كلية الصيدلة

جامعة المنصورة

توصيف مقررات برنامج
بكالوريوس الصيدلة
لائحة فارم دى
2024/2023

Created By: Quality Assurance Unit

المستوى الثالث

no	اسم المقرر	كود المقرر	من	إلى
1	Biochemistry II	PB 313	337	348
2	Parasitology and Virology	PM 312	349	366
3	Phytochemistry I	PG 314	367	380
4	Pharmaceutics III	PT 315	381	395
5	Spectroscopic Identification	PO 314	396	405
6	Pharmacology I	PH 314	406	418
7	Pharmaceutical Microbiology	PM 323	419	432
8	Biopharmaceutics and Pharmacokinetics	PT 326	433	444
9	Phytochemistry II	PG 325	445	456
10	Pharmaceutics IV	PT 327	457	467
11	Pharmacology II	PH 325	468	484
12	Hospital Pharmacy	PP 322	485	494

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Biochemistry-II	**اسم المقرر:كيمياء حيوية-2**
Academic Level: Level 3	**المستوى الأكاديمي: الثالث**
Scientific department: Biochemistry	**القسم العلمي:الكيمياء الحيوية**
Head of Department: Dr. Noha M.H. Abdel-Rahman	**رئيس القسم : د/ نهى منصور حسن عبدالرحمن**
Course Coordinator: Prof. Dr. Laila A. Eissa	**منسق المقرر: أ.د/ ليلى أحمد عيسى**

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Biochemistry**
Department supervising the course	**Biochemistry**
Program on which the course is given	**Pharmaceutical sciences program (Pharm-D)**
Academic Level	**Third level, First semester, 2023-2024**
Date of course specification approval	**16/9/2023**

A- Basic Information: Course data:

Course Title	Biochemistry-II
Course Code	PB-313
Prerequisite	Biochemistry-I
Teaching Hours: Lecture	2
Teaching Credit Hours: Practical/ tutorial	1
Total Credit Hours	3 (Credit H)

B- Professional Information:

1- Course Aims:

1- Understand the major metabolic pathways that take place in human body.

2- Learn the interrelationship between carbohydrates, lipid and protein metabolism.

3- Practice skills that are of value to future employment in some areas of biology.

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 knowledge of biomedical and clinical sciences.
1.1.5	1.1.5.1	List the different analytical techniques for assaying different biomarkers and define the principles of body function in health and diseases states; as well as the laboratory diagnosis, clinical features of different diseases.
1.1.6	1.1.6.1	Analyze and apply relevant scientific literature and other scientific resources to make evidence-informed professional decisions.

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
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 ethical, legal and safety standards for management of biological and pharmaceutical materials/products.
2.4.1	2.4.1.1	Conduct proper procedures to discard any poisons to public.

Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Handling laboratory glassware and machines for a patient based on knowledge ofphysiological, biochemical and metabolic changes brought about by disease or concomitant drug therapy.
3.1.3	3.1.3.1	Conduct laboratory tests and measuring biochemical parameters in different body fluids like urine and blood in order to identify of different types of diseases.
3.1.4	3.1.4.1	Explain the laboratory diagnosis of different diseases and list the appropriate treatment and prevention modalities.

Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element
4.1.1	4.1.1.1	Share decision-making activities with other pharmacy team

		members and non-pharmacy team members and apply effective time management skills.
4.1.2	**4.1.2.1**	Collect information and analyze data, identify problems and present solutions, participate independently and collaboratively with other team members in the healthcare system.
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**	Conduct self-evaluation strategies to manage and improve professional of pharmacy.
4.3.2	**4.3.2.1**	Promote continuous professional development by practicing self and independent learning.

3- Course Contents

Week No.	Topics	Credit Hours
1	Carbohydrates: introduction to metabolism, digestion and absorption of carbohydrates/ Glycolysis and Regulation of glycolysis.	2
2	Krebs's cycle and Glycogen metabolism.	2
3	HMP shunt and Uronic acid pathway, Monosaccharides interconversion.	2
4	Glycogen metabolism and gluconeogenesis	2
5	Digestion and absorption of lipids. Neutral fat metabolism and B-oxidation.	2
6	Fatty acid synthesis.	2
7	Ketogenesis, ketolysis and phospholipids metabolism.	2
8	Cholesterol and Sphingomyelins metabolism.	2
9	Protein metabolism, Protein digestion and absorption	2
10	General reactions of amino acids and urea cycle.	2
11	Individual amino acids metabolism (Glycine, Alanine, Serine Phenyl alanine, Tyrosine)	2
12	Individual amino acids metabolism (Methionine, Cysteine Tryptophan, Histidine, Proline) The interrelationship between carbohydrates, lipid and protein metabolism	2

13	Respiratory chain and biological oxidation	2
14	Revision and quiz	2
15	**Start of Final written and oral exam**	-
Week No.	**Practical topics**	**Practical credit hours**
1	Chemical analysis for biological fluids; Urine analysis / Urine report	1
2	Chemical analysis for biological fluids; Urine analysis / Urine report	1
3	Urine report	1
4	Infection Control Principles/ **Urine report activity**	1
5	Colorimetric assay of Glucose in urine and serum/ **Urine report activity**	1
6	Colorimetric assay of Liver Function Tests (serum albumin)/**Urine report activity**	1
7	Colorimetric assay of Liver Function Tests (total protein levels)	1
8	Midterm exam	-
9	Colorimetric assay of Renal Function Tests (creatinine) /**quiz**	1
10	Colorimetric assay of Renal Function Tests (urea)	1
11	Colorimetric assay of Renal Function Tests (uric acid)	1
12	Colorimetric assay Cholesterol blood level	1
13	Lipid profile and Revision	1
14	**Sheet and Practical Exam**	-

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, 1.1.5.1, 1.1.6.1, 3.1.1.1, 3.1.4.1
4.2	Hybrid learning: On line learning through My mans "Mansoura university "	1-14	1.1.1.1, 1.1.5.1, 1.1.6.1, 2.3.1.1, 2.3.2.1, 2.4.1.1 3.1.1.1, 4.2.2.1
4.3	Practical works and tutorials	1-14	2.3.1.1, 2.3.2.1, 2.4.1.1
4.4	Self-learning	13	1.1.1.1, 1.1.5.1, 4.1.1.1, 4.1.2.1, 4.3.1.1, 4.3.2.1
4.5	Case study	4,5,6	3.1.4.1, 4.3.2.1
4.6	Presentation	2-9	4.3.1.1, 4.3.2.1

5- Student Assessment:

a- Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.1.1,1.1.5.1, 1.1.6.1
2-Practical exam applying OSPE	1.1.5.1, 2.3.1.1, 2.3.2.1, 2.4.1.1, 3.1.1.1, 3.1.3.1,3.1.4.1,4.1.2.1, 4.2.1.1
3-Oral	1.1.1.1, 1.1.5.1, 4.1.2.1, 4.2.2.1, 4.3.1.1
4- Periodical (Mid-term	1.1.1.1, 1.1.6.1,4.1.2.1, 4.2.1.1, 4.2.2.1

exam) / Course work	

b- Assessment Schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7-9th week
Assessment 2	Practical examination and tutorial	14th week
Assessment 3	Written exam	15th week
Assessment 4	Oral exam	15th 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	Internet in the classroom
Laboratory facilities	Microscopes, equipment, tools
Library	Textbooks

7- List of References

No	Reference	Type
1.	Harper's Biochemistry. Peter Kennelly, Kathleen Botham, Owen McGuinness, Victor Rodwell, P. Anthony Weil; 32nd edition-2022.	Textbook
2.	Lippincott's Illustrated Reviews: Biochemistry. Emine E. Abali, Susan D. Cline, David S. Franklin, Dr. Susan M. Viselli; 8th edition-2021.	Textbook
3.	Harper's Biochemistry. Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell; 31st edition-2018.	Textbook
4.	Lippincott's Illustrated Reviews: Biochemistry. Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier; 7th edition-2017.	Textbook
5.	https://05101jr8h-1105-y-https-www-sciencedirect-com.mplbci.ekb.eg/science/article/pii/S221323172030879X?via%3Dihub	Website (EKB)
6.	https://0511xjs0m-1105-y-https-www-ncbi-nlm-nih-gov.mplbci.ekb.eg/pmc/articles/PMC6559295/	Website (EKB)

8-Matrix:

Matrix 1. Course contents and course key elements

Course contents	Outcomes Domains / Key elements														
	Domain 1			Domain 2			Domain 3			Domain 4					
	1.1.1.1	1.1.5.1	1.1.6.1	2.3.1.1	2.3.2.1	2.4.1.1	3.1.1.1	3.1.3.1	3.1.4.1	4.1.1.1	4.1.2.1	4.2.1.1	4.2.2.1	4.3.1.1	4.3.2.1
Carbohydrates: introduction to metabolism, digestion and absorption of carbohydrates. Glycolysis and Regulation of glycolysis.	√	√					√								
Kreb's cycle and Glycogen metabolism.	√						√								
HMP shunt and Uronic acid pathway, Monosaccahrides inter-conversion, Glycogen metabolism, and gluconeogenesis.	√	√					√			√	√				
Digestion and absorption of lipids, Neutral fat metabolism and β-oxidation.	√	√					√			√	√		√		
Fatty acid synthesis	√	√					√			√	√		√		
ketogenesis, ketolysis, and Phospholipids metabolism.															
Cholesterol and Sphingomyelins metabolism.	√	√	√				√			√	√	√	√		

Protein metabolism, Protein digestion and absorption	√	√	√				√			√	√	√	√		
General reactions of amino acids and urea cycle.	√	√					√				√				
Individual amino acids metabolism (Glycine, Alanine, Serine Phenyl alanine, Tyrosine) Individual amino acids metabolism (Methionine, Cysteine Tryptophan, Histidine, Proline) The interrelationship between carbohydrates, lipid and protein metabolism	√	√	√				√			√	√	√	√		
Biological oxidation, Respiratory chain	√	√	√								√		√	√	√
Chemical analysis for biological fluids; Urine analysis / Urine report		√	√	√		√	√		√		√		√	√	√
Urine report/ Infection Control Principles		√	√	√		√	√		√		√		√	√	√
Colorimetric assay (Glucose in urine and serum)/ colorimetric assay of Liver Function Tests (serum albumin and total protein levels)	√	√		√		√		√		√	√		√		√
colorimetric assay of Renal	√	√		√		√		√		√	√		√		√

Function Tests (creatinine, urea and uric acid levels)														
Colorimetric assay Cholesterol blood level	√	√		√		√					√		√	√	
Lipid profile and revision	√			√			√				√	√		√		√

Matrix 2. course contents, methods of learning and assessment

A) Theoretical Part

Course contents	Teaching and learning methods						Assessment methods			
	Advance lectures	Hybrid leaning	Lab session	presentation	Case study	Self-learning	Corse Work	Practical	Written	Oral
Carbohydrates: introduction to metabolism, digestion and absorption of carbohydrates/ Glycolysis and Regulation of glycolysis.	√	√					√		√	√
Krebs's cycle and Glycogen metabolism.	√	√					√		√	√
HMP shunt and Uronic acid pathway, Monosaccharides interconversion.	√	√					√		√	√
Glycogen metabolism, and gluconeogenesis.	√	√					√		√	√
Digestion and absorption of lipids. Neutral fat metabolism and B-oxidation.	√	√					√		√	√
Fatty acid synthesis.	√	√					√		√	√
Ketogenesis, ketolysis, and Phospholipids metabolism.	√	√					√		√	√
Cholesterol and Sphingomyelins metabolism.	√	√							√	√
Protein metabolism, Protein digestion and absorption	√	√			√				√	√

General reactions of amino acids and urea cycle.	√	√							√	√
Individual amino acids metabolism (Glycine, Alanine, Serine Phenyl alanine, Tyrosine)	√	√							√	√
Individual amino acids metabolism (Methionine, Cysteine, Tryptophan, Histidine, Proline) The interrelationship between carbohydrates, lipid and protein metabolism	√	√							√	√
Respiratory chain and biological oxidation	√	√				√			√	√
B) Practical part										
Chemical analysis for biological fluids; Urine analysis / Urine report		√	√					√		
Chemical analysis for biological fluids; Urine analysis / Urine report		√	√	√				√		
Urine report		√	√	√				√		
Infection Control Principles/ **Urine report activity**		√	√	√	√			√		
Colorimetric assay of Glucose in urine and serum/ **Urine report activity**		√	√	√	√			√		
Colorimetric assay of Liver Function Tests (serum albumin)/**Urine report activity**		√	√	√	√			√		
Colorimetric assay of Liver Function Tests (total protein levels)		√	√	√				√		
Colorimetric assay of Renal Function Tests (creatinine) /**quiz**		√	√	√				√		
Colorimetric assay of Renal Function Tests (urea and uric acid levels)		√	√	√				√		
Colorimetric assay Cholesterol blood level		√	√					√		
Lipid profile and revision		√	√							

Course Coordinator	**Prof. Dr. Laila A. Eissa**
	Laila Eissa
Head of Department	**Dr. Noha M.H. Abdel- Rahman**
Date: 16/9/2023	

بكالوريوس الصيدلة (فارم دى- **Pharm D)**

Course Specification

Academic year: 2023/2024

Course name: Parasitology and Virology PM 312	**اسم المقرر : طفيليات وفيروسات PM 312**
Academic Level: level 3	**الأكاديمي : الثالث المستوى**
Scientific department: Microbiology and Immunology	**القسم العلمي : الميكروبيولوجى والمناعة**
Head of Department: **Prof. Dr. El-Sayed El-Sherbeny Habib**	**رئيس القسم : أ. د./ السيد الشربينى حبيب**
Course Coordinator: **Prof. Dr. El-Saved El-Sherbeny Habib**	**منسق المقرر: أ. د./ السيد الشربينى حبيب**

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

A-Basic Information: Course data:

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

Course Title	**Parasitology and Virology**
Course Code	**PM 312**
Prerequisite	**No**
Teaching Credit Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

A. Course Aims:

1. To provide students with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans.
2. To enable students to understand the pathogenesis, clinical presentations and complications of parasitic and viral diseases.
3. To enable students to reach diagnosis and know the general outline of treatment, prevention and control of parasitic and viral infections

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**	Classify parasites and viruses of medical importance in its broad scientific taxonomic positions.
1.1.2	**1.1.2.1**	Define terms related to medical parasitology and virology.
1.1.5	**1.1.5.1**	Describe and discuss the common parasitic diseases caused by helminthes and protozoa as regards infective stage, mode infection and life cycle of parasites of medical importance.
	1.1.5.2	Identify and describe pathogenesis, clinical pictures, complications of viral diseases
1.1.6	**1.1.6.1**	Outline principle of treatment and prevention and control of common parasitic and viral 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 common parasitic and viral 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
2.5.2	**2.5.2.1**	Integrate the most important signs and symptoms of important parasitic and viral infections and the laboratory test findings into a meaningful diagnostic significance (using case study)
2.5.3	**2.5.3.1**	Express systemic thinking and personal judgment for differential diagnosis with prioritization of the common possibilities for each parasitic and viral infection.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	**3.1.1.1**	Interpret clinical and investigational data with evidence based knowledge and skill of deductive reasoning for clinical problem solving ((using case study).
3.1.4	**3.1.4.1**	Record the common diseases caused by parasites and viruses of medical interest as regards etiology, pathogenesis, clinical features and methods of combat.
	3.1.4.2	Recommend serological tests used for detection of viral antigens in clinical samples and analyze the results.
	3.1.4.3	Practice examination to identify, draw and label diagrams of parasites and their different stages (eggs, cysts, larvae, trophozoites) or any of their body parts (segment, hooks, scolices…etc).

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.
4.1.2	**4.1.2.1**	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team
4.3.2	**4.3.2.1**	Practice self-learning to improve professional skills

3- Course Contents

Week No.	Topics	Credit Hours
1	**Introduction and classification of parasites.**	**2**
2	**Intestinal protozoae** - ***Entameba histolytica*** - ***Giardia lamblia*** - ***Balantidium coli*** - ***Trichomonas vaginalis***	**2**
3	**Blood protozoae** - **Trypanosoma** - **Leishmania** - **Plasmodium** - **Toxoplasma** **Arthropoda**	**2**

4	**Trematoda** - **Fasciolae** - ***Heterophyes heterophyes.*** - ***Human schistosomiases***	**2**
5	**Nematoda** - ***Trichuris trichiura*** - ***Wuchereria bancrofti*** - ***Strongyloides stercoralis*** - ***Ascaris lumbricoides***	**2**
6	**Nematoda** - ***Enterobius vermicularis*** - ***Trichinella spiralis*** - ***Ancylostoma duodenale***	**2**
7	**Cestoda** - ***Taeniae solium*** - ***Taeniae saginata*** - ***Hymenolepis nana*** - ***Hymenolepis diminuta*** - ***Echinococcus granulosus*** - ***Echinococcus multilocularis***	**2**
8	**Introduction and classification of viruses**	**2**
9	**RNA viruses** - **Positive single strand RNA viruses**	**2**
10	**RNA viruses** - **Negative single strand RNA viruses**	**2**
11	**RNA viruses** - **Double-stranded Non-enveloped RNA Viruses**	**2**
12	**DNA viruses** - **Non-Enveloped DNA viruses**	**2**
13	**DNA viruses** - **Enveloped DNA Viruses**	**2**
14	**Revision and quiz**	**-**
15	**Start of Final written and oral exam**	**-**

Week No.	Practical topics	Credit hours
1	**Laboratory diagnostic techniques**	**1**
2	**Slide examination and case study of:** • ***Entamoeba coli***	**1**

	• *Giardia intestinalis*	
3	**Slide examination and case study of:** • ***Balantidium coli*** • ***Trypanosomes gambiense***	**1**
4	**Slide examination and case study of** • **Fasciolae** • ***Heterophyes heterophyes.*** • ***Human schistosomiases***	**1**
5	**Slide examination and case study of:** • ***Trichuris trichiura*** • ***Wuchereria bancrofti*** • ***Strongyloides stercoralis***	**1**
6	**Slide examination and case study of:** • ***Ascaris lumbricoides*** • ***Enterobius vermicularis***	**1**
7	**Slide examination and case study of:** • ***Trichinella spiralis*** • ***Ancylostoma duodenale***	**1**
8	**Midterm exam**	**-**
9	**Slide examination and case study of:** • ***Taeniae*** • ***Echinococcus granulosus*** • ***Hymenolepis nana***	**1**
10	**Slide examination and case study of:** **Arachnida: -** ***Sarcoptes scabiei***	**1**
11	**Slide examination and case study of:** • ***Plasmodium malariae*** • ***Toxoplasma gondii***	**1**
12	• **Lab methods of diagnosis for viral infection**	**1**
13	**Viral diseases and revision**	**1**
14	**Practical exam**	**-**

