Kafr el-Sheikh university
Faculty of Pharmacy
Clinical (Pharm-D) program
Course Specification
2025/2026

Clinical (Pharm-D) program

Course Specification

2025/2026

Fourth Level

Second Semester

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Kafrelsheikh University
Faculty of Pharmacy

جامعة كفر الشيخ
كلية الصيدلة

Course Specification (2025)

1. Basic Information

Course Title (according to the bylaw)	Medicinal Chemistry II			
Course Code (according to the bylaw)	PC 805			
Department/s participating in delivery of the course	Pharmaceutical Chemistry Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2	1	--------	3
Course Type	Compulsory			
Academic level at which the course is taught	Fourth level, Semester (2)			
Academic Program	Bachelor of Pharmacy (Pharm-D) (Clinical Pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate. Prof. Tamer Mohamed Ibrahim			
Course Specification Approval Date	9/2025			
Course Specification Approval	Department Council			

2. Course Overview (Brief summary of scientific content)

This course covers the relationship of chemical structure to biological activity and the general structural features required for the drug action, the chemistry of different classes of drugs in addition to drug metabolic pathways, the effect of molecular modifications on the absorption, distribution, metabolism, and target binding of drugs, and pharmacopeial methods of assay for drugs in different dosage forms.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (According to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (Fundamental Knowledge) **1.1-COMPETENCY**		**Upon completing this course, students will be able to integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.** **This competency will be developed via the following key elements:**	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Explain the chemical structures, functional groups, and physicochemical properties of drug classes studied in Medicinal Chemistry
		1.1.2	Relate chemical structure to pharmacological activity, mechanism of action, and therapeutic applications.
		1.1.3	Interpret how physicochemical and pharmacokinetic properties influence drug absorption, distribution, metabolism, and excretion (ADME).
1.1.3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of	**1.1.4**	Interpret structure–activity relationships (SAR) to predict biological activity and guide molecular modification.
		1.1.5	Apply chemical and analytical methods for identification and quality assurance of studied pharmaceuticals.

Program Outcomes (NARS/ARS) (According to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	synthetic/natural pharmaceutical materials/products.	**1.1.6**	Discuss synthetic pathways and isolation methods for selected drug molecules from natural and synthetic sources.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	**1.1.7**	Critically evaluate research articles discussing synthesis, SAR, and pharmacological properties of drugs.
		1.1.8	Use literature to propose potential chemical modifications to improve drug activity or reduce side effects.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-2- COMPETENCY		**Upon completing this course, students will be able to standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.** **This competency will be developed via the following key elements:**	
2.2.1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/natural pharmaceutical materials.	**2.2.1**	Outline synthetic schemes for target drug molecules studied in the course.
		2.2.2	Describe analytical methods for confirming the identity and purity of pharmaceuticals.
		2.2.3	Apply SAR knowledge to modify existing drugs for improved therapeutic profiles.
2.2.2	Apply the basic requirements of quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/ products considering various incompatibilities.	**2.2.4**	Identify stability issues and incompatibilities in drug molecules based on their chemical structure.
		2.2.5	Discuss storage conditions for maintaining stability of labile drugs.
2.2.3	Recognize the principles of various tools and instruments and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	**2.2.6**	Identify instrumental methods used in structural elucidation (e.g., NMR, IR, MS) of studied drugs.
		2.2.7	Explain how analytical tools support SAR and drug design.

Program Outcomes (NARS/ARS) (According to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		2.2.8	Interpret instrumental data for verification of drug identity and purity.
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	**2.2.9**	Apply basic pharmacokinetic calculations to predict drug behavior based on structure.
		2.2.10	Relate physicochemical parameters (e.g., pKa, logP) to drug absorption and distribution.
		2.2.11	Discuss examples of drug delivery modifications based on medicinal chemistry principles.
2-3- COMPETENCY		**Upon completing this course, students will be able to handle and dispose of biological and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations.** **This competency will be developed via the following key elements:**	
2.3.1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field	**2.3.1**	Identify labeling and storage requirements for hazardous medicinal compounds.
		2.3.2	Follow environmental and safety regulations during experimental work.
2.3.2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biological and pharmaceutical materials/products.	**2.3.3**	Demonstrate adherence to laboratory safety rules in handling pharmaceuticals.
		2.3.4	Discuss ethical considerations in medicinal chemistry research and drug development.
		2.3.5	Apply proper waste disposal methods for environmentally hazardous chemicals
2-4- COMPETENCY		**Upon completing this course, students will be able to actively share professional decisions and proper actions to save patient's life in emergency situations including poisoning with various xenobiotics and effectively work in forensic fields.**	

Program Outcomes (NARS/ARS) (According to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		This competency will be developed via the following key elements:	
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	**2.4.1**	Identify chemical causes of drug instability or incompatibility.
		2.4.2	Propose structural modifications to overcome resistance or reduce side effects.
		2.4.3	Suggest alternative therapeutic agents based on SAR analysis.
		2.4.4	Apply medicinal chemistry knowledge to interpret and address adverse drug reaction mechanisms.
2-5- COMPETENCY		**Upon completing this course, students will be able to contribute to pharmaceutical research studies and clinical trials needed to authorize medicinal products. This competency will be developed via the following key elements:**	
2.5.1	Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.	**2.5.1**	Explain preclinical chemical characterization required for drug registration.
		2.5.2	Relate structural features to safety and efficacy assessment.
		2.5.3	Identify documentation requirements for chemical quality assurance in regulatory submissions.
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies.	**2.5.4**	Formulate a research question related to drug design or SAR.
		2.5.5	Select appropriate experimental or computational methods to address the research problem.
		2.5.6	Present medicinal chemistry research findings in a scientific format.

Program Outcomes (NARS/ARS) (According to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
DOMAIN 3: Pharmaceutical Care 3-2- COMPETENCY		**Upon completing this course, students will be able to provide counselling and education services to patients and communities about safe and rational use of medicines and medical devices. This competency will be developed via the following key elements:**	
3.2.1	Integrate the pharmacological properties of drugs, including mechanisms of action, therapeutic uses, dosage, contraindications, adverse drug reactions, and drug interactions	**3.2.1**	Explain the mechanism of action of each drug class studied in relation to its chemical structure.
		3.2.2	Interpret how structural modifications can alter side effect profiles and drug interactions.
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	**3.2.3**	Discuss how chemical structure influences clinical efficacy and safety monitoring.
		3.2.4	Apply medicinal chemistry knowledge to guide drug selection in special populations.
		3.2.5	Evaluate reported adverse reactions in relation to drug structure and metabolism.
DOMAIN 4: Personal Practice 4-2- COMPETENCY		**Upon completing this course, students will be able to communicate effectively, verbally, non-verbally, and in writing with individuals and communities. This competency will be developed via the following key elements:**	
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	**4.2.1**	Prepare scientific presentations explaining SAR and the synthesis of drugs.
		4.2.2	Use molecular modeling software to visually present drug–target interactions.
		4.2.3	Create digital posters or infographics summarizing medicinal chemistry topics.
		4.2.4	Deliver oral presentations that effectively integrate chemical and pharmacological data.

4. Teaching and Learning Methods

1. **Lectures** **(√)**
2. **E-learning** **(√)**
3. **Practical training/ laboratory** **(√)**
4. **Discussion** **(√)**
5. **Brainstorming (√)**
6. **Assignments (√)**
7. **Case study (√)**
8. **Seminars** **(√)**

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/ discussion groups/ .....)	Training (Practical/ Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Drug Metabolism	**4**	**2**	**2**	**---**	**---**
2	Non-steroidal anti-inflammatory drugs (NSAIDs) and Disease Modified Antirheumatic drugs (DMARDs)	**4**	**2**	**2**	**---**	**---**
3	Opioids	**4**	**2**	**2**	**---**	**---**
4	Local anesthetics	**4**	**2**	**2**	**---**	**---**
5	H1-Antihistamines	**4**	**2**	**2**	**---**	**---**
6	H2-Antihistamines, Proton pump inhibitors and GIT drugs	**4**	**2**	**2**	**---**	**---**
7	**Periodical exam**					
8	Drugs acting on CNS	**4**	**2**	**2**	**---**	**---**
9	Drugs acting on CNS	**4**	**2**	**2**	**---**	**---**
10	Hypoglycemic drugs	**4**	**2**	**2**	**---**	**---**
11	Steroid Hormones	**4**	**2**	**2**	**---**	**---**
12	Steroid Hormones (cont.) and Thyroid Hormones	**4**	**2**	**2**	**---**	**---**
13	Anticancer drugs	**4**	**2**	**2**	**---**	**---**
14	Anticancer drugs	**2**	**2**	**Practical exam**		
15	Anticancer drugs	**2**	**2**	**Practical exam**		

5. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Periodical exam	Week 7	15 marks	15%
2	Final Practical/Clinical/… Exam	Week 14,15	20 marks	20%
2	Final Written Exam	Week 16,17	50 marks	50%
4	Final Oral Exam	Week 16,17	10 marks	10%
5	Assignments / Project /Portfolio/ Logbook	All semester long	5 marks	5%
	Total		100	100%

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	**The main (essential) reference for the course**	Notes on medicinal chemistry 2 prepared and distributed by Dept. of Pharmaceutical Chemistry. Lab Manual of medicinal chemistry 2 prepared and distributed by Dept. of Pharmaceutical Chemistry.
	Other References	Wilson and Gisvold's " Textbook of Organic and Pharmaceutical Chemistry", 12th Ed., Jaime N. Delgado, J.B. Lippincot Co., 2010. William O Foye, " Principle of Medicinal Chemistry" 8th edition (2019), Williams & Wilkins, London
	Electronic Sources	www.medscape.com http://www.sciencedirect.com/ https://pubmed.ncbi.nlm.nih.gov/
	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other	
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	- Data show, Computers, Library, Internet, Interactive boards and distant learning unit
	Supplies	Classrooms.
	Skill Labs/ Simulators	----------

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Medicinal Chemistry II **Course code: PC 805**

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	**Drug Metabolism**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning practical training and class activities	Written, practical and oral exams
Week # 2	**Non-steroidal anti-inflammatory drugs (NSAIDs) and Disease Modified Antirheumatic drugs (DMARDs)**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 3	**Opioids**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 4	**Local anesthetics**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 5	**H1-Antihistamines**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 6	**H2-Antihistamines,**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6,	Lectures, E-learning, practical	Written, practical

	Proton pump inhibitors and GIT drugs	2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	training and class activities	and oral exams
Week # 7	**Periodical exam**			
Week # 8	**Drugs acting on CNS**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 9	**Drugs acting on CNS**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 10	**Hypoglycemic drugs**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 11	**Steroid Hormones**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams
Week # 12	**Steroid Hormones (cont.) and Thyroid Hormones**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures, E-learning, seminars and practical training	Written, practical and oral exams
Week # 13	**Anticancer drugs**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures and E-learning	Written, practical and oral exams
Week # 14	**Anticancer drugs**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1,	Lectures and E-learning	Written and oral exams

		2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.		
Week # 15	**Anticancer drugs**	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7, 2.2.8, 2.2.9, 2.2.10, 2.2.11, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.3.5, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 2.5.5, 2.5.6.	Lectures and E-learning	Written and oral exams

