating assay methods and predicted stability.
4. Factors affecting drug degradation, Drug expiration, Drug withdrawal from the market. Pharmaceutical regulations according to FDA & EMA (European medicine agency) and ISO and BSI. Drug-excipient interactions and adduct formation.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 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	Recognize the principles of different pharmaceutical sciences
1.1.2	1.1.2.1	Use appropriate terminology and recall the analysis of pharmaceutical compounds using GLP guidelines and validation procedures.
1.1.3	1.1.3.1	List the different analytical techniques for analyze and assure qualityof drugs from synthetic and natural origin
1.1.4	1.1.4.1	Distinguish good manufacturing practice and quality control criteria in pharmaceutical industry and critical analysis

### DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

Program K. element no.	Course K. element no.	Course K. element
2.1.2	2.1.2.1	Propose suitable methods of chemical analysis for materials from different origin.
2.2.2	2.2.2.1	Apply Good Manufacturing Practice (GMP) guidelines including principles of quality control related to pharmaceutical industry.



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

2.2.3	2.2.3.1	Use instruments and different kinds of simulation software to design analytical processes for quality control and quality assurance of raw materials and pharmaceutical products.
2.2.4	2.2.4.1	Implement quality control and quality assurance, calculations, biostatistical analysis as per the needs of pharmaceutical industry.
2.3.1	2.3.1.1	Select and apply appropriate methods, resource and procedures for handling and disposal of synthetic/natural materials.
2.3.2	2.3.2.1	Choose best practice and adhere to high ethical, legal and safety standards for management of pharmaceutical materials/products.
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
2.6.2	2.6.2.1	Practice guidelines of drug promotion, sales, marketing, accounting and outcomes of pharmacoeconomic analysis.





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

#### 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 team members and apply effective time management skills.
4.2.2	4.2.2.1	Use technology whenever possible to present relevant information.
4.3.1	4.3.1.1	Use effective strategies to manage and improve self-practice of pharmacy. Practice guidelines of drug promotion, sales, marketing, accounting and outcomes of pharmaco-economic analysis.
4.3.2	4.3.2.1	Practice self-learning to improve professional skills



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

### 3- Course Contents

Week No.	Topics	Credit Hours
1	Introduction to Quality control (QC)	2
2	Chemical Purity of drugs and Official Methods to QC.	2
3	Specifications of Dosage Forms.	2
4	Sampling and documentation.	2
5	Analytical methods of analysis; Gravimetric; Titrimetric	2
6	Analytical methods of analysis; Electrochemical.	2
7	Molecular Absorption Spectrometry and their applications in drug analysis	2
8	Atomic Absorption Spectrometry and their applications in drug analysis	2
9	Validation of analytical methods according to ICH Guidelines.	2
10	Typical validation characteristics which should be considered, specificity, linearity, range and accuracy, precision, detection limit, quantitation limit, robustness and system suitability testing.	2
11	Drug-excipients interactions	2
12	Stability indicating assay methods (SIAM): Introduction and chemical degradation routes.	2
13	Stability indicating assay methods (SIAM): examples and analysis/ stability studies. -drug-excipients interactions examples of pharmaceutical drugs (Self-Learning)	2
14	-drug-excipients interactions examples of pharmaceutical drugs (Cont.)	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	<b>Final Written and Oral Exam</b>	----



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Week No.	Practical topics	Credit hours
1	Pharmacopeial monographs	1
2	Validation of Analytical procedures -Linearity	1
3	Validation of Analytical procedures -Accuracy and Precision	1
4	Assay of Glacial Acetic acid	1
5	Assay of Indomethacin in Indocid Capsules	1
6	Assay of Aspirin in Rivo®Tablets	1
7	Assay of zinc content in dosage forms	1
8	Mid-term exam	-
9	Assay of Magnesium content in dosage forms	1
10	Assay of Calcium content in Calcinate Ampoules	1
11	Assay of Depovit ampoules	1
12	Assay of Naftazone	1
13	Assay of Haemojet ampoules	1
14	Validation proplems	1
15	<b>Revision and activity</b>	1
16	<b>Practical exam (OSPE)</b>	1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