4- Teaching and Learning Methods:

No	Teaching and Learning Methods	week	Key elements to be addressed
5.1	Lectures using Data show, PowerPoint presentations	1-14	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), (2.5.3.1), (3.1.1.1), (3.1.4.1), (3.1.4.2), (4.3.2.1)
5.2	Distance learning: a. Online learning through My mans "Mansoura university "as recorded – video for practical sessions. b. Interactive discussion through My Mans	1-14	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), (2.5.3.1), (3.1.1.1), (3.1.4.1), (3.1.4.2), (4.3.2.1)
5.3	Practical sessions	1-14	(1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), 2.5.3.1), (3.1.1.1), (3.1.4.1), (3.1.4.2), (3.1.4.3), (4.1.1.1), (4.1.2.1)
5.4	Self-learning	13	(4.1.1.1) (4.1.2.1)(4.3.2.1)
5.5	Research assignments	6	(4.1.1.1) (4.1.2.1)(4.3.2.1)
5.6	Role play	2-11	(4.1.1.1) (4.1.2.1)(4.3.2.1)
5.7	Case study	2-9	(4.1.1.1)(4.1.2.1)(4.3.2.1)

5- Student Assessment:

a- Assessment Methods:

1- Periodical (Mid-term / Course work)	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), (2.5.3.1), (3.1.1.1), (3.1.4.1)
2-Practical exam applying OSPE	(1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), 2.5.3.1), (3.1.1.1), (3.1.4.1), (3.1.4.2), (3.1.4.3),
3-Written exam	(1.1.1.1), (1.1.2.1), (1.1.5.1), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.2.1), (2.5.3.1), (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), (1.1.5.2), (1.1.6.1), (1.1.7.1), (2.5.3.1), (3.1.4.1), (3.1.4.2), (4.1.1.1), (4.1.2.1),(4.3.2.1)

b- Assessment schedule

Assessment 1	Periodical (Mid-term exam) / Course work	7-9th week
Assessment 2	Practical examination and tutorial	14th week
Assessment 3	Written	Start from 15th week
Assessment 4	Oral	Start from 15th 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%
5	**Other types of assessment**	0 %
Total		100%

6- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	Data show- Computers, Internet, Platform- tools for role play
Library	Books

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Book
2.	Textbook of Medical Parasitology: Protozoology and Helminthology, 4 th edition by S. C. Parija 2013	Essential Book
3.	Lippincott's Illustrated Reviews: Microbiology Third Edition	Essential Book
4.	Centers for Disease Control and Prevention	The national public health agency of the United States.

5.	- http://www.sciencedirect.com / **http://www.google.com /** - **http://www.pubmed.com** **WHO | World Health Organization** - **https://www.who.int** - **https://08101ozhx-1103-y-https-www-sciencedirect-com.mplbci.ekb.eg/science/article/pii/S138665322030113X** - **https://08122ozhv-1103-y-https-iopscience-iop-org.mplbci.ekb.eg/article/10.1088/1755-1315/615/1/012015** - **https://08122ozhw-1103-y-https-iopscience-iop-org.mplbci.ekb.eg/article/10.1088/1755-1315/761/1/012115** - **https://08122ug5n-1105-y-https-iopscience-iop-org.mplbci.ekb.eg/article/10.1149/1945-7111/abe9cc** - **https://0810ough9-1105-y-https-www-webofscience-com.mplbci.ekb.eg/wos/woscc/full-record/WOS:000844948900001?SID=EUW1ED0AAFIzfz2BfUwzl9ofbfYMj** - **https://08102ozhk-1103-y-https-link-springer-com.mplbci.ekb.eg/referenceworkentry/10.1007/978-3-642-27769-6_902-2** - **https://08102ozhq-1103-y-https-link-springer-com.mplbci.ekb.eg/article/10.1007/s15010-013-0491-2** - **https://08102ozhs-1103-y-https-link-springer-com.mplbci.ekb.eg/chapter/10.1007/978-1-4612-2476-1_15**	Websites

8- Matrix

a- 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	1.1.5.2	1.1.6.1	1.1.7.1		2.5.2.1	2.5.3.1	3.1.1.1	3.1.4.1	3.1.4.2	3.1.4.3		4.1.1.1	4.1.2.1	4.3.2.1
Introduction and classification of parasites.	√	√	√		√	√							√				
Intestinal protozoae - ***Entameba histolytica*** - ***Giardia lamblia*** - ***Balantidium coli*** - ***Trichomonas vaginalis***			√		√	√		√	√	√	√		√				
Blood protozoae - **Trypanosoma** - **Leishmania** - **Plasmodium** - **Toxoplasma** **Arthropoda**			√		√	√		√	√	√	√		√		√	√	

Trematoda - **Fasciolae** - ***Heterophyes heterophyes.*** - ***Human schistosomiases***			√		√	√		√	√		√	√		√		√		
Nematoda - ***Trichuris trichiura*** - ***Wuchereria bancrofti*** - ***Strongyloides stercoralis*** - ***Ascaris lumbricoides***			√		√	√		√	√		√	√		√		√		
Nematoda - *Enterobius vermicularis* - *Trichinella spiralis* - *Ancylostoma duodenale*			√		√	√		√	√		√	√		√			√	
Cestoda			√		√	√		√	√		√	√		√			√	

- *Taeniae solium* - *Taeniae saginata* - *Hymenolepis nana* - *Hymenolepis diminuta* - *Echinococcus granulosus* - *Echinococcus multilocularis*																		
Introduction and classification of viruses	√	√						√				√	√					
RNA viruses - Positive single strand RNA viruses				√	√	√		√	√		√	√	√		√		√	
RNA viruses - Negative single strand RNA viruses				√	√	√		√	√		√	√	√		√		√	
RNA viruses - Double-stranded Non-enveloped RNA Viruses				√	√	√		√	√		√	√	√			√		
DNA viruses - Non-Enveloped DNA viruses				√	√	√		√	√		√	√	√			√		
DNA viruses - Enveloped DNA Viruses				√	√	√		√	√		√	√	√			√	√	√

B) Practical part:

Course contents / K. elements		Domain : 1						Domain 2		Domain 3				Domain: 4		
	1.1.1.1	1.1.2.1	1.1.5.1	1.1.5.2	1.1.6.1	1.1.7.1		2.5.2.1	2.5.3.1	3.1.1.1	3.1.4.1	3.1.4.2	3.1.4.3	4.1.1.1	4.1.2.1	4.3.2.1
Laboratory diagnostic techniques	√	√	√		√	√							√			
Slide examination and case study of: • ***Entamoeba coli*** • ***Giardia intestinalis***			√		√	√		√	√	√	√		√		√	
Slide examination and case study of: • ***Balantidium coli*** • ***Trypanosomes gambiense***			√		√	√		√	√	√	√		√	√		
Slide examination and case study of • **Fasciolae** • ***Heterophyes heterophyes.*** • ***Human schistosomiases***			√		√	√		√	√	√	√		√	√		
Slide examination and			√		√	√		√	√	√	√		√	√		√

case study of: • ***Trichuris trichiura*** • ***Wuchereria bancrofti*** • ***Strongyloides stercoralis***																		
Slide examination and case study of: • ***Ascaris lumbricoides*** • ***Enterobius vermicularis***			√		√	√		√	√		√	√		√		√	√	√
Slide examination and case study of: • ***Trichinella spiralis*** • ***Ancylostoma duodenale***			√		√	√		√	√		√	√		√			√	
Slide examination and case study of: • ***Taeniae*** • ***Echinococcus granulosus*** • ***Hymenolepis nana***			√		√	√		√	√			√		√		√		

Arachnida: - ***Sarcoptes scabiei***																		
Slide examination and case study of: • ***Plasmodium malariae*** • ***Toxoplasma gondii***	√	√			√	√		√	√		√	√		√	√		√	
• **Lab methods of diagnosis for viral infection**	√	√		√	√	√		√	√		√	√	√			√	√	√
• **Viral diseases and revision**	√	√	√	√	√	√		√	√		√	√	√	√	√	√	√	√

Course Contents	Assessment methods									
	Advanced lecture	On line learning	Self-learning	Research assignments	Case study	Collaborative learning: Role play	Course Work mid-term Exam)	Practical/sheet	Written	Oral
Introduction and classification of parasites.	✓						✓		✓	✓
Intestinal protozoae - ***Entameba histolytica*** - ***Giardia lamblia*** - ***Balantidium coli*** - ***Trichomonas vaginalis***	✓						✓		✓	✓
Blood protozoae - **Trypanosoma** - **Leishmania** - **Plasmodium** - **Toxoplasma** **Arthropoda**	✓						✓		✓	✓
Trematoda - **Fasciolae** - ***Heterophyes heterophyes.*** - ***Human schistosomiases***	✓						✓		✓	✓
Nematoda - ***Trichuris trichiura*** - ***Wuchereria bancrofti*** - ***Strongyloides stercoralis*** - ***Ascaris lumbricoides***	✓								✓	✓
Nematoda - ***Enterobius vermicularis*** - ***Trichinella spiralis*** - ***Ancylostoma duodenale***	✓			✓					✓	✓
Cestoda - *Taeniae solium* - *Taeniae saginata* - *Hymenolepis nana* - *Hymenolepis diminuta* - *Echinococcus granulosus* - *Echinococcus multilocularis*	✓	✓							✓	✓

Introduction and classification of viruses	✓								✓	✓
RNA viruses - Positive single strand RNA viruses	✓								✓	✓
RNA viruses - Negative single strand RNA viruses	✓								✓	✓
RNA viruses - Double-stranded Non-enveloped RNA Viruses	✓								✓	✓
DNA viruses - Non-Enveloped DNA viruses	✓								✓	✓
DNA viruses - Enveloped DNA Viruses	✓	✓	✓						✓	✓

Course Contents	**Assessment methods**									
	Lab sessions	**On line learning**	**Self-learning**	**Research assignments**	**Case study**	**Collaborative learning: Role play**	**Course Work**	**Practical/sheet**	**Written**	**Oral**
Laboratory diagnostic techniques	✓	✓					✓	✓		
Slide examination and case study of: • *Entamoeba coli* • *Giardia intestinalis*	✓	✓			✓	✓	✓	✓		
Slide examination and case study of: • *Balantidium coli* • *Trypanosomes gambiense*	✓	✓			✓	✓	✓	✓		
Slide examination and case study of • Fasciolae • *Heterophyes heterophyes.* • *Human schistosomiases*	✓	✓			✓	✓	✓	✓		

Slide examination and case study of: • *Trichuris trichiura* • *Wuchereria bancrofti* • *Strongyloides stercoralis*	✓	✓			✓	✓	✓	✓		
Slide examination and case study of: • *Ascaris lumbricoides* • *Enterobius vermicularis*	✓	✓		✓	✓	✓	✓	✓		
Slide examination and case study of: • *Trichinella spiralis* • *Ancylostoma duodenale*	✓	✓			✓	✓		✓		
Slide examination and case study of**:** • *Taeniae* • *Echinococcus granulosus* • *Hymenolepis nana* **Arachnida:** - *Sarcoptes scabiei*	✓	✓			✓	✓		✓		
Slide examination and case study of: • *Plasmodium malariae* • *Toxoplasma gondii*	✓	✓			✓	✓		✓		
• Lab methods of diagnosis for viral infection	✓	✓				✓		✓		
• Viral diseases and revision	✓	✓				✓		✓		

Course Coordinator	Prof. Dr. El-Sayed E. Habib
Head of Department	Prof. Dr. El-Sayed E. Habib

Date: 10/9/ 2023

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Phytochemistry-1	**اسم المقرر :** كيمياء العقاقير 1
Academic Level: level 3	**المستوى الأكاديمي :** الثالث
Scientific department: Pharmacognosy	**القسم العلمي :** العقاقير
Head of Department: Prof. Dr. Mahmoud F. Elsebai	**رئيس القسم :** أ.د/ محمود فهمي السباعي
Course Coordinator: Prof. Dr. Weaam Nabil Ebrahim	**منسق المقرر:** أ.د/ وئام نبيل إبراهيم

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy Dept.
Program on which the course is given	Bachelor's degree in pharmacy - PharmD
Academic Level	level 3, First semester, 2023/2024
Date of course specification approval	6 /9/2023

A- Basic Information: Course data:

Course Title	Phytochemistry-1
Course Code	PG 314
Prerequisite	Registration
Teaching Hours/ week: Lecture:	2
Practical:	1
Total Credit Hours	3

B- Professional Information:

1- Course Aims:

This course enables the students to:

- Gain an understanding of the chemistry of carbohydrates, glycosides, bitter principles, and tannins.
- Have the skills to isolate, purify, identify, and/or analyze carbohydrates, glycosides, bitter principles, tannins, and antioxidant drugs.
- Be aware of different chromatographic methods for the isolation and analysis of the for mentioned plant constituents.
- Know the various pharmacological actions and medicinal uses of carbohydrates, glycosides, bitter principles, tannins, and antioxidant drugs.

2- Course k. elements:

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

Domain 1: fundamental knowledge

Program Key element No.	Course Key element No.	Course Key Element
1.1.1	1.1.1.1	List the different classes of carbohydrates, glycosides, tannins, and bitter principles with emphasis on those having pharmaceutical applications.
1.1.3	1.1.3.1	Identify the main sources for carbohydrates, glycosides, tannins, bitter principles having pharmaceutical importance, and their physical, chemical characters.
	1.1.3.2	Understand principles of different chromatographic methods used for isolation and / or analysis of plant active constituents.
1.1.4	1.1.4.1	Recognize pharmacological effects of carbohydrates, glycosides, tannins, bitter principles, and antioxidants drugs as well as their medicinal uses.

Domain 2: professional and ethical practice

Program Key element No.	Course Key element No.	Course Key Element
2.2.1	2.2.1.1	Manipulate the suitable methods for carbohydrates, glycosides and tannins extraction, isolation, purification, qualitative and quantitative determination from their respective sources adapting the suitable laboratory rules
2.2.2	2.2.2.1	Analyze carbohydrates, glycosides, tannins and bitter principles in their natural sources or in the pharmaceutical preparation for quality management employing the suitable chromatographic methods.
2.3.1	2.3.1.1	Recognize the appropriate methods for preparation, analysis and handling of carbohydrates, glycosides, tannins and / or bitter principles and production of pharmaceuticals

Domain 4: personal practice

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

-Course Contents

A) Theoretical part

Week No.	Topics	Hours
1	**Introduction to carbohydrates**	2
2	**Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.**	2
3	**Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.**	2
4	**Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.**	2
5	**Antibiotic containing carbohydrates and pharmaceutical carbohydrates**	2
6	**Introduction to glycosides**	2
7	**Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.**	2
8	**Flavones and related flavonoid, saponins: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.**	2

9	**Introduction to Glycosides of Triterpene Origin**	2
10	**Steroidal glycosides and cyanogenic glycosides**: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	2
11	**Antioxidant drugs**	2
12	**Tannins**: Introduction, classification, identification and/or determination and biological activities	2
13	**Bitter principles**: classification, identification and/or determination and biological activities	2
14	**Revision and quiz**	--
15	**Final Written and Oral Exam**	--

B) Practical part

Week No.	Topics	Hours
1	Qualitative estimation of monosaccharides & reducing disaccharides (Glucose, Fructose, Maltose, lactose, Sucrose)	1
2	Qualitative estimation of polysaccharides & pentoses (Xylose, Rhamnose, Starch)	1
3	Scheme for identification of unknown carbohydrate	1
4	Quantitative estimation of carbohydrates (glucose) • Copper reduction method (Practical) • Enzymatic method	1
5	Quantitative estimation of glucose and fructose mixture • Copper reduction method (Practical)	1
6	Quantitative estimation of glucose and fructose mixture Iodimetric method (Practical)	1
7	Quantitative estimation of glucose and sucrose mixture (Practical) Quantitative estimation of glucose and maltose mixture	1
8	Midterm exam	-
9	Qualitative identification of glycosides	1
10	Colorimetric estimation of Digitalis glycosides by Baljet's test	1
11	Preliminary phytochemical screening of unknown drugs	1
12	Principles of different chromatographic methods used for isolation or analysis of plant active constituents.	1
13	(Isolation and Estimation of khellin in Ammi visnaga)	1
14	**Sheet / and Practical exam**	1

-Teaching and Learning Methods:

Teaching and learning Methods		Weeks No.	Key elements to be addressed
4.1	**Computer aided learning:** ➢ **Lectures using Data show, power Point presentations.** ➢ **Distance learning** • **Online learning through my mans "Mansoura university "as recorded – video lectures** • **Inter active discussion through My Mans**	1-14	1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.2.1.1, 4.3.2.1
4.1	**Self-learning**	14	1.1.1.1, 1.1.3.1, 4.3.2.1
4.2	**Practical session using chemicals and laboratory equipment and/ or tutorials**	1-14	1.1.3.2, 2.2.1.1, 2.2.2.1, 2.3.1.1, 4.2.1.1, 4.1.2.1
4.3	**Class Activity: Group discussion offline and online.**	9-10	1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 4.2.1.1

-Student Assessment:

Assessment Methods:

Assessment Methods	Key elements to be assessed
1- Periodical (Mid-term exam / Course work)	1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1
2- Practical exam using OSPE	1.1.3.2, 2.2.1.1, 2.2.2.1, 2.3.1.1,
3- Written exam	1.1.1.1, 1.1.3.1, 1.1.3.2, 1.1.4.1, 2.2.1.1., 4.2.1.1, 4.3.2.1
4- Oral exam	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 4.2.1.1, 4.3.2.1

Assessment schedule:

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

-Weighing of assessment:

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

-Facilities required for teaching and learning.