Name and Signature
Course Coordinator

Associate. Prof. Tamer Mohamed Ibrahim

Name and Signature
Program Coordinator

Associate. Prof. Ahmed Amin Ali

Kafrelsheikh University

Faculty of Pharmacy

جامعة كفر الشيخ

كلية الصيدلة

Course Specification

(2025)

Course Title (according to the bylaw)	**Management of Endocrine and Renal Disorders**			
Course Code (according to the bylaw)	**PP 804**			
Department/s participating in delivery of the course	**Clinical Pharmacy Department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	2	**1**	**----**	**3**
Course Type	**Compulsory**			
Academic level at which the course is taught	**Fourth level, second semester**			
Academic Program	**BSc in pharmacy (pharm-D clinical)**			
Faculty/Institute	**Faculty of Pharmacy**			
University/Academy	**Kafrelsheikh University**			
Name of Course Coordinator	**Associate. Prof. Noha El-Khodary**			
Course Specification Approval Date	**31/8/2025**			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	**Department council**			

2. Course Overview (Brief summary of scientific content)

This course aims to provide students with comprehensive knowledge of pathophysiology, clinical interpretation, pharmacotherapy, and management of endocrine and renal disorders including hypothyroidism, hyperthyroidism, obesity, diabetes mellitus and its complications, polycystic ovary syndrome, acute kidney injury, drug-induced kidney damage, drug dosing considerations in kidney impairment, chronic kidney disease, and dialysis. Students will develop skills in patient assessment, therapeutic monitoring, and pharmaceutical care for these complex conditions.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (FUNDAMENTAL KNOWLEDGE) 1-1- COMPETENCY		**Upon finishing this course, students will be able to recognize endocrine and renal disorders including symptoms, signs, pathophysiology, risk factors, and laboratory investigations that help diagnose patients and identify non-pharmacological and pharmacological treatments for each disorder.** **This competency will be developed via the following key elements:**	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Understand thyroid gland anatomy and physiology to explain hypothyroidism and hyperthyroidism
		1.1.2	Recognize psychosocial factors contributing to diabetes management and obesity
		1.1.3	Integrate clinical knowledge in selecting appropriate treatment for

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			thyroid disorders, diabetes, or kidney disease
		1.1.4	Understand administrative and public health aspects of diabetes prevention and obesity management programs
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	**1.1.5**	Explain mechanisms of levothyroxine, antithyroid drugs, metformin, insulin, ACE inhibitors, diuretics
		1.1.6	Evaluate drug safety in kidney impairment and adjust doses accordingly in AKI and CKD
		1.1.7	Justify selection of diabetes medications based on patient factors and kidney function
		1.1.8	Justify selection of thyroid hormone replacement based on patient age and comorbidities
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems	**1.1.9**	Use clinical guidelines (ADA, ATA, KDIGO) to guide treatment of endocrine and renal disorders
		1.1.10	Solving drug dosing issues in complex cases like diabetes with kidney disease
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	**1.1.11**	Review of recent trials for new diabetes medications, thyroid treatments, or kidney protective agents
		1.1.12	Interpret lab values (TSH, HbA1c, creatinine, eGFR) for clinical decisions
		1.1.13	Identify studies comparing different treatment regimens in diabetes or thyroid disorders

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	**1.1.14**	Discuss impact of new diabetes technologies and continuous glucose monitoring
		1.1.15	Explore personalized medicine approaches in thyroid disorders and kidney disease
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-1- COMPETENCY		**Students develop the ability to work effectively within inter-professional healthcare teams to provide patient-centered care. They collaborate with physicians, nurses, dietitians, and other professionals to manage thyroid disorders, diabetes, obesity, PCOS, and kidney disease. The course emphasizes ethical practice, patient education, and quality of life improvement in chronic conditions This competency will be developed via the following key elements:**	
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	**2.1.1**	Learn ethical and respectful patient interaction in chronic endocrine and renal diseases
		2.1.2	Respect patient's right to treatment choice and cultural considerations in diabetes, obesity, and kidney disease management
2.1.3	Recognize your own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.	**2.1.3**	Identify when referral to endocrinologist or nephrologist is needed (complex diabetes, thyroid nodules, dialysis patients)
		2.1.4	Acknowledge limits in managing complex diabetes with multiple complications or end-stage kidney disease
2-2- COMPETENCY		**Students learn to apply scientific principles to ensure medication quality and effectiveness in endocrine and renal conditions, including:**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			• How kidney disease affects drug elimination and requires dose adjustments **• Proper storage of insulin, thyroid hormones, and temperature-sensitive medications** **• Selection of appropriate dosage forms for different conditions (e.g., insulin formulations, thyroid preparations)** **• Understanding drug-induced kidney damage and prevention strategies** **This competency will be developed via the following key elements:**
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice	**2.2.1**	Calculate dose modifications for renally eliminated drugs in AKI and CKD patients
		2.2.2	Apply pharmacokinetic principles in kidney impairment for drug dosing
		2.2.3	Understand impact of kidney disease on drug clearance and bioavailability
2-4- COMPETENCY		Students learn to take professional action in emergency situations affecting endocrine or renal systems, including diabetic emergencies, thyroid storm, myxedema coma, acute kidney injury, and drug-induced kidney damage.,	
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	2.4.1	Detect and manage hypoglycemia, hyperglycemia, and diabetic ketoacidosis

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		2.4.2	Manage drug-related adverse effects in endocrine and renal medications
		2.4.3	Address non-adherence in chronic conditions like diabetes, hypothyroidism, and CKD
		2.4.4	Apply emergency management protocols (IV fluids, glucose correction, etc.)
2-5- COMPETENCY		Students understand the importance of pharmaceutical research in developing new treatments for endocrine and renal disorders, including clinical trials for diabetes medications, thyroid treatments, and kidney protective agents.	
2.5.2	Competency Contribute to pharmaceutical research studies and clinical trials needed to authorize medicinal products.	**2.5.1**	Review evidence from clinical databases for endocrine and renal treatments
		2.5.2	Participate in case study discussions relevant to diabetes, thyroid disorders, and kidney disease.
Domain 3: Pharmaceutical Care		Students must understand:	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
3-1- Competency		• How endocrine and renal systems function in health and disease • Genetic factors affecting disease and treatment response • Laboratory diagnosis and monitoring • Integration of pathophysiology with treatment approaches	
3.1.1	Apply the principles of body function and the basis of genomics in health and disease states to manage different diseases.	**3.1.1**	Explain pathophysiology of diabetes complications
		3.1.2	Relate genetic factors in diabetes and drug metabolism
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	**3.1.3**	Describe clinical presentation of endocrine and renal diseases
		3.1.4	Correlate lab findings with therapeutic options
3-2- Competency		Students are trained to educate patients about safe and effective use of medications for endocrine and renal disorders, including proper insulin injection techniques, thyroid hormone administration, and medication adjustments in kidney disease.	
3.2.1	Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.	**3.2.1**	Match drug mechanisms to therapeutic goals in diabetes, thyroid disorders, and kidney disease
		3.2.2	Explain adverse effects of insulin, metformin, levothyroxine, antithyroid drugs, and kidney medications
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational	**3.2.3**	Report and manage adverse drug reactions from endocrine and renal medications

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	use of medicines and medical devices.	**3.2.4**	Monitor drug interactions in polypharmacy patients with diabetes and kidney disease
3.2.3	Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.	**3.2.5**	Counsel on herbal remedies and their interactions with diabetes and thyroid medications
3.2.4	Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control	**3.2.6**	Identify signs of drug toxicity (e.g., levothyroxine)
		3.2.7	Provide management steps for drug overuse/misuse (e.g., Educate patients on safe OTC use such as avoiding decongestants containing pseudoephedrine in Diabetes mellitus)
3.2.5	Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.	**3.2.8**	Counsel on proper insulin injection, thyroid hormone timing, and medication adherence
		3.2.9	Educate patients on diet, exercise, and lifestyle modifications in diabetes, obesity, and kidney disease
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse.	**3.2.10**	Warning against misuse of insulin patients with DM.
		3.2.11	Discuss the harm of unregulated "natural" products such as kelp supplements and bitter melon marked for endocrine disorders.
Domain 4: Personal Practice **4-1- Competency**		From this competency, the student should learn how to: • Work effectively in teams • Manage time and take responsibility	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			• Think critically and solve problems • Work independently while supporting team goals
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	**4.1.1**	Take responsibility in case presentations and treatment plans
		4.1.2	Provide constructive peer feedback
		4.1.3	Manage time effectively in project completion
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	**4.1.4**	Critically analyze treatment guidelines
		4.1.5	Solve complex therapeutic problems
		4.1.6	Collaborate in team discussions
4-2- Competency		Upon finishing this course, students will be able to Effectively communicate verbally, non-verbally and in writing with individuals and communities. This competency will be developed via the following key elements:	
4.2.1	Show the ability to effectively present a topic of interest using recent technology.	**4.2.1**	Present endocrine and renal case studies and write care plans clearly and concisely
		4.2.2	Use modern presentation tools effectively
4.2.2	Communicate clearly by verbal and written means with patients and members of healthcare society	**4.2.3**	Explain conditions and treatments verbally and in writing
		4.2.4	Communicate effectively with patients and healthcare team members, respecting their level of understanding and cultural background.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4-3- Competency		The students should learn how to reflect on their own performance when working on endocrine and renal-related tasks (such as presenting a case on hyperthyroidism or designing a care plan for AKI). They should identify their strengths and weaknesses. This competency will be developed via the following key elements:	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	**4.3.1**	Reflect on knowledge gaps in managing endocrine and renal diseases and plan improvement
		4.3.2	Complete self-assessment tasks post-lecture
4.3.2	**Pra**ctice independent learning is needed for continuous professional development.	**4.3.3**	Follow the latest guidelines and research
		4.3.4	Use independent learning to stay updated on drug safety and new therapies.

