Level 3

Semester (5)

Course code	Course Title
PA 315	Instrumental and Applied Analysis
PO 315	Spectroscopic Identification
PG 315	Phytochemistry (1)
PT 315	Pharmaceutical Dosage Forms (2)
PH 314	Pharmacology (1)
PB 312	Biochemistry (2)

Semester (6)

Course code	Course Title
PG 326	Phytochemistry (2)
PP 324	Drug Information
PP 325	Hospital Pharmacy
PH 325	Pharmacology (2)
PM 321	Pharmaceutical Microbiology
PM 322	Parasitology

Third Level

Course Specification Instrumental and Applied Analysis

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutical Analytical Chemistry
Course title: **Instrumental and Applied Analysis**
Course code: PA315

Program on which the course is given	**B. Pharm**
Academic Level	Third Level, First semester, 2023-2024
Date of course specification approval	10/09/2023

1. Basic Information: Course data:

Course title:	**Instrumental and Applied Analysis**	**Code: PA315**
Specialization:	**Pharmaceutical**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture:2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

Give the principle of instrumental and applied analytical methods, including chromatographic methods, electrochemical analysis, capillary electrophoresis and mass spectrometry. Cover the application of these methods to pharmaceutical compounds.

3. Course k. elements:

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

Domain 1- Fundamental Knowledge

Program K. elements no	Course K. elements no	Course K. elements

(1.1.1)	(1.1.1.1)	**Clarify the theory and principles of Spectroscopy, Atomic absorption and Chromatography.**
(1.1.3)	(1.1.3.1)	**Combine the principles of different analytical techniques using instruments for the estimation of pharmaceutical compounds.**

Domain 2: Professional and Ethical Practice

Program K. elements no	Course K. elements no	Course K. elements
(2.2.1)	(2.2.1.1)	**Select and apply spectroscopic analytical methods or chromatographic methods to analyze pharmaceutical materials .**
(2.2.3)	(2.2.3.1)	**Demonstrate the principles of various analytical instruments used for the analysis of different raw materials .**
(2.2.4)	(2.2.4.1)	**Explain the principles of pharmaceutical calculations and their applications to pharmaceutical and environmental analysis.**
(2.3.1)	(2.3.1.1)	**Select appropriate methods for handling and disposal of materials used in pharmaceutical analysis.**
(2.3.2)	(2.3.2.1)	**Adapt ethical and legal and safety guidelines for handling and disposal of biologicals and pharmaceutical materials or products**
(2.5.1)	(2.5.1.1)	Adapt national and international standards for authorization of medicinal products including quality, safety and efficacy requirements

Domain 4: Personal Practice:

Program K. elements no	Course K. elements no	Course K. elements
(4.1.1)	(4.1.1.1)	**Demonstrate responsibility for team performance and beer evaluation of other team members and express time management skill**

(4.1.2)	(4.1.2.1)	**Retrieve and analyze information to solve problems, and work individually or effectively in a team.**
(4.2.2)	(4.2.2.1)	**Apply contemporary technologies to demonstrate effective presentation skills**
(4.3.1)	(4.3.1.1)	**Apply effective strategies to manage and improve self-practice of pharmacy**
(4.3.2)	(4.3.2.1)	**Practice self-learning needed to improve professional skills**

4. Contents:

Week No	Topics	No.of hours	Lecture credit hours	Practical credit hours
1.	Introduction to chromatography, PC, TLC	2	2 hours	
2.	HPLC, instrumentation and applications.	2	2 hours	
3.	GC, instrumentation and applications	2	2 hours	
4.	Capillary electrophoresis.	2	2 hours	
5.	Potentiometry principles and instrumentation	2	2 hours	
6.	Potentiometric titration and its pharmaceutical applications.	2	2 hours	
7.	Potentiometric titration and its pharmaceutical applications, cont.	2	2 hours	
8.	Introduction of polarography	2	2 hours	
9.	Polarography instrumentation	2	2 hours	
10.	Applications of polarography.	2	2 hours	
11.	Conductometry principles	2	2 hours	
12	Conductometry instrumentation	2	2 hours	
13	Conductometry applications	2	2 hours	
14	Revision and quiz	2	2 hours	

15	Final written & oral exam			
	Practical topics			
Week No	Topics	No.of hours	Lecture credit hours	Practical credit hours
1	Water acidity and water alkalinity.	2		1 hour
2	Water hardness: EDTA method	2		1 hour
3	Water hardness: Soda reagent method	2		1 hour
4	Determination of chloride content in water	2		1 hour
5	Determination of chlorine content in water	2		1 hour
6	Determination of cupper content in water	2		1 hour
7	Determination of oxygen absorbed from KMnO4	2		1 hour
8.	Periodical Exam.			
9.	Potentiometric titration of HCl, NaOH	2		1 hour
10.	Paper chromatography, Thin layer chromatography,	2		1 hour
11	-HPLC demonstration.	2		1 hour
12	Interpretation of chromatograms	2		1 hour
13	Problem on Interpretation of chromatograms	2		1 hour
14	Final practical exam	2		1 hour

5. Teaching and learning Methods:

5.1	Lectures using Data show, PowerPoint presentations
5.2	Laboratory equipment such as HPLC, TLC plates, potentiometer and glassware.
5.3	Online learning through my mans (Mansoura University) as recorded video lectures

5.4	Interactive discussion through My Mans.
5.5	Self-learning
5.6	Tutorial

6. Student Assessment:

a- Assessment methods

1. Written exam	1.1.1.1, 1.1.3.1, 2.2.1.1, 2.2.3.1, 2.2.4.1
2. Practical exam	2.2.1.1, 2.2.3.1, 2.2.4.1, 2.3.1.1, 2.3.2.1, 2.5.1.1
3. Oral exam	4.1.2.1, 1.1.1.1, 1.1.3.1, 2.2.1.1, 2.2.3.1, 2.2.4.1
4. Periodical exam	1.1.1.1, 1.1.3.1, 2.2.1.1, 2.2.3.1, 2.2.4.1

b- Assessment schedule

Assessment 1	Practical	14th week
Assessment 2	Periodical exam	8thweek
Assessment 3	Oral	15thweek
Assessment 4	Written	15thweek

c- Weighting of assessments

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

7. List of References

No	Reference	Type
1.	Practical course notes prepared by the department staff members	Course notes
2.	Lecture notes and practical course notes prepared by the department staff members.	Course notes

3.	Fundamentals of Analytical Chemistry , Douglas A.; Skoog; Donald M., West, F.James Holler, Stanely, R.Crouch Thomson, Australia 8th ed. (2004).	**Book**
4.	Quantitative Chemical Analysis, Daniel C. Harris, 6th ed., W.H. Freeman and Company, New York (2003).	**Book**
5.	Vogel,s Textbook of Quanitative chemical Analysis, J. Mendham, M.A, MSc, C. Chem, M. RSC, 6th ed., India (2004).	**Book**
6.	Pharmaceutical Analytical Chemistry, Quantitative Analysis, Amer, M.M. Faculty of Pharmacy, Cairo University.	**Book**
7.	Practical Pharmaceutical Chemistry, par II, Beckett, A. H. and Stenlake, J. B. 4th ed., Cambridge, England (2001)	**Book**
8.	Instrumental Methods of Chemical Analysis, Galan W. Ewing, 5th ed. McGraw-hill book company, New York (1995).	**Books**
9.	Principles of Instrumrntal Analysis, Skoog, D. A. Holler, F. J. and Crouch, S.R. 6th ed., Thomson, Belmont, USA (2007)	**Books**

8. Matrix of knowledge and skills of the course

Course contents	Study Week		Course Key Elements											
		Domain: 1		Domain: 2						Domain: 4				
		1.1.1.1	1.1.3.1	2.2.1.1	2.2.3.1	2.2.4.1	2.3.1.1	2.3.2.1	2.5.1	4.1.1.1	4.1.2.1	4.2.2.1	4.3.1.1	4.3.2.1

Introduction to chromatography, PC, TLC	1	√	√	√	√	√	√	√	√	√	√			
HPLC, instrumentation and applications.	2		√		√					√		√	√	
GC, instrumentation and applications	3		√			√	√	√	√		√	√	√	
Capillary electrophoresis.	4	√	√	√						√	√	√	√	
Potentiometry principles and instrumentation	5	√	√											
Potentiometric titration and its pharmaceutical applications.	6	√	√								√	√	√	
Potentiometric titration and its pharmaceutical applications, cont.	7	√	√	√	√	√	√	√	√	√	√	√	√	
Introduction of polarography	8	√	√	√	√	√	√	√		√	√	√	√	
Polarography instrumentation	9	√	√	√	√	√	√	√		√	√	√	√	
Applications of polarography.	10	√	√								√	√	√	
Conductometry principles	11	√	√								√	√	√	
Conductometry instrumentation	12	√	√	√	√	√	√	√		√	√	√	√	
Conductometry applications	13	√	√								√	√	√	√
Revision and quiz	14										√	√	√	√