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

-List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Charles A. Hales ،Hari G. Garg ،Mary K. Cowman. "Carbohydrate Chemistry, Biology and Medical Applications" Elsevier Science, 2011	Essential Book
3.	Cseke, L. J., Kirakosyan, A., Kaufman, P. B., Warber, S., Duke, J. A., & Brielmann, H. L. "Natural products from plants", CRC press., 2016	Recommended Book
4.	Dewick P. M."Medicinal Natural Products, a Biosynthetic Approach", 3rd edition John Wiley & sons, 2009	Recommended Book
5.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg	Website

8-Matrix:

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents	Course Key elements									
	Domain: 1				Domain: 2			Domain: 4		
	1.1.1.1	1.1.3.1	1.1.3.2	1.1.4.1	2.2.1.1	2.2.2.1	2.3.1.1	4.1.2.1	4.2.1.1	4.3.2.1
Introduction to carbohydrates	√									
Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.		√	√	√						
Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.		√	√	√						
Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.		√	√	√						
Antibiotic containing carbohydrates and pharmaceutical carbohydrates	√									
Introduction to glycosides		√	√	√						

Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.		√	√	√						
Flavones and related flavonoid, saponins: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.		√	√	√						
Introduction to Glycosides of Triterpene Origin	√			√					√	√
Steroidal glycosides and cyanogenic glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√		√					√	√
Antioxidant drugs	√	√	√	√						
Tannins: Introduction, classification, identification and/or determination and biological activities	√	√		√				√	√	√
Bitter principles: classification, identification and/or determination and biological activities	√	√	√	√						

B) Practical part:

Course contents	Course Key elements								
	Domain: 1			Domain: 2			Domain: 4		
	1.1.1.1	1.1.3.1	1.1.3.2	2.2.1.1	2.2.2.1	2.3.1.1	4.1.2.1	4.2.1.1	4.3.2.1
Qualitative estimation of monosaccharides & reducing disaccharides (Glucose, Fructose, Maltose, lactose, Sucrose)	√			√			√	√	
Qualitative estimation of polysaccharides & pentoses (Xylose, Rhamnose, Starch)	√			√			√	√	
Scheme for identification of unknown carbohydrate	√	√		√		√	√	√	
Quantitative estimation of carbohydrates (glucose) • Copper reduction method (Practical) • Enzymatic method	√	√		√		√	√	√	
Quantitative estimation of glucose and fructose mixture • Copper reduction method (Practical)	√	√	√	√		√	√	√	√
Quantitative estimation of glucose and fructose mixture • Iodimetric method (Practical)	√	√	√	√	√	√	√	√	√
Quantitative estimation of glucose and sucrose mixture (Practical) Quantitative estimation of glucose and maltose mixture	√	√	√	√		√	√	√	
Qualitative identification of glycosides	√	√	√	√	√	√	√	√	
Colorimetric estimation of Digitalis glycosides by Baljet's test	√	√	√	√	√	√	√	√	
Preliminary phytochemical screening of unknown drugs	√	√	√	√	√		√	√	
principles of different chromatographic methods used for isolation or analysis of plant active constituents. (Isolation and Estimation of khellin in Ammi visnaga)				√	√	√	√	√	

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

A) Theoretical part:

Course Contents	Teaching and Learning methods					Assessment methods			
	Lecture	Hybrid leaning	Group discussion	Lab sessions	Self-learning	Corse Work	Practical/ Tutorial	Written	Oral
Introduction to carbohydrates	√	√				√		√	√
Different classes of carbohydrates including monosaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√				√		√	√
Disaccharides and polysaccharides their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√				√		√	√
Polysaccharides and polysaccharide containing amino-sugar units: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√				√		√	√
Antibiotic containing carbohydrates and pharmaceutical carbohydrates	√	√						√	√
Introduction to glycosides	√	√						√	√

Alcohol, Simple phenolic, coumarin, lignans and neolignans and anthraquinones, glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√						√	√
Flavones and related flavonoid, saponins: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√						√	√
Introduction to Glycosides of Triterpene Origin	√	√	√					√	√
Steroidal glycosides and cyanogenic glycosides: their preparation, identification and determination including chromatographic methods used for isolation or analysis as well as their pharmacological actions and medicinal uses.	√	√	√					√	√
Antioxidant drugs	√	√						√	√
Tannins: Introduction, classification, identification and/or determination and biological activities	√	√			√			√	√
Bitter principles: classification, identification and/or determination and biological activities	√	√						√	√

B) Practical part:

Course Contents	Teaching and Learning methods					Assessment methods			
	Lecture	Hybrid learning	Comp. aided learning	Lab sessions	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Qualitative estimation of monosaccharides & reducing disaccharides (Glucose, Fructose, Maltose, lactose, Sucrose)		√		√			√		
Qualitative estimation of polysaccharides & pentoses (Xylose, Rhamnose, Starch)		√		√			√		
Scheme for identification of unknown carbohydrate		√		√			√		
Quantitative estimation of carbohydrates (glucose) • **Copper reduction method (Practical)** • **Enzymatic method**		√		√			√		
Quantitative estimation of glucose and fructose mixture Copper reduction method (Practical)		√		√			√		
Quantitative estimation of glucose and fructose mixture Iodimetric method (Practical)		√		√			√		
Quantitative estimation of glucose and sucrose mixture (Practical) Quantitative estimation of glucose and maltose mixture		√	√	√			√		
Qualitative identification of glycosides		√	√	√			√		
Colorimetric estimation of Digitalis glycosides by Baljet's test		√		√			√		
Preliminary phytochemical screening of unknown drugs		√		√			√		

principles of different chromatographic methods used for isolation or analysis of plant active constituents. (Isolation and Estimation of khellin in Ammi visnaga)		√	√	√			√		

Course Coordinator	**Prof. Dr. Weaam Nabil Ebrahim**
Head of Department	**Prof. Dr. Mahmoud F. Elsebai**

Approval Date: 6/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 202 4/2023

Course name: Pharmaceutics 3	**اسم المقرر: صيدلانيات 3**
Academic Level: Level 3	**المستوى الأكاديمي: الثالث**
Scientific department: Pharmaceutics	**القسم العلمي: الصيدلانيات**
Head of Department: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**رئيس القسم:** **أ.د/ ارهان ابراهيم أبوهاشم**
Course Coordinator: **Prof. Dr. Yosry Elsaid Ebrahim**	**منسق المقرر:** **أ.د/ يسري السعيد ابراهيم**

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

a-Basic Information: Course data:

Course Title	**Pharmaceutics 3**
Course Code	**PT 315**
Prerequisite	**No**
Teaching Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**(Credit H) 3**

B. Professional Information:

Course Aims:

1. **Differentiate a powder from a granule, explain how a drug's powder particle size affects the behavior of pharmaceutical dosage forms also to differentiate between the various types of tablet dosage forms, compare advantages and disadvantages of the various types of tablet dosage forms. The student will be able to compare various suppositories dosage forms.**

2. **Understand the factors that affect the rate of chemical reactions and determine the rate of reaction at given time and concentration.**

3. Understand the form and meaning of a rate law including the ideas of reaction order and rate constant.

4. Predict the rate law and rate constant for a reaction from a series of experiments given the measured rates for various concentrations of reactants.

5. Use the integrated form of a rate law to determine the concentration of a reactant at a given time.

6. Explain how the activation energy affects a rate and be able to use the Arrhenius Equation.

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	Demonstrate understanding of knowledge of solid pharmaceutical dosage forms.
1.1.3	1.1.3.1	Integrate to identify, prepare and assure quality of powder, granules, tablets and suppositories.
1.1.9	1.1.9.1	Perform pharmacokinetic calculations like determination of the rate of reaction at given time and concentration, reaction order and rate constant.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.4	2.2.4.1	Adopt the principles of pharmaceutical calculations and pharmacokinetics using the integrated form of a rate law to determine the concentration of a reactant at a given time Explain how the activation energy affects a rate and be able to use the Arrhenius Equation.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.2.1	4.2.1.1	Use clear language, pace, tone and non-verbal communication and good writing skills.
4.3.2	4.3.2.1	Practice self-learning to improve professional skills.

Course Contents:

A-Theoretical part

Week No	Topics	No. of hours
1.	Introduction about kinetics of drug decomposition	2
.2	Rate and orders of reaction	2
.3	Determination of Half-life, Expiry date and Shelf-life by different methods	2
.4	Stability testing methods	2
.5	Stability Protocols and chambers	2
.6	In vitro drug/excipients interactions	2
.7	Degradation pathways	2
.8	Formulation and manufacturing of powders	2
.9	Formulation and manufacturing of granules	2

.10	Formulation and manufacturing of tablets New strategies in tablet manufacture (self learning)	2
.11	Formulation and manufacturing of suppositories	2
.12	Capsules (types- formulation)	2
.13	Capsules (Quality control tests and applications)	2
.14	Revision and quiz	2
.15	Final written and oral exam	

Practical Part .A

Week No.	Topics	Hours
1	Formulation and manufacturing of powders	1
2	Formulation and manufacturing of granules Effervescent and non-effervescent	1
3	Formulation of tablets triturates	1
4	Formulation of prescribed tablets	1
5	Determination of Powder density (bulk & tapped)	1
6	Orders of reactions and determination the rate constant of a reaction	1
7	Determination of activation energy (Arrhenius plot)	1
8	Midterm exam	-
9	Determination of angle of repose (powder flowability)	1

10	Formulation of fatty base suppositories	1
11	Formulation of plain glycerogelatine suppositories	1
12	Formulation of medicated glycerogelatine suppositories	1
13	Formulation of medicated glycerogelatine suppositories part 2	1
14	Practical exam	1

4- Teaching and learning Methods:

Teaching and learning Methods		Weeks	K. elements to addressed be
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • Online learning through my mans "Mansoura university" as recorded video lectures • Interactive discussion through My Mans & Advanced lectures.	Weeks 1-14	1.1.1.1, 1.1.3.1, 1.1.9.1,
4.2	Practical session using chemicals and laboratory equipment	1-14	2.2.4.1
4.3	Self-learning	10	4.3.2.1/4.2.1.1
4.4	Class Activity /Problem – based learning and brainstorming	5-8	4.2.1.1
4.5	Presentations	10-12	4.3.2.1

5- Student Assessment:

a- Assessment Methods:

Assessment Methods	K. elements to be assessed
1-Written exam	1.1.1.1/1.1.3.1/1.1.9.12.2.4.1
2-Practical exam applying OSPE	1.1.1.1/1.1.3.1/1.1.9.1/2.2.4.1
3-Oral	1.1.1.1/1.1.3.1/1.1.9.1/4.2.1.1/4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1/1.1.3.1/1.1.9.1/2.2.4.1/ 4.2.1.1/4.3.2.1

b. Assessment schedule

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

c. Weighing of assessments

1	Periodical (Mid-term) exam / Course work	15%
2	Practical 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	Computers, and Internet. Data show,
- Laboratory facilities	Water baths, glassware, chemicals, electronic balance.

7- List of Refernces

No	Reference	Type
1.	Electronic book prepared by staff members	E-book
2.	Recorded videos prepared by stuff members	Videos on platform
3.	Applied Physical Pharmacy, 2e. eds. Mansoor M. Amiji, PhD, RPh, Thomas J. Cook, PhD, RPh, W. Cary Mobley, PhD, RPh. Second Edition. Chapter 11: Chemical Kinetics of Pharmaceuticals by J. Cook Thomas, 2014.	Book
4.	"Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems" 10th Ed., Wolters Kluwer, Loyd Allen, Howard C. Ansel, Lippincott Williams and Wilkins, Philadelphia, (2013).	Book
5.	Applied Biopharmaceutics & Pharmacokinetics, 7e. eds. Leon Shargel, Andrew B.C. Yu. Seventh Edition, 2016.	Book
6.	Applied Physical Pharmacy, Third Edition. Eds. Michael Weitz and Peter J. Boyle, 2019.	Book
7.	Drug Information: A Guide for Pharmacists, 6e. eds. Michael Weitz, Brian Kearns, and Peter J. Boyle, 2018.	Book

8.	**www.pharmacy.wsu.edu/courses/** **http://www.fda.gov/downloads/RegulatoryInformation/Guidances/ucm128204** **http://www.sciencedirect.com /** **http://www.google scholar.com /** **http://www.pubmed.com** **https://www.ekb.eg**	**Websites**

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

Matrix 1. Course contents and course key elements

A) Theoretical part:

Course contents	Course Key elements											
	Domain 1				Domain 2						Domain 4	
	1.1.1.1	1.1.3.1	1.1.9.1		2.2.4.1					4.2.1.1	4.3.2.1	
Introduction about kinetics of drug decomposition			√		√							
Rate and orders of reaction			√		√							
Determination of Half-life, Expiry date and Shelf-life by different methods			√		√							
Stability testing methods			√		√							
Stability Protocols and chambers					√							
In vitro drug/excipients interactions			√		√							
Degradation pathways	√	√										
Formulation and manufacturing of powders	√	√	√		√							
Formulation and manufacturing of granules	√	√	√		√							

Formulation and manufacturing of tablets • **New strategies in tablet manufacture (self-learning)**	√	√					√	√
Formulation and manufacturing of suppositories	√	√						
Capsules (types-formulation)	√	√						
Capsules (Quality control tests and applications)	√	√						

B) Practical part:

Course contents	**Course Key elements**							
	Domain 1				**Domain 2**		**Domain 4**	
	1.1.1.1	**1.1.3.1**	**1.1.9.1**		**2.2.4.1**		**4.2.1.1**	**4.3.2.1**
Formulation and manufacturing of powders	√	√						
Formulation and manufacturing of granules **Effervescent and non-effervescent**	√	√						
Formulation of tablets	√	√						

triturates								
Formulation of prescribed tablets	√	√						
Determination of Powder density (bulk & tapped)	√	√						√
Orders of reactions and determination the rate constant of a reaction			√		√			√
Determination of activation energy (Arrhenius plot)			√		√			√
Determination of angle of repose (powder flowability)			√		√			√
Formulation of fatty base suppositories	√	√						
Formulation of plain glycerogelatine suppositories	√	√					√	
Formulation of medicated glycerogelatine suppositories	√	√					√	

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

A) Theoretical part:

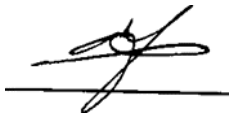
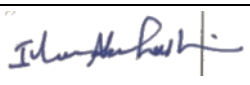
Course Contents	Teaching and Learning methods				Assessment methods			
	Advanced Lecture	Hybrid leaning	Comp. aided learning	Self-learning	Presentations	Course work(midterm)	Written	Oral
Introduction about kinetics of drug decomposition	√	√	√			√	√	√
Rate and orders of reaction	√	√	√			√	√	√
Determination of Half-life, Expiry date and Shelf-life by different methods	√	√	√			√	√	√
Stability testing methods	√	√	√			√	√	√
Stability Protocols and chambers	√	√	√				√	√
In vitro drug/excipients interactions	√	√	√				√	√
Degradation pathways	√	√	√				√	√
Formulation and manufacturing of powders	√	√	√				√	√
Formulation and manufacturing of granules	√	√	√				√	√

Formulation and manufacturing of tablets **New strategies in tablet manufacture (self learning)**	√	√	√	√	√		√	√
Formulation and manufacturing of suppositories	√	√	√				√	√
Capsules (types-formulation)	√	√	√				√	√
Capsules (Quality control tests and applications)	√	√	√				√	√

B) Practical part:

Course Contents	**Teaching and Learning methods**				**Assessment methods**	
	Hybrid learning	**Problem solving**	**Lab sessions**	**Course work**	**Practical**	**Written**
Formulation and manufacturing of powders	√		√	√	√	
Formulation and manufacturing of granules **Effervescent and non-effervescent**	√		√	√	√	
Formulation of tablets triturates	√		√	√	√	
Formulation of prescribed tablets	√		√	√	√	

Determination of Powder density (bulk & tapped)	√	√	√		√	
Orders of reactions and determination the rate constant of a reaction	√	√	√		√	
Determination of activation energy (Arrhenius plot)	√	√	√		√	
Determination of angle of repose (powder flowability)	√	√	√		√	
Formulation of fatty base suppositories	√		√		√	
Formulation of plain glycerogelatine suppositories	√		√		√	
Formulation of medicated glycerogelatine suppositories	√		√		√	

Course Coordinator	**Prof. Dr. Yosry Elsaid Ibrahim**
	
Head of Department	**Prof. Dr. Irhan Ibrahim Abu Hashim**
	

Approval Date: 20/9/2023

(بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Spectroscopic Identification	**اسم المقرر : الاثبات الطيفي**
Academic Level: Third Level	**المستوى الأكاديمي : الثالث**
Scientific department: Pharmaceutical Organic Chemistry	**القسم العلمي : الكيمياء العضوية الصيدلية**
Head of Department: Prof. Shahenda M. El-messery.	**رئيس القسم : ا.د/ شاهنده متولي المسيري**
Course Coordinator: Prof. Shahenda M. El-messery.	**منسق المقرر : ا.د/ شاهنده متولي المسيري**

University	**Mansoura**
Faculty	**Pharmacy**
Department offering the course	**Pharmaceutical Organic Chemistry**
Department supervising the course	**Pharmaceutical Organic Chemistry**
Program on which the course is given	**Bachelor's Degree in Pharmacy - Pharm D**
Academic Level	**Third level, First semester, 2023/2024**
Date of course specification approval	**10/9/2023**

C- Basic Information: Course data:

Course Title	Spectroscopic Identification
Course Code	PO314
Prerequisite	-
Teaching Hours/ week: Lecture	2
Practical:	1
Total Credit Hours	3 (Credit H)

D- Professional Information:

1- Course Aims:

This course enables the students to:

- Demonstrate basic principles of Ultraviolet, Infrared, Nuclear Magnetic Resonance Spectroscopy and Mass Spectrometry.
- Distinguish different structural features and components of chemical compounds` structural identification.
- Elucidate functional groups, unsaturation, protons and carbons environment in organic and natural molecules.
- Apply the use of spectroscopic devices such as; Ultraviolet, Infrared, Nuclear Magnetic Resonance spectrophotometer and Mass spectrometer to determine structures of chemical compounds and drugs

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	Distinguish the basic principles of Ultraviolet, Infrared, Nuclear magnetic resonance spectroscopy and mass spectrometry.
	1.1.1.2	Recognize the theories of Ultraviolet, Infrared, Nuclear magnetic resonance spectrophotometer and mass spectrometer devices.
1.1.2	1.1.2.1	Specify appropriate chemical terminology, abbreviations ,symbols and units related to Ultraviolet, Infrared, Nuclear magnetic resonance and mass spectra.
1.1.3	1.1.3.1	Integrate principles of Ultraviolet, Infrared, Nuclear magnetic resonance spectroscopy and mass spectrometry to identify, and analyze synthetic starting and finished pharmaceutical materials.
1.1.6	1.1.6.1	Retrieve key spectroscopic data of any given pharmaceutical Organic compound via searching up scientific literature sources.
1.1.7	1.1.7.1	Collect, analyze and interpret spectroscopic data of some organic compounds of interest in pharmaceutical industry.