4. Teaching and Learning Methods

1- **Lectures** **(√)**

2- **E-learning** **(√)**

3- **Practical training/ laboratory** **(√)**

4- **Discussion** **(√)**

5- **Brainstorming** **(√)**

6- **Class activity** **(√)**

7- **Seminars** **(√)**

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Hypothyroidism	4	2	2	---	---
2	Hyperthyroidism	4	2	2	---	---
3	Obesity	4	2	2	---	---
4	Diabetes Mellitus	4	2	2	---	---
5	Insulin products	4	2	2	---	---
6	Oral hypoglycemic drugs	4	2	2	---	---
7	**Periodical exam**					
8	Complications of DM	4				

			2	**2**	**---**	**---**
9	Polycystic Ovary Syndrome	**4**	**2**	**2**	**---**	**---**
10	Acute Kidney Injury	**4**	**2**	**2**	**---**	**---**
11	Drug-induced Kidney Damage	**4**	**2**	**2**	**---**	**---**
12	Drug Dosing Considerations in AKI	**4**	**2**	**2**	**---**	**---**
13	Chronic Kidney Disease	**4**	**2**	**2**	**---**	**---**
14	Dialysis	**4**	**2**	**Practical exam**		
15	Genitourinary tract infections	**4**	**2**	**Practical exam**		

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Periodical exam	**Week 7**	**10 marks**	**10%**
3	Final Written Exam	**Week 16,17**	**50 marks**	**50%**
4	Final Practical/Clinical/… Exam	**Week 14,15**	**15 marks**	**15%**
5	Final Oral Exam	**Week 16,17**	**10 marks**	**10%**
6	Assignments / Project /Rubric/ Logbook	**All semester long**	**10 marks**	**10%**
7	Quizzes	**Week 4, 8, 12**	**5 marks**	**5%**

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	• Pharmacotherapy: A Pathophysiologic Approach, DiPiro JT, 12th Edition (2023), McGraw-Hill • Applied Therapeutics: The Clinical Use of Drugs, 12th Edition, 2024. • Pharmacotherapy: Principles & Practice, 7th Edition, latest release. • Clinical Pharmacy and Therapeutics, 7th Edition, 2025.
	Other References	Theoretical Notes and Lab manual prepared by the department staff.
	Electronic Sources (Links must be added)	http://www.pubmed.com http://www.sciencedirect.com/ http://www.FDA.gov
	Learning Platforms (Links must be added)	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other (to be mentioned)	**Pharmacotherapy handbook, 12th (2023)**
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	**-Data show.** **- Computers.** **–Library.** **–Internet.** **-Interactive boards and distant learning unit**
	Supplies	Classrooms. -Educational pharmacy
	Electronic Programs	**https://www.mdcalc.com**
	Skill Labs/ Simulators	**Educational pharmacy**

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Management of Endocrine and Renal Disorders.
Course code: PP 804

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week 1	Hypothyroidism	1.1.1 , 1.1.2 , 1.1.3, 2.1.1 , 2.1.2 , 2.1.3 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning	Written, practical and oral exams
Week 2	Hyperthyroidism	1.1.1 , 1.1.2 , 1.1.3, 2.1.1 , 2.1.2 , 2.1.3 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 3	Obesity	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week 4	Diabetes Mellitus	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 5	Insulin products	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 6	Oral hypoglycemic drugs	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 7	**Periodical exam**			
Week 8	Complications of DM	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week 9	Polycystic Ovary Syndrome	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 10	Acute Kidney Injury	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week 11	Drug-induced Kidney Damage	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams
Week 1**2**	Drug Dosing Considerations in AKI	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2,	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

		3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week 14	Dialysis	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, seminars and practical training	Written, practical and oral exams
Week 15	Genitourinary tract infections	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 ,1.1.14, 1.1.15 2.1.4, 2.2.1, 2.2.2, 2.2.3, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.1, 2.5.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

Name and Signature
Course Coordinator
Associate. Prof. Noha Mahmoud El-Khodary

Name and Signature
Program Coordinator
Associate. Prof. Ahmed Amin Ali

Course Specification
(2025)

Course Title (according to the bylaw)	**Management of Oncological Diseases and Radiopharmacy**			
Course Code (according to the bylaw)	**PP 805**			
Department/s participating in delivery of the course	**Clinical Pharmacy department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	2	**1**	**--------**	**3**
Course Type	**Obligatory**			
Academic level at which the course is taught	**Fourth Level, second Semester**			
Academic Program	**BSc in pharmacy (pharm-D clinical)**			
Faculty/Institute	**Faculty of Pharmacy**			
University/Academy	**Kafrelshiekh University**			
Name of Course Coordinator	**Associ. Prof. Ahmed Amin**			
Course Specification Approval Date	**31/8/2025**			
Course Specification Approval	**Department Counsil**			

2. Course Overview (Brief summary of scientific content)

Cancer aetiology, risk factors, cancer staging and grading, diagnosis, prognosis, optimizing chemotherapeutic regimens, different types of tumors (solid and hematologic) and their management, toxicities of chemotherapy, supportive treatment, pharmaceutical care and

patient's support measures. This course also includes studying radioactive isotopes which process medical applications and precautions of their usage.

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3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (FUNDAMENTAL KNOWLEDGE) 1-1- **COMPETENCY**		**Upon completing this course, students will be able to describe the aetiology, risk factors, staging, grading, diagnosis, and prognosis of various cancers, and explain principles of tumour growth and chemotherapy. They will identify therapeutic regimens for solid and hematologic tumors, recognize chemotherapy toxicities, and outline supportive and pharmaceutical care measures for oncology patients. Students will also describe radioactive isotopes, their diagnostic and therapeutic applications, and safety precautions in nuclear pharmacy. They will demonstrate the ability to counsel patients and healthcare professionals on cancer treatments, supportive measures, and radiopharmaceutical use.** **This competency will be developed via the following key elements:**	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Explain the biomedical and molecular basis of cancer etiology, risk factors, and tumor progression.
		1.1.2	Describe the pharmacological mechanisms, therapeutic uses, and safety profiles of chemotherapeutic agents and radiopharmaceuticals.
		1.1.3	Relate cancer staging, grading, and diagnostic techniques to individualized treatment planning

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		1.1.4	Discuss the social, behavioral, and administrative aspects of providing oncology pharmaceutical care in a hospital setting.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	**1.1.5**	Evaluate the rationale for drug selection Interpret the pharmacokinetic and pharmacodynamic principles underlying the use of chemotherapeutic agents and radiopharmaceuticals.
		1.1.6	Assess the appropriateness of oncology treatment regimens based on cancer type, stage, and patient-specific factors.
		1.1.7	Evaluate the clinical effectiveness of cancer therapies using relevant patient outcomes and evidence-based guidelines.
		1.1.8	Identify, prevent, and manage adverse effects and safety concerns associated with cancer drugs in both inpatient and outpatient settings.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	**1.1.9**	Integrate cancer biology, pathology, and pharmacology to select appropriate chemotherapeutic and radiopharmaceutical agents.
		1.1.10	Apply knowledge of tumor staging, molecular markers, and patient comorbidities .to optimize individualized treatment plans.
		1.1.11	Interpret laboratory, imaging, and clinical data to address therapeutic challenges in oncology patient care.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	**1.1.12**	Search and appraise oncology clinical guidelines, trial data, and systematic reviews to guide patient care.
		1.1.13	Analyze cancer staging reports, tumor markers, and imaging findings to inform treatment decisions.
		1.1.14	Integrate evidence on chemotherapy protocols, supportive care, and