Course Coordinator:	**Prof. Dr. Amina El Brashy**
Head of Department:	**Prof. Dr. Jenny Jeehan Nasr**

Third Level

Course Specification
Spectroscopic Identification

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutical Organic Chemistry
Course title: Spectroscopic Identification
Course code: PO 315

Program on which the course is given	B. Pharm
Academic Level	Third Level, First semester
Date of course specification approval	20/9/2023

2. Basic Information: Course data:

Course title:	**Spectroscopic Identification**	**Code: PO 315**
Specialization:	**Basic Sciences**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 1**	**Practical: 1**
Number of units: (credit hours)	**2**	

2. Course Aims:

2.1. Enable students to understand the basic principles of spectroscopy.
2.2. Teach the students how to identify the structural skeleton of a chemical compounds.
2.3. Recognize and elucidate the functional groups in the organic and natural molecules.
2.4. Teach the students how to apply the different methods of spectroscopic devices inn determination the entity of chemical compounds and drugs.

3- Course k. elements:

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

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

Program K. element no	Course K. element no	Course K. element
1.1.1	1.1.1.1	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.Contents:

Week No	Topics	No. of hours	Lecture credit hours
Theoretical Topics			
1.	Ultraviolet-visible spectroscopy Introduction	1	1 hours
2.	Infrared spectroscopy	1	1 hours
3.	Infrared spectroscopy	1	1 hours
4.	Raman Spectroscopy	1	1 hours
5.	Nuclear Magnetic Resonance spectroscopy - 1H-NMR	1	1 hours
6.	Nuclear Magnetic Resonance spectroscopy - 1H-NMR (cont.)	1	1 hours
7.	Nuclear Magnetic Resonance spectroscopy - 13C-NMR	1	1 hours
8.	Mass Spectroscopy and types of fragmentation	1	1 hours
9-10	Mass Spectroscopy and types of fragmentation (cont.)	2	2 hours
11-12	Nuclear Magnetic Resonance spectroscopy – 2D	2	2 hours
13.	Deduction of chemical structure using spectroscopic data	1	1 hours
14.	General Problems for structure determination	1	1 hours

15.	**Final written & oral**		
Practical topics			
Week No	Topics	**No. of hours**	**Practical credit hours**
1.	Index of Hydrogen deficiency and Molecular formula calculations	2	1 hour
2.	UV spectroscopy	2	1 hour
3.	IR spectroscopy	2	1 hour
4.	IR spectroscopy (cont.)	2	1 hour
5.	1H NMR	2	1 hour
6.	1H NMR continue	2	1 hour
7.	13C NMR	2	1 hour
8.	Periodical Exam		
9.	13C NMR (cont.)	2	1 hour
10.	13C NMR (cont.)	2	1 hour
11.	Mass Spectrometry	2	1 hour
12	Mass Spectrometry (cont.)	2	1 hour
13	Revision (problems)	2	1 hour
14.	**Practical Exam**	2	1 hour

5. Teaching and learning Methods:

5.1	**Computer aided learning:** **a. On line learning through my mans "Mansoura university "as recorded – video lectures** **b. Inter active discussion through My Mans** **c. power point presentation**
5.2	**Self-learning**
5.3	**Computer aided learning: Group discussion**
5.4	**Problem – based learning and brainstorming**
5.5	**Practical session using laboratory equipment (Microscopes and glass wares), and tutorials**

6. Student Assessment:

a-Assessment methods

1. Written exam	To assess understanding, intellectual and professional skills
2. Practical exam	To assess professional and practical skills
3. Oral exam	To assess knowledge, understanding, intellectual skills, general skills and confidence

b-Assessment schedule

Assessment 1	Practical	14th week
Assessment 2	Periodical	8thweek
Assessment 3	Oral	Start from 15thweek
Assessment 4	Written	Start from 15thweek

c-Weighting of assessments

1.	Periodical examination	10%
2.	Final-term examination	50%
3.	Oral examination	15%
4.	Practical examination	25%
Total		100%

7. List of References

No	Reference	Type
1.	Practical course notes prepared by the department staff members	Course notes
2.	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.	
3.	Introduction to Spectroscopy, 5th Edition, Donald L. Pavia, 2015.	Book
4.	Spectrometric Identification of Organic Compounds 7th Edition by Robert M. Silverstein	Book
5.	SDBS Spectral Database for Organic Compounds	Website

8. Matrix of knowledge and skills of the course

Course contents	Study Week	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
Ultraviolet-visible spectroscopy Introduction	1.	√				√	√	√			
Infrared spectroscopy	2.	√	√			√	√	√			
Infrared spectroscopy	3.	√	√			√	√	√	√	√	
Raman Spectroscopy	4.	√				√	√		√	√	
Nuclear Magnetic Resonance spectroscopy - 1H-NMR	5.	√	√			√	√		√	√	
Nuclear Magnetic Resonance spectroscopy - 1H-NMR (cont.)	6.	√	√						√	√	√
Nuclear Magnetic	7.	√	√						√	√	√

Resonance spectroscopy - 13C-NMR											
Mass Spectroscopy and types of fragmentation	**8.**	√	√			√	√		√	√	√
Mass Spectroscopy and types of fragmentation (cont.)	**9-10**	√	√	√	√	√	√	√	√	√	√
Nuclear Magnetic Resonance spectroscopy – 2D	**11-12**	√	√	√	√	√	√	√	√	√	√
Deduction of chemical structure using spectroscopic data	**13**	√	√	√	√	√	√	√	√	√	√
General Problems for structure determination	**14.**	√	√	√	√	√	√	√	√	√	√

Course Coordinator:	**Walaa M.Elhusseieny**
Head of Department:	**Shahenda Metwally EL-Messery**

Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Credit Hours Program
Course Specification
2023- 2024

المستوى الثالث

توصيف مقرر Phytochemistry-1

University: **Mansoura University** **(MU)**
Faculty : **Pharmacy**
Department : **Pharmacognosy**
Course title: **Phytochemistry-1**
Course Code : **PG 315**

Program on which the course is given	B. Pharm
Academic Level	THird Level, First semester
Date of course specification approval	9/2023

1- Basic Information : Course data :

Course title:	Phytochemistry-1	**Code: PG**315	
Specialization:	**pharmaceutical sciences**		
Prerequisite:	**Pharmaceutical Organic Chemistry (1)**		
Teaching Hours:	**Lecture: 2**	**Practical: 1**	
Number of units: (credit hours)	**3**		

2- Course Aims:

1. Gain valuable knowledge about the chemistry of carbohydrates , glycosides, tannins and natural toxins
2. Master the different methods of isolation and characterization of naturally occurring compounds as carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological potential.
3. Gain understanding of qualitative and quantitative estimation methods of carbohydrates, glycosides and tannins

3- Course k. elements:

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

key elements

Domain 1- Fundamental Knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	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 anti-oxidants drugs as well as their medicinal uses.