Domain 2: professional and ethical practice

Program K. element no	Course K. element no	Course K. element
2.2.1	2.2.1.1	Apply principles of Ultraviolet, Infrared, Nuclear magnetic resonance spectroscopy and mass spectrometry to Identify pharmaceutical organic materials from different sources
2.2.3	2.2.3.1	Utilize and carefully select appropriate spectroscopic technique for identification and analysis of raw and finished pharmaceutical organic compounds
2.5.3	2.5.3.1	Employ different scientific basics and systematically search and investigate spectral data of pharmaceutical organic compounds.

Domain 4: personal practice

Program K. element no	Course K. element no	Course K. element
4.1.1	4.1.1.1	Show the ability to operate in team works and conduct time management skills

3- Course Contents

A) Theoretical part:

Week No.	Topics	Hours
1	Introduction to Spectroscopy & Uses of light spectrum	2
2	Ultraviolet-visible spectroscopy	2
3	Infrared spectroscopy: Principles & Theory	2
4	Infrared spectroscopy: Problem solving	2
5	Raman Spectroscopy	2
6	Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Nuclear spinning, chemical shift, shielding & deshielding	2
7	Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Splitting & integration	2
8	Nuclear Magnetic Resonance spectroscopy - ^{13}C-NMR	2
9	Deduction of chemical structure using spectroscopic data	2
10	Problems for structure determination	2
11	Mass Spectroscopy : Theory & main definitions	2
12	Mass Spectroscopy: types of fragmentation patterns	2
13	Spectroscopic problems (Self-Learning)	2
14	Revision and quiz	2
15	**Final written and oral exam**	-

B) Practical part

Week No.	Practical tutorial topics	hours
1	Molecular formula & Empirical formula	1
2	UV Spectroscopy	1
3	UV Spectroscopy problems	1
4	IR spectroscopy	1
5	IR Problems	1
6	NMR spectroscopy (intro)	1

7	Shielding *vs*. Deshielding	1
8	Midterm exam	-
9	NMR problems (Chemical Shift)	1
10	NMR problems (Splitting and integration)	1
11	^{13}C NMR	1
12	Mass and collective problems part 1	1
13	Mass and collective problems part 2	1
14	Practical Exam	1

4- Teaching and Learning Methods:

Teaching and learning Methods		Weeks	**K. elements to be addressed**
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • Online learning through my mans "Mansoura university" as recorded video lectures. • Interactive discussion through My Mans.	1-14th	1.1.1.1,1.1.1.2, 1.1.2.1, 1.1.6.1, 1.1.3.1, 1.1.7.1
4.2	Practical tutorials	1-14	2.2.1.1, 2.2.3.1 2.5.3.1
4.3	Self-learning	13	1.1.6.1, 1.1.7.1, 4.1.1.1.
4.4	Class Activity Discussion / Brainstorming / problem solving Collaborative Learning / Role Playing	1-14	1.1.3.1,1.1.6.1,1.1.7.1, .4.1.1.1

5- Student Assessment:

Assessment Methods:

Assessment Methods	**K elements to be assessed**
1-Written exam	1.1.1.1,1.1.1.2, 1.1.2.1, 1.1.3.1, 1.1.7.1
2-Practical exam using OSPI	2.2.1.1, 2.2.3.1, 2.5.3.1
3-Oral	1.1.1.1,1.1.1.2, 1.1.2.1, 1.1.3.1, 4.1.1.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1,1.1.1.2, 1.1.2.1, 1.1.3.1, 4.1.1.1

Assessment schedule

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

Weighing of assessment

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, molecular chemical models and animation files.
- Laboratory facilities	Data show, computers and white board.
- Library	Books for self-learning

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	**Course notes**
2.	Recorded videos prepared by stuff members	**Videos on platform**
3.	Practical course notes prepared by the department staff members	**Course notes**
4.	Pavia, D. L., Lampman, G. M., Kriz, G. S.. *Introduction to spectroscopy*. Ed. 5th, Philadelphia: W.B. Saunders Co, 2015.	**Essential Book**
5.	Silverstein, R.M., Webster, F.X., Kiemle, D.j., Bryce, D.L.. *Spectrometric Identification of Organic Compounds.* Ed. 8th, Hoboken, NJ : John Wiley & Sons, 2014.	**Recommended Book**
6.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg	**Website**

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

A) Theoretical part:

Course contents	Course Key elements									
	Domain 1						Domain 2			Domain 4
	1.1.1.1	1.1.1.2	1.1.2.1	1.1.3.1	1.1.6.1	1.1.7.1	2.2.1.1	2.2.3.1	2.5.3.1	4.1.1.1
Introduction to Spectroscopy & Uses of light spectrum	√	√	√			√			√	
Ultraviolet-visible spectroscopy	√	√	√			√			√	
Infrared spectroscopy: Principles & Theory	√	√		√	√	√		√		
Infrared spectroscopy: Problem solving	√			√			√		√	
Raman Spectroscopy	√			√			√			
Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Nuclear spinning, chemical shift, shielding & deshielding	√	√	√	√	√		√	√		
Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Splitting & integration	√			√		√				√
Nuclear Magnetic Resonance spectroscopy -	√				√	√		√		√

^{13}C-NMR										
Deduction of chemical structure using spectroscopic data	√		√			√			√	√
Problems for structure determination	√	√	√	√		√	√		√	√
Mass Spectroscopy : Theory & main definitions			√			√		√		√
Mass Spectroscopy: types of fragmentation patterns	√			√	√		√			√
Spectroscopic problems (Self-Learning)	√		√	√	√		√	√		√

B) Practical part:

Course contents	Course Key elements									
	Domain 1						Domain 2			Domain 4
	1.1.1.1	1.1.1.2	1.1.2.1	1.1.3.1	1.1.6.1	1.1.7.1	2.2.1.1	2.2.3.1	2.5.3.1	4.1.1.1
Molecular formula & Empirical formula	√	√	√			√	√		√	
UV Spectroscopy	√	√		√	√	√		√		
UV Spectroscopy problems	√						√		√	
IR spectroscopy	√	√		√	√		√	√		
IR Problems	√		√	√		√				
NMR spectroscopy (intro)	√			√	√	√		√		√
Shielding vs. Deshielding	√	√	√			√		√		√
NMR problems (Chemical shift)	√			√	√		√			√
NMR problems (Splitting and	√			√			√			√

integration)										
^{13}C NMR	√		√	√	√		√	√		√
Mass and collective problems	√	√	√	√	√		√	√		√

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

A) Theoretical part:

Course Contents	Teaching and Learning methods					Assessment methods			
	Lecture	Hybrid leaning	Comp. aided learning	Lab sessions	Self-learning	Corse Work	Practical/ Tutorial	Written	Oral
Introduction to Spectroscopy & Uses of light spectrum	√		√			√		√	√
Ultraviolet-visible spectroscopy	√		√			√		√	√
Infrared spectroscopy: Principles & Theory	√		√			√		√	√
Infrared spectroscopy: Problem solving	√	√	√			√		√	√
Raman Spectroscopy	√		√					√	√
Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Nuclear spinning, chemical shift, shielding & deshielding	√		√					√	√
Nuclear Magnetic Resonance spectroscopy - ^{1}H-NMR Splitting & integration	√		√					√	√
Nuclear Magnetic Resonance spectroscopy - ^{13}C-NMR	√	√	√					√	√
Deduction of chemical structure using spectroscopic data	√		√					√	√
Problems for structure determination	√		√					√	√

Mass Spectroscopy : Theory & main definitions	√		√					√	√
Mass Spectroscopy: types of fragmentation patterns	√		√					√	√
Spectroscopic problems (Self-Learning)	√	√	√		√			√	√

B) Practical part:

Course Contents	**Teaching and Learning methods**					**Assessment methods**			
	Lecture	Hybrid learning	Comp. aided learning	Lab sessions	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Molecular formula & Empirical formula		√	√	√			√		
UV Spectroscopy			√	√			√		
UV Spectroscopy problems		√	√	√			√		
IR spectroscopy		√	√	√			√		
IR Problems			√	√			√		
NMR spectroscopy (intro)			√	√		√	√		
Shielding vs. Deshielding			√	√		√	√		
NMR problems (Chemical Shift)			√	√		√	√		
NMR problems (Splitting and integration)			√	√	√	√	√		
^{13}C NMR		√	√	√			√		
Mass and collective problems			√	√			√		

Course Coordinator	**Prof. Shahenda M. El-Messery.**	
Head of Department	**Prof. Shahenda M. El-Messery.**	

Approval Date: 10/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmacology -1	**اسم المقرر : فارماكولوجي 1**
Academic Level: 3	**المستوى الاكاديمي : الثالث**
Scientific department: Pharmacology& Toxicology	**القسم العلمي : الادوية والسموم**
Head of Department: Prof Dr Manar ANader	**رئيس القسم : أ.د/ منار أحمد نادر**
Course Coordinator: Prof Dr GhadaM Suddek	**منسق المقرر : أ.د/ غادة محمد صديق**

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

1- Basic Information: Course data:

Course Title	**Pharmacology 1**
Course Code	**PH-314**
Prerequisite	**Physiology**
Teaching Hours: Lecture	**2**
Practical:	**1**
Total Credit Hours	**3**

2- Course Aims:

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

1. **pharmacology (pharmacokinetics and pharmacodynamics).**
2. **Introduce concepts of drug action at cell, tissue and system levels.**
3. **Provide fundamental pharmacological knowledge of the principles of drug action andinteraction.**
4. **Provide comprehensive coverage of the major drug groups affecting different body systems;autonomic nervous system and autacoids**

3- Course k. elements:

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

Domain 1- fundament

ProgramK. elementno.	Course K. element no.	Course K. element
(1.1.1)	1.1.1.1	Describe information on pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences
(1.1.4)	1.1.4.1	Recognize drugs' mechanism of action, therapeutic effects and assess theirsuitability, effectiveness, and safety in individuals and populations, using .knowledge from fundamental sciences

Domain 2: Professional and Ethical Practice

Program K. element no.	**Course K. element no.**	**Course K. element**
(2.1.3)	**2.1.3.1**	Assess suitable professional limits and take responsibility and accountability withinhealthcare team
(2.2.3)	**2.2.3.2**	Develop the capability to practice lab equipment and different kinds of simulation software with in depth knowledge to Integrate the effectiveness, and safety in drug use in individuals and populations

Domain 3: Pharmaceutical care

ProgramK. elementno.	**Course K. element no.**	**Course K. element**
(3.1.1)	**3.1.1.1**	handle a dosage schedule for a patient based on the physiological, genetic, biochemical and immunological changes taken by disease or concomitant drug therapy
(3.1.4)	**3.1.4.1**	Manipulate the characters, epidemiology, pathogenesis, laboratory diagnosis, andclinical features of diseases and their treatment and prevention.

(3.2.1)	3.2.1.1	perform principles of pharmacological aspects of drugs, as mode of action,therapeutic uses, proper dosage, unwanted effects and drug interactions.

Domain 4: Personal Practice

Program K. element no.	Course K. element no.	Course K. element
(4.1.1)	4.1.1.1	Record decision-making activities with pharmacy team members and non-pharmacy team members and use effective time management skills.
(4.1.2)	4.1.2.1	Supply the creation of knowledge or practices in the field of pharmacy and participate independently and collaboratively in the delivery of health services .
(4.2.1)	4.2.1.1	Practice clear language, pace, tone and non-verbal communication and writing skills when dealing with patients, other health team and communities.

1- Course Contents

Week No	Topics	No. of hours
1	Introduction & Pharmacokinetics	2
2	Pharmacokinetics and Pharmacodynamics	2
3	Pharmacodynamics	2
4	Principles of drug interaction	2
5	Principles of drug interaction	2
6	Pharmacology of Autonomic Nervous System	2
7	Pharmacology of Autonomic Nervous System	2
8	Pharmacology of Autonomic Nervous System	2
9	Pharmacology of Autonomic Nervous System	2
10	Pharmacology of Autonomic Nervous System	2
11	Pharmacology of Autonomic Nervous System	2
12	**Pharmacology of Autacoids**	**2**

13	**Pharmacology of Autacoids**	**2**
14	**Revision and quiz**	**2**
15	**Start of Final written and oral exam**	**-**
	Practical topics	
1	**Animals used for the experimental purpose**	**1**
2	**Routes of Drug Administration**	**1**
3	**Drug metabolism**	**1**
4	**Autonomic Innervation of the Eye**	**1**
5	**Drugs for Treatment of Glaucoma**	**1**
6	**Effect of autonomic drugs on rabbit's isolated intestine**	**1**
7	Dose response curve of acetylcholine on rectus abdominal muscles of Frog	1
8	Midterm exam-	
9	Action of neuromuscular blockers on isolated frog rectus abdominus	1
10	Autonomic Drugs Acting On Rat Cardiovascular System	1
11	Electrocardiogram (ECG or EKG)	1
12	Drug Interactions part 1	1
13	Drug Interactions part 2	1
14	Practical Exam	1

5- Teaching and Learning Methods:

No	Teaching and Learning Methods	week	K. elements to be addressed
5.1	**Advanced lectures** • **Lectures using Data show, power Point presentations** • **Brain storming** • **Group discussion**	1-14	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)
5.2	**Hybrid learning:** **On line learning through My mans "Mansoura university "**	1-14	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)
5.3	**Practical Training / Laboratory**	1-14	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)
5.4	**Self learning**	13	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)
5.5	**Case study**	4, 7-9	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)
5.6	**Collaborative learning**	2-8	(1.1.1), (1.1.4), (2.1.3), (2.2.3), (3.1.1), (3.1.4), (3.2.1), (4.1.1), (4.1.2), (4.2.1)

6- Student Assessment:

a- Assessment Methods:

1-Written exam	1.1.1.1, 1.1.4.1, 2.1.3.1, 2.2.3.2, 3.1.1.1, 3.1.4.1, 3.2.1.1
2-Practical exam	1.1.1.1, 1.1.4.1, 2.1.3.1, 2.2.3.2, 3.1.1.1, 3.1.4.1, 3.2.1.1
3-Oral	1.1.1.1, 1.1.4.1, 2.1.3.1, 2.2.3.2, 3.1.1.1, 3.1.4.1, 3.2.1.1, 4.1.1.1, 4.1.2.1, 4.2.1.1
4-Case study	4.1.1.1, 4.1.2.1, 4.2.1.1

b- Assessment schedule

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

c- Weighing of assessments

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

7- List of References

No	Reference	Type
1.	Lectures Handout	Course notes
2.	Lippincott's Pharmacology; illustrated review; Finkel, Richard; Clark, MichelleA.; Cubeddu, Luigi X. 6th edition (2009)	Book
3.	Basic and Clinical Pharmacology; Bertram Katzung, Mark von Zastrow, 9thedition (2011)	Book
4.	Pubmed……	websites
	https://www.ekb.eg	

8- Matrix

b- Course content and key element

Course contents / K. elements	Domain : 1			Domain 2			Domain: 3				Domain: 4		
	1.1.1.1	1.1.4.1		2.1.3.1	2.2.3.2		3.1.1.1	3.1.4.1	3.2.1.1		4.1.1.1	4.1.2.1	4.2.1.1
Introduction & Pharmacokinetics	√	√		√	√		√	√ √	√ √				
Pharmacokinetics and Pharmacodynamics	√	√		√	√		√	√	√				
Pharmacodynamics	√	√		√	√		√	√	√		√	√	√
Principles of drug interaction	√	√		√	√		√	√	√		√	√	√
Principles of drug interaction	√	√		√	√		√	√	√		√	√	√
Pharmacology of Autonomic Nervous System	√	√		√	√		√	√	√		√	√	√
Pharmacology of Autonomic Nervous System	√	√		√	√		√	√	√		√	√	√
Pharmacology of Autonomic Nervous	√	√		√	√		√	√	√		√	√	√

System													
Pharmacology of Autonomic Nervous System	√	√		√	√		√	√	√		√	√	√
Pharmacology of Autonomic Nervous System	√	√		√	√		√	√	√		√	√	√
Pharmacology of Autonomic Nervous System	√	√		√	√		√		√		√	√	√
Pharmacology of Autacoids	√	√		√	√		√		√		√	√	√
Pharmacology of Autacoids	√	√		√	√		√		√		√	√	√
B) Practical part													
Animals used for the experimental purpose		√		√	√			√					
Routes of Drug Administration		√		√	√		√	√			√	√	√
Drug metabolism		√			√			√				√	
Autonomic Innervation of the Eye		√		√	√		√	√			√	√	√

Drugs for Treatment of Glaucoma		√		√	√		√	√	√		√	√	√
Effect of autonomic drugs on rabbit's isolated intestine		√		√	√			√	√		√	√	√
Dose response curve of acetylcholine on rectus abdominal muscles of frog		√		√	√		√	√	√		√	√	√
Action of neuromuscular blockers on isolated frog rectus abdominus		√		√	√		√	√	√		√	√	√
Autonomic Drugs Acting On Rat Cardiovascular System		√		√	√			√			√	√	√
Electrocardiogram (ECG or EKG)		√		√	√			√				√	
Drug Interactions		√		√	√			√			√	√	

Matrix 2. Between course contents, learning methods and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods						Assessment methods				
	Advanced lectures	Hybrid learning	Self-learning	Tutorial / Interactive Sessions learning: Research Project	Collaborative learning: Role play	Case study	Corse Work (presentation)	Corse Work mid-term Exam)	Practical/sheet	Written	Oral
Introduction & Pharmacokinetics	✓	✓					✓	✓		✓	✓
Pharmacokinetics and Pharmacodynamics	✓	✓					✓	✓		✓	✓
Pharmacodynamics	✓	✓					✓	✓		✓	✓
Principles of drug interaction	✓	✓				✓	✓	✓		✓	✓
Principles of drug interaction	✓	✓					✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓			✓		✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓				✓	✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓				✓	✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓				✓	✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓					✓			✓	✓
Pharmacology of Autonomic Nervous System	✓	✓								✓	✓
Pharmacology of Autacoids	✓	✓				✓				✓	✓
Pharmacology of Autacoids	✓	✓	✓							✓	✓

B) Practical Part:

Course Contents	Teaching and Learning Methods				Assessment methods		
	Practical Training / Laboratory	Hybrid learning	Collaborative learning:	Case study	Corse Work	Sheet	Practical exam
Animals used for the experimental purpose	✓	✓					✓

Routes of Drug Administration	✓	✓	✓		✓	✓	✓
Drug metabolism	✓	✓			✓	✓	✓
Autonomic Innervation of the Eye	✓	✓	✓	✓	✓	✓	✓
Drugs for Treatment of Glaucoma	✓	✓	✓	✓	✓	✓	✓
Effect of autonomic drugs on rabbit's isolated intestine	✓	✓			✓	✓	✓
Dose response curve of acetylcholine on rectus abdominal muscles of frog	✓	✓	✓		✓	✓	✓
Action of neuromuscular blockers on isolated frog rectus abdominus	✓	✓	✓	✓	✓	✓	✓
Autonomic Drugs Acting On Rat Cardiovascular System	✓	✓			✓	✓	✓
Electrocardiogram (ECG or EKG)	✓	✓			✓	✓	✓
Drug Interactions	✓	✓		✓	✓	✓	✓

Course Coordinator	Prof. Dr. Ghada M Suddek
Head of Department	Prof. Dr. Manar A Nader

Date: 18/9/ 2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmaceutical Microbiology	اسم المقرر: الميكروبيولوجيا الصيدلية
Academic Level: level 3	المستوى الأكاديمي : الثالث
Scientific department: Microbiology & Immunology	القسم العلمي: الميكروبيولوجيا والمناعة
Head of Department: **Prof. Dr El Sayed E. Habib**	رئيس القسم: أ.د/ السيد الشربيني حبيب
Course Coordinator: **Prof. Dr Khaled Hussein Abd El Galil**	منسق المقرر: أ.د/ خالد حسين عبد الجليل

Faculty	Pharmacy
Department offering the course	Microbiology & Immunology
Department supervising the course	Microbiology & Immunology
Program on which the course is given	Bachelor in Pharmacy- Pharm D
Academic Level	Level three, second semester, 2023-2024
Date of course specification approval	18 / 9 / 2023

A. Basic Information: Course data:

Course Title	**Pharmaceutical Microbiology**
Course Code	**PM 323**
Prerequisite	**Registration**
Teaching credit Hours: Lecture	**2 H**
Practical	**1 H**
Total Credit Hours	**3 H**

B. Professional Information:

1. Course Aims:

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

- Describe different methods of microbial growth control in clinical practice.
- Appreciate different ways of preserving pharmaceutical dosage forms and cosmetics.
- Identify principles and quality control of sterilization and sterility validation.
- Describe different evaluation methods for disinfectant, antiseptic and preservative.
- Recognize mechanism of action, spectrum of activity and indications of antibacterial, antifungal and antiviral agents in clinical use.
- Realize the rationale of antimicrobial combination.
- Understand the mechanisms of antimicrobial resistance and the ways to delay it.