#### 4- Teaching and Learning Methods:

Teaching and learning Methods		Weeks N o.	K. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning <ul style="list-style-type: none"><li>Online learning through my mans "Mansoura university" as recorded video lectures</li><li>Interactive discussion through My Mans.</li></ul>	1-16	1.1.1.1, 1.1.2.1, 1.1.3.1, 1.1.4.1,2.1.2.1
4.2	Practical session using chemicals and laboratory equipment and/or tutorials	1-16	2.2.2.1, 2.2.4.1, 2.2.3.1, 2.3.2.1, 2.3.1.1, 2.5.1.1, 4.2.2.1, 4.3.1.1, 4.3.2.1
4.3	Self-learning	13	4.1.2.1,4.2.2.1, 4.3.2.1
4.4	Class Activity Discussion / Brainstorming / problem solving	4,6	4.1.2.1,4.2.2.1,4.3.1.1 4.3.2.1



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 5- Student Assessment:

### a. Assessment Methods:

Assessment Methods	K elements to be assessed
1- Periodical exam / Course work	2.2.3,1.1.2
2-Practical exam applying OSPE/	2.2.2.1, 2.2.4.1, 2.2.3.1, 2.3.2.1, 2.3.1.1, 2.5.1.1, 4.2.2.1, 4.3.1.1, 4.3.2.1
3-Written exam	1.1.1.1, 1.1.2.1, 1.1.3.1, 1.1.4.1,2.1.2.1
4-Oral exam	1.1.3.1,2.6.2.1,2.2.3.1, 1.1.1.1, 1.1.2.1

### b. Assessment schedule

Assessment 1	Periodical exam/ Course work	7-9 <sup>th</sup> week
Assessment 2	Practical examination and tutorial	16 <sup>th</sup> week
Assessment 3	Written exam	17 <sup>th</sup> week
Assessment 4	Oral exam	17 <sup>th</sup> week

### c. Weighing of assessments

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



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

## 6- Facilities required for teaching and learning

<b>Classroom</b>	Data show- Computers, Internet, Platform
<b>Laboratory facilities</b>	Water baths, glassware, chemicals, electronic balance
<b>Library</b>	Books and Pharmacopoeia

## 7- List of References

No	Reference	Type
1.	Practical course notes prepared by the department staff members	Course notes
2.	Theoretical course Notes "Quality Control of Drugs" prepared by staff members	Course notes
3.	Skoog, D. A. Holler, F. J. and Crouch, S.R. "Principles of Instrumental Analysis". 7th ed., Thomson, Belmont, USA ( 2016)	Book
4.	Christian, G.D. and O'Reilly, J.E., in "Instrumental Analysis" 6th Ed., Prentice Hall, New Jersey.(2013)	Book
5.	Pharmaceutical Quality Assurance, B.P. Nagori, Ajay Gaur, Renu Solanki, Vipin Mathur, Scientific Publishers (2018).	Book
6.	Quality Control of Pharmaceuticals: Compendial Standards and Specifications, Md. Sahab Uddin, Scholars' Press (2017).	Book
7.	Different pharmacopoeias: USP 2016; BP 2016 and EP 2016.	Book
8.	ICH Harmonized Tripartite Guideline, Validation of Analytical Procedures: Text and Methodology, Q2(R1), Current Step 4 Version, Parent Guidelines on Methodology. Accessed Aug 2023 at: <a href="http://www.ich.org/LOB/media/MEDIA417.pdf">http://www.ich.org/LOB/media/MEDIA417.pdf</a> .	Website