Domain 2: Professional and Ethical Practice

Program K. element no.	Course K. element no.	Course K. element
2.2.1	2.2.1.1	Manipulate the 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 K. element no.	Course K. element no.	Course K. element

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

4- Contents :-

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1.	**Introduction to carbohydrates**	2	2	
2.	Classification, separation , purification, qualitative and quantitative evaluation and medicinal uses of: **monosaccharides**	2	2	
3.	Classification, separation , purification, qualitative and quantitative evaluation and medicinal uses of: **disaccharides**	2	2	
4-5	Separation , purification, qualitative identification and medicinal uses of homo-polysaccharides, hetero polysaccharides and **polysaccharide** containing amino-sugar units	4	4	
6	**Introduction to glycosides**	2	2	
7	**Phenolic glycosides**: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	2	2	
8	**Phenolic and Terpenoid glycosides**: separation, purification, identification, quantitative and quantitative	2	2	

	evaluation and their medicinal uses.			
9	**Tannins**: Introduction, classification	2	2	
10	**Tannins**: study of different classes	2	2	
11	**Tannins**: study of biological activities	2	2	
12	**Natural toxins**	2	2	
13	**Bitter principles**	2	2	
14	Revision & Quiz	2	2	
15	**Week 15 Final written & oral**			
	Practical topics			
1	Qualitative identification of carbohydrates (Monosaccharide, Disaccharides)	2		1
2	Qualitative identification of carbohydrates (Polysaccharides)	2		1
3	General scheme for carbohydrate, and unknowns	2		1
4	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose (Copper reduction and enzymatic methods)	2		1
5	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and fructose mixture (Copper reduction and iodimertric method)	2		1
6	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and Sucrose mixture (Direct copper reduction and copper reduction method after hydrolysis)	2		1

	Assay of glucose and maltose mixture			
7	Qualitative identification of glycosides: (Anthraquinones)	2		1
8	**Week 8 Mid-term**			
9	Qualitative identification of glycosides: (Cyanogen and Flavonoids)	2		1
10	Preliminary phytochemical screening of unknown drugs	2		1
11	Quantitative estimation of glycosides	2		1
12	(Colorimetric estimation of digitalis glycosides by Baljet's reagent)	2		1
13	**Revision & Sheet**	2		1
14	**Week 14 Practical exam**			

5- Teaching and learning Methods:

5.1	**Computer aided learning:** **a. On line learning through my mans "Mansoura university "as recorded – video lectures** **b. Inter active discussion through My Mans**
5.2	**Practical session using laboratory equipment (microscope and glass wares)**
5.3	**Research assignments**
5.4	**Case study**
5.5	**Discussion session**

6- Student Assessment:

a- Assessment methods:

1-Written exam	**To assess understanding, intellectual, professional**
2-Practical exam	**To assess professional and practical skills**
3-Oral	**To assess Knowledge, understanding, intellectual skills, general skills and confidence**

4-Quizzes	To assess Knowledge, understanding and intellectual skills
5-Case study	To assess the skills of problem-solving and date presentation

b- Assessment schedule

Assessment 1	Periodical exam	8th week
Assessment 2	Practical exam	14th week
Assessment 3	Oral exam	15th week
Assessment 4	Written exam	15th week

c- Weighting of assessments

1	Mid-term examination	10 %
2	Final-term examination	50 %
3	Oral examination	15 %
4	Practical examination & Semester work	25 %
5	Other types of assessment	0
Total		100%

7 - List of References

N0.	Reference	type
1	Evans, W.C "Trease and Evans". "Pharmacognosy" 15th edition, 2012	Book
2	Torssell B. G "Natural Product Chemistry, A Mechanistic, Biosynthetic and Ecological Approach", 2019	Book
3	Dewick P. M."Medicinal Natural Products, a Biosynthetic Approach", 3rd edition John Wiley & sons, 2019	Book
4	Lectures notes prepared by staff members	Course notes

8- Matrix of knowledge and skills of the course

Course contents	Study Week	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	1	√	√	√	√						
Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of: **monosaccharides**	2	√	√	√	√						
Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of:	3	√	√	√	√		√				

disaccharides											
Separation, purification, qualitative identification and medicinal uses of homo-polysaccharides, hetero polysaccharides and **polysaccharide** containing amino-sugar units	**4-5**	√	√	√		√		√			
Introduction to glycosides	**6**		√	√	√	√		√			
Phenolic glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	**7**	√	√	√	√	√	√			√	

Phenolic and Terpenoid glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	**8**	√	√	√	√	√	√				√
Tannins: Introduction, classification	**9**	√	√	√	√	√	√		√		
Tannins: study of different classes	**10**		√	√	√	√		√		√	√
Tannins: study of biological activities	**11**	√	√	√	√	√	√	√	√	√	√
Natural toxins	**12**	√	√	√	√	√	√	√	√	√	√
Bitter principles	**13**	√	√	√	√	√	√	√	√	√	√
Revision & Quiz	**14**	√	√	√	√	√	√	√	√	√	√

Course Coordinator:	**Prof. Dr. Weaam Nabil Ebrahim**

Head of Department	**Prof. Mahmoud Fahmi Elsebai**

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutics
Course title: **Pharmaceutical Dosage Forms (2)**
Course code: PT 315

Program on which the course is given	B. Pharm
Academic Level	Level three, First semester 2023/2024
Date of course specification approval	20th september 2023

1.Basic Information: Course data:

Course title:	**Pharmaceutical Dosage Forms (2)**	**Code: PT 315**
Specialization:	**Pharmaceutical**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

2.1. Orienting the students to the basic principles and techniques of compounding and dispensing different pharmaceutical dosage forms.
2.2. Recognizing different methods for preparation and evaluation of pharmaceutical dosage forms such as topical preparations, semisolid preparations, parenteral, ophthalmic, aerosols preparations and different cosmetic preparations as well as their applications.

3. Course k. elements:

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

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

Program K. element no.	Course K. element no.	Course K. element
1.1.1	**1.1.1.1**	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.

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 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.

4. Contents:

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1	sterile products	2	2	
2	Parenteral preparations.	2	2	
3	Ophthalmic preparations.	2	2	
4	anatomy and physiology of skin	2	2	
5	skin care products	2	2	
6	hair care products	2	2	
7	Cosmetic preparations.	2	2	
8	Pharmaceutical aerosols theory	2	2	
9	Pharmaceutical aerosols mechanism	2	2	
10	Pharmaceutical aerosols application	2	2	
11	Topical semi -solid preparations structure and function	2	2	
12	Topical semi -solid preparations ointment	2	2	

13	Topical semi -solid preparations creams and self learning	2	2	
14	revision and quiz	2	2	
15	final written exam			
Practical topics				
Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1	Cold Cream	2		1
2	Cleansing Cream	2		1
3	Vanishing Cream	2		1
4	brush Shaving Cream	2		1
5	brushless Shaving Cream	2		1
6	Sunscreen Cream	2		1
7	acne vulgaris cream	2		1
8	Mid-term Exam	------		------
9	Ointment	2		1
10	Sulphur ointment	2		1
11	Shampoo	2		1
12	Stick	2		1
13	Tooth Paste	2		1
14	Practical Exam	—----		—--------

5. Teaching and learning Methods:

5.1	Computer aided learning: a. On line learning through My mans "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans

	c. Lectures using Data show, PowerPoint presentations
5.2	Self-learning
5.3	Formative Assignments
5.4	Tutorial

6. Student Assessment:

a. Assessment methods

1. Mid Term exam	1.1.1.1, 1.1.3.1, 2.2.4.1
2. Practical exam	2.2.4.1, 4.2.1.1, 4.3.2.1
3. Final Written exam	1.1.1.1, 1.1.3.1, 2.2.4.1

b. Assessment schedule

Assessment 1	Practical	14th week
Assessment 2	Mid-term	8th week
Assessment 3	Oral	15th week
Assessment 4	Written	15 th week

c. Weighting of assessments

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

7. List of References

No.	Reference	type
1	Theoretical course Notes “Pharmaceutical Dosage Forms 2” prepared by staff members	Course notes
2	British pharmacopoeia, Vol., I, 2017th Ed., The stationery office, London, U.K., (2017)	Book
3	Handbook of pharmaceutical Manufacturing Formulations second Ed.,, Sarfaraz K. Niazi (2013)	Book
4	"Remington's: The science and practice of pharmacy" 23rd Ed., Lippincott Williams and Wilkins, Philadelphia, (2020)	Book
5	"Ansel's: Pharmaceutical Dosage Forms and drug delivery Systems" 11th Ed., Wolters Kluwer, Lippincott Williams and Wilkins, Philadelphia, (2017)	book
6	http://www.google.com	Website
7	http://www.pubmed.com	Website

8. Matrix of knowledge and skills of the course

Course contents	Study Week	Course Key Elements				
		Domain: 1		Domain: 2	Domain: 4	
		1.1.1.1	1.1.3.1	2.2.4.1	4.1.2.1	4.3.2.1
sterile products	1	√	√	√		
Parenteral preparations.	2	√	√	√		
Ophthalmic preparations.	3	√	√	√		
anatomy and physiology of skin	4	√	√	√		
skin care products	5	√	√	√		
hair care products	6	√	√	√		
Cosmetic preparations.	7	√	√	√		
Pharmaceutical aerosols theory	8	√	√	√	√	√
Pharmaceutical aerosols mechanism	9	√	√	√	√	√
Pharmaceutical aerosols application	10	√	√	√	√	√
Topical semi -solid preparations structure and function	11	√	√	√	√	√
Topical semi -solid preparations ointment	12	√	√	√	√	√
Topical semi -solid preparations creams	13	√	√	√	√	√

Course Coordinator:	**Prof Dr/ Osama Abd-El Azeem Soliman**
Head of Department:	**Prof Dr. Irhan Ibrahim Abu Hashim**

20/9/2023

Third Level

Course Specification: Pharmacology1

University: Mansoura University (MU)

Faculty: Pharmacy

Department: Pharmacology and toxicology

Course title: **Pharmacology1**

Course code: **PH 314**

Program on which the course is given	B. Pharm
Academic Level	Third Level, First semester
Date of course specification approval	September 2023

2. Basic Information: Course data:

Course title:	**Pharmacology1**	**Code: PH 314**
Specialization:	**Pharmaceutical**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

1. 1. Provide knowledge and understanding of the basic principles of pharmacology (pharmacokinetics and pharmacodynamics).