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			radiopharmaceutical use into patient management.
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.1.15	Detect recent advances and emerging trends in oncology therapeutics and radiopharmaceuticals.
		1.1.16	Evaluate the clinical and safety implications of newly approved anticancer agents and diagnostic tools.
		1.1.17	Synthesize information from current research and industry reports to recommend safe, effective, and innovative practices in oncology pharmacy.
		1.1.13	Assess the impact of drug shortages, recalls, and new regulatory policies on cancer patient care.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE **2-1- COMPETENCY**		**Upon finishing this course, students will be able Work collaboratively as a member of an inter-professional health care team to improve the quality of life of individuals and communities and respect patients' rights.** **This competency will be developed via the following key elements:**	
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.1.1	Demonstrate integrity and honesty in all oncology pharmacy practices.
		2.1.2	Uphold patient confidentiality in cancer care and radiopharmaceutical handling.
		2.1.3	Advocate for patients' rights in access to safe, effective, and affordable cancer therapies.
		2.1.4	Respect cultural, religious, and personal values when delivering oncology pharmaceutical care.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		2.1.5	Apply ethical decision-making in managing chemotherapy, investigational drugs, and palliative care.
		2.1.6	Promote equity and inclusivity in serving diverse cancer patient populations.
		2.1.7	Reflect on professional responsibilities to continually improve ethical standards in oncology and hospital pharmacy practice.
2-2- COMPETENCY		**students apply scientific and professional principles to ensure the safe, effective, and high-quality use of anticancer medicines and radiopharmaceuticals. They learn to:** • **Evaluate and standardize oncology drugs and radiopharmaceuticals per quality and regulatory requirements.** • **Prepare individualized chemotherapy regimens and supportive treatments tailored to cancer patients.** • **Handle, store, and dispose of hazardous and temperature-sensitive oncology agents safely.** • **Participate in oncology dispensing, including order verification, IV admixture preparation, and patient counseling on treatment and side-effect management.** **This competence will be developed via the following key elements:**	
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their	**2.2.1**	Apply pharmaceutical calculations and pharmacokinetic principles to adjust and optimize drug dosing in hospital settings.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	**2.2.2**	Utilize biostatistics, bioinformatics, and biopharmaceutics to support evidence-based decisions in drug delivery and therapy management.
		2.2.3	Evaluate and implement new drug delivery systems and conduct bioequivalence assessments to enhance patient care.
2-4- COMPETENCY		**Students are trained to respond promptly and responsibly to oncology-related emergencies such as chemotherapy extravasation, tumor lysis syndrome, and severe treatment toxicities. They develop skills in selecting and administering antidotes, managing hazardous cytotoxic drugs, and participating in multidisciplinary decision-making to ensure patient safety. The course also prepares students to collaborate with oncology care teams in critical situations, support life-saving interventions, and contribute to accurate medication-related assessments.** **This competency will be developed via the following key elements:**	
2.4.1	Ensure safe handling/use of poisons to avoid their harm to individuals and communities.	**2.4.1**	Identify and classify poisons, their sources, and mechanisms of toxicity..
		2.4.2	Apply protocols for the safe storage, labeling, and disposal of poisonous substances.
		2.4.3	Implement hospital guidelines for the prevention and management of poisoning incidents.
2.4.2		**2.4.4**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	Demonstrate understanding of the first aid measures needed to save patient's life.		Recognize oncologic emergencies such as tumor lysis syndrome, spinal cord compression, and febrile neutropenia.
		2.4.5	Apply immediate first-line interventions to stabilize oncology patients in critical conditions.
		2.4.6	Coordinate with the multidisciplinary team to ensure rapid referral and advanced management
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	**2.4.7**	Identify and assess medicine-related problems in oncology patients, including dosing errors, drug interactions, and contraindications.
		2.4.8	Implement evidence-based interventions to resolve identified pharmaceutical care issues.
		2.4.9	Monitor and evaluate patient outcomes to ensure the effectiveness and safety of implemented solutions.
2-5- COMPETENCY		**This course enables students to retrieve and critically appraise evidence-based oncology data to support clinical decisions and optimize cancer patient care. It also equips them with the skills to contribute effectively to planning and conducting research using appropriate methodologies relevant to oncology and cancer pharmacotherapy.** **This competency will be developed via the following key elements:**	
2.5.2	Retrieve, interpret, and critically evaluate evidence-based	**2.5.1**	Search and retrieve relevant clinical and pharmaceutical information from trusted oncology and hospital pharmacy resources.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	information needed in pharmacy profession	2.5.2	Interpret clinical data to support therapeutic decisions
		2.5.3	Critically appraise the validity, reliability, and applicability of evidence to patient care in hospital settings.
		2.5.4	Apply evaluated evidence to guide safe, effective, and patient-centered pharmaceutical decisions.
		2.5.5	Interpret and synthesize scientific data related to oncology therapeutics and supportive care.
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies.	2.5.6	Design oncology-related research protocols addressing cancer treatment, supportive care, or radiopharmaceutical applications.
		2.5.7	Apply appropriate oncology research methodologies, such as clinical trial design, tumor response assessment, and adverse event monitoring.
		2.5.8	Analyse and interpret oncology research data to improve chemotherapeutic regimens and patient care strategies.
DOMAIN 3: Pharmaceutical Care **3-1- COMPETENCY**		**This course students gain the ability to apply scientific and professional principles to ensure the quality, safety, and effective use of anticancer medicines in hospital settings. They learn:** • **How to evaluate and standardize cytotoxic drugs and supportive care medications according to oncology quality standards and regulatory guidelines.** • **How to compound and prepare individualized chemotherapy regimens, parenteral nutrition, and other patient-specific formulations**.	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			• **How to ensure proper storage and handling of high-alert oncology drugs (e.g., cytotoxic agents, targeted therapies, radiopharmaceuticals).** • **How to participate in oncology medication dispensing systems, including unit-dose preparation, automated systems, and patient counseling for cancer therapy.** **This competency will be developed via the following key elements:**
3.1.1	Apply the principles of body function and the basis of genomics in health and disease states to manage different diseases.	3.1.1	Explain the pathophysiology of cancer development, progression, and metastasis in relation to normal body functions.
		3.1.2	Interpret genomic and molecular biomarkers to guide targeted cancer therapy selection.
		3.1.3	Correlate genetic mutations with cancer risk, prognosis, and individualized treatment plans.
		3.1.4	Apply pharmacogenomics principles to optimize chemotherapy efficacy and minimize adverse effects.
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.1.5	Perform aseptic techniques to prevent infections in immunocompromised oncology patients.
		3.1.6	Conduct microbiological testing to identify opportunistic infections in cancer patients undergoing chemotherapy or radiotherapy.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		3.1.7	Interpret laboratory results to guide antimicrobial prophylaxis and treatment in oncology settings.
		3.1.8	Apply infection control protocols in oncology wards and during handling of high-risk medications.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches	3.1.9	Explain the etiology and epidemiology of infections commonly affecting cancer patients, especially those with immunosuppression.
		3.1.10	Describe the pathophysiological changes that predispose oncology patients to infection during chemotherapy and radiotherapy.
		3.1.11	Interpret laboratory diagnostic findings to differentiate between bacterial, viral, and fungal infections in oncology settings.
		3.1.12	Identify the clinical features and progression of opportunistic infections in cancer patients.
		3.1.13	Recommend evidence-based pharmacotherapeutic regimens for infection prevention and treatment in oncology patients.
3-2- COMPETENCY		**Upon finishing this course, students will be able to Provide counselling and education services to patients and communities about safe and rational use of medicines and medical devices.**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		This competency will be developed via the following key elements:	
3.2.1	Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions	**3.2.1**	Describe the therapeutic uses, standard dosage regimens, and contraindications of anticancer agents and supportive medications.
		3.2.2	Identify common adverse drug reactions and clinically significant drug–drug interactions in oncology pharmacotherapy.
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	**3.2.3**	Interpret pharmacokinetic and pharmacodynamic data to optimize dosing regimens of anticancer drugs and supportive therapies.
		3.2.4	Apply pharmacovigilance principles to detect, assess, and report adverse effects or safety concerns related to oncology medicines and medical devices.
		3.2.5	Recommend evidence-based adjustments in drug therapy or device use to improve treatment outcomes and minimize toxicity in cancer patients.
3.2.3	Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals	**3.2.6**	Evaluate scientific evidence on the efficacy and safety of complementary therapies used alongside conventional cancer treatments.
		3.2.7	Counsel patients and healthcare teams on potential benefits, risks, and interactions of phytotherapy, aromatherapy, and nutraceuticals in oncology care.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
3.2.4	Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control.	3.2.8	Identify sources and toxicological profiles of drugs and other xenobiotics encountered in clinical practice.
		3.2.9	Recognize clinical signs and symptoms of toxicity.
		3.2.10	Implement evidence-based management and control strategies, including antidote administration and supportive care in emergency and critical care units.
3.2.5	Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC .preparations and medical devices	3.2.11	Deliver patient-centered counseling on the correct use, storage, and disposal of oncology-related medicines, including oral chemotherapy and supportive care drugs.
		3.2.12	Train healthcare professionals on proper handling and administration of high-risk cancer medicines and related medical devices (e.g., infusion pumps, ports).
		3.2.13	Provide community education programs to raise awareness on safe OTC use and interactions with cancer therapies.
3.2.6	Maintain public awareness on social health hazards of drug misuse and .abuse	3.2.14	Organize awareness campaigns on the risks of opioid misuse in cancer pain management.
		3.2.15	Educate patients and caregivers on the safe use, storage, and disposal of controlled substances used in oncology care.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		3.2.16	Collaborate with healthcare teams to develop educational materials addressing substance abuse risks in cancer patients.
DOMAIN 4: Personal Practice **4-1- COMPETENCY**		**Upon finishing this course, students will be able to express leadership, time management, critical thinking, problem solving, independent and teamwork, creativity and entrepreneurial skills** **This competency will be developed via the following key elements:**	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.1.1	Coordinate with oncology healthcare teams to ensure timely preparation and delivery of chemotherapy and supportive care medications.
		4.1.2	Provide constructive feedback to peers on oncology-related tasks, ensuring adherence to safety protocols and efficiency in workflow.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.3	Retrieve and critically appraise oncology-related clinical data and literature to support evidence-based treatment decisions.
		4.1.4	Identify and propose solutions to medicine-related problems in cancer therapy, including dose adjustments and toxicity management.
4-2- COMPETENCY		**Upon finishing this course, students will be able to Effectively communicate verbally, non-verbally and in writing with individuals and communities.** **This competency will be developed via the following key elements:**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care teams, patients, and communities	4.2.1	Communicate oncology-related information clearly and empathetically to patients, caregivers, and healthcare professionals through verbal and written formats.
		4.2.2	Apply appropriate non-verbal cues and culturally sensitive communication techniques when counseling cancer patients and collaborating with oncology teams.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.3	Utilize modern presentation software, data visualization tools, and digital platforms to present oncology-related topics effectively.
		4.2.4	Integrate multimedia resources and evidence-based oncology data to create engaging and informative presentations for healthcare professionals and patient education.
4-3- COMPETENCY		**Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement. This competency will be developed via the following key elements:**	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Reflect on personal oncology-related knowledge, clinical skills, and decision-making to identify strengths and areas for improvement.
		4.3.2	Develop and implement an action plan to enhance professional growth and personal competencies in oncology pharmacy practice.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4.3.2	Practice independent learning is needed for continuous professional development.	4.3.3	Engage in self-directed study to stay current with advances in oncology therapeutics, radiopharmaceuticals, and supportive care.
		4.3.4	Apply newly acquired oncology knowledge and skills to improve clinical decision-making and patient care outcomes.

4. Teaching and Learning Methods

.1- **Lectures** **(√)**

2- **E-learning** **(√)**

3- **Practical training/ laboratory** **(√)**

4- **Discussion** **(√)**

5- **Brainstorming** **(√)**

6- **Assignments** **(√)**

7- **Case study** **(√)**

8- **Seminars** **(√)**

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Inroduction of cancer	4	2	2	---	---
2	Principles of tumor growth,diagnosis and staging	4	2	2	---	---
3	Principles of chemotherapy &general supportive care issues	4	2	2	---	---
4	Breast cancer	4	2	2	---	---
5	Lung cancer	4	2	2	---	---
6	Malignant lymphoma	4	2	2	---	---
7	**Periodical exam**					
8	Leukemia	4	2	2	---	---
9	Prostate cancer	4	2	2	---	---
10	Colorectal cancer	4	2	2	---	---
11	Introduction to the concept of nuclear pharmacy, and radiopharmaceuticals	4	2	2	---	---
12	Diagnostic radiopharmaceuticals	4	2	2	---	---
13	Therapeutic radiopharmaceuticals	4	2	2	---	---
14	Applications of radiopharmaceuticals	4	2	**Practical exam**		
15	Applications of radiopharmaceuticals	4	2	**Practical exam**		

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Periodical exam	**Week 7**	**10 marks**	**10%**
2	Final Written Exam	**Week 16,17**	**50 marks**	**50%**
3	Final Practical/Clinical/… Exam	**Week 14,15**	**15 marks**	**15%**
4	Final Oral Exam	**Week 16,17**	**15 marks**	**10%**
5	Assignments / Project /Rubric System/ Logbook	**All semester long**	**10 marks**	**10%**

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course**	Pharmacotherapy. DiPiro JT et al (Ed). McGraw Hill, 11th Edition.2024
	Other References	Polovich M (ed). Safe Handling of Hazardous Drugs. 4th ed. Pittsburgh: Oncology Nursing Society; 2023.
	Electronic Sources	https://www.nccn.org https://www.asco.org https://www.esmo.org
	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php
	Others	Cancer: Principles & Practice of Oncology (DeVita, Hellman & Rosenberg) 12th edition 2023. The MD Anderson Manual of Medical Oncology 4th edition 2022.
Supportive facilities & equipment for teaching	**Devices/Instruments**	- Data show. - Computers. –Library.

and learning *		–Internet. -Interactive boards and distant learning unit
	Supplies	Classrooms. -Educational pharmacy
	Electronic Programs	**/https://www.mdcalc.com**
	Skill Labs/ Simulators	-Educational pharmacy **- IV Admixture unit**

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Management of Oncological Diseases and Radiopharmacy.
Course code: PP805

Course Contents		**Key elements**	**Teaching and Learning Methods**	**Student Assessment Methods**
Week # 1	Inroduction of cancer	1.1.1 , 1.1.2 , 1.1.3, 2.1.1 , 2.1.2 , 2.1.3	Lectures, E-learning	Written, practical and oral exams
Week # 2	Principles of tumor growth,diagnosis and staging	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6 , 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9,3.2.10, 3.2.11, 3.2.12, 3.2.13	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1.4, 4.2.2.2.2.2.4, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 3	Principles of chemotherapy &general supportive care issues	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13, 2.1.4, 2.1.5, 2.1.6, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 4	Breast cancer	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		2.5.3, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 5	Lung cancer	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 6	Malignant lymphoma	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 7	**Periodical exam**			
Week # 8	Leukemia	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		2.5.3, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 9	Prostate cancer	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.134.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.3.2, 4.3.3, 4.3.4		
Week # 10	Colorectal cancer	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 11	Introduction to the concept of nuclear pharmacy, and radiopharmaceuticals	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.5,	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams

		3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.134.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 12	Diagnostic radiopharmaceuticals	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

Week # 13	Therapeutic radiopharmaceuticals	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13 , 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4	Lectures and E-learning	Written, practical and oral exams
Week # 14	Applications of radiopharmaceuticals	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.3,	Lectures and E-learning	Written and oral exams

		3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 15	Applications of radiopharmaceuticals	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11. 1.1.12, 1.1.13, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13, 3.2.14 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2,	Lectures and E-learning	Written and oral exams

		4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		

Name and Signature Course Coordinator **Associate. Prof.** Ahmed Amin Ali	Name and Signature Program Coordinator **Associate. Prof.** Ahmed Amin Ali

Kafrelsheikh University

Faculty of Pharmacy

جامعة كفر الشيخ

كلية الصيدلة

Course Specification

(2025)

Course Title (according to the bylaw)	Clinical Pharmacokinetics			
Course Code (according to the bylaw)	PP806			
Department/s participating in delivery of the course	Clinical Pharmacy Department			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	2	**1**		**3**
Course Type	obligatory			
Academic level at which the course is taught	Fourth level, second semester			
Academic Program	Bachelor in pharmacy (Pharm D- clinical)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate professor/ Ahmed Amin			
Course Specification Approval Date	8/31/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	Department council			