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 elements no.	Course k elements no.	Course k. elements
(1.1.1)	**(1.1.1.1)**	Explain principles of chemical and physical methods of microbial growth and contamination control in clinical practice.
(1.1.2)	**(1.1.2.1)**	Distinguish between different terminologies, abbreviation and symbols used in microbial growth control.
	(1.1.2.2)	Recall scientific names of antibacterial, antifungal and antiviral agents appropriate to each clinical case.
(1.1.3)	**(1.1.3.1)**	Utilize principles of microbial growth control to assure quality of preservation, disinfection, antisepsis and sterilization.
(1.1.4)	**(1.1.4.1)**	Illustrate mechanism of action, therapeutic uses, contraindications, adverse drug reactions of the used antibacterial, antifungal and antiviral agents.
(1.1.5)	**(1.1.5.1)**	Choose the most appropriate antimicrobial chemotherapeutic agent in infectious diseases.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. elements
(2.2.2)	**(2.2.2.1)**	Choose the most appropriate sterilization method compatible with each pharmaceutical preparation.
	(2.2.2.2)	Recommend good laboratory practice (GLP), good manufacturing practice (GMP).

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. elements
(3.1.2)	**(3.1.2.1)**	Utilize proper methods of infection control according to the clinical situation.
(3.1.3)	**(3.1.3.1)**	Monitor and control microbial growth
(3.1.4)	**(3.1.4.1)**	Utilize the proper antimicrobial chemotherapeutic option based on etiology, epidemiology, laboratory diagnosis and clinical features of infectious disease.
(3.2.5)	**(3.2.5.1)**	Advice patients on antimicrobial agents use, including dose, duration, drug-drug interaction, side effects and possible toxicity.
(3.2.6)	**(3.2.6.1)**	Develop a greater awareness for the consequences of ingesting prescription medicines and risk from environmental and

		biological threats to public safety.
(3.2.7)	**(3.2.7.1)**	Communicate with other healthcare professionals to tailor appropriate healthcare plans.

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.
(4.2.1)	**(4.2.1.1)**	Communicate effectively in a scientific language to support patients, and health care regarding the studied topics.
(4.3.2)	**(4.3.2.1)**	Practice self-learning to improve professional skills

3- Course Contents

Week No.	Topics	Hours
1	Classification of antibacterial agents: bacterial cell wall inhibitors	2
2	Antibacterial agents: cell membrane disruptors, inhibitors of protein synthesis	2
3	Anti-metabolite and bacterial nucleic acid inhibitors. Antimicrobial resistance	2
4	Antibacterial combinations Evaluation of antibiotics, antibiotic combinations	2
5	Antifungal agents	2
6	Antiviral Drugs	2
7	Introduction to sterilization, classification of sterilization methods: physical methods of sterilization	2
8	Chemical method of sterilization	2
9	Mechanical method of sterilization, quality control of sterile and non-sterile pharmaceutical products	2
10	Sterility test and pyrogen test	2
11	Evaluation of disinfectants and antiseptics (self-learning)	2
12	Microbial contamination of pharmaceutical products	2
13	Preservation of pharmaceutical product	2
14	Evaluation of preservative	2
15	Compensatory and alternative lecture	2

16	Revision and quiz	2
17	**Final written and oral exam**	--
Week No.	**Practical topics**	**Hours**
1	Evaluation of Antibacterial agents: MIC by broth dilution	1
2	Evaluation of Antibacterial agents: MIC by microbroth dilution	1
3	Evaluation of Antibacterial agents: MIC by agar diffusion	1
4	Evaluation of Antibacterial agents: MIC by agar dilution	1
5	Antibiotic assay	1
6	Antibiotic sensitivity testing	1
7	Evaluation of Antimicrobial combinations part 1	1
8	Midterm exam	-
9	Evaluation of Antimicrobial combinations part 2	1
10	Methods of sterilization part 1	1
11	Methods of sterilization part 2	1
12	Evaluation of sterilization techniques and sterility test	1
13	Evaluation of disinfectants	1
14	Evaluation of preservatives	1
15	Revision and activity	1
16	**Practical exam**	--

4- Teaching and Learning Methods:

No	Teaching and Learning Methods	week	K. elements to be addressed
4.1	**Advanced lecture**	**1-16**	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.5.1) (3.2.6.1)**
4.2	**Distance learning:** **Online learning through My mans "Mansoura university "**	**1-16**	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.5.1) (3.2.6.1)**
4.3	**Practical works and tutorials**	**1-16**	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.7.1), (4.3.2.1)**

4.4	**Self-learning**	**11**	**(1.1.1.1), (1.1.2.1), (1.1.3.1) (2.2.2.1), (3.1.2.1), (3.1.3.1), (4.1.1.1), (4.2.1.1), (4.3.2.1)**
4.5	**Collaborative learning:** **Research Project**	**1-11**	**(1.1.1.1), (1.1.2.1), (1.1.3.1),** **(2.2.2.1), (3.1.2.1), (3.1.3.1),** **(4.1.1.1), (4.2.1.1), (4.3.2.1)**
4.7	**Case study**	**1-5**	**(1.1.1.1), (1.1.2.2), (1.1.4.1), (1.1.5.1), (3.1.2.1), (3.1.4.1), (3.2.5.1) (3.2.6.1), (3.2.7.1), (4.1.1.1), (4.2.1.1),** **(4.3.2.1)**

5- Student Assessment:

a- Assessment Methods:

1- Periodical (Mid-term exam) / Course work	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.4.1), (1.1.5.1), (3.1.4.1), (3.2.5.1), (3.2.5.1), (3.2.6.1)**
2-Practical exam	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.7.1), (4.3.2.1)**
3-Written exam	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.5.1), (3.2.6.1),**
4-Oral	**(1.1.1.1), (1.1.2.1), (1.1.2.2), (1.1.3.1), (1.1.4.1), (1.1.5.1), (2.2.2.1), (2.2.2.2), (3.1.2.1), (3.1.3.1), (3.1.4.1), (3.2.5.1), (3.2.6.1), (3.2.7.1), (4.1.1.1), (4.2.1.1)**

b- Assessment schedule

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

c- Weighing of assessments

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

6- Facilities required for teaching and learning

Classroom	Data show- Computers, whiteboard, Internet, Platform
Laboratory facilities	Laboratory equipment, whiteboard, tools and glasswares
Library	Books

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Book
2.	Recorded videos prepared by staff members	Videos on platform
3.	Cynthia Nau Cornelissen; Bruce D Fisher.; Richard A Harvey. Lippincott's Illustrated Reviews of Microbiology, 3rd Edition, 2013. Philadelphia : Lippincott Williams & Wilkins, 2013	Book
4.	Denyer, S. P., & Hugo, W. B. (2011). Hugo and Russell's pharmaceutical microbiology (8th ed.). Wiley-Blackwell.	E Book
5.	Kar, A. (2008). Pharmaceutical microbiology. New Age International (P) Ltd., Publishers.	E Book

6.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg https://0810ezig5-1103-y-https-onlinelibrary-wiley-com.mplbci.ekb.eg/doi/10.1128/9781555819682.ch4 https://0810ezig5-1103-y-https-onlinelibrary-wiley-com.mplbci.ekb.eg/doi/10.1128/9781555819682.ch4 •https://www.slideshare.net/kmv/testing-of-disinfectants •https://www.koshic.org/event/file/2013_17/3_02.pdf •https://www.slideshare.net/IkennaGodwin/evaluation-of-disinfectant-76555655 •https://courses.lumenlearning.com/microbiology/chapter/testing-the-effectiveness-of-antiseptics-and-disinfectants/ •https://www.microrao.com/micronotes/pg/testing_of_disinfectants.pdf •https://www.cambridge.org/core/services/aop-cambridge-core/content/view/6417853D22D6AA767279B733EE45E9D3/S0950268805004231a.pdf/div-class-title-3-the-chick-martin-test-for-disinfectants-chick-h-martin-c-j-hyg-1908-span-class-bold-8-span-654-697-div.pdf https://slidetodoc.com/disinfectant-silpa-m-assistant-professor-dept-of-pharmacognosy	Websites

8- Matrix

a. Course content and key element

Course contents / K. elements	Domain : 1						Domain 2		Domain 3						Domain: 4		
	1.1.1.1	1.1.2.1	1.1.2.2	1.1.3.1	1.1.4.1	1.1.5.1	2.2.2.1	2.2.2.2	3.1.2.1	3.1.3.1	3.1.4.1	3.2.5.1	3.2.6.1	3.2.7.1	4.1.1.1	4.2.1.1	4.3.2.1
Classification of antibacterial agents: bacterial cell wall inhibitors		✓	✓		✓	✓					✓	✓	✓	✓	✓	✓	
Antibacterial agents: cell membrane disruptors, inhibitors of protein synthesis			✓		✓	✓					✓	✓	✓	✓	✓	✓	
Anti-metabolite and bacterial nucleic acid inhibitors.			✓		✓	✓					✓	✓	✓	✓	✓	✓	
Antibacterial combinations			✓		✓	✓					✓	✓	✓	✓	✓	✓	
Antifungal agents			✓		✓	✓					✓	✓	✓	✓	✓	✓	
Antiviral Drugs			✓		✓	✓					✓	✓	✓	✓	✓	✓	
Introduction to sterilization,	✓	✓					✓	✓	✓	✓					✓	✓	

classification of sterilization methods: physical methods of sterilization																
Chemical method of sterilization	✓	✓					✓	✓	✓	✓					✓	✓	
Mechanical method of sterilization, quality control of sterile and non-sterile pharmaceutical products	✓	✓		✓			✓	✓	✓	✓					✓	✓	
Sterility test and pyrogen test	✓	✓		✓				✓	✓	✓						✓	✓
Evaluation of disinfectants and antiseptics (self-learning)	✓	✓		✓				✓	✓	✓					✓	✓	
Microbial contamination of pharmace	✓	✓		✓				✓	✓	✓					✓	✓	

utical products																	
Preservation of pharmaceutical product	✓	✓		✓				✓	✓	✓					✓	✓	
Evaluation of preservative	✓	✓		✓				✓	✓	✓					✓	✓	

8- Matrix

b. Between course contents, learning methods and assessment methods

A) Theoretical Part:

Course Contents	Teaching and Learning Methods					Assessment methods			
	Advanced lecture	On line learning	Self-learning	Collaborative learning: Research Project learning: Research Project	Case study	Course Work (presentation)	Course Work mid-term Exam)	Written	Oral
Classification of antibacterial agents: bacterial cell wall inhibitors	✓			✓	✓	✓	✓	✓	✓
Antibacterial agents: cell membrane disruptors, inhibitors of protein synthesis	✓			✓	✓	✓	✓	✓	✓
Anti-metabolite and bacterial nucleic acid inhibitors. Antimicrobial resistance	✓			✓	✓	✓	✓	✓	✓
Antibacterial combinations Evaluation of antibiotics, antibiotic combinations	✓			✓	✓	✓	✓	✓	✓
Antifungal agents	✓			✓	✓	✓		✓	✓
Antiviral Drugs	✓			✓		✓		✓	✓
Introduction to sterilization, classification of sterilization methods: physical methods of sterilization	✓	✓		✓		✓		✓	✓
Chemical method of sterilization	✓			✓		✓		✓	✓
Mechanical method of sterilization, quality control of sterile and non-sterile pharmaceutical products	✓			✓		✓		✓	✓

Sterility test and pyrogen test	✓			✓		✓		✓	✓
Evaluation of disinfectants and antiseptics	✓		✓					✓	✓
Microbial contamination of pharmaceutical products	✓					✓		✓	✓
Preservation of pharmaceutical product	✓	✓				✓		✓	✓
Evaluation of preservative	✓	✓				✓		✓	✓

B) Practical Part:

Course Contents	**Teaching and Learning Methods**					**Assessment methods**		
	Practical work/tutorials	**On line learning**	**Self-learning**	**learning: Research Project**	**Case study**	**Course Work**	**Sheet**	**Practical exam**
Evaluation of Antibacterial agents: MIC by broth dilution	✓					✓	✓	✓
Evaluation of Antibacterial agents: MIC by microbroth dilution	✓					✓	✓	✓
Evaluation of Antibacterial agents: MIC by agar diffusion	✓					✓	✓	✓
Evaluation of Antibacterial agents: MIC by agar dilution	✓					✓	✓	✓
Antibiotic assay	✓					✓	✓	✓
Antibiotic sensitivity testing	✓					✓	✓	✓
Evaluation of Antimicrobial combinations	✓					✓	✓	✓
Methods of sterilization	✓					✓	✓	✓
Evaluation of sterilization techniques and sterility test	✓					✓	✓	✓
Evaluation of disinfectants	✓					✓	✓	✓
Evaluation of preservatives	✓					✓	✓	✓

revision	✓	✓	✓	✓	✓	✓	✓	✓

Course Coordinator Prof. Dr Khaled Hussein Abd El Galil

Head of Department Prof. Dr. El-Sayed El-Sherbeni Habib

Date: 10/9/2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Biopharmaceutics and pharmacokinetics	**اسم المقرر: الصيدلة الحيوية وحركية الدواء**
Academic Level: Level 3	**المستوى الأكاديمي: الثالث**
Scientific department: pharmaceutics	**القسم العلمي: الصيدلانيات**
Head of Department: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**رئيس القسم:** **أ.د/ ارهان ابراهيم أبوهاشم**
Course Coordinator: **Prof. Dr. Mahasen Mohammed Mashaly**	**منسق المقرر:** **أ.د/ محاسن محمد مشالي**

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 (Pharm-D)**
Academic Level	**Third level, Second Semester, 2023/2024**
Date of course specification approval	**September 2023**

A-Basic Information: Course data:

Course Title	**Biopharmaceutics and pharmacokinetics**
Course Code	**PT 326**
Prerequisite	**Physical pharmacy**
Teaching Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

1-Course Aims:

This course enables the students to:

7. Understand the principles of biopharmaceutics and pharmacokinetic parameters.
8. Describe terms of absorption, distribution, metabolism, and excretion (ADME) processes as well as the different factors affecting them.
9. Predict the drug bioavailability, bioequivalence, biowaivers and in vitro in vivo correlations.
10. Design a dosage regimen in a particular patient.
11. Know the basis of selection a particular drug preparation, route of administration and evaluation of bioavailability of dugs products.

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**	Describe the principles of pharmacokinetics; predict the fate of the drug in the body, appropriateness, effectiveness, and safety in individuals and populations and summarize the different physiological, physicochemical and dosage form factors affecting drug absorption.
1.1.9	**1.1.9.1**	Manipulate pharmacokinetic equations and profiles for the calculation of different pharmacokinetic parameters and drug dosage regimen.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.4	**2.2.4.1**	Adopt the principles of pharmacokinetics to calculate the dose of a drug that will result in a desired plasma drug concentration with the prediction of drug bioavailability, bioequivalence and biowaivers.

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.2	**4.1.2.1**	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.
4.3.2	**4.3.2.1**	Practice self-learning to improve professional skills.