2. 2. Introduce concepts of drug action at cell, tissue and system levels.
3. 3. Provide fundamental pharmacological knowledge of the principles of drug action.
4. 4. Provide comprehensive coverage of the major drug groups affecting different body systems; autonomic nervous system, respiratory system and gastrointestinal system and autacoids

3. Course K. elements:

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**	**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 their suitability, effectiveness, and safety in individuals and populations, using knowledge from fundamental sciences.

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

(2.1.3)	**2.1.3.1**	Assess suitable professional limits and take responsibility and accountability within healthcare 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

(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, and clinical 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

(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.

4. Contents:

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1-3	introduction of pharmacology	6	6	
4-6	Pharmacology of Autonomic nervous system	6	6	
7-9	Pharmacology of Autonomic nervous system	6	6	
10-11	Pharmacology of respiratory tract	4	4	
12-13	Pharmacology of Autacoids	4	4	

14	Revision and quiz	2	2	
15	Final written and oral exams	-	-	

Practical topics				
Week No	**Topics**	**No. of hours**	**Lecture credit hours**	**Practical credit hours**
1.	Searching Internet	2		1
2	Handling of Experimental animals & Routes of drug administration	2		1
3	Drug metabolism	2		1
4	Techniques used in experimental research in pharmacology	2		1
5	Pharmacology of autonomic drugs affecting the eye	2		1
6	Clinical cases on glaucoma Anaphylactic shock	2		1
7	Pharmacology of autonomic drugs affecting the GIT	2		1
8	Mid term exam	-		-
9-10	Effect of Autonomic drugs on Rat Cardiovascular System (Heart rate and Blood pressure)	4		2
11-13	Investigation of effect of histamine on Rat Cardiovascular System (Heart rate and Blood pressure)	6		3
14	Practical Exam			

5. Teaching and learning Methods:

5.1	**Computer aided learning:** **a. On line learning through My mans "Mansoura university "as recorded – video lectures** **b. Inter active discussion through My Mans** **c. Lectures using Data show, PowerPoint presentations**
5.2	**Self-learning**
5.3	**Formative Assignments**
5.4	**Tutorial**

6. Student Assessment:

1. Assessment methods

Assessment Methods	K elements to be assessed
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, 4.1.1.1, 4.1.2.1, 4.2.1.1
2-Practical exam applying OSPE	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
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- Periodical (Mid-term 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, 4.1.1.1, 4.1.2.1, 4.2.1.1

2. Assessment schedule

Assessment 1	**Practical**	**14th week**
Assessment 2	**Mid-term**	**8th week**
Assessment 3	**Oral**	**15th week**
Assessment 4	**Written**	**15th week**

3. Weighting of assessments

1.	**Mid-term examination**	**10 %**
2.	**Final-term examination**	**50 %**
3.	**Oral examination**	**15 %**
4.	**Practical examination and Semester work**	**25 %**

Total	**100 %**

7. List of References

N0.	Reference	type
1	Tutorial pharmacology 1	Course notes
2	Lippincott's Pharmacology; illustrated review 6th edition(2015)	Books
3	PubMed, Medscape.....	Websites

8. Matrix of knowledge and skills of the course

Course contents	Study Wee	Course Key Elements									
		Domain: 1		Domain: 2		Domain: 3			Domain: 4		
		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.

	k	1	1	1	2	1	1	1	1	1	1
introduction of pharmacology	1-3	√		√	√	√	√	√	√	√	
Pharmacology of Autonomic nervous system	4-6	√		√	√						
Pharmacology of Autonomic nervous system	7-9	√		√		√			√	√	√
Pharmacology of respiratory tract	10-11	√	√	√	√	√	√	√	√		
Pharmacology of Autacoids	12-13	√	√	√	√	√	√	√	√		
Revision	14	√	√	√	√	√	√	√	√	√	√

Course Coordinator:	**Dr. Marwa Salah El-dein**
Head of Department:	**Prof. Dr. Manar A. Nader**

بكالوريوس الصيدلة

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

University	Mansoura
Faculty	Pharmacy
Department offering the course	Biochemistry
Department supervising the course	Biochemistry
Program on which the course is given	Bachelor in Pharmacy
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-312
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/quiz	2
15	**Start of Final written and oral exam**	-

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

4- Teaching and Learning Methods:

No	Teaching and Learning Methods	Week
4.1	Computer aided learning: a. On line learning through my mans "Mansoura university "as recorded video lectures b. Inter active discussion through My Mans.	1-14
4.2	Computer aided learning- Group Discussion	1-13
4.3	Practical sessions using Laboratory equipment, Data show & PowerPoint presentation or whiteboard	1-13
4.4	Self-learning	13
4.5	Case study	4,5,6
4.6	Presentation	2-9

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	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 exam)	1.1.1.1, 1.1.6.1,4.1.2.1, 4.2.1.1, 4.2.2.1

b- Assessment Schedule

Assessment 1	Periodical (Mid-term exam)	8th week
Assessment 2	Practical exam	14th week
Assessment 3	Written exam	15th week
Assessment 4	Oral exam	15th week

c. Weighing of assessments

1	Periodical (Mid-term) exam	10%
2	Practical exam	25%
3	Final-term written examination	50%
4	Oral examination	15%
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:

Course contents and course key elements

Study Week	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
1	Carbohydrates: introduction to metabolism, digestion and absorption of carbohydrates. Glycolysis and Regulation of glycolysis.	√	√					√								
2	Kreb's cycle and Glycogen metabolism.	√						√								
3,4	HMP shunt and Uronic acid pathway, Monosaccahrides inter-conversion, Glycogen metabolism, and gluconeogenesis.	√	√					√			√	√				

5	Digestion and absorption of lipids, Neutral fat metabolism and β-oxidation.	√	√					√			√	√		√		
6	Fatty acid synthesis	√	√					√			√	√		√		
7	ketogenesis, ketolysis, and Phospholipids metabolism.															
8	Cholesterol and Sphingomyelins metabolism.	√	√	√				√			√	√	√	√		
9	Protein metabolism, Protein digestion and absorption	√	√	√				√			√	√	√	√		
10	General reactions of amino acids and urea cycle.	√	√					√				√				
11,12	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															
13	Biological oxidation, Respiratory chain	√	√	√								√		√	√	√
Practical topics																
1	Lab safety		√		√		√			√		√				
2,3	Chemical analysis for biological fluids; Urine analysis / Urine report		√	√	√		√	√		√		√				
4,5	Urine report/ Infection Control Principles		√	√	√		√	√		√		√		√	√	√

6,7,9	Colorimetric assay (Glucose in urine and serum)/ colorimetric assay of Liver Function Tests (serum albumin and total protein levels)	√	√		√		√		√		√	√		√		√
10,11	colorimetric assay of Renal Function Tests (creatinine, urea and uric acid levels)	√	√		√		√		√		√	√		√		√
12	Colorimetric assay Cholesterol blood level	√	√		√		√		√		√	√		√	√	
13	Revision	√			√		√				√	√		√		√

Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Course Specification
Credit Hours Program
2023- 2024

Course Coordinator	**Prof. Dr. Laila A. Eissa**
	
Head of Department	**Dr. Noha M.H. Abdel- Rahman**
	

Date: 16/9/2023

Mansoura University
Faculty of Pharmacy
Quality Assurance Unit
Credit Hours Program
Course Specification
2023- 2024

المستوى الثالث

توصيف مقرر2-Phytochemistry

University: Mansoura University (MU)
Faculty : Pharmacy
Department : Pharmacognosy
Course title: Phytochemistry-2
Course code: PG 326

Program on which the course is given	B. Pharm
Academic Level	Third Level, Second semester
Date of course specification approval	9/2023

1- Basic Information : Course data :

Course title:	Phytochemistry-2	**Code:** PG326	
Specialization:	**pharmaceutical sciences**		
Prerequisite:	**Pharmaceutical Organic chemistry-1**		
Teaching Hours:	**Lecture:** 2	**Practical:** 1	
Number of units: (credit hours)	**3**		

2- Course Aims:

At the end of the course, the student will be able to identify the different chemical classes of alkaloids, volatile oil constituents and bitter principles, describe the appropriate methods for their qualitative identification and quantitative estimation, and recognize their pharmaceutical importance.