2. Course Overview (Brief summary of scientific content)

Introduction to clinical pharmacokinetics and its applications, pharmacokinetics, noncompartmental pharmacokinetics and moment analysis. Drug distribution and drug clearance mechanisms, IV infusion kinetics and kinetics following extra-vascular dosing, metabolite kinetics, multiple dose kinetics, non-linear pharmacokinetics, dosage regimen design, dosage individualization of drugs of narrow therapeutic index especially in patients with compromised renal and hepatic function

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

<table>
<tr><th colspan="2">Program Outcomes (NARS/ARS)
(according to the matrix in the program specs)</th><th colspan="2">Course Learning Outcomes
Upon completion of the course, the student will be able to:</th></tr>
<tr><th>Code</th><th>Text</th><th>Code</th><th>Text</th></tr>
<tr><td colspan="2">Domain 1 (FUNDAMENTAL KNOWLEDGE)
1-1- COMPETENCY</td><td colspan="2">By the end of the Clinical Pharmacokinetics course, the student will be able to
Integrate knowledge from basic and applied pharmaceutical and clinical sciences to interpret drug absorption, distribution, metabolism, and elimination.
Apply this integration to determine appropriate dosing regimens for individual patients and populations.
This competency will be developed via the following key elements:</td></tr>
<tr><td rowspan="3">1.1.1</td><td rowspan="3">Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.</td><td>1.1.1</td><td>Relate ADME processes to PK models (single dose IV/oral, multiple dosing, infusion, two-compartment model).</td></tr>
<tr><td>1.1.2</td><td>Apply physiology and pathophysiology to predict drug behavior in patients.</td></tr>
<tr><td>1.1.3</td><td>Connect basic sciences with clinical dosing decisions</td></tr>
</table>

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.1.4	Use clearance, volume of distribution, and half-life to justify dose adjustments.
		1.1.5	Evaluate safety in hepatic and renal impairment dosing.
		1.1.6	Link PK parameters to therapeutic effects for drugs like vancomycin, aminoglycosides, phenytoin.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems	1.1.7	Apply PK equations to calculate loading and maintenance doses
		1.1.8	Solve dose adjustment cases for impaired organ function
		1.1.9	Interpret serum drug levels to guide therapy.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.10	Use literature to interpret bioavailability and bioequivalence data.
		1.1.11	Apply evidence from PK studies to clinical practice
		1.1.12	Compare alternative dosage regimens from research findings
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.1.13	Stay updated on new dosing strategies (e.g., extended-interval aminoglycosides).
		1.1.14	Evaluate new PK models for precision dosing.
		1.1.15	Assess updated therapeutic drug monitoring guidelines.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE **2-2- COMPETENCY**		**By the end of the Clinical Pharmacokinetics course, the student will be able to** • Perform accurate pharmacokinetic calculations for single-dose and multiple-dose regimens (IV bolus, oral, IV infusion, two-compartment models). • Adjust doses based on bioavailability, bioequivalence, and patient-specific variables.	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		This competency will be developed via the following key elements:	
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice	2.2.1	Perform dose and interval calculations for various administration routes.
		2.2.2	Use statistical tools to analyze PK study results.
		2.2.3	Interpret bioequivalence studies to ensure interchangeability
2-5- COMPETENCY		**By the end of the Clinical Pharmacokinetics course, the student will be able to** • Retrieve, interpret, and critically evaluate pharmacokinetic data from clinical studies. • Apply evidence-based strategies for dosing complex drugs such as phenytoin, aminoglycosides, vancomycin, lithium, and digoxin. This competency will be developed via the following key elements:	
2.5.2	Competency Contribute to pharmaceutical research studies and clinical trials needed to authorize medicinal products.	2.5.1	Critically review PK data for nonlinear drugs like phenytoin
		2.5.2	Compare literature values of PK parameters for dose optimization.
		2.5.3	Assess the quality of bioavailability studies before clinical application.
Domain 3: Pharmaceutical Care **3-2- Competency**		**By the end of the Clinical Pharmacokinetics course, the student will be able to** • Counsel patients on safe and effective medication use, especially for drugs with narrow therapeutic windows. • Explain the importance of therapeutic drug monitoring and adherence to dosing schedules.	
3.2.1	Integrate the pharmacological properties of drugs including mechanisms of action,	3.2.1	Combine mechanism of action with PK to explain dosing choices.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.	3.2.2	Counsel on dosing schedules to improve adherence.
		3.2.3	Identify risks of toxicity from PK accumulation (digoxin, lithium).
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.2.4	Monitor serum drug levels to prevent toxicity.
		3.2.5	Adjust therapy based on PK and ADR reports.
		3.2.6	Implement TDM protocols for high-risk drugs.
Domain 4: Personal Practice **4-1- Competency**		**By the end of the Clinical Pharmacokinetics course, the student will be able to** • Demonstrate leadership and teamwork skills in solving pharmacokinetic case studies under time constraints. • Apply critical thinking and problem-solving to dose adjustments in hepatic and renal impairment. This competency will be developed via the following key elements:	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.1.1	Collaborate on PK case studies with strict deadlines.
		4.1.2	Ensure accurate and timely calculations
		4.1.3	Delegate PK tasks effectively in group projects.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.4	Independently evaluate patient PK profiles.
		4.1.5	Identify dosing errors and propose evidence-based solutions
		4.1.6	Cross-check team calculations for accuracy.
4-2- Competency		**By the end of the Clinical Pharmacokinetics course, the student will be able to**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
			• Communicate dosing recommendations clearly to healthcare teams using verbal, written, and electronic formats. • Present pharmacokinetic concepts and case solutions effectively to peers and professionals. This competency will be developed via the following key elements:
4.2.1	Show the ability to effectively present a topic of interest using recent technology.	**4.2.1**	Present PK findings to physicians in clinical rounds.
		4.2.2	Use visual aids (charts, graphs) for PK data presentation.
4.2.2	Communicate clearly by verbal and written means with patients and members of healthcare society	**4.2.3**	Use PK simulation software to illustrate dosing regimens.
		4.2.4	Prepare PK graphs and tables for presentations
		4.2.5	Employ digital tools to enhance PK data visualization.
4-3- Competency		**By the end of the Clinical Pharmacokinetics course, the student will be able to** • Assess personal strengths and weaknesses in pharmacokinetics. • Engage in continuous learning by reviewing updated guidelines and literature to enhance dosing practices. This competency will be developed via the following key elements:	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	**4.3.1**	Review personal PK calculation accuracy.
		4.3.2	Reflect on decision-making in PK case studies.
		4.3.3	Identify personal strengths/weaknesses in PK knowledge.
4.3.2		**4.3.4**	Follow new PK research in journals.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		4.3.5	Learn updated dosing algorithms.
		4.3.6	Explore emerging PK software and models.

4. Teaching and Learning Methods

1. **Lectures (√)**
2. **Tutorial (Case study) (√)**
3. **Seminar / Workshop (√)**
4. **Class Activity (discussion, brain storm) (√)**
5. **Assignments (√)**

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/ Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Introduction (basic pharmacokinetics, rates and orders)	**4**	**2**	**2**	**---**	**---**
2	Single IV bolus &oral pharmacokinetics	**4**	**2**	**2**	**---**	**---**
3	Multiple IV&oral pharmacokineetics	**4**	**2**	**2**	**---**	**---**
4	Dose adjustment in hepatic and renal diseases	**4**	**2**	**2**	**---**	**---**
5	Dose adjustment in hepatic and renal diseases (cont.)	**4**	**2**	**2**	**---**	**---**
6	Two compartment pharmacokinetics model	**4**	**2**	**2**	**---**	**---**
7	**Periodical exam**					
8	Therapeutic drug monitoring(TDM) of phenytoin	**4**	**2**	**2**	**---**	**---**
9	Therapeutic drug monitoring(TDM) of phenytoin (cont.)	**4**	**2**	**2**	**---**	**---**
10	TDM of aminoglycoside	**4**	**2**	**2**	**---**	**---**
11	TDM of Aminoglycoside (cont.)	**4**	**2**	**2**	**---**	**---**
12	TDM of vancomycin	**4**	**2**	**2**	**---**	**---**
14	TDM of vancomycin (cont.)	**4**	**2**	**2**	**---**	**---**
14	Bioavailability and bioequivalence	**4**	**2**	**Practical exam**		

15	Bioavailability and bioequivalence (cont.)	**4**	**2**	**Practical exam**		

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Periodical exam	**Week 7**	**10 marks**	**10%**
2	Final Written Exam	**Week 16,17**	**50 marks**	**50%**
3	Final Practical/Clinical/… Exam	**Week 14,15**	**15 marks**	**15%**
4	Final Oral Exam	**Week 16,17**	**10 marks**	**10%**
5	Assignments / Project /Rubric system / Logbook	**All semester long**	**10 marks**	**10%**
6	Quizzes	**Week 4. 8.12**	**5 marks**	**5%**

*** The methods mentioned are examples, the organization may add and/or delete**

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course**	Basic Pharmacokinetics,Mohsen A. Hedaya Edition3rd Edition,2023 Shargel and Yu's Applied Biopharmaceutics & Pharmacokinetics, 8th Edition, 8th Edition.2022 2023 Casebook in Clinical Pharmacokinetics and Drug Dosing, 1st Edition .2014
	Other References	Notes in clinical pharmacokinetics Practical notes in Clinical pharmacokinetics .
	Electronic Sources	RxKinetics Pharmacokinetics and Nutrition Software for Pharmacists Pharmaceutical Press | Essential Pharmaceutical Knowledge www.medscape.com

	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other	Clinical Pharmacokinetics, 7th Edition & Workbook,2021
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	- Data show. - Computers. –Library. –Internet. -Interactive boards and distant learning unit
	Supplies	Classrooms. -Educational pharmacy
	Electronic Programs	**/https://www.mdcalc.com**
	Skill Labs/ Simulators	-Educational pharmacy

*** The list mentioned is an example, the institution may add and/or delete depending on the nature of the course**

Course Plan

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Clinical Pharmacokinetics

Course code: P806

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Introduction (basic pharmacokinetics, rates and orders)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6		
Week # 2	Single IV bolus &oral pharmacokinetics	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 3	Multiple IV&oral pharmacokineetics	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 4	Dose adjustment in hepatic and renal diseases	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

Week # 5	Dose adjustment in hepatic and renal diseases (cont.)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 6	Two compartment pharmacokinetics model	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 7	**Periodical exam**			
Week # 8	Therapeutic drug monitoring(TDM) of phenytoin	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 9	Therapeutic drug monitoring(TDM) of phenytoin (cont.)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6		
Week # 10	TDM of aminoglycoside	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 11	TDM of Aminoglycoside (cont.)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams
Week # 12	TDM of vancomycin	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

Week # 13	TDM of vancomycin (cont.)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, seminars and practical training	
Week # 14	Bioavailability and bioequivalence	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, seminars and practical training	Written, practical and oral exams
Week # 15	Bioavailability and bioequivalence (cont.)	1.1.1, 1.1.2, 1.1.3, 1.1.4 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,1.1.10 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 2.2.1,2.2.2, 2.2.3, 2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2 ,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1 ,4.1.2, 4.1.3,4.1.5,4.1.6,4.2.1,4.2.2, 42.3,4.2.4,4.2.5, 4.3.1,4.3.2,4.3.3,4.3.4,4.3.4, 4.3.5,4.3.6	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

Name and Signature Course Coordinator	**Name and Signature Program Coordinator**

Kafrelsheikh University

Faculty of Pharmacy

جامعة كفر الشيخ
كلية الصيدلة

Course Specification
(2025)

1. Basic Information

Course Title (according to the bylaw)	Clinical Biochemistry			
Course Code (according to the bylaw)	**PB 804**			
Department/s participating in delivery of the course	Biochemistry			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	2	1		3
Course Type	Compulsory			
Academic level at which the course is taught	Fourth level, second semester			
Academic Program	Bachelor degree in clinical pharmacy (pharm D clinical)			
Faculty/Institute	Pharmacy			
University/Academy	Kafrelsheikh university			
Name of Course Coordinator	Dr/ Tarek Okda			
Course Specification Approval Date	9/2025			

Course Specification Approval (Attach the decision/minutes of the department /committee/council ….)	Department council

2. Course Overview (Brief summary of scientific content)

This course covers the fundamental aspects of clinical chemistry of various diseases, such as cancer, liver, heart, and kidney. The necessary clinical knowledge and skills correlate with the biochemical analyses of a certain disease and its appropriate management. The recent specific diagnostic markers of each disease and how they can be analyzed.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (fundamental knowledge) **1-1 competency**		Upon finishing this course, students will be able to integrate knowledge from clinical biochemistry science to deliver population and patient-centered care. This competency will be developed via the following key elements:	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Recognize how biochemical processes and molecules in diabetes, liver, kidney, tumor markers, nutrition, plasma proteins, immunoglobulins, hormones, coagulation, enzymes, and electrolytes relate to human health and disease.
		1.1.2	Identify laboratory tests to diagnose, monitor, and manage medical conditions in diabetes, liver, kidney, tumor markers, nutrition, plasma proteins, immunoglobulins, hormones, coagulation, enzymes, and electrolytes through the measurement of biomarkers in body fluids.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	1.1.3	Use concepts from basic sciences to address therapeutic problems in diabetes, liver, kidney, tumor markers, nutrition, plasma proteins, immunoglobulins, hormones, coagulation, enzymes, and electrolytes, and this supports evidence-based decision-making in selecting, monitoring, and adjusting treatment plans for optimal patient outcomes.
1.1.6	Utilize scientific literature, collect and interpret information to enhance professional decisions.	1.1.4	Search, critically appraise, and extract relevant data from scientific literature about diabetes, liver, kidney, tumor markers, nutrition, plasma proteins, immunoglobulins, hormones, coagulation, enzymes, and electrolytes to inform clinical judgments.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE **2-1 competency**		Upon finishing this course, students will be able to work collaboratively as members of an inter-professional health care team to improve the quality of life of individuals and communities, and respect patients' rights. This competency will be developed via the following key elements:	
2.1.1	Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of healthcare professionals team.	2.1.1	Adhere to the pharmaceutical law and legislation in clinical biochemistry laboratories and respect human rights.
2.1.2	Adopt the ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.1.2	Obey the ethical and legal guidelines in clinical biochemistry laboratories while performing their responsibilities and recognize patients' rights.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
2.1.3	Recognize your own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.	2.1.3	Recognize self-professional limitations and accept guidance from other healthcare colleagues.
2-3 competency		Upon finishing this course, students will be able to handle and dispose of biological and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations. This competency will be developed via the following key elements:	
2.3.1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical fields	2.3.1	Manipulate different chemical, pharmaceutical, and biological products such as blood and urine samples.
2.3.2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.3.2	Handle and dispose of biological materials and synthetic/natural pharmaceutical products, taking in consideration ethical, legal, and safety guidelines
2-4 competency		Upon finishing this course, students will be able to actively share professional decisions and proper actions to save a patient's life in emergencies through different lab investigation tests. That can detect poisoning with various xenobiotics. This competency will be developed via the following key elements:	
2.4.4	Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.	2.4.1	Detect the cause of toxicity based on lab investigations such as serum creatinine, ALT, and AST, and work efficiently in the forensic team.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
2-5 competency		Upon finishing this course, students will be able to contribute to clinical biochemistry research studies and learn about different types of specimens, analysis methods, and instruments. This competency will be developed via the following key elements:	
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in the pharmacy profession.	**2.5.1**	Detect possible disorder based on lab investigations.
2.5.3	Contribute to planning and conducting research studies using appropriate methodologies.	**2.5.2**	Select a suitable method for the analysis of different body fluid samples.
Domain 3 (Pharmaceutical Care) **3-1 competency**		Upon finishing this course, students will be able to apply the principles of body biochemistry to improve health care services using evidence-based information. This competency will be developed via the following key elements:	
3.1.1	Apply the principles of body function and the basis of genomics in health and disease states to manage different diseases.	**3.1.1**	Relate the biochemistry of normal and abnormal body function to manage different disorders and diseases, especially disorders of the endocrine systems and metabolic diseases, to improve healthcare services.
3.1.3	Monitor and control microbial growth and carry out laboratory tests for the identification of infections/diseases.	**3.1.2**	Perform different biochemical tests to identify and diagnose different infections/diseases.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and	**3.1.3**	Relate disease etiology, epidemiology, pathophysiology, clinical features, lab investigation and pharmacotherapy approaches based on recent international practice guideline

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.1.4	Make necessary changes in the therapeutic plan based on the clinical picture and lab investigations.
Domain 4: Personal Practice **4-1 competency**		Upon finishing this course, students will be able to express leadership, manage time, solve problems, work in a team, be independent, and creative This competency will be developed via the following key elements:	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills	4.1.1	Plan and set realistic targets to achieve the required task by deadlines based on the available information.
		4.1.2	Manage different and unexpected challenges in to work effectively independently and in a team.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.3	Demonstrate critical thinking skills, including problem-solving, creativity, and time management in team performance evaluation.
4-2 competency		Upon finishing this course, students will be able to communicate verbally, non-verbally, and in writing with either their colleagues in the medical field, patients, or communities. This competency will be developed via the following key elements:	
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care teams, patients, and communities.	4.2.1	Communicate clearly by verbal and written means with patients and members of healthcare society.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills	4.2.2	Present clinical biochemistry data and topics effectively using modern technology.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4-3 competency		Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement. This competency will be developed via the following key elements:	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Determine self-merits/limitations to improve personal and professional skills using information from different clinical biochemistry sources.
4.3.2	Practice independent learning is needed for continuous professional development.	4.3.2	Track the continuous updates with respect to new regulations and guidelines.
		4.3.3	Learn independently to develop professional skills.

4. Teaching and Learning Methods

1. Lecture
2. Practical
3. Presentation
4. E.learning
5. Brain storming
6. Discussion
7. Case study
8. Assignment
9. Virtual lab

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ ……)	Training (Practical/Clinical/ ……)	Self-learning (Tasks/ Assignments/ Projects/ …)	Other (to be determined)
1	Diabetes mellitus and laboratory tests	4	2	2		
2	Liver Functions and laboratory Tests	4	2	2		
3	Renal Functions and laboratory tests	4	2	2		
4	Urine as a diagnostic tool for diseases	4	2	2		
5	Electrolyte balance and imbalance	4	2	2		
6	Nutrition and health	4	2	2		
7	**Mid-term exam**					
8	Tumor markers	4	2	2		
9	Hormonal disturbances	4	2	2		
10	Hormonal disturbances 2	4	2	2		
11	Hormonal disturbances 3	4	2	2		
12	Plasma proteins	4	2	2		
13	Coagulations.	4	2	2		
14	Immunoglobulins.	2	2	Practical exam		
15	Plasma and non-pasma enzymes.	2	2	Practical exam		

Course Schedule

5. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks

1	Exam 1written (Semester work)	Week 7	10	10%
2	Exam 2 ……. (Semester work)			
3	Final Written Exam	Week 16-17	50	50%
	Final Practical/Clinical/… Exam	Week 14-15	20	20%
	Final Oral Exam	Week 16-17	10	10%
	Assignments / Project /Portfolio/ Logbook	Week 3,6,11	5	5%

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	1- Michael Murphy Rajeev Srivastava Kevin Deans (2018) Clinical Biochemistry, 6th Edition, Elsevier. 2-**Murphy, M. J., Srivastava, R., & Deans, K. A. (2022).** *Clinical biochemistry: An illustrated colour text* (7th ed.). Elsevier.
	Other References	**Vasudevan, D. M., Sreekumari, S., & Vaidyanathan, K. (2022).** *Textbook of medical biochemistry* (9th ed.). Jaypee Brothers Medical Publishers
	Electronic Sources (Links must be added)	www.highwire.com,www.google.com,www.pubmed.com &www.biomed.net
	Learning Platforms (Links must be added)	**https://lms3.kfs.edu.eg/pharm/login/index.php**
	Other (to be mentioned)	Notes in Clinical Biochemistry by staff-members of department of Biochemistry. Lab.manual in Clinical Biocemistry by staff-members of Department of Biochemistry
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	Laboratory facilities
	Supplies	lab instruments such as glass wares, pH meters, electrophoretic apparatus, centrifuge, spectrophotometers, session rooms
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	Praxi lab
	Other (to be mentioned)	Data show, smart board, Unit for distance learning, Computers, Internet and Library.

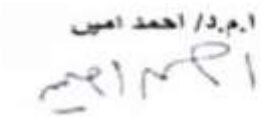
Course Plan

Course title: Clinical biochemistry **Course code: PB 804**

Wk.	Topic	Key Elements	Teaching & Learning Methods	Student Assessment Methods
1	**Diabetes mellitus and laboratory tests**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
2	**Liver Functions and laboratory Tests**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
3	**Renal Functions and laboratory tests**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, virtual lab, assignment and presentation	Written, practical and oral exams
4	**Urine as a diagnostic tool for diseases**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3. 1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams

5	**Electrolyte balance and imbalance**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
6	**Nutrition and health**	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, virtual lab, assignment and presentation	Written, practical and oral exams
7				
8	Tumor markers	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
9	Hormonal disturbances	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
10	Hormonal disturbances 2	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2,	Lectures, E-learning, practical training, discussion, brain storming,	Written, practical and oral exams

		4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	case study, and virtual lab,	
11	Hormonal disturbances 3	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, virtual lab, assignment and presentation	Written, practical and oral exams
12	Plasma proteins	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study, and virtual lab,	Written, practical and oral exams
13	Coagulations.	1.1.1,1.1.2,1.1.3, 1.1.4,2.1.1,2.1.2, 2.1.3,2.3.1,2.3.2, 2.4.1,2.5.1,2.5.2, 3.1.1,3.1.2,3.1.3, 3.1.4,4.1.1,4.1.2, 4.1.3,4.2.1,4.2.2, 4.3.1,4.3.2,4.3.3	Lectures, E-learning, practical training, discussion, brain storming, case study and virtual lab	Written, practical and oral exams
14	Immunoglobulins.	1.1.1,1.1.2,1.1.3, 1.1.4,3.1.1,3.1.2, 3.1.3,3.1.4,4.1.1, 4.1.2,4.1.3,4.2.1, 4.2.2,4.3.1,4.3.2, 4.3.3	Lectures, E-learning, discussion, brain storming and case study	Written and oral exams
15	Plasma and non-pasma enzymes.	1.1.1,1.1.2,1.1.3, 1.1.4,3.1.1,3.1.2, 3.1.3,3.1.4,4.1.1, 4.1.2,4.1.3,4.2.1, 4.2.2,4.3.1,4.3.2, 4.3.3	Lectures, E-learning, discussion, brain storming and case study	Written and oral exams

Name and Signature Course Coordinator Dr/ Tarek Okda	Name and Signature Program Coordinator
	

Kafrelsheikh University

Faculty of Pharmacy

جامعة كفر الشيخ

كلية الصيدلة

Course Specification

2025

1. Basic Information

Course Title (according to the bylaw)	**Public Health and Preventive Medicine**			
Course Code (according to the bylaw)	**PM 806**			
Department/s participating in delivery of the course	**Microbiology and Immunology department**			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	2	**0**	**----**	**2**
Course Type	**Compulsory course**			
Academic level at which the course is taught	**Fourth level, semester (2)**			
Academic Program	**BSc in Pharmacy (Pharm D clinical)**			
Faculty/Institute	**Faculty of Pharmacy**			
University	**Kafrelsheikh University**			
Name of Course Coordinator	**Prof. Dr. Mysara Mohammed**			
Course Specification Approval Date	**9/2025**			
Course Specification Approval	**Department council**			

2. Course Overview (Brief summary of scientific content)

The course introduces students to the global public health and the Sustainable Development Goals (SDGs). It also includes the fundamentals of epidemiology, communicable and non-communicable diseases and their control with special emphasis on antibiotic resistance and antibiotic stewardship as well as emerging pathogens. The course also covers nutritional health, occupational medicine and women's, children's and adolescent's health and the relationship between the environment and public health. It is anticipated that students will achieve an understanding of the optimal environmental conditions for improved public health such as air, food and water purity and sanitary water disposal. The ability to understand and evaluate the biological and chemical basis for health threats emanating from the environment is also gained.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (FUNDAMENTAL KNOWLEDGE) 1-1- COMPETENCY		**Upon finishing this course, students will be able to integrate knowledge from basic Public health science to understand the epidemiological characteristics of infectious diseases and outbreak epidemiology.** **This competency will be developed via the following key elements:**	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Describe core concepts of epidemiology, determinants of health, and disease prevention.
		1.1.2	Identify major public health problems.
		1.1.3	Explain the stages of the infection cycle and describe the interactions between pathogen, host, and environment, emphasizing factors influencing transmission, prevention, and control in public health and pharmacy practice

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		1.1.4	Describe occupational and nosocomial diseases and describe their causes, risk factors, and prevention strategies.
		1.1.5	Classify major diseases, their modes of transmission, and outline their epidemiology, prevention, and control measures in the community.
		1.1.6	Describe the principles of nutrition and their impact on individual and family health, and relate nutritional interventions to the prevention and management of common public health problems.
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	**1.1.7**	Utilize appropriate pharmaceutical and medical terminology, abbreviations, and symbols when documenting, reporting, and communicating public health data, disease surveillance findings, and community health interventions
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	**1.1.8**	Integrate knowledge from public health science to evaluate the effectiveness and safety of drugs for both individuals and populations in the context of disease prevention and health promotion.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	**1.1.9**	Retrieve information from pharmaceutical and public health sciences to address therapeutic problems, considering both individual patient needs and population-level health priorities.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	**1.1.10**	Utilize scientific literature and gather relevant epidemiological and clinical data to inform evidence-based professional decisions that improve individual and population health outcomes.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-1- COMPETENCY		**Upon finishing this course, students will be able to collaborate effectively within inter-professional health care teams to plan and implement public health**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		interventions, promote patients' rights, and enhance the quality of life for individuals and communities **This competency will be developed via the following key elements:**	
2.1.1	Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team.	**2.1.1**	Fulfill professional responsibilities in accordance with legal, ethical, and professional frameworks, while respecting the roles of all health care team members in delivering public health services.
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	**2.1.2**	Adhere to national and international public health laws, ethical codes, and professional standards when delivering pharmacy-related public health services.
2-4- COMPETENCY		**Upon finishing this course, students will be able to collaborate with relevant public health authorities to protect patient safety and the community.** **This competency will be developed via the following key elements:**	
2.4.1	Ensure safe handling/use of poisons to avoid their harm to individuals and communities.	**2.4.1**	Apply legal, ethical, and professional guidelines and support public health safety measures.
2.4.2	Demonstrate understanding of the first aid measures needed to save patient's Life.	**2.4.2**	Follow the evidence-based first aid measures and apply them effectively to preserve life, prevent complications, and support community emergency preparedness in public health contexts.
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	**2.4.3**	Detect related health care problems and implement public health–oriented strategies such as patient counseling and community education to prevent recurrence.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
2-5- COMPETENCY		**Upon finishing this course, students will be able to participate in public health research studies and generate evidence required for the authorization, safety monitoring, and public health evaluation of medicinal products.** **This competency will be developed via the following key elements:**	
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.	**2.5.1**	Interpret and critically evaluate epidemiological data and public health surveillance findings to inform evidence-based pharmaceutical care decisions and support community health interventions.
Domain 3: Pharmaceutical Care **3-1- Competency**		**Upon finishing this course, students will be able to evaluate patient health status and epidemiological evidence to design and deliver pharmaceutical care interventions that enhance health outcomes and support public health initiatives.** **This competency will be developed via the following key elements:**	
3.1.2	Apply the principles of public health and pharmaceutical microbiology to select and assess proper methods of infection control.	**3.1.1**	Apply principles of public health to select and evaluate evidence-based infection control methods that prevent disease transmission, protect patient safety, and reduce community health risks.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	**3.1.2**	Relate etiology, epidemiology and clinical features of diseases to their public health impact and prevention strategies.
3-2- Competency		**Upon finishing this course, students will be able to deliver community education programs to enhance public health awareness.**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		This competency will be developed via the following key elements:	
3.2.5	Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.	**3.2.1**	Counsel communities to enhance public health awareness
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse.	**3.2.2**	Raise public awareness about the health hazards through preventive strategies and targeted education, and outreach activities
Domain 4: Personal Practice **4-1- Competency**		**Upon finishing this course, students will be able to express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.** **This competency will be developed via the following key elements:**	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	**4.1.1**	Apply effective time management skills to plan and complete public health activities that improve patient and community outcomes.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	**4.1.2**	Retrieve, critically appraise, and synthesize evidence from scientific literature, epidemiological datasets, and surveillance findings to support public-health decisions.
4-2- Competency		**Upon finishing this course, students will be able to effectively communicate verbally, non-verbally and in writing with individuals and communities.** **This competency will be developed via the following key elements:**	

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.	**4.2.1**	Produce accurate, concise, and audience-appropriate written communications (e.g., patient information leaflets, clinical documentation, public health awareness materials) that support safe and effective healthcare delivery.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	**4.2.2**	Design clear and evidence-based presentations using digital tools and media to effectively communicate healthcare and public health information.
4-3- Competency		**Upon finishing this course, students will be able to express self-awareness and be lifelong learners for continuous professional improvement.** **This competency will be developed via the following key elements:**	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	**4.3.1**	Perform self-assessment to enhance public health awareness.
4.3.2	Practice independent learning needed for continuous professional development.	**4.3.2**	Select appropriate resources to enhance professional knowledge and skills in public health practices.

4. Teaching and Learning Methods

.1- **Lectures** (√)

2- **E-learning** (√)

3- **Assignment** (√)

4- **Self learning** (√)

5- **Seminar** (√)

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	**Training (Practical/ Clinical/ .....)**	**Self-learning (Tasks/ Assignments/ Projects/ ...)**	**Other (to be determined)**
1	Introduction, epidemiologic characteristics of infectious diseases and outbreak epidemiology	**2**	**2**	**0**		
2	The dynamics of infection and the cycle of infection	**2**	**2**	**0**		
3	Preventive and control of communicable diseases	**2**	**2**	**0**		
4	Non communicable health problems	**2**	**2**	**0**		
5	(continue) Non communicable health problems	**2**	**2**	**0**		
6	Ocupitional diseases	**2**	**2**	**0**		
7	**Periodical exam**					
8	Nosocomial infection	**2**	**2**	**0**		
9	Airborne diseases	**2**	**2**	**0**		
10	Food, water and milk borne diseases	**2**	**2**	**0**		
11	Food, water and milk borne disease	**2**	**2**	**0**		
12	Diseases transmitted primarily from animals to humans and arthropods borne diseases	**2**	**2**	**0**		
13	(continue) Diseases transmitted primarily from animals to humans and arthropods borne diseases	**2**	**2**	**0**		
14	Nutrition and family health	**2**	**2**	**0**		
15	Revision and open discussion	**2**	**2**	**0**		

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (formative exam)	**5**	**Training**	**------**
2	Periodical exam	**7**	**15**	**15%**
3	Final Written Exam	**16, 17**	**75**	**75%**
4	Final Oral Exam	**16, 17**	**10**	**10%**
5	Assignments	**--------**	**-------**	**------**

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Kaplan, Robert M., and Ron D. Hays. "Health-related quality of life measurement in public health." Annual review of public health 43.1 (2022): 355-373. Steiner, Timothy J., and Lars Jacob Stovner. "Global epidemiology of migraine and its implications for public health and health policy." Nature Reviews Neurology 19.2 (2023): 109-117.
	Other References	Notes prepared by the department staff.
	Electronic Sources (Links must be added)	www.pubmed.com www.sciencedirect.com
	Learning Platforms (Links must be added)	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Faculty facilities.
	Supplies	Class rooms
	Electronic Programs	----
	Skill Labs/ Simulators	----
	Virtual Labs	----
	Other (to be mentioned)	Data show, smart board, Unit for distance learning, Computers, Internet and Library.

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Public Health and Preventive medicine Course code: PM 806

Course Contents		Key elements	**Teaching and Learning Methods**	**Student Assessment Methods**
Week # 1	Introduction, epidemiologic characteristics of infectious diseases and outbreak epidemiology	1.1.1,1.1.2	Lectures, E-learning	Written and oral exams
Week # 2	The dynamics of infection and the cycle of infection	1.1.2, 1.1.3,	Lectures, E-learning, and self learning	Written and oral exams
Week # 3	Preventive and control of communicable diseases	1.1.1, 1.1.3, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3,	Lectures, E-learning, and self learning	Written and oral exams
Week # 4	Non-communicable health problems	1.1.2, 1.1.3, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, and self learning	Written and oral exams
Week # 5	(continue) Non-communicable health problems	1.1.2, 1.1.3, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, and self learning	Written and oral exams
Week # 6	Ocupitional diseases	1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, seminar, and self learning	Written and oral exams
Week # 7	Periodical exam			
Week # 8	Nosocomial infection	1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, seminar, and self learning	Written and oral exams
Week # 9	Airborne diseases	1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, assignments and self learning	Written and oral exams

Week # 10	Food, water and milk borne diseases	1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, assignments and self learning	Written and oral exams
Week # 11	Food, water and milk borne diseases	1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, and self learning	Written and oral exams
Week # 12	Diseases transmitted primarily from animals to humans and arthropods borne diseases	1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures, E-learning, and self learning	Written and oral exams
Week # 13	(continue) Diseases transmitted primarily from animals to humans and arthropods borne diseases	1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures and E-learning	Written and oral exams
Week # 14	Nutrition and family health	1.1.61.1.7, 1.1.8, 1.1.9, 1.1.10, 2.1.1, 2.1.2, 2.4.1, 2.4.2, 2.4.3, 3.1.1, 3.1.2, 3.2.1, 3.2.2	Lectures and E-learning	Written and oral exams
Week # 15	Revision and open discussion	1.1.7, 1.1.8, 1.1.9, 1.1.10, 2.5.1, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, 4.3.2	Lectures and E-learning	Written and oral exams

Name and Signature
Course Coordinator
Prof. Mysara Mohammed

Name and Signature
Program Coordinator
Prof. Ahmed Amin

Kafrelsheikh University

Faculty of Pharmacy

جامعة كفر الشيخ

كلية الصيدلة

Course Specification

2025

1. Basic Information

Course Title (according to the bylaw)	Pharmacy Legislation and practice ethics			
Course Code (according to the bylaw)	NP 803			
Department/s participating in delivery of the course	Pharmaceutics & Pharmaceutical Technology			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	-----	----	1
Course Type	Compulsory			
Academic level at which the course is taught	Fourth level/ Semester (2)			
Academic Program	Bachelor of pharmacy (Pharm D) (Clinical Pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Prof. Abd El-Aziz EL-said Ass. Prof. Eman Mazyed			
Course Specification Approval Date	9/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	department council			

2. Course Overview (Brief summary of scientific content)

A detailed presentation of law that governs and affects the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, OTC drug requirements, opening new pharmacies, opening medical stores, opening factories, opening scientific offices, medicine registration, pharmacies and medicine stores management. Pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles and moral rules.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 1 (FUNDAMENTAL KNOWLEDGE) 1-1- COMPETENCY		**Upon finishing this course, students will be able to integrate knowledge from basic legislation and ethics to apply good practice.** **This competency will be developed via the following key elements**	
1-1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1**	Demonstrate understanding of different laws and legislations.
		1.1.2	Integrate biomedical, social, and administrative principles to ensure safe, effective, and ethical pharmacy practice.
		1.1.3	Recognize pharmacist duties and responsibilities, pharmacist-patient relationship, patient's rights and ethical principles
		1.1.4	Identify legal principles for non-controlled and controlled prescriptions.
		1.1.5	Identify requirements needed for opening new pharmacies, medical stores, factories and scientific offices.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-1- COMPETENCY		**Upon finishing this course, students will be able to work collaboratively as a member of a health care team to improve the quality of life of individuals and communities, and respect patient rights.** **This competency will be developed via the following key elements**	
2-1.1	Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team.	**2.1.1**	Perform responsibilities in compliance with the legal and professional structure and role of all members of the health care professional team.
		2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.
2-1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	**2.1.3**	Demonstrate ethical decision-making in dispensing, compounding, and counseling, ensuring respect for patients' rights, confidentiality, and cultural diversity.
		2.1.4	Comply with legal and professional responsibilities related to drug control, record keeping, and safe handling of narcotic and psychotropic substances
2-1.3	Recognize your own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.	**2.1.5**	Identify legal limits of professional practice in community, institutional, and other pharmaceutical settings, and refer cases beyond authority to competent bodies.
		2.1.6	Seek guidance from qualified health or regulatory professionals in matters related to pharmacy practice laws, narcotic schedules, and institutional regulations.
2-5 Competency		**Upon finishing this course, students will be able to Apply national and international pharmaceutical laws and regulations governing the conduct of research studies and clinical trials for the authorization of medicinal products.** **This competency will be developed via the following key elements**	
2.5.1	Fulfill the requirements of the regulatory framework to	**2.5.1**	Ensure adherence to legal requirements for safety evaluation, including pre-clinical and clinical data submission.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	authorize a medicinal product including quality, safety, and efficacy requirements.	**2.5.2**	Follow regulatory guidelines for demonstrating the therapeutic efficacy of medicinal products prior to licensing
2-6 competency		**Upon finishing this course, students will be able to apply the legal and regulatory frameworks related to pharmacoeconomic analysis, drug promotion, sales, marketing, and business administration to ensure compliance with pharmaceutical laws and ethical standards.** **This competency will be developed via the following key elements**	
2.6.2	Utilize the principles of drug promotion, sales, marketing, accounting, and pharmacoeconomic analysis.	**2.6.1**	Implement the legal and ethical standards governing drug promotion, sales, marketing, accounting, and pharmacoeconomic evaluation in accordance with national and international pharmaceutical regulations
		2.6.2	Ensure compliance with regulatory restrictions and documentation requirements for drug promotion and marketing practices, supported by scientific data on drug safety, efficacy, and cost-effectiveness to safeguard public health
Domain 4: Personal Practice **4-1- Competency**		**Upon finishing this course, students will be able to express leadership, time management, critical thinking, problem solving, independent and team working skills.** **This competency will be developed via the following key elements:**	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	**4.1.1**	Ensure compliance with pharmacy laws and regulations when coordinating tasks within the team and evaluating colleagues' adherence to professional and legal standards
		4.1.2	Demonstrate effective leadership skills among students and staff.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	**4.1.3**	Interpret and apply national pharmacy legislation to resolve legal and ethical issues in pharmaceutical practice.
		4.1.4	Independently review pharmacy-related regulations and collaborate with team members to address compliance challenges in various pharmacy settings

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4.1.3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity	**4.1.5**	Demonstrate creativity and apply entrepreneurial skills within simulated pharmaceutical and healthcare business activities.
4-2- Competency		**Upon finishing this course, students will be able to effectively communicate verbally, non-verbally and in writing with individuals and communities.** **This competency will be developed via the following key elements:**	
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care teams, patients, and communities.	**4.2.1**	Communicate clearly with regulatory authorities, pharmacy institutions, and professional bodies to ensure compliance with pharmacy legislation and ethical standards.
		4.2.2	Prepare accurate and legally compliant pharmaceutical documentation, reports, and records for communication with health care teams, patients, and the public
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	**4.2.3**	Prepare and deliver a presentation in the Pharmacy Legislation course covering topics such as the regulation of pharmaceutical institutions, drug classification and scheduling, narcotic control laws, licensing procedures, and the Pharmacy Practice Law
		4.2.4	Acquire effective presentation skills in modern technology and media to create engaging and memorable experiences. This includes using interactive slides, incorporating multimedia (videos, images, audio), and employing tools for real-time feedback and collaboration. By integrating these elements, student can enhance audience engagement, clarify complex information, and leave a lasting impact.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4-3 competency		**Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement. This competency will be developed via the following key elements**	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	**4.3.1**	Conduct regular self-evaluation of understanding and application of pharmacy legislation and regulations governing pharmaceutical institutions to strengthen legal compliance and professional effectiveness
4.3.2	Practice independent learning is needed for continuous professional development.	**4.3.2**	Demonstrate commitment to independent learning by continuously updating knowledge of pharmacy legislation and regulatory requirements to enhance professional competence and ensure full legal compliance

4. Teaching and Learning Methods

.1- Lectures (√)

2- E-learning (√)

3- Discussion (√)

4- Brain storming (√)

5- Assignment (√)

6- Presentations (√)

Course Schedule						
Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/ discussion groups/ .....)	**Training (Practical/ Clinical/ .....)**	**Self-learning (Tasks/ Assignments/ Projects/ ...)**	**Other (to be determined)**
1	قانون مزاولة مهنة الصيدلة	**1**	**1**	**-------**	**-------**	**-------**
2	المؤسسات الصيدلية (الصيدليات العامة)	**1**	**1**	**-------**	**-------**	**-------**
3	المؤسسات الصيدلية (الصيدليات الخاصة - مخازن الادوية)	**1**	**1**	**-------**	**-------**	**-------**
4	المؤسسات الصيدلية (مجال الاتجار في النباتات الطبية)	**1**	**1**	**-------**	**-------**	**-------**
5	المؤسسات الصيدلية (المستحضرات الصيدلية الخاصة والدستورية)	**1**	**1**	**-------**	**-------**	**-------**
6	جداول المواد المخدرة وطريقة تخزينها	**1**	**1**	**-------**	**-------**	**-------**
7	**Periodical exam**					
8	المواد المؤثرة على الحالة النفسية	**1**	**1**	**-------**	**-------**	**-------**
9	جداول المواد المؤثرة على الحالة النفسية	**1**	**1**	**-------**	**-------**	**-------**
10	قواعد تكليف الصيادلة	**1**	**1**	**-------**	**-------**	**-------**
11	قانون مكافحة المخدرات وتنظيم استعمالها والاتجار فيها	**1**	**1**	**-------**	**-------**	**-------**
12	جداول قانون مكافحة المخدرات	**1**	**1**	**-------**	**-------**	**-------**
13	جداول قانون مكافحة المخدرات (تكمله)	**1**	**1**	**-------**	**-------**	**-------**
14	جداول قانون مكافحة المخدرات (تكمله)	**1**	**1**	**-------**	**-------**	**-------**
15	**Revision**	**1**	**1**	**-------**	**-------**	**-------**

5. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Mark/ Scores	Percentage of total course Marks
1	Periodical exam	**7**	**15**	**15%**
2	Final Written Exam	**16,17**	**85**	**85%**
	Total		**100**	**100%**

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	مجموع القوانين والقرارات التي تحكم مزاولة مهنة الصيدلة
	Other References	Notes on Pharmacy laws and regulations prepared by the department staff
	Electronic Sources (Links must be added)	www.pubmed.com
	Learning Platforms (Links must be added)	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other (to be mentioned)	مجموع القوانين التي تحكم مزاولة المهن الطبية.
Supportive facilities & equipment for teaching and learning *	**Devices/Instruments**	Projector, smart board, Computers, and Internet
	Supplies	----------
	Electronic Programs	----
	Skill Labs/ Simulators	----
	Virtual Labs	----
	Other (to be mentioned)	Data shows, smart board, Unit for distance learning, and Library.

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Pharmacy Legislation and practice ethics

Course code: NP 803

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	**قانون مزاولة مهنة الصيدلة**	1.1.1, 1.1.2 ,1.1.3 , 1.1.5, 2.1.2 ,2.1.6, 2.5.1 .	Lectures, E-learning, and class activities	Written exams
Week # 2	**المؤسسات الصيدلية الصيدليات العامة**	1.1.1, 1.1.3, 1.1.4 2.1.1, 2.1.2 , 2.1.3 , 2.1.4, 2.6.1 , 4.1.4, 4.2.1, .	Lectures, and discussion	Written exams
Week # 3	**المؤسسات الصيدلية الصيدليات الخاصة مخازن الادوية**	1.1.1, 1.1.3, 1.1.5 2.1.1, 2.1.2 , 2.1.5 , 2.1.6, 2.6.2,4.1.2 4.1.3, 4.2.2, 4.2.3 , 4.2.1, 4.2.2 .4.3.1	Lectures, and presentation	Written exams
Week # 4	**المؤسسات الصيدلية مجال الاتجار في النباتات الطبية**	1.1.1, 1.1.3, 1.1.4, 1.1.5, 2.1.1, 2.1.2 , 2.1.5 , 2.1.6, 2.6.2, 4.1.1, 4.1.2, 4.1.5 4.2.3 .4.2.4	Lectures, E-learning, and seminar	Written exams
Week # 5	**المؤسسات الصيدلية المستحضرات الصيدلية الخاصة و الدستورية**	1.1.1,1.1.2,1.1.3, 2.1.1,2.1.2,2.1.3, 2..5.1, 2.6.2 4.1.3, 4.1.4	Lectures, and discussion	Written exams
Week # 6	**جداول المواد المخدرة و طريقة تخزينها**	1.1.1, 1.