9.	<a href="https://www.ekb.eg">https://www.ekb.eg</a> <a href="http://www.sciencedirect.com">http://www.sciencedirect.com</a> <a href="http://www.google scholar.com">http://www.google scholar.com</a> <a href="http://www.pubmed.com">http://www.pubmed.com</a>	Website
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### 8- Matrix:

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

Course contents	Outcomes											
	Domain 1				Domain 2							
	1.1.1.1	1.1.1.2	1.1.1.3	1.1.1.4	2.1.2.1	2.2.2.1	2.2.3.1	2.2.4.1	2.3.1.1	2.3.2.1	2.5.1.1	2.6.2.1
Introduction to Quality control (QC)	√			√			√					
Chemical Purity of drugs and Official Methods to QC.	√			√			√					
Specifications of Dosage Forms.	√			√			√					
Sampling and documentation.	√			√			√					
Analytical methods of analysis; Gravimetric; Titrimetric	√		√		√	√	√					
Analytical methods of analysis; Electrochemica	√		√		√	√	√					



**Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program**



**Course specification  
2023- 2024**

I.													
Molecular Absorption Spectrometry and their applications in drug analysis	√		√		√	√	√						
Atomic Absorption Spectrometry and their applications in drug analysis		√						√	√	√			√
Validation of analytical methods according to ICH Guidelines.			√	√	√							√	
Typical validation characteristics which should be considered, specificity, linearity, range and accuracy, precision, detection limit, quantitation limit, robustness and system suitability testing.			√	√	√							√	
Drug-			√	√	√								





Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

excipients interactions													
Stability indicating assay methods (SIAM): Introduction and chemical degradation routes.			√	√	√								
Stability indicating assay methods (SIAM): examples and analysis/ stability studies. -drug- excipients interactions examples of pharmaceutical drugs (Self-Learning)			√	√	√								
-drug- excipients interactions examples of pharmaceutical drugs (Cont.)			√	√	√								



<b>Practical topics</b>													
Pharmacopeial monographs		√		√	√	√	√	√	√				
Validation of Analytical procedures -Linearity		√		√	√	√	√	√	√				
Validation of Analytical procedures -Accuracy and Precision		√		√	√	√	√	√	√		√		
Assay of Glacial Acetic acid		√		√	√	√	√	√	√				
Assay of Indomethacin in Indocid Capsules		√		√	√	√	√	√	√		√		
Assay of Aspirin in Rivo®Tablets		√		√	√	√	√	√	√		√		
Assay of zinc content in dosage forms		√		√	√	√	√	√	√		√		
Assay of Magnesium content in dosage forms		√		√	√	√	√	√	√		√		
Assay of Calcium content in Calcinate Ampoules		√		√	√	√	√	√	√		√		



**Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program**



**Course specification  
2023- 2024**

Assay of Depovit ampoules		√		√		√	√	√	√	√		√	
Assay of Naftazone		√		√		√	√	√	√	√		√	
Assay of Haemojet ampoules		√		√		√	√	√	√	√		√	
Validation proplems		√		√		√	√	√	√	√		√	

Course contents	Outcomes Domains / Key elements			
	Domain 4			
	4.1.1.1	4.2.2.1	4.3.1.1	4.3.2.1
Introduction to Quality control (QC)			√	
Chemical Purity of drugs and Official Methods to QC.			√	
Specifications of Dosage Forms.			√	
Sampling and documentation.				
Analytical methods of analysis; Gravimetric; Titrimetric	√		√	
Analytical methods of analysis; Electrochemical.	√		√	
Molecular Absorption Spectrometry and their applications in drug analysis	√		√	
Atomic Absorption Spectrometry and their applications in drug analysis		√		
Validation of analytical methods according to ICH Guidelines.			√	√
Typical validation characteristics which should be considered, specificity, linearity, range and accuracy, precision, detection limit, quantitation limit, robustness and system suitability testing.			√	√
Drug-exipients interactions			√	√
Stability indicating assay methods (SIAM): Introduction and chemical degradation routes.			√	√