3- Course k. elements:

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

Domain 1- Fundamental Knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.1	1.1.1.1	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

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

Program K. element no.	Course K. element no.	Course K. element
4.1.2	4.1.2.1	Retrieve and evaluate information, solve problems, and work effectively in a team.

4.2.1	4.2.1.1	Communicate effectively in a scientific language by verbal and written means in the field of health care and natural pharmaceutical preparations regarding the studied topics.
4.3.2	4.3.2.1	Practice independent learning to promote continuous professional development.

4- Contents :-

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1.	**Volatile oils:** Introduction & Preparation	2	2	
2.	**Volatile oils: (**Terpene hydrocarbons**)**	2	2	
3.	**Volatile oils:** (Oxygenated hydrocarbons	2	2	
4.	**Volatile oils:**(Oxygenated, Sulfur & nitrogen comp)	2	2	
5	**Alkaloids:** (Introduction)	2	2	
6	**Alkaloids**:(Non-heterocyclic: Phenylalkylamine and Heterocyclic: Pyridine)	2	2	
7	**Alkaloids**: (Iso-quinoline)	2	2	
8	**Alkaloids**: (Opium)	2	2	
9	**Alkaloids**: (Phenanthrene)	2	2	
10	**Alkaloids**:(Heterocyclic: Tropane**)**	2	2	
11	**Alkaloids**:(Heterocyclic: Indole**)**	2	2	
12	**Alkaloids**:(Quinine)	2	2	
13	**Alkaloids**:(Terpene)	2	2	
14	**Alkaloids**: Imidazole	2	2	
16	**Week 16 Final written & oral**			
	Practical topics			
1	Quantitative estimation of cinnamaldehye in Cinnamon oil.	2		1
2	Determination of eugenol in clove oil.	2		1

3	Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil.)	2		1
4	Qualitative identification of Alkaloids (Dil. Ephedrine, Quinine)	2		1
5	Qualitative identification of Alkaloids (Quinidine, Atropine).	2		1
6	Qualitative identification of Alkaloids (Papaverine, Pilocarpine)	2		1
7	Qualitative identification of Alkaloids (Brucine, Methyl ergometrine)	2		1
8	**Week 8 Mid-term**			
9	Qualitative identification of Alkaloids (Caffeine and Theophylline)	2		1
10	Micro-chemical tests for Alkaloids (Quinine, Nicotine)	2		1
11	Micro-chemical tests for Alkaloids (Papaverine, Atropine)	2		1
12	Micro-chemical tests for Alkaloids (Caffeine, Ephedrine)	2		1
13	Micro-chemical tests for Alkaloids (Theobromine, Aminophylline)	2		1
14	Revision	2		1
15	**Week 15 Practical exam**			

5- Teaching and learning Methods:

5.1	**Computer aided learning:** **a. On line learning through my mans "Mansoura university "as recorded – video lectures** **b. Inter active discussion through My Mans**
5.2	**Practical session using laboratory equipment (microscope and glass wares)**
5.3	**Research assignments**
5.4	**Case study**
5.5	**Discussion session**

6- Student Assessment:

a- Assessment methods:

1-Written exam	To assess understanding, intellectual, professional
2-Practical exam	To assess professional and practical skills
3-Oral	To assess Knowledge, understanding, intellectual skills, general skills and confidence
4-Quizzes	To assess Knowledge, understanding and intellectual skills
5-Case study	To assess the skills of problem-solving and date presentation

b- Assessment schedule

Assessment 1	Periodical exam	8th week
Assessment 2	Practical exam	15th week
Assessment 3	Oral exam	16th week
Assessment 4	Written exam	16th week

c- Weighting of assessments

1	Mid-term examination	10 %
2	Final-term examination	50 %
3	Oral examination	15 %
4	Practical examination & Semester work	25 %
5	Other types of assessment	0
Total		100%

7 - List of References

N0.	Reference	type
1	Phytochemical Methods A Guide to Modern Techniques of Plant Analysis, By A.J. Harborne, 3rd edition, 2018	Book
2	"Textbook of Pharmacognosy and Phytochemistry" Shah B., Elsevier, (2019)	Book
3	"Medicinal Natural Products, a Biosynthetic Approach" Dewick P. M. John Wiely and Sons Ltd (2019)	Book

4	Lectures notes prepared by staff members	**Course notes**

8- Matrix of knowledge and skills of the course

Course contents	Study Week	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
Volatile oils: Introduction & Preparation	1	√	√							
Volatile oils: (Terpene hydrocarbons)	2	√	√							
Volatile oils: (Oxygenated hydrocarbons	3	√	√			√				
Volatile oils:(Oxygenated, Sulfur & nitrogen comp)	4	√	√		√		√			
Alkaloids: (Introduction)	5	√	√	√	√	√	√			
Alkaloids: (Non-heterocycli	6		√		√		√			

c: Phenylalkylamine and Heterocyclic: Pyridine)										
Alkaloids: (Iso-quinoline)	7	√	√		√	√			√	
Alkaloids: (Opium)	8	√	√		√	√				√
Alkaloids: (Phenanthrene)	9	√	√		√	√		√		
Alkaloids: (Heterocyclic: Tropane)	10		√		√		√		√	√
Alkaloids: (Heterocyclic: Indole)	11	√	√	√	√	√	√	√	√	√
Alkaloids: (Quinine)	12	√	√	√	√	√	√	√	√	√
Alkaloids: (Terpene)	13	√	√	√	√	√	√	√	√	√
Alkaloids: Imidazole	14	√	√	√	√	√	√	√	√	√

Course Coordinator :	**Prof. Dr. Ahmed Mohamed Khalel Zaghlol**
Head of Department	**Prof. Mahmoud Fahmi Elsebai**

Course Specification

2023- 2024

Faculty of Pharmacy

Mansoura University

University: Mansoura University (MU)

Faculty: Pharmacy

Department: Pharmacy practice

Course title: Drug Information

Course code: PP 324

Program on which the course is given	B. Pharm
Academic Level	Third Level, second semester
Date of course specification approval	7/9/2023

2. Basic Information: Course data:

Course title:	**Drug Information**	**Code:** PP 324
Specialization:	**Pharmaceutical**	
Prerequisite:		
Teaching Hours:	**Lecture: 1**	**Practical: 0**
Number of units: (credit hours)	**1**	

2. Course Aims:

1. Identify drug information resources
2. Address a medication related question
3. Recognize role of pharmacist as a drug information specialist
4. Understand concepts of cost effectiveness and pharmaco-economics
5. Run drug information centre

3-Course Learning Outcomes

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

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

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

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

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

2.5.2	**2.5.2.1**	Collect, interpret and assess relevant, drug information requested by members of health care team.
2.5.3	**2.5.3.1**	Use appropriate resources in the search for best available drug information.
2.6.2	**2.6.2.1**	Practice guidelines of clinical use of medications.

DOMAIN 3: Pharmaceutical Care

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

DOMAIN 4: PERSONAL PRACTICE

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

4. Contents:

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1.	Introduction to drug information concept	1	1 hours	-

2.	Types of drug information resources	1	1 hours	-
3.	Primary drug information resources	1	1 hours	-
4.	Secondary drug information resources	1	1 hours	-
5	Tertiary drug information resources	1	1 hours	-
6.	Setting up drug information center	1	1 hours	-
7.	Principles of Pharmacoeconomics	1	1 hours	-
8	**Mid-term Exam**			
9	Consequences (Outcomes) of Medical Care	1	1 hours	-
10	Methods of Pharmacoeconomic Analysis	1	1 hours	-
11	Applications of Pharmacoeconomics	1	1 hours	-

12	Clinical Pharmacy Service Evaluation	1	1 hours	-
13	Conduct A Pharmacoeconomic Evaluation	1	1 hours	-
14	Revision			
15	Theoretical Exam	---	----	

5. Teaching and learning Methods:

5.1	**Computer aided learning:** **a. Online through Mansoura University educational platform "My Mans" using recorded videos for lectures.** **b. Interactive sessions through " My Mans"** **c. On line quizzes**
5.2	**Lectures using Data show, PowerPoint presentations**
5.3	**Research assignments**
5.4	**Discussion session**
5.5	**Self-learning**