3- Course Contents

A) Theoretical part:

Week No.	Topics	Credit hours
1.	Introduction to pharmacokinetics.	2
2.	One-compartment open model: IV bolus administration.	2
3.	Intravenous infusion.	2
4.	Drug absorption and mechanisms of drug absorption.	2
5.	Factors affecting drug absorption from GIT (physiological and dosage form and formulation factors)	2
6.	Factors affecting drug absorption from GIT (physicochemical factors)	2
7.	Drug distribution and factors affecting distribution.	2
8.	Drug metabolism	2
9.	Drug elimination.	2
10.	Pharmacokinetics of oral absorption.	2
11.	Multiple-Dosage Regimens.	2
12.	Nonlinear pharmacokinetics.	2
13	Bioavailability and bioequivalence	2
14	In vitro-in vivo correlations (self-learning).	2
15	Compensatory and alternative lecture	2
16	Revision and quiz	2
17	**Final written and oral exam**	-

Practical part:

Week No.	Topics	Credit hours
1	Semilog paper and mathematical review.	1
2	Review on rate, rate constants and orders of reactions.	1
3	IV Bolus- one compartment.	1
4	IV Bolus- one compartment (pharmacokinetics parameters).	1
5	IV Bolus- one compartment (Urine Data).	1
6	IV infusion.	1
7	IV infusion and cessation of infusion.	1
8	Midterm exam	-

9	Oral absorption.	1
10	Multiple-Dosage Regimens.	1
11	Nonlinear pharmacokinetics.	1
12	Bioavailability types.	1
13	Bioavailability methods of calculations.	1
14	Two and three compartment models	1
15	**Revision and activity**	1
16	**Practical exam**	-

4- Teaching and Learning Methods:

Teaching and learning Methods		Week No.	K. elements to be addressed
4.1	**Advanced lecture / Brain storming**	**1-16**	**1.1.4.1,1.1.9.1 2.2.4.1,4.1.2.1**
4.2	**Hybrid Learning:** **Online learning through my Mans platform • "Mansoura university" Recorded video lectures**	**1-16**	**1.1.4.1,1.1.9.1 2.2.4.1,4.1.2.1 , 4.3.2.1**
4.3	**Self-learning**	**13**	**4.1.2.1 4.3.2.1**
4.4	**Problem Solving**	**2-3 & 10-13**	**1.1.9.1 2.2.4.1**
4.5	**Practical works and tutorials**	**1-12**	**4.3.2.1/4.1.2.1**

5- Student Assessment:

a- Assessment Methods:

Assessment Methods	Key elements to be assessed
1- Periodical (Mid-term exam / Course work)	**1.1.4.1, 1.1.9.1, 4.1.2.1, 4.3.2.1**
2- Practical exam using OSPE	**2.2.4.1, 4.1.2.1**
3- Written exam	**1.1.4.1, 1.1.9.1, 2.2.4.1**
4- Oral exam	**1.1.4.1, 1.1.9.1, 2.2.4.1, 4.1.2.1, 4.3.2.1**

b- Assessment schedule

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

c- Weighing of assessments

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

6- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	White board
Library	Books and Pharmacopoeia

7- List of References

No	Reference	Type
1.	**Electronic book prepared by staff members**	**Course notes**
2.	**Shargel, L. and Andrew B.C.(2016), Applied Biopharmaceutics & Pharmacokinetics, 7th ed., Mc Graw Hill New, York Chicago San Francisco.**	**Book**
3.	**Jambhekar, S.S. and Philip J. Breen, P.J. (2012), Basic Pharmacokinetics, 2nd ed, Pharmaceutical press, London, Philadelphia.**	**Book**
4.	**Rowe, P. (2012) Pharmacokinetics, Ventus Pulishing APS**	**Book**
5.	**Felton, L. A. (2012), Remington, Essentials of Pharmaceutics, Chapters 5, 6 and 37, Pharmaceutical Press , 1 Lambeth High Street, London SE1 7JN, UK**	**Book**
6.	**www.pubmed.com** **https://www.ekb.eg/en/web/researchers/home**	**Websites**

8- Matrix

8.1. Matrix of knowledge and skills of the course

A) Theoretical part:

Course contents	Course Key elements				
	Domain: 1		Domain: 2	Domain: 4	
	1.1.4.1	1.1.9.1	2.2.4.1	4.1.2.1	4.3.2.1
Introduction to pharmacokinetics.	✓				
One-compartment open model: IV bolus administration.		✓	✓	✓	
Intravenous infusion.		✓	✓	✓	
Drug absorption and mechanisms of drug absorption.	✓				
Factors affecting drug absorption from GIT and bioavailability (physiological and dosage form and formulation factors)	✓				
Factors affecting drug absorption from GIT and bioavailability (physicochemical factors)	✓				
Drug distribution and factors affecting distribution.	✓				
Drug metabolism	✓				
Drug elimination.	✓				
Pharmacokinetics of oral absorption.		✓	✓	✓	
Multiple-Dosage Regimens.		✓	✓	✓	
Nonlinear pharmacokinetics.		✓	✓	✓	
Bioavailability and bioequivalence			✓	✓	✓
In vitro-in vivo correlations			✓	✓	✓

B) Practical part:

Course contents	Course Key elements				
	Domain: 1		Domain: 2	Domain: 4	
	1.1.4.1	1.1.9.1	2.2.4.1	4.1.2.1	4.3.2.1
Semilog paper and mathematical review.	✓		✓	✓	
Review on rate, rate constants and orders of reactions.	✓	✓	✓	✓	
IV Bolus- one compartment.		✓	✓	✓	
IV Bolus- one compartment (pharmacokinetics parameters).		✓	✓	✓	
IV Bolus- one compartment (Urine Data).		✓	✓	✓	
IV infusion.		✓	✓	✓	
IV infusion and cessation of infusion.		✓	✓	✓	
Oral absorption.		✓	✓	✓	
Multiple-Dosage Regimens.		✓	✓	✓	
Nonlinear pharmacokinetics.		✓	✓	✓	
Bioavailability types.		✓	✓	✓	
Bioavailability methods of calculations.		✓	✓	✓	
Two and three compartment models		✓	✓	✓	

8.2. Matrix between contents, methods of learning and assessment

A) Theoretical part:

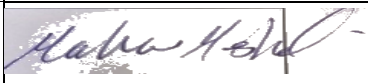
Course contents	Teaching and learning methods				Assessment methods			
	Advanced lecture	Hybrid learning	Self-learning	Problem Solving	Course work	Practical/Tutorial	Written	Oral
Introduction to pharmacokinetics.	✓	✓			✓		✓	✓
One-compartment open model: IV bolus administration.	✓	✓		✓	✓		✓	✓
Intravenous infusion.	✓	✓		✓	✓		✓	✓
Drug absorption and mechanisms of drug absorption.	✓	✓			✓		✓	✓
Factors affecting drug absorption from GIT and bioavailability (physiological and dosage form and formulation factors)	✓	✓					✓	✓
Factors affecting drug absorption from GIT and bioavailability (physicochemical factors)	✓	✓					✓	✓
Drug distribution and factors affecting distribution.	✓	✓					✓	✓
Drug metabolism	✓	✓					✓	✓
Drug elimination.	✓	✓					✓	✓
Pharmacokinetics of oral absorption.	✓	✓		✓			✓	✓
Multiple-Dosage Regimens.	✓	✓		✓			✓	✓

Nonlinear pharmacokinetics.	✓	✓		✓			✓	✓
Bioavailability and bioequivalence	✓	✓	✓	✓			✓	✓
In vitro-in vivo correlations	✓	✓	✓	✓			✓	✓

B) Practical part:

Course contents	Teaching and learning methods				Assessment methods			
	Hybrid Learning	Lab sessions	Problem solving	Practical tutorial sessions	Course work	Practical/Tutorial	Written	Oral
Semilog paper and mathematical review.	✓	✓	✓	✓		✓		
Review on rate, rate constants and orders of reactions.	✓	✓	✓	✓		✓		
IV Bolus- one compartment.	✓	✓	✓	✓		✓		
IV Bolus- one compartment (pharmacokinetics parameters).	✓	✓	✓	✓		✓		
IV Bolus- one compartment (Urine Data).	✓	✓	✓	✓		✓		
IV infusion.	✓	✓	✓	✓		✓		
IV infusion and cessation of infusion.	✓	✓	✓	✓		✓		
Oral absorption.	✓	✓	✓	✓		✓		
Multiple-Dosage Regimens.	✓	✓	✓	✓		✓		
Nonlinear pharmacokinetics.	✓	✓	✓	✓		✓		
Bioavailability types.	✓	✓		✓		✓		
Bioavailability methods of calculations.	✓	✓		✓		✓		
Two and three compartment models	✓	✓		✓		✓		

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

Course Coordinator	**Prof. Dr. Mahasen Mashaly**
	
Head of Department	**Prof. Dr. Irhan Ibrahim Abu Hashim**

Date: 20 September 2023

بكالوريوس الصيدلة (فارم د - Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Phytochemistry-2	**اسم المقرر** : كيمياء العقاقير 2
Academic Level: level 3	**المستوى الأكاديمي** : الثالث
Scientific department: Pharmacognosy	**القسم العلمي** : العقاقير
Head of Department: Prof. Dr. Mahmoud F. Elsebai	رئيس القسم : أ. د./ محمود فهمي السباعي
Course Coordinator: Ass. Prof. Mona Farouk El-Neketi	منسق المقرر : أ.م.د/ منى فاروق النقيطى

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmacognosy Dept.
Department supervising the course	Pharmacognosy department
Program on which the course is given	Bachelor in Pharmacy- Pharm D
Academic Level	Level 3, Second semester, 2023/2024
Date of course specification approval	6/9/2023

A. Basic Information: Course data:

Course Title	Phytochemistry-2
Course Code	PG 325
Prerequisite	Registration
Teaching Hours: Lecture	2
: Practical	1
Total Credit Hours	3

B. Professional Information:

1 . Course Aims:

This course enables the students to:

- Gain an understanding of the chemistry of alkaloids, volatile oils and miscellaneous terpenoids.
- Have the skills to deal with the different techniques for their isolation, purification, identification and determination from their respective sources
- Know the various pharmacological actions and medicinal uses of alkaloids, volatile oils and miscellaneous terpenoids.
- Be aware with the structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features.

2- Course Learning Outcomes:

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

Domain 1- fundamental knowledge

1.1.1	1.1.1.1	List the different classes of alkaloids, volatile oils and miscellaneous terpenoids with emphasis on those having pharmaceutical applications.
1.1.3	1.1.3.1	Identify the main sources for alkaloids, volatile oils and miscellaneous terpenoids having pharmaceutical importance, and their physical, chemical characters.
1.1.4	1.1.4.1	Recognize the pharmacological effects, medicinal uses as well as structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features.

Domain 2: Professional and Ethical Practice

2.2.1	2.2.1.1	Manipulate the suitable methods for alkaloids, volatile oils and miscellaneous terpenoids extraction, isolation, purification, qualitative and quantitative determination from their natural origin adapting the suitable laboratory rules
2.3.1	2.3.1.1	Recognize the appropriate methods for preparation, identification, analysis and handling of alkaloids, volatile oils and miscellaneous terpenoids and production of pharmaceuticals
2.4.1	2.4.1.1	Discriminate poisonous alkaloids/ volatile oil components s or terpenes and apply the safe procedures for their handling to discard any harm to public.

Domain 4: personal practice:

4.1.2	4.1.2.1	Retrieve and evaluate information, solve problems, and work effectively in a team.
4.2.1	4.2.1.1	Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development.

3- Course Contents:

Week No.	Topics	Lecture credit Hours
1	**Introduction to alkaloids**	2
2.	**Different classes of alkaloids:** each class covers their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses **Non-heterocyclic** alkaloids: Phenylalkylamine, Structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features (**self-learning**).	2
3.	**Heterocyclic alkaloids:** Pyridine containing group alkaloids The SAR of them as well as their pharmacophoric features (**self-learning**).	2
4.	**Heterocyclic alkaloids:** Tropane containing group alkaloids The SAR of them as well as their pharmacophoric features (**self-learning**).	2
5.	**Heterocyclic alkaloids:** Quinoline and Imidazole containing groups The SAR of them as well as their pharmacophoric features (**self-learning**).	2
6.	**Heterocyclic alkaloids:** Iso-quinoline, Phenanthrene – Opium alkaloids The SAR of them as well as their pharmacophoric features (**self-learning**).	2
7.	**Heterocyclic alkaloids:** Indole containing group alkaloids The SAR of them as well as their pharmacophoric features (**self-learning**).	2
8.	**Heterocyclic alkaloids:** Purine, Terpenoid and Steroids containing alkaloids The SAR of them and their pharmacophoric features (**self-learning**).	2
9.	**Introduction to volatile oil**	2
10.	**Different classes of volatile oil:** each class covers their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses **as well as** Structure activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features **Volatile oils: (**Terpene hydrocarbons**)**	2
11.	**Volatile oils:** (Oxygenated derivatives**:** alcohol, phenol, ether, aldehyde and ketones	2
12.	**Volatile oils:** (Oxygenated derivatives**:** acids, ester, oxide, peroxide Sulfur & nitrogen volatile oil constituents	2

13.	**Miscellaneous terpenoids**: Introduction, classification, identification.	2
14	**Miscellaneous terpenoids**: determination and biological activities.	2
15	**Compensatory and alternative lecture**	2
16	**Revision and quiz**	2
Start 17	**Final written and oral exam**	-
Week No.	**Practical topics**	**Practical credit hours**
1.	**Qualitative identification of alkaloids:** **(micro-crystallization or crystallography)** Caffeine, and Theophylline (Aminophylline), Nicotine, Codeine, Atropine	1
2.	**Qualitative identification of alkaloids:** **(micro-crystallization or crystallography)** Ephedrine, Theobromine; Berberine, Quinine, Papaverine	1
3.	**General scheme for alkaloids using micro-crystallization**	1
4.	**Qualitative identification of alkaloids:** Dil. Ephedrine, Quinine and Quinidine, Atropine and Pilocarpine	1
5.	**Qualitative identification of alkaloids (Cont.):** Strychnine, Papaverine, Caffeine and Theophylline	1
6.	**Alkaloids Brucine Colchicine, Methyl ergometrine** **Quantitative estimation of alkaloids:** (colorimetric method). Estimation of Methylergometrine Maleate In Pharmaceutical Preparation	1
7.	**General scheme for alkaloids**	1
8.	**Midterm exam**	-
9.	**Volatile Oils** • Preparation of volatile oils (Distillation method)	1
10.	**Volatile Oils (cont.):** - Determination of free and combined phenols in Clove oil	1

11.	**Volatile Oils (cont.):** • Determination of cinnamaldehyde in cinnamon oil	1
12.	**Volatile oils (Cont.)** Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil)	1
13	**Volatile Oils (cont.):** - Determination of oxides (e.g. cineol in Eucalyptus oil)	1
14	**Volatile Oils (cont.):** Determination of peroxides in chenopodium oil	1
15	**Revision and activity**	1
16	**Sheet Exam and Practical Exam**	1

4- Teaching and Learning Methods:

5.1	Lectures using Power point (PPT) presentations and whiteboard.	1-13	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.2.1.1
5.2	Computer aided learning: a. On line learning through my mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans	1-13	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.1.2.1, 4.2.1.1,
5.3	Self-learning	2-8	1.1.1.1, 1.1.3.1, 1.1.4.1 4.2.1.1, 4.3.2.1
5.4	Group discussion	2-13	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.3.2.1
5.5	Practical session using laboratory equipment	1-11	1.1.1.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.1.2.1, 4.2.1.1
5.6	Semester Activity (presentation, Quiz, problem solving)	2-12	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1

5- Student Assessment:

d- Assessment Methods:

1-Written exam	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.2.1.1
2-Practical exam applying OSPE	1.1.1.1, 1.1.3.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.1.2.1, 4.2.1.1, 4.3.2.1
3-Oral	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1., 2.3.1.1, 4.2.1.1
4- Periodical (Mid-term exam) / Course work	1.1.1.1, 1.1.3.1, 1.1.4.1, 2.2.1.1, 2.3.1.1, 2.4.1.1, 4.3.2.1

b. Assessment schedule

Assessment 1	Mid-term	7th-9th week
Assessment 2	Practical	16th
Assessment 3	Written	Start from 17th week
Assessment 4	Oral	Start From 17th 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%
Total		100%

6- Facilities required for teaching and learning

-Class room	Data show- Computers, Internet.
- Laboratory facilities	Microscopes- chemicals- glass wares- white board

- List of References

No	Reference	Type
1.	**Electronic book prepared by staff members**	**Course notes**
2.	**Recorded videos prepared by stuff members**	**Videos on platform**
3.	**Egbuna, C., Ifemeje, J. C., Udedi, S. C., & Kumar, S. (Eds.). (2018). Phytochemistry: Volume 1: Fundamentals, Modern Techniques, and Applications. CRC Press.**	**Textbook**
4.	**Egbuna, C., Kumar, S., Ifemeje, J. C., & Kurhekar, J. V. (Eds.). (2018). Phytochemistry: Volume 2: Pharmacognosy, Nanomedicine, and Contemporary Issues. CRC Press.**	**Textbook**
5.	**Evans, W. C. (2009). Trease and Evans' pharmacognosy. Elsevier Health Sciences.**	**Textbook**
6.	**Cseke, L. J., Kirakosyan, A., Kaufman, P. B., Warber, S., Duke, J. A., & Brielmann, H. L. (2016). Natural products from plants. CRC press.**	**Textbook**
7.	**Dewick, P. M. (2009). Medicinal natural products: a biosynthetic approach. John Wiley & Sons.**	**Textbook**

8.	**Shah, B. N. (2009). Textbook of pharmacognosy and phytochemistry. Elsevier India.**	**Textbook**
9.	**http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg**	**websites**

8- Matrix

1: Course contents and key elements

Course contents	Course Key Elements									
	Domain 1			Domain 2			Domain 4			
	1.1.1.1	1.1.3.1	1.1.4.1	2.2.1.1	2.3.1.1	2.4.1.1	4.1.2.1	4.2.1.1	4.3.2.1
A. Theoretical Topics									
Introduction to alkaloids	✓								
Different classes of alkaloids: **Non-heterocyclic** alkaloids: Phenylalkylamine - **Structure activity relationships (SAR)** of these natural products (**self-learning**).	✓	✓	✓	✓	✓	✓	✓		✓
Heterocyclic alkaloids: Pyridine containing alkaloids - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓		✓
Heterocyclic alkaloids: Tropane containing alkaloids - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓		✓
Heterocyclic alkaloids: Quinoline and Imidazole groups - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heterocyclic alkaloids: Iso-quinoline, Phenanthrene – Opium alkaloids - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heterocyclic alkaloids: Indole containing alkaloids - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heterocyclic alkaloids: Purine, Terpenoid and Steroids containing alkaloids - The SAR of them (**self-learning**).	✓	✓	✓	✓	✓	✓	✓	✓	✓
Introduction to volatile oil	✓								
Different classes of volatile oil: each class covers their chemical structure, physical, chemical characters, sources, isolation, identification and determination as well as their pharmacological actions and medicinal uses **as well as** Structure	✓	✓	✓	✓	✓	✓			

activity relationships (SAR) of these natural products derived compounds and their pharmacophoric features **Volatile oils: (**Terpene hydrocarbons**)**											
Volatile oils: (Oxygenated derivatives**:** alcohol, phenol, ether, aldehyde and ketones	✓	✓	✓		✓	✓	✓			✓	
Volatile oils: (Oxygenated derivatives**:** acids, ester, oxide, peroxide, sulfur & nitrogen volatile oil constituents	✓	✓	✓		✓	✓	✓			✓	
Miscellaneous terpenoids: Introduction, classification, identification and/or determination and biological activities.	✓	✓	✓		✓	✓	✓			✓	