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Stability indicating assay methods (SIAM): examples and analysis/ stability studies. -drug-excipients interactions examples of pharmaceutical drugs (Self-Learning)	√	√	√	√
-drug-excipients interactions examples of pharmaceutical drugs (Cont.)	√	√	√	√
<b>Practical topics</b>				
Pharmacopeial monographs	√	√	√	√
Validation of Analytical procedures -Linearity	√	√	√	√
Validation of Analytical procedures -Accuracy and Precision	√	√	√	√
Assay of Glacial Acetic acid	√	√	√	√
Assay of Indomethacin in Indocid Capsules	√	√	√	√
Assay of Aspirin in Rivo® Tablets	√	√	√	√
Assay of zinc content in dosage forms	√	√	√	√
Assay of Magnesium content in dosage forms	√	√	√	√
Assay of Calcium content in Calcinate Ampoules	√	√	√	√
Assay of Depovit ampoules	√	√	√	√
Assay of Naftazone	√	√	√	√
Assay of Haemojet ampoules	√	√	√	√
Validation proplems	√	√	√	√



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

A) Theoretical Part:								
Course Contents	Teaching and Learning Methods				Assessment Methods			
	Lecture	Lab sessions	Self-learning	Class Activity Discussion	Periodical Exam	Practical/Tutorial	Written	Oral
Introduction to Quality control (QC)	√				√		√	√
Chemical Purity of drugs and Official Methods to QC.	√				√		√	√
Specifications of Dosage Forms.	√				√		√	√
Sampling and documentation.	√			√	√		√	√
Analytical methods of analysis; Gravimetric; Titrimetric	√						√	√
Analytical methods of analysis; Electrochemical.	√			√			√	√
Molecular Absorption Spectrometry and their applications in drug analysis	√						√	√
Atomic Absorption Spectrometry and their applications in drug analysis	√						√	√
Validation of analytical methods according to ICH Guidelines.	√						√	√
Validation characteristics which should be considered, specificity, linearity, range and accuracy, precision, detection limit, quantitation limit, robustness and system suitability testing.	√						√	√



**Mansoura University**  
**Faculty of Pharmacy**  
**Clinical Pharmacy Program**



**Course specification**  
**2023- 2024**

Drug-excipients interactions	√						√	√
Stability indicating assay methods (SIAM): Introduction and chemical degradation routes.	√						√	√
-Stability indicating assay methods (SIAM): examples and analysis/ stability studies. -drug-excipients interactions examples of pharmaceutical drugs (Self-Learning)	√		√				√	√
-drug-excipients interactions examples of pharmaceutical drugs (Cont.)	√		√				√	√

<b>B) Practical Part:</b>								
<b>Course Contents</b>	<b>Teaching and Learning Methods</b>				<b>Assessment methods</b>			
	Lecture	Lab sessions	Self-learning	Problem Solving	Periodical Exam	Practical/Tutorial	Written	Oral
	Pharmacopeial monographs		√				√	
Validation of Analytical procedures -Linearity		√		√		√		
Validation of Analytical procedures -Accuracy and Precision		√		√		√		



Mansoura University  
Faculty of Pharmacy  
Clinical Pharmacy Program



Course specification  
2023- 2024

Assay of Glacial Acetic acid		√				√		
Assay of Indomethacin in Indocid Capsules		√				√		
Assay of Aspirin in Rivo®Tablets		√				√		
Assay of zinc content in dosage forms		√				√		
Assay of Magnesium content in dosage forms		√				√		
Assay of Calcium content in Calcinate Ampoules		√				√		
Assay of Depovit ampoules		√				√		
Assay of Naftazone		√				√		
Assay of Haemojet ampoules		√				√		
Validation proplems		√		√		√		

Course Coordinator	Prof. Dr. Manal Mohamed Eid
	<i>M. Eid</i>
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Date: 10 / 9 / 2023