6. Student Assessment:

a- Assessment methods

1. Written exam	**To assess understanding, intellectual and professional skills**

3. Oral	**To assess knowledge, understanding, intellectual skills, general skills and confidence**

b- Assessment schedule

Assessment 1	**Mid-term**	**8th week**
Assessment 2	**Oral**	**15th week**
Assessment 3	**Written**	**15th week**

c- Weighting of assessments

1.	**Mid-term examination**	**10 %**
2.	**Final-term examination**	**75 %**
3.	**Oral examination**	**15 %**
Total		**100 %**

7. List of References

No	Reference	Type
1.	Course notes prepared by the department staff members	**Course notes**

2.	Remington Education: Drug Information and Literature Evaluation Abate, Marie A.; Blommel, Matthew L.	**Book**
3.	AHFS - Drug Information Published by the American Society of Health-System Pharmacists	**Book**

8. Matrix of knowledge and skills of the course

Course contents	Study Week	Course Key Elements										
		Domain: 1			Domain: 2			Domain: 3			Domain: 4	
		1.1.1.1	1.1.6.1	1.1.7.1	2.5.2.1	2.5.3.1	2.6.2.1	3.1.1.1	3.2.3.1	3.2.4.1	4.1.1.1	4.1.2.1	4.3.2.1
Introduction to drug information concept	1.	√	√	√	√	√	√		√	√	√		

Types of drug information resources	2.	√	√	√	√	√	√		√	√	√		
Primary drug information resources	3.	√	√	√	√	√	√						
Secondary drug information resources	4.	√	√	√	√	√	√				√	√	√
Tertiary drug information resources	5.	√	√	√	√	√	√				√	√	√
Setting up drug information center	6.	√	√	√	√	√	√				√	√	√
Principles of Pharmacoeconomics	7.	√	√	√	√	√	√				√	√	√
Consequences (Outcomes) of Medical Care	9.	√	√	√	√	√	√	√	√	√	√	√	√
Methods of Pharmacoeconomic Analysis	10	√	√	√	√	√	√				√	√	√
Applications of Pharmacoeconomics	11	√	√	√	√	√	√				√	√	√
Clinical Pharmacy Service Evaluation	12	√	√	√	√	√	√	√	√	√	√	√	√

Conduct A Pharmacoeconomic Evaluation	13	√	√	√	√	√	√	√	√	√	√	√	√
Revision	14												

Course Coordinator:	**Dr. Moetaza Mahmoud Hassab** Moetaza Soliman
Head of Department:	**Prof. Mohamed Elhusseiny Shams** Mohamed Shams

Course Specification

2023- 2024

Faculty of Pharmacy

Mansoura University

University: Mansoura

Faculty : Pharmacy

Department : Pharmacy practice

Course title: Hospital Pharmacy

Program on which the course is given	B. Pharm
Academic Level	Third Level, semester two
Date of course specification approval	7/9/2023

1- Basic Information : Course data :

Course title:	Hospital Pharmacy	**Code:**	**PP 325**
Specialization:	**Pharmacy practice**		
Prerequisite:			
Teaching Hours:	**Lecture: 2**	**Practical:**	------
Number of units: **(credit hours)**	2		

2- Course Aims:

This course was designed to provide student with knowledge about the basic structure and functions of hospital pharmacy focusing on the role of pharmacist in

hospitals and the pharmacy services provided to in patients and out-patients. The course affords awareness about safe use of medications in the hospitals and develops different skills needed for hospital pharmacist, including pharmaceutical calculations.

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

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

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

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- Contents:-

Week No	Topics	No. of hours	Lecture	Practical
1.	Introduction to hospital pharmacy	2	2	-
2.	Plasma substitutes and plasma expanders	2	2	-
3.	Blood products	2	2	-
4.	Parenteral products and methods of administration	2	2	-
5.	Surgical sutures	2	2	-
6.	Hospital therapeutic committee.	2	2	-
7.	Drug formulary of the hospital.	2	2	-
8.	**Mid-term**			
9.	Inpatient medication management.	2	2	-
10.	Outpatient pharmacy.	2	2	-

11.	-Small scale production -Pharmaceutical disposal -Controlling leakage	2	2	-
12.	Enteral nutrition	2	2	-
13.	Total parenteral nutrition	2	2	-
14.	Revision	2	2	-
15	**Final written & oral**			

5- Teaching and learning Methods:

5.1	**Computer aided learning:** **a. Online through Mansoura University educational platform "My Mans" using recorded videos for lectures.** **b. Interactive sessions through " My Mans" using Microsoft Teams**
5.2	**Assignment**
5.3	**Self-learning**

6. Student Assessment:

a- Assessment methods:

1-Written exam	**To assess understanding, intellectual, professional**
2-Oral	**To assess Knowledge, understanding, intellectual skills, general skills and confidence**

3-Quizzes	**To assess Knowledge, understanding and intellectual skills**

b- Assessment schedule

Assessment 1	**Mid-term**	**8th week**
Assessment 2	**Oral**	**15th week**
Assessment 3	**Written**	**15th week**

c- Weighting of assessments

1	**Mid-term examination**	**10 %**
2	**Final-term examination**	**75 %**
3	**Oral examination**	**15 %**
Total		**100%**

7 - List of References

No.	Reference	type
1	Hospital Pharmacy Journals, Thomas L. and Publishers Incorporated, 2006-2013	course notes

2	1. British National Formulary, British Medical Association and Royl Pharmaceutical Society of Great Britian, London., 2012 2. Clinical Pharmacy, G.N. jenkins, G.J. Sperandio & C.J. Latiolais, The Blakiston Division, McGraw-Hill Book Co. N.Y., London,2012 3. Remington's Pharmaceutical Sciences, Alfenso R. Gennaro, Editor, Mack Publishing Company, Easton, PA, USA., 22nd edition, 2012 4. Hospital Pharmacy, Martin Stephen, 2nd edition, Pharmaceutical Press, London, 2011. 5. Introduction to Hospital & Health-System Pharmacy Practice, T.R. Brown and D.A. Holdford, American Society oh health-System Pharmacists, 2010.	Books
3	http://www.mcc.ac.UK/pharmweb, http://www.druginfonet.com	**Websites**

8.Matrix of knowledge and skills of the course

Course contents	Study Week	Course Key Elements				
		Domain: 1	Domain: 2	Domain: 3		Domain: 4
		1.1.1.1	2.3.2.1	3.2.5.1	3.2.6.1	4.3.2.1
Introduction to hospital pharmacy	1.	√	√	√		

Plasma substitutes and plasma expanders	2.	√	√	√		
Blood products	3.	√	√	√		
Parenteral products and methods of administration	4.	√	√	√		
Surgical sutures	5.	√	√	√		
Hospital therapeutic committee.	6.	√			√	
Drug formulary of the hospital.	7.	√		√		
Inpatient medication management.	9.	√	√	√	√	
Outpatient pharmacy.	10.	√	√	√	√	
-Small scale production -Pharmaceutical disposal -Controlling leakage	11	√	√	√	√	√
Enteral nutrition	12	√	√	√	√	√

Total parenteral nutrition	13	√	√	√	√	√
Revision	14	√	√	√	√	√

Course Coordinator :	**Dr. Noha O. Mansour**
	Noha O. Mansour
Head of the Department	**Prof. Dr. Mohamed E. E. Shams**
	Mohamed Shams

Third Level

Course Specification: Pharmacology 2

University: Mansoura University (MU)

Faculty: Pharmacy

Department: Pharmacology and Toxicology

Course title: Pharmacology 2

Course code: **PH 325**

Program on which the course is given	B. Pharm
Academic Level	Third Level, Second semester
Date of course specification approval	September 2023

2. Basic Information: Course data:

Course title:	**Pharmacology2**	**Code: PH 325**
Specialization:	**Major**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 2**	**Practical: 1**
Number of units: **(credit hours)**	**3**	

2. Course Aims:

1. On completion of the course, the student will be able to describe mechanisms of action, prototypic examples and therapeutic applications of drugs used in endocrine and CNS disorders. Also, students will be aware of diverse treatments used in infections (antibiotics, antimycobacterials, antifungal)

3. Course k. elements:

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

key elements

Domain 1- Fundamental Knowledge

Program K. element no.	Course K. element no.	Course K. element
1.1.4	**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
2.4.4	**2.4.4.1**	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.