Course contents	Course Key Elements										
	Domain 1				Domain 2				Domain 4		
	1.1.1.1	1.1.3.1	1.1.4.1		2.2.1.1	2.3.1.1	2.4.1.1		4.1.2.1	4.2.1.1	4.3.2.1
B: Practical Topics											
Qualitative identification of alkaloids: (micro-crystallization or crystallography) Caffeine, and Theophylline (Aminophylline), Nicotine, Codeine, Atropine, Ephedrine, Theobromine; Berberine, Quinine, Papaverine	✓	✓			✓	✓	✓		✓		✓
Qualitative identification of alkaloids: Dil Ephedrine, Quinine and Quinidine, Atropine and Pilocarpine, Strychnine, Papaverine, Caffeine and Theophylline, Brucine Colchicine, Methyl ergometrine **Quantitative estimation of alkaloids:** (colorimetric method). Estimation of Methylergometrine Maleate In Pharmaceutical Preparation	✓	✓			✓	✓	✓		✓	✓	✓
Volatile Oils - Preparation of volatile oils (Distillation method) - Determination of free and combined phenols in Clove oil	✓	✓			✓	✓	✓		✓	✓	
Volatile Oils (cont.): - Determination of cinnamaldehyde in cinnamon oil	✓	✓			✓	✓	✓		✓	✓	

Volatile oils (Cont.) - Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil)	✓	✓			✓	✓	✓		✓	✓		
Volatile Oils (cont.): - Determination of oxides (e.g. cineol in Eucalyptus oil) - Determination of peroxides in chenopodium oil	✓	✓			✓	✓	✓		✓	✓		

Matrix 2. Between course contents, learning methods and assessment

A) Theoretical Part:

Course Contents	Teaching and Learning Methods									Assessment methods				
	Lecture	Online interactive lecture	recorded video	Self-learning	Group discussion	Lab sessions	Problem solving	presentation	Quiz	Corse Work (presentation)	Corse Work mid-term Exam)	Practical/sheet	Written	Oral
Introduction to alkaloids	✓								✓		✓		✓	✓
Non-heterocyclic alkaloids: Phenylalkylamine – **(SAR)**	✓			✓	✓			✓	✓	✓	✓		✓	✓
Heterocyclic alkaloids: Pyridine alkaloids – **SAR**	✓			✓	✓			✓	✓	✓	✓		✓	✓
Tropane alkaloids – **SAR**	✓			✓	✓			✓	✓	✓			✓	✓
Quinoline and Imidazole alkaloids **– SAR**	✓		✓	✓	✓			✓		✓			✓	✓
Isoquinoline-Phenanthrene – Opium alkaloids – **SAR**	✓	✓	✓	✓	✓			✓		✓			✓	✓
Indole alkaloids – **SAR**	✓			✓	✓			✓	✓	✓			✓	✓
Purine, Terpenoid and Steroids alkaloids – **SAR**	✓			✓	✓			✓		✓			✓	✓
Introduction to volatile oil	✓	✓							✓		✓		✓	✓
Different classes of volatile oil - (Terpene hydrocarbons)	✓	✓			✓				✓				✓	✓

Volatile oils: (**Oxygenated** derivatives**:** alcohol, phenol, ether, aldehyde and ketones	✓	✓			✓		✓		✓				✓	✓
Volatile oils: (**Oxygenated** derivatives**:** acids, ester, oxide, peroxide, sulfur and nitrogen volatile oil constituents	✓	✓			✓		✓						✓	✓
Miscellaneous terpenoids.	✓	✓			✓								✓	✓

B) Practical Part:

Course Contents	Teaching and Learning Methods							Assessment methods		
	Lecture	Online interactive discussion	recorded video	Group discussion	Lab sessions	Problem solving	Quiz	Practical Corse Work	sheet	Practical
Qualitative identification of alkaloids: (micro-crystallization or crystallography) Caffeine, and Theophylline (Aminophylline), Nicotine, Codeine, Atropine	✓	✓	✓	✓	✓		✓	✓	✓	✓
Qualitative identification of alkaloids: (micro-crystallization or crystallography) Ephedrine, Theobromine; Berberine, Quinine, Papaverine	✓	✓	✓	✓	✓		✓	✓	✓	✓
Scheme for alkaloids using micro-crystallization	✓	✓	✓	✓	✓		✓	✓	✓	✓
Qualitative identification of alkaloids: Dil. Ephedrine, Quinine and Quinidine, Atropine and Pilocarpine	✓	✓	✓	✓	✓		✓	✓	✓	✓
Qualitative identification of alkaloids (Cont.): Strychnine, Papaverine, Caffeine and Theophylline	✓	✓	✓	✓	✓		✓	✓	✓	✓
Alkaloids Brucine Colchicine, Methyl ergometrine Quantitative estimation of alkaloids: (colorimetric estimation of Methylergometrine Maleate In Pharmaceutical Preparation	✓	✓	✓	✓	✓		✓	✓	✓	✓
General scheme for alkaloids	✓	✓	✓	✓	✓		✓	✓	✓	✓
Volatile Oils • Preparation of volatile oils (Distillation method) • Determination of free and combined phenols in Clove oil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Volatile Oils (cont.): • Determination of cinnamaldehyde in cinnamon oil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Volatile oils (Cont.) • Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Volatile Oils (cont.): • Determination of oxides (e.g. cineol in Eucalyptus oil) • Determination of peroxides in chenopodium oil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Course Coordinator	**Dr. Mona Farouk El-Neketi**
Head of Department	**Prof. Dr. Mahmoud F. Elsebai**

Date: 6 /9 / 2023

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmaceutics 4	**اسم المقرر: صيدلانيات 4**
Academic Level: Level 3	**المستوى الأكاديمي: الثالث**
Scientific department: pharmaceutics	**القسم العلمي: الصيدلانيات**
Head of Department: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**رئيس القسم:** **أ.د/ ارهان ابراهيم أبوهاشم**
Course Coordinator: **Prof. Dr. Irhan Ibrahim Abu Hashim**	**منسق المقرر:** **أ.د/ ارهان ابراهيم أبوهاشم**

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

University	Mansoura
Faculty	Pharmacy
Department offering the course	Pharmaceutics
Department supervising the course	Pharmaceutics
Program on which the course is given	**Bachelor of Pharmacy (Pharm-D)**
Academic Level	Third level, Second Semester, 2023/2024
Date of course specification approval	September 2023

A-Basic Information: Course data:

Course Title	**Pharmaceutics 4**
Course Code	**PT 327**
Prerequisite	**------**
Teaching Hours: Lecture	**2**
Practical	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

1-Course Aims:

At the end of the course, the students will be able:

12. Differentiate the types of parental, ophthalmic and blood products, as well as compare their advantages and disadvantages.
13. Understand the principles for calculation and manipulation of parental and ophthalmic preparations.
14. Explain different vaccines types.
15. Understand the quality control testing of pharmaceutical sterile drug products.
16. Recognize the applications of radio materials in nano-drug delivery systems.
17. Understand the formulation and quality control testing of aerosols and inhalation products.

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**	Demonstrate understanding of knowledge of parenteral and ophthalmic pharmaceutical dosage forms.
1.1.3	**1.1.3.1**	Combine the principles of fundamental sciences to design, prepare, and assure quality of radio pharmaceutical materials, aerosols and sterile products.
1.1.7	**1.1.7.1**	Gather and critically analyze information about vaccines that may be applicable to pharmaceutical industry and patient care.
1.1.9	**1.1.9.1**	Perform parenteral calculations like determination of the rate of infusion.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.5	**2.2.5.1**	Define the proper quality control testing for different types of dosage forms.
2.2.4	**2.2.4.1**	Adopt the principles of parental pharmaceutical calculations.
2.4.1	**2.4.1.1**	Select proper formulations and applications of radiopharmaceuticals in medical use.

Domain 3: pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	**3.1.1.1**	**Gather based information about vaccines and immunological changes.**
3.2.6	**3.2.6.1**	**Establish public awareness on rational use of vaccines, radiopharmaceuticals to ensure personal safety.**

Domain 4: personal practice

Program K. element no.	Course K. element no.	Course K. element
4.1.1	**4.1.1.1**	Share decision-making activities with other pharmacy team members and apply effective time management skills.
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.
4.3.2	**4.3.2.1**	Practice self-learning to improve professional skills.

3

- Course Contents

A- Theoretical part

Week No	Topics	No. of hours
1.	Formulation and evaluation of parenterals.	2
2.	Principles of parenterals calculations.	2
3.	Eye anatomy, classification of ophthalmic preparations.	2
4.	Formulation and preparation ophthalmic dosage forms.	2
5.	Inhalation products (Formulation and Preparation	2
6.	Quality control of Inhalation products.	2
7.	Blood products.	2
8.	Blood products applications and vaccines	2
9.	Formulation and quality control of aerosols	2
10.	Introduction about radiation and radiopharmaceutical	2
11.	Preparation of radiopharmaceuticals	2

12.	The application of radiation and radioactive compounds in pharmaceutics	2
13.	Mechanisms of radiopharmaceuticals localization	2
14.	quality control of radiopharmaceuticals	2
15.	Compensatory and alternative lecture	2
16.	Revision and quiz	2
17.	**Final Written and oral exam**	--

B-Practical part

Week No	Topics	No. of hours
1	Formulation of eye drops	1
2	Formulation of eye ointments	1
3	Formulation of ocular *insitu* gel	1
4	Formulation of ocular ocuserts	1
5	Parenteral calculations	1
6	Isotonicity calculations part 1	1
7	Isotonicity calculations part 2	1
8	Midterm exam	-
9	Types of aerosol	1
10	Inhalation products	1
11	Radiopharmaceutical (Generators and equipment used for the production)	1
12	Radiopharmaceuticals calculations	1
13	Quality control radiopharmaceuticals	1
14	Quality control of radiopharmaceuticals	1
15	Revision and activity	1
16	Practical exam	1

4- Teaching and Learning Methods:

Teaching and learning Methods		Weeks	K. elements to be addressed
4.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning • Online learning through my mans "Mansoura university" as recorded video lectures • Interactive discussion through My Mans & Advanced lectures.	Weeks 1-16	1.1.1.1, 1.1.3.1, 1.1.7.1/ 1.1.9.1, 2.2.5.1, 2.2.4.1, 2.4.1.1
4.2	Practical session using chemicals and laboratory equipment	1-16	2.2.4.1, 2.2.5.1/4.1.1.1/4.2.1.1
4.3	Self-learning	10-11	4.3.2.1
4.4	Class Activity /Problem – based learning	1-4 and 9	3.1.1.1/2.2.4.1/

5- Student Assessment:

e- Assessment Methods:

1-Written exam	1.1.1.1/1.1.3.1/1.1.7.1/1.1.9.1/ 2.1.6.1/2.2.4.1/2.4.1.1/3.1.1.1/3.2.6.1
2-Practical exam	1.1.1.1/1.1.3.1/1.1.9.1/2.2.4.1/2.4.1.1/3.2.6.1
3-Oral	1.1.1.1/1.1.3.1/1.1.7.1/1.1.9.1/ 2.1.6.1/2.2.4.1/3.1.1.1/3.2.6.1/4.2.1.1/4.3.2.1
4-Midterm exam	1.1.1.1/1.1.9.1/2.4.1.1

f- Assessment schedule

Assessment 1	**Mid-term**	7-9th week
Assessment 2	**Practical**	16th week
Assessment 3	**Written**	Starts from17th week
Assessment 4	**Oral**	Starts from 17th week

g- Weighing of assessments

1	**Mid-term examination**	10%
2	**Practical examination & Semester work**	25%

3	**Final-term examination**	50%
4	**Oral examination**	15%
Total		100%

6- Facilities required for teaching and learning

Classroom	Data show- Computers, Internet, Platform
Laboratory facilities	Electric balances- water baths- Chemicals- glass wares
Library	Books and Pharmacopoeia

7-List of References

No	Reference	Type
1.	Electronic book prepared by staff members	**Course notes**
2.	Recorded videos prepared by stuff members	**Videos on platform**
3.	Avis, K. E. (4th Ed.). (2018). Pharmaceutical dosage forms: parenteral medications. Routledge.	**Book**
4.	Handbook of radiopharmaceutical: Methodology and Applications, 2 nd Ed, Peter Scott, Michael Kilbourn (2020).	**Book**
5.	Allen, L., & Ansel, H. C "Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems" , Lippincott Williams & Wilkins, 12th eedition, (2021).	**Book**
6.	Niazi, S. K. (2019). Handbook of Pharmaceutical Manufacturing Formulations: Volume Two, Uncompressed Solid Products. CRC press.	**Book**
7.	https://www.ekb.eg/web/guest/home www.pharmacy.wsu.edu/courses/ http://www.fda.gov/downloads/RegulatoryInformation/Guidances/ucm128204	**Websites**

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	1.1.3.1	1.1.7.1	1.1.9.1	2.2.5.1	2.2.4.1	2.4.1.1	3.1.1.1	3.2.6.1	4.1.1.1	4.2.1.1	4.3.2.1
A)Theoretical part												
Formulation and evaluation of parenterals.	√			√		√						
Principles of parenterals calculations.	√			√		√				√	√	
Ophthalmic preparations	√											
Ophthalmic preparations	√											
Inhalation products (Formulation and Preparation		√										
Quality control of Inhalation products.			√									
Blood products.			√					√				
Blood products applications and vaccines		√			√							
Formulation and quality control of aerosols		√					√	√	√			
Introduction about radiation and radiopharmaceutical		√					√					√
Preparation of radiopharmaceuticals		√					√					√
The application of radiation and radioactive compounds in pharmaceutics		√					√					
Mechanisms of radiopharmaceuticals localization		√			√		√					
quality control of radiopharmaceuticals		√			√		√					
course contents	**Course key elements**											

	Domain 1				Domain 2			Domain 3		Domain 4		
	1.1.1.1	1.1.3.1	1.1.7.1	1.1.9.1	2.2.5.1	2.2.4.1	2.4.1.1	3.1.1.1	3.2.6.1	4.1.1.1	4.2.1.1	4.3.2.1
B) Practical part												
Formulation of eye drops	√			√		√						
Formulation of eye ointments	√			√		√					√	
Formulation of ocular *insitu* gel	√										√	
Formulation of ocular ocuserts	√										√	
Parenteral calculations		√								√	√	
Isotonicity calculations			√							√		
Isotonicity calculations			√					√		√		
Types of aerosol		√			√				√			
Inhalation products		√					√	√	√			
Radiopharmaceutical (Generators and equipment used for the production and quality control)		√			√		√					
Radiopharmaceuticals calculations		√			√		√		√		√	
Quality control radiopharmaceuticals		√			√		√		√		√	

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

A) Theoretical part:							
Course contents	Teaching and learning methods				Assessment method		
	Advanced lecture	Hybrid based learning	Problem solving	Self-learning	Corse work/mid-term	written	oral
Formulation and evaluation of parenterals.	√				√	√	√
Principles of parenterals calculations.	√		√		√	√	√

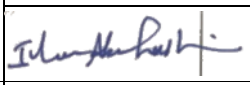
Ophthalmic preparations	√				√	√	√
Ophthalmic preparations	√				√	√	√
Inhalation products (Formulation and Preparation	√					√	√
Quality control of Inhalation products.	√					√	√
Blood products.	√	√				√	√
Blood products applications and vaccines	√					√	√
Formulation and quality control of aerosols	√		√		√	√	√
Introduction about radiation and radiopharmaceutical	√			√		√	√
Preparation of radiopharmaceuticals	√			√		√	√
The application of radiation and radioactive compounds in pharmaceutics	√					√	√
Mechanisms of radiopharmaceuticals localization	√					√	√
quality control of radiopharmaceuticals	√					√	√

B) practical part:

Course contents	Teaching and learning methods			Assessment method		
	Hybrid based learning	Lab sessions	Problem solving	Course work	Practical	written
Formulation of eye drops	√	√		√	√	
Formulation of eye ointments	√	√		√	√	
Formulation of ocular *insitu* gel	√	√		√	√	
Formulation of ocular ocuserts	√	√		√	√	
Parenteral calculations	√	√			√	

Isotonicity calculations	√	√	√		√	
Isotonicity calculations	√	√	√		√	
Types of aerosol	√	√			√	
Inhalation products	√	√			√	
Radiopharmaceutical (Generators and equipment used for the production and quality control)	√	√			√	
Radiopharmaceuticals calculations	√	√			√	
Quality control radiopharmaceuticals	√	√			√	

Approval Date: 20 /9/ 2023

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

بكالوريوس الصيدلة (فارم د – Pharm D)

Course Specification

Academic year: 2023/2024

Course name: Pharmacology-II	**اسم المقرر : فارماكولوجي-2**
Academic Level: Level 3	**المستوى الأكاديمي : الثالث**
Scientific department: Pharmacology & Toxicology	**القسم العلمي : الأدوية والسموم**
Head of Department: **Prof Dr Manar A Nader**	**رئيس القسم :** **ا.د/ منار احمد نادر**
Course Coordinator: **Dr. Rania Ramadan Abdelaziz**	**منسق المقرر :** **د/ رانيا رمضان عبد العزيز**

Course Specification
2023- 2024
Pharm D Program
Faculty of Pharmacy
Mansoura University

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

A. Basic Information: Course data:

Course Title	**Pharmacology-2**
Course Code	**PH 325**
Prerequisite	**Physiology**
Teaching credit Hours: Lecture	**2**
Teaching Credit Hours: Tutorial	**1**
Total Credit Hours	**3 (Credit H)**

B. Professional Information:

1. Course Aims:

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

Describe mechanisms of action, prototypic examples and therapeutic applications of drugs used in cardiovascular disorders.

Also, students will be aware of diverse treatments used in infections, cancers, respiratory and GIT disorder

2- Course k. elements:

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

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.4	1.1.4.1	Identify drugs' mechanism of action, therapeutic effects and assess their suitability, effectiveness, and safety in individuals and populations, using knowledge from fundamental sciences.

Domain 2: Professional and Ethical Practice

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

Domain 3: Pharmaceutical Care

Program K. element no.	Course K. element no.	Course K. element
3.1.1	3.1.1.1	Handle a dosage schedule for a patient based on the physiological, genetic, biochemical and immunological changes taken by disease or concomitant drug therapy
3.2.1	3.2.1.1	Perform principles of pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions.

Domain 4: Personal Practice:

Program K. element no.	Course K. element no.	Course K. element

4.1.2	4.1.2.1	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.
4.3.2	4.3.2.1	Use artificial technology whenever possible to present relevant information.

3- Course Contents:

A: Theoretical

Week No.	Topics	Lecture credit Hours
1	**Diuretics**	**2**
2	**Antihypertensive drugs**	**2**
3	**Antihypertensive drugs- Drugs for heart failure**	**2**
4	**Drugs for heart failure- Anti anginal drugs**	**2**
5	**Antianginal drugs**	**2**
6	**Antiplatelets- Anticoagulants**	**2**
7	**Anticoagulants- Thrombolytics**	**2**
8	**Antiarrhythmic- Antihyperlipidemic drugs**	**2**
9	**Pharmacology of GIT**	**2**
10	**Pharmacology of respiratory system**	**2**
11	**Antimicrobial drugs**	**2**
12	Antiviral drugs- Antifungal drugs	2
13	Anticancer drugs (part 1)	2
14	Anticancer drugs (part 2) (self learning)	2
15	Compensatory and alternative lecture	2

16	Revision and quiz	2
Stating from 17	Final written and oral exam	-

B. Practical Part

Week No.	Topics	Lecture credit Hours
1.	**Cardiovascular drugs affecting Electrocardiogram**	1
2.	**Drugs acting on rat cardiovascular system using cardiovascular simulator program**	1
3.	**Drugs acting on rat cardiovascular system using cardiovascular simulator program**	1
4.	**Isolated perfused heart using cardiovascular simulator program**	1
5.	**Clinical case-hypertension part 1**	1
6.	**Clinical case-hypertension part 2**	1
7.	**Clinical case-angina**	1
8	**Midterm exam**	-
9	**Clinical case-myocardial infarction**	1
10	**Clinical case –GERD**	1
11	**Clinical case-bronchial asthma**	1
12	**Clinical case-Peptic ulcer**	1
13	**COPD case (part 1)**	1
14	**COPD case (part 2)**	1
15	**Revision and activity**	**1**
16	**Practical exam**	**1**

4- Teaching and learning Methods:

	Teaching and learning Methods:	Week .No	K. elements to be addressed
4.1	Advanced lectures: Lectures using Data show, power Point presentations Brain storming Group discussion	1-16	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1
4.2	Hybrid learning: On line learning through My mans "Mansoura university "	1-16	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1
4.3	Self-learning	14	4.1.2.1 - 4.3.2.1
4.4	Practical session	1-15	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1
4.5	Case study- problem solving	5-12	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1
4.6	Collaborative learning: research project	1-12	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1

5- Student Assessment:

a. Assessment Methods:

Assessment Methods	K elements to be assessed
1-Written exam	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1
2-Practical exam applying OSPE	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1
3-Oral	1.1.4.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1
4- Periodical (Mid-term exam) / Course work	1.1.4.1 - 2.4.5.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1

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

b. Assessment schedule

c. Weighing of assessments

1	**Periodical (Mid-term) exam / Course work**	**15%**
2	**Tutorial examination**	**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	**white board- Data show- Computers-soft ware program**

7- List of References

No	Reference	Type
1.	Electronic book prepared by staff members	Course notes
2.	Recorded videos prepared by stuff members	Videos on platform
3.	Ritter J, Flower R, Henderson G, Loke YK, MacEwan D, Rang H (2020) Rang and Dale's pharmacology 9th edition Publisher: Elsevier	Book
4.	Basic and Clinical Pharmacology; Bertram Katzung, Mark von Zastrow, 9th edition (2011)	Book
	Rollins D, Blumenthal D (2021), Workbook and case book for Goodman and Gilman's pharmacological basis of therapeutics 12th edition Publisher: McGraw Hill Lange	Book
	Katzung B, Kruidering-Hall M, Tuan RL, Vander TW, Trevor A (2021). Katzung and Trevor's Pharmacology Examination and Board Review 13th edition Publisher: McGraw Hill Lange	Book

5.	http://www.sciencedirect.com / http://www.google scholar.com / http://www.pubmed.com https://www.ekb.eg	Websites

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

Theoretical Part

Course contents /	Domain 1		Domain 2	Domain 3		Domain 4	
K. elements	1.1.4.1		2.4.5.1	3.1.1.1	3.2.1.1	4.1.2.1	4.3.2.1
Diuretics	✓		✓	✓	✓		
Antihypertensive drugs	✓		✓	✓	✓		
Antihypertensive drugs- Drugs for heart failure	✓		✓	✓	✓		
Drugs for heart failure- Anti anginal drugs	✓		✓	✓	✓		
Antianginal drugs	✓		✓	✓	✓		
Antiplatelets- Anticoagulants	✓		✓	✓	✓		
Anticoagulants- Thrombolytics	✓		✓	✓	✓		

Antiarrhythmic- Antihyperlipidemic drugs	✓		✓		✓	✓	✓	✓
Pharmacology of GIT	✓		✓		✓	✓	✓	✓
Pharmacology of respiratory system	✓		✓		✓	✓	✓	✓
Antimicrobial drugs	✓		✓		✓	✓	✓	✓
Antiviral drugs- Antifungal drugs	✓		✓		✓	✓	✓	✓
Anticancer drugs (part 1)							✓	✓
Anticancer drugs (part 2) (self learning)							✓	✓

Practical Part

Course contents /	Domain 1		Domain 2	Domain 3		Domain 4	
K. elements	1.1.4.1		2.4.5.1	3.1.1.1	3.2.1.1	4.1.2.1	4.3.2.1
Cardiovascular drugs affecting Electrocardiogram	✔		✔	✔	✔		
Drugs acting on rat cardiovascular system using cardiovascular simulator program	✔		✔	✔	✔		
Drugs acting on rat cardiovascular system using cardiovascular simulator program	✔		✔	✔	✔		
Isolated perfused heart using cardiovascular simulator program	✔		✔	✔	✔		
Clinical case-hypertension	✔		✔	✔	✔	✔	✔
Clinical case-angina	✔		✔	✔	✔	✔	✔

Clinical case-myocardial infarction	✔		✔		✔	✔	✔	✔
Clinical case –GERD	✔		✔		✔	✔	✔	✔
Clinical case-bronchial asthma	✔		✔		✔	✔	✔	✔
Clinical case-Peptic ulcer	✔		✔		✔	✔	✔	✔
COPD case (part 1)	✔		✔		✔	✔	✔	✔
COPD case (part 2)	✔		✔		✔		✔	✔

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

A) Theoretical Part:										
Course Contents	Teaching and Learning Methods						Assessment methods			
	Advanced Lecture	Hybrid learning	Practical session	Case study- problem solving	Collaborative learning: research project	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Diuretics	√						√		√	√
Antihypertensive drugs	√						√		√	√

Antihypertensive drugs- Drugs for heart failure	√						√		√	√
Drugs for heart failure- Anti anginal drugs	√						√		√	√
Antianginal drugs	√								√	√
Antiplatelets- Anticoagulants	√	√							√	√
Anticoagulants- Thrombolytics	√								√	√
Antiarrhythmic- Antihyperlipidemic drugs	√								√	√
Pharmacology of GIT	√								√	√
Pharmacology of respiratory system	√								√	√
Antimicrobial drugs	√								√	√
Antiviral drugs- Antifungal drugs	√								√	√
Anticancer drugs (part 1)		√				√			√	√
Anticancer drugs (part 2) (self learning)		√				√			√	√

B) Tutorial Part:

Course Contents	Teaching and Learning Methods						Assessment methods			
	Advanced Lecture	Hybrid learning	Practical session	Case study- problem solving	Collaborative learning: research project	Self-learning	Corse Work	Practical/Tutorial	Written	Oral
Electrocardiogram		√	√					√		
Drugs acting on rat cardiovascular system using cardiovascular simulator program		√	√		√		√	√		
Drugs acting on rat cardiovascular system using cardiovascular simulator program		√	√		√		√	√		
Isolated perfused heart using cardiovascular simulator program		√	√		√		√	√		
Clinical case-hypertension		√	√	√	√		√	√		

Clinical case-angina		√	√	√	√		√	√		
Clinical case-myocardial infarction		√	√	√	√		√	√		
Clinical case –GERD		√	√	√	√		√	√		
Clinical case-bronchial asthma		√	√	√	√		√	√		
Clinical case-Peptic ulcer		√	√	√	√		√	√		
COPD case (part 1)		√	√	√	√		√	√		
COPD case (part 2)		√	√	√	√		√	√		

Course Coordinator	**Dr. Rania Ramadan Abdelaziz**
Head of Department	**Prof Dr Manar A Nader**

Date: 18/ 9 / 2023

بكالوريوس الصيدلة الإكلينيكية (فارم د - **(Pharm D**

Course Specification

Academic year: 2023-2024

Course name: Hospital Pharmacy	اسم المقرر: صيدلة المستشفيات
Academic Level: 3	المستوى الأكاديمي: الثالث
Scientific department: Clinical Pharmacy and Pharmacy Practice	القسم العلمي: الصيدلة الإكلينيكية والممارسة الصيدلية
Head of Department: **Prof. Dr. Mohamed El-Husseiny Shams**	رئيس القسم : **أ.د/محمد الحسيني شمس**
Course Coordinator: **Dr. Noha O. Mansour**	منسق المقرر: د/ نهى اسامة منصور

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)**
Academic Level	Third level, Second Semester, 2023-2024
Date of course specification approval	7th September 2023

1- Basic Information: Course data:

Course Title	**Hospital Pharmacy**
Course Code	**PP 322**
Prerequisite	**Registration**
Credit Hours: Lecture	**2**
Teaching Credit Hours: Practical/ tutorial	0
Total Credit Hours	**2 (Credit H)**

2-Course Aims:

This course familiarizes the students with organization of hospital pharmacy with its different facilities and emphasize the role of hospital pharmacist in different services (inpatient and outpatient services), transfer of care, patient's medication record, and rational medication use, hospital formulary, pharmacy and therapeutic committee, I.V. admixtures and incompatibilities, enteral and parenteral nutrition, handling of cytotoxic drugs, and risk management.

3- Course key elements:

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

Domain 1- fundamental knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	**1.1.1.1**	Recognize the organization of hospital pharmacy and role of hospital pharmacist with different hospital facilities
1.1.9	**1.1.9.1**	Manage pharmaceutical calculations within the hospital setting: nutrition calculation, infusion rates, and pediatric dose calculations.

Domain 2: professional and ethical practice

Program K. element no.	Course K. element no.	Course K. element
2.2.5	**2.2.5.1**	Compound non-sterile and sterile preparations and manage extemporaneous preparations according to international guidelines and professional practice standards.
2.3.2	**2.3.2.1**	Implement international standards for patient safety within the hospital.

Domain 3: Pharmaceutical care

Program K. element no.	Course K. element no.	Course K. element
3.2.5	**3.2.5.1**	Provide counseling to the patients and health care professionals within the hospital settings & optimize outcomes of patient care through effective implementation of formulary system
3.2.6	**3.2.6.1**	Apply principles of safe handling of hazardous drugs within the hospital setting
3.2.7	**3.2.7.1**	Report adverse drug reactions according to the international professional standards of practice.

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

4- Course Contents

Theoretical part:

Week No.	Topics	Hours
1	**Introduction to Hospital pharmacy practice** Organization of hospital pharmacy with its different facilities, the role of hospital pharmacist in different services (inpatient and outpatient services)	2
2	**In-Patient services:** ● **Compounding sterile preparations**. Types of compounding, standards, and resources, Interpreting USP terminology, USP space requirements for sterile compounding, Types of locations that can house a primary engineering control, "risk" and compounded formulations, garbing for all types of compounding	2
3	**In-Patient services:** ● **Parenteral therapy** Types of parenteral drug administration, IV incompatibilities (different types, prevention strategies) complications of parenteral drug administration (physical and therapeutic complications) and patient monitoring.	2
4	**Inpatient services:** ● **Handling of hazardous and cytotoxic drugs** Hazardous drug exposure & spill management	2
5	**Inpatient services:** ● **Handling of controlled substances** A drug or a substance, or immediate precursor, included in schedule I, II, III, IV or V	2
6	**Inpatient services: Nutrition therapy management** ● **Parenteral & enteral nutrition** Recommend a patient-specific nutrition and monitoring parameters based on nutritional needs, comorbidities, and clinical condition	2

7	**Inpatient services:** ● **Drug Distribution systems** Types of drug distribution within the hospital
8	**Inpatient and outpatient services: Drug information for hospital pharmacist** *Types of information resources, function, systematic approach to answer drug information request*
9	**Pharmacovigilance and adverse drug reactions**
10	**Inpatient services: Fluid and Electrolytes Therapy** *Recommend an appropriate IV fluid regimen and monitoring parameters given a patient clinical scenario, monitoring parameters of safe and effective use of these intravenous fluids, electrolyte abnormalities and recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms.*
11	**Inpatient and outpatient services:** ● **e-Prescribing (Electronic prescribing service)** *definition, steps and advantages of e-Prescribing*
12	**Inpatient and outpatient services:** ● **Medication errors** *Types and prevention*
13	**Inpatient and outpatient services:** ● **Patient counselling** *Steps in counseling patients regarding medication use, Important patient considerations for counseling, Concepts to discuss with patients and health care professionals*
14	**Pharmacy and therapeutics committee: Self learning** *Organization and function of Pharmacy and therapeutics committee* **Hospital Formulary:** *Management, drug evaluations monograph*
15	**Compensatory and alternative lecture**
16	**Revision and quiz**
17	**Final written and oral exam**

5- Teaching and Learning Methods:

	Teaching and Learning Methods	Weeks	K. elements to be addressed
5.1	Computer aided learning: a. Lectures using Data show, power Point presentations b. Distance learning ● Online learning through My Mans "Mansoura university "as recorded – video lectures ● Inter active discussion through My Mans	1-16	1.1.1.1, 1.1.9.1, 2.2.5.1, 2.3.2.1., 3.2.5.1, 3.2.6.1, 3.2.7.1
5.2	Self-learning	14	4.3.2.1
5.3	Class Activity: Group discussion offline and online	14	1.1.1.1, 1.1.9.1, 2.2.5.1, 2.3.2.1., 3.2.5.1, 3.2.6.1, 3.2.7.1

6- Student Assessment:

a- Assessment Methods:

1-Written exam	1.1.1.1, 1.1.9.1, 2.2.5.1, 2.3.2.1., 3.2.5.1, 3.2.6.1, 3.2.7.1
2-Oral	1.1.1.1, 2.2.5.1, 2.3.2.1., 3.2.5.1, 3.2.6.1, 3.2.7.1, 4.3.2.1
3- Periodical (Mid-term exam) / Course work	1.1.1.1, 1.1.9.1, 2.2.5.1, 3.2.5.1, 3.2.6.1

b- Assessment schedule

Assessment 1	**Periodical (Mid-term exam) / Course work**	**7-9th week**
Assessment 2	**Written exam**	**Starting from 17th week**
Assessment 3	**Oral exam**	**Starting from 17th week**

c- Weighing of assessments

1	**Periodical (Mid-term exam) / Course work**	**15%**
2	**Final-term examination**	**75%**
3	**Oral examination**	**10%**
Total		**100%**

7- Facilities required for teaching and learning

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

8- 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	1.1.9.1	2.2.5.1	2.3.2.1	3.2.5.1	3.2.6.1	3.2.7.1	4.3.2.1
Introduction to Hospital pharmacy practice	√					√	√	
In-Patient services: Parenteral therapy	√	√	√					
In-Patient services: compounding sterile preparations.	√	√	√					
Inpatient services: Handling of hazardous drugs	√			√		√		
Inpatient services: Handling of controlled drugs	√			√		√		
Inpatient services: Nutrition therapy	√	√			√			
Inpatient services: Drug Distribution systems	√							
Inpatient and outpatient services: drug information for hospital pharmacist	√						√	
Pharmacovigilance and adverse drug reactions	√						√	
in-patient services: Fluid and Electrolytes Therapy	√	√						
Inpatient and outpatient services: E prescribing	√			√	√			
Inpatient and outpatient services: Medication error	√			√	√			
Inpatient and outpatient services: • Patient counselling	√			√	√			
Pharmacy and therapeutic committee	√				√			√

Formulary management **{self-learning)**											

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

Course Contents	Teaching and learning methods					Assessment methods		
	Lecture	Online lecture	Problem solving	Case Study	Self-learning	Corse Work	Written	Oral
Introduction to Hospital pharmacy practice	√	√				√	√	√
In-Patient services: Parenteral therapy	√	√		√		√	√	√
In-Patient services: compounding sterile preparations.	√	√				√	√	√
Inpatient services: Handling of hazardous drugs	√	√				√	√	√
Inpatient services: Handling of controlled drugs	√	√				√	√	

Inpatient services: Nutrition therapy	√	√	√	√			√	√
Inpatient services: Drug Distribution systems	√	√					√	√
Inpatient and outpatient services: drug information for hospital pharmacist	√	√					√	√
Pharmacovigilance and adverse drug reactions	√	√					√	√
In-patient services: Fluid and Electrolytes Therapy	√	√	√	√			√	√
Inpatient and outpatient services: E prescribing	√	√					√	√
Inpatient and outpatient services: Medication error	√	√					√	√
Inpatient and outpatient services: Patient counselling	√	√		√			√	√
Pharmacy and therapeutic committee Formulary management {self-learning)	√	√			√		√	√

9- 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	Karen Shapiro; Chelsea Bombatch; Stephanie D Garrett; Angie Veverka, 2022 NAPLEX Course Book.	Essential Book
4	• https://www.ekb.eg/. • https://go.wolterskluwer.com/lexicomp-drug-references-int-b.html?utm_source=google&utm_medium=cpc&utm_campaign=ALL_Lexicomp_INT_Brand&utm_content=001-ETA-Brand_Exact&utm_term=lexicomp&gclid=CjwKCAjwhuCKBhADEiwA1HegOa3V40mlNyAwkxXqqD-MhuJqRWNSUDOi7AlREiUFqTghXadDjRSaGBoC2GcQAvD_BwE • https://accesspharmacy.mhmedical.com/ • https://www.usp.org/compounding/general-chapter-797	Websites

Course Coordinator	**Dr. Noha O. Mansour** Noha Osama
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