4. Contents:

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1-3	Diuretics + Hematologic drugs	6	6	
4-6	Treatments for hypertension + Treatment of congestive heart failure	6	6	
7-8	Antibiotics	4	4	
9-10	Antifungal and antiviral	4	4	
11-12	Anticancer and antiprotozoal	4	4	
13-14	Treatment of angina + Treatment of arrhythmia + Antihyperlipidemic	4	4	
15	Revision and quiz	2	2	
16	Final written and oral exam			
	Practical topics			
1	Drugs acting on CVS	2		1
2	Case of hypertension	2		1
3	Case of heart failure	2		1
4	Case of stable angina	2		1
5	Case of blood	2		1
6	Case of MI	2		1
7	Case Chemotherapy	2		1
8	**Mid term exam**	-		-
9-14	Case Chemotherapy	12		6
15	**Practical Exam**			

5. Teaching and learning Methods:

5.1	**Computer aided learning:** **a. Online learning through My mans "Mansoura university "as recorded**

	– video lectures **b. Inter active discussion through My Mans** **c. Lectures using Data show, PowerPoint presentations**
5.2	**Self-learning**
5.3	**Formative Assignments**
5.4	**Tutorial**

6. Student Assessment:

1. Assessment methods

Assessment Methods	K elements to be assessed
1-Written exam	1.1.4.1 - 2.4.4.1 - 3.1.1.1 - 3.2.1.1
2-Practical exam applying OSPE	1.1.4.1 - 2.4.4.1 - 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 exam	1.1.4.1 - 2.4.4.1 - 3.1.1.1 - 3.2.1.1 - 4.1.2.1 - 4.3.2.1

2. Assessment schedule

Assessment 1	**Practical**	**15th week**
Assessment 2	**Mid-term**	**8th week**
Assessment 3	**Oral**	**16th week**
Assessment 4	**Written**	**16th week**

3. Weighting of assessments

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

7. List of References

No.	Reference	type
1	Lippincott Illustrated Reviews, Pharmacology 6th edition, 2014.	book

2	Lectures notes prepared by staff members	Course notes

8. Matrix of knowledge and skills of the course

Course contents	Study Week	Course Key Elements					
		Domain: 1	Domain: 2	Domain: 3		Domain: 4	
		1.1.4.1	2.4.4.1	3.1.1.1	3.2.1.1	4.1.2.1	4.3.2.1
Diuretics + Hematologic drugs	1-3	√	√		√		
Treatments for hypertension + Treatment of congestive heart failure	4-6	√	√		√		
Antibiotics	7-8	√	√				√
Antifungal and antiviral	9-10	√	√	√	√	√	√
Anticancer and antiprotozoal	11-12	√	√	√	√	√	√
Treatment of angina + Treatment of arrhythmia + Antihyperlipidemic	13-14	√	√	√	√	√	√
Revision and quiz	15	√	√	√	√	√	√

Course Coordinator:	**Prof. Dr. Ghada Mohamed Sedek Bostan**
Head of Department:	**Prof. Dr. Manar A. Nader**

Course specification
2023-2024
Faculty of Pharmacy
Mansoura University

المستوى الثالث

توصيف مقرر Pharmaceutical Microbiology

Code:	PM 321					
Course title:	Pharmaceutical Microbiology					
Level:	Three					
Program Title:	• B. Pharm					
Specialization :	Major					
Teaching Hours:	**Theoretical :**	2	**Tutorial :**		**Practical :**	1

2- Course aims :-

1. Recognise basic structure and growth of microorganisms.
2. Classify antimicrobial agents used clinically.
3. Identify different mechanisms of resistance to antimicrobial agents.
4. Describe different methods of sterilization and evaluation of disinfectants.

3- Course k. elements:

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

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

Program k elements no.	Course k elements no.	Course k. elements
(1.1.1)	**(1.1.1.1)**	Define 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, abbreviations 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 known antibacterial, antifungal and antiviral agents.
(1.1.5)	**(1.1.5.1)**	List the most appropriate antimicrobial chemotherapeutic agent in the treatment of 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)**	Specify the most appropriate sterilization method compatible with each pharmaceutical preparation.
	(2.2.2.2)	Apply good laboratory practice (GLP), as well as 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 the 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)**	Provide consultation and counselling to other healthcare professionals to support the patients with safe, effective and cheap care plan.
(3.2.5)	**(3.2.5.2)**	Perform different tests for evaluation of the efficacy and spectrum of different antimicrobial agents.
(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.

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 healthcare 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

4- Course contents :-

Theoretical

Topics	Week
Introduction, history of microorganisms,	1
microscopic examination and classification of bacteria	2
Bacterial cell structure, requirements for microbial growth and microbial growth & reproduction	3
Endospore formation, culturing of bacteria, measurement of microbial growth and identification of bacteria	4
Antibacterial agents classes, antibacterial agent resistance	5
Antibacterial agents combinations, antibiotic susceptibility testing, antibiotic assay	6

Introduction to mycology, Antifungal agents	7
introduction to virology	8
classification of viruses	9
virus replication	10
bacteriophages	11
antiviral agents	12
Sterilization principles, physical methods of sterilization, Mechanical methods of sterilization,	13
chemical Methods of sterilization and disinfection	14
Final written and oral exam	16

Practical

Topics	Week
Evaluation of Antibacterial agents: MIC by broth dilution	1

Evaluation of Antibacterial agents: MIC by microbroth dilution	2
Evaluation of Antibacterial agents: MIC by agar diffusion	3
Evaluation of Antibacterial agents: MIC by agar dilution	4
Antibiotic assay	5
Antibiotic sensitivity testing	6
Evaluation of Antimicrobial combinations	7
Mid-term exam	8
Methods of sterilization	9
Evaluation of sterilization techniques	10
Sterility test	11
Evaluation of disinfectants	12
Evaluation of disinfectants (continued)	13

revision	14
Practical exam	15

5- Teaching and learning methods :-

S	Method
1	Interactive sessions (online)
2	Recorded lectures
3	Case study
4	Practical
5	Self-learning

6- Teaching and learning methods of disables :-

1. Not available

7- Student assessment :-

a- Student assessment methods

No	Assessment Method
1	Written exam
2	Practical exam
3	Oral exam

b- Assessment schedule

No	Method	Week
1	Mid-term exam	8
2	Practical	15

3	Written	16
4	Oral	16

c- Weighting of assessments

No	Method	Weight
1	Mid-term exam	10
2	Practical	25
3	Written	50
4	Oral	15
Total		100%

8- List of references

S	Item	Type
1	Lecture notes	Course notes
2	Lippincott's Illustrated Reviews of Microbiology, 3rd Edition, 2013	Books
3	Hugo and Russell's Pharmaceutical Microbiology, 8th Edition, Blackwell, 2011	Books
4	Prescott, Harley and Klein's Microbiology, seventh edition, 2008	Books
5	www.usp.org	Web sites

9- Matrix of knowledge and skills of the course

Theoretical

Course contents	Study Week	Course Key Elements															
		Domain: 1						Domain: 2		Domain: 3						Domain: 4		
		1.1.1.1	1.1.2.1	1.1.2.2	1.1.3.1	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	3.2.5.2	3.2.6.1	4.1.1.1	4.2.1.1	4.3.2.1
Introduction, history of microorganisms,	1.	√	√	√	√		√	√	√	√	√		√					
microscopic examination and classification of bacteria	2.	√	√	√	√		√	√	√	√			√					
Bacterial cell structure, requirements for microbial growth and	3.	√	√	√	√		√	√	√	√			√					

microbial growth & reproduction																	
Endospore formation, culturing of bacteria, measurement of microbial growth and identification of bacteria	4.	√	√	√	√		√	√	√	√							
Antibacterial agents classes, antibacterial agent resistance	5.	√	√	√	√				√	√	√	√	√	√	√	√	
Antibacterial agents combinations, antibiotic susceptibility	6.	√	√	√	√				√	√	√	√	√				

testing, antibiotic assay																		
Introduction to mycology, Antifungal agents	7	√	√	√	√	√			√	√	√	√	√					
introduction to virology	8.	√	√	√	√	√												
classification of viruses	9	√	√	√	√	√							√	√	√	√	√	
virus replication	10	√	√	√	√	√							√	√	√	√	√	
bacteriophages	11	√	√	√	√	√							√	√	√	√	√	
antiviral agents	12	√	√	√	√	√				√	√	√	√	√	√	√	√	
Sterilization principles, physical methods of sterilization, Mechanical	13	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	

methods of sterilization,																	
chemical Methods of sterilization and disinfection	14	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	

Practical

Course contents	Study Week	Course Key Elements																
		Domain: 1						Domain: 2		Domain: 3						Domain: 4		
		1.1.1.1	1.1.2.1	1.1.2.2	1.1.3.1	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	3.2.5.2	3.2.6.1	4.1.1.1	4.2.1.1	4.3.2.1
Evaluation of Antibacterial agents: MIC by broth dilution	1.	√	√	√	√		√	√	√	√	√		√					
Evaluation of Antibacterial agents: MIC by	2.	√	√	√	√		√	√	√	√			√					

microbroth dilution																	
Evaluation of Antibacterial agents: MIC by agar diffusion	3.	√	√	√	√		√	√	√	√			√					
Evaluation of Antibacterial agents: MIC by agar dilution	4.	√	√	√	√		√	√	√	√								
Antibiotic assay	5.	√	√	√	√				√	√	√	√	√	√	√	√		
Antibiotic sensitivity testing	6.	√	√	√	√				√	√	√	√	√					

Evaluation of Antimicrobial combinations	7	√	√	√	√	√			√	√	√	√	√					
Methods of sterilization	9	√	√	√	√	√							√	√	√	√	√	
Evaluation of sterilization techniques	10	√	√	√	√	√							√	√	√	√	√	
Sterility test	11	√	√	√	√	√							√	√	√	√	√	
Evaluation of disinfectants	12	√	√	√	√	√				√	√	√	√	√	√	√	√	
Evaluation of disinfectants (continued)	13	√	√	√							√	√	√	√	√	√	√	
revision	14	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	

Course specification
2023-2024
Faculty of Pharmacy
Mansoura University

Course Coordinator(s): -

1. Hani Ibrahim Mohamed Elmorsi Kenawy

Head of department: - Elsayed Elsherbiny Mohamed Habeb

Course Specification

2023- 2024

Faculty of Pharmacy

Mansoura University

Course Specification: Parasitology

Third Level

University: Mansoura University (MU)

Faculty: Pharmacy

Department: Microbiology and Immunology

Course title: Parasitology

Course code: PM 322

Program on which the course is given	B. Pharm
Academic Level	Third Level, Second semester, 2023- 2024
Date of course specification approval	10/9/2023

Basic Information: Course data:

Course title:	Parasitology	Code: PM 322
Specialization:	Medical	
Prerequisite:	None	
Teaching Hours:	Lecture: 1	Practical: 1
Number of units: (credit hours)	2	

2. Course Aims:

2.1. Equip students with adequate knowledge about endemic parasites, national parasitic problems and common parasites worldwide.
2.2. Provide students with knowledge concerning biological, epidemiological and ecological aspect of parasites causing diseases to human.

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	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

Contents:

Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1.	- Introduction and classification of parasites.	1	1 hour	
2.	-Trematoda - Fasciolae - *Heterophyes heterophyes.* -	1	1 hour	
3	-Trematoda - *Human schistosomiases*	1	1 hour	

4	Cestoda - *Taeniae solium* - *Taeniae saginata*	1	1 hour	
5	Cestoda - *Hymenolepis nana* - *Hymenolepis diminuta*	1	1 hour	
6	Cestoda - *Echinococcus granulosus* - *Echinococcus multilocularis*	1	1 hour	
7	Nematoda - *Trichuris trichiura* - *Wuchereria bancrofti*	1	1 hour	
8	**Nematoda** - *Strongyloides stercoralis* - *Ascaris lumbricoides*	1	1 hour	
9	**Nematoda** - *Enterobius vermicularis* - *Trichinella spiralis* - *Ancylostoma duodenale*	1	1 hour	
10	**Intestinal protozoae** - *Entameba histolytica* - *Giardia lamblia*	1	1 hour	
11	**Intestinal protozoae** - *Balantidium coli* - *Trichomonas vaginalis*	1	1 hour	
12	**Blood protozoae** - Trypanosoma - Leishmania	1	1 hour	

13	**Blood protozoae** - Plasmodium - Toxoplasma	1	1 hour	
14	Arthropoda	1	1 hour	
16	**Final written and oral exam**			
	Practical topics			
Week No	Topics	No. of hours	Lecture credit hours	Practical credit hours
1.	Laboratory diagnostic techniques Slide examination and case study of: Fasciolae	2		1 hour
2.	Slide examination and case study of: Heterophyes heterophyes. Human schistosomes	2		1 hour
3.	Slide examination and case study of: Taeniae Echinococcus granulosus Hymenolepis nana	2		1 hour
4.	Slide examination and case study of: Ascaris lumbricoides Enterobius vermicularis	2		1 hour
5.	Slide examination and case study of: Trichinella spiralis	2		1 hour

	Ancylostoma duodenale			
6.	Slide examination and case study of: Trichuris trichiura Wuchereria bancrofti	2		1 hour
7	Slide examination and case study of: Strongyloides stercoralis			
8.	Mid-term Exam	-		-
9.	Slide examination and case study of: Entamoeba coli Giardia intestinalis Balantidium coli	2		1 hour
10.	Slide examination and case study of: Trypanosomes gambiense	2		1 hour
11.	Slide examination and case study of: Plasmodium malariae	2		1 hour
12.	Slide examination and case study of: Toxoplasma gondii	2		1 hour
13	Arachnida: - Sarcoptes scabiei	2		1 hour
14	Revision	2		1 hour
15	Slide examination and case study exam			

5. Teaching and learning Methods:

5.1	Computer aided learning: a. On line learning through my mans platform "Mansoura university "as recorded – video lectures b. Inter active discussion through My Mans platform c. power point presentation and data show
5.2	Practical session using laboratory equipment
5.3	Research assignments
5.4	Case study
5.5	Role play
5.6	Self-learning

6. Student Assessment:

Assessment methods

1. Written exam	To assess understanding, intellectual and professional skills
2. Practical exam	To assess professional and practical skills
3. Oral	To assess knowledge, understanding, intellectual skills, general skills and confidence
4. Case study	To assess the skills of problem-solving and date presentation

Assessment schedule

Assessment 1	Practical	15th week

Assessment 2	Mid-term	8th week
Assessment 3	Oral	16th week
Assessment 4	Written	16th week

Weighting of assessments

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

7. List of References

No	Reference	Type
1.	Course notes prepared by the department staff members	Course notes
2.	Textbook of Medical Parasitology: Protozoology and Helminthology, 4 th edition by S. C. Parija 2013	Book
3.	Medical Microbiology by Patrick R Murray, Ken S Rosenthal, Michael a Pfaller, MD 7 th edition, 2012	Book

8. Matrix of knowledge and skills of the course

Course Specification

2023- 2024

Faculty of Pharmacy

Mansoura University

Course contents	Study Week	Course Key Elements														
		Domain: 1						Domain: 2		Domain: 3				Domain: 4		
		1.1.1.1	1.1.2.1	1.1.2.2	1.1.3.1	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	4.1.1.1	4.2.1.1	4.3.2.1
- Introduction and classification of parasites.	1.	√	√	√	√		√	√	√	√	√					
-Trematoda - Fasciolae - *Heterophyes heterophyes.* -	2.	√	√	√	√		√	√	√	√						
-Trematoda - *Human schistosomiases*	3	√	√	√	√		√	√	√	√						
Cestoda - *Taeniae solium* - *Taeniae saginata*	4	√	√	√	√		√	√	√	√						
Cestoda - *Hymenolepis nana* - *Hymenolepis diminuta*	5	√	√	√	√		√	√	√	√						
Cestoda - *Echinococcus granulosus*	6	√	√	√	√		√	√	√	√						

- *Echinococcus multilocularis*																
Nematoda - *Trichuris trichiura* - *Wuchereria bancrofti*	7	√	√	√	√		√	√	√	√						
Nematoda - *Strongyloides stercoralis* - *Ascaris lumbricoides*	8	√	√	√	√		√	√	√	√						
Nematoda - *Enterobius vermicularis* - *Trichinella spiralis* - *Ancylostoma duodenale*	9	√	√	√	√		√	√	√	√						
Intestinal protozoae - *Entameba histolytica* - *Giardia lamblia*	10	√	√	√	√	√			√	√	√	√				
Intestinal protozoae - *Balantidium coli* - *Trichomonas vaginalis*	11	√	√	√	√	√			√	√	√	√				
Blood protozoae - Trypanosoma - Leishmania	12	√	√	√	√	√			√	√	√	√				
Blood protozoae - Plasmodium - Toxoplasma	13	√	√	√	√	√			√	√	√	√				

Arthropoda	14	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Course Coordinator:	Professor Dr. Rasha F. Barwa
Head of Department:	Prof. Dr. EL-Sayed E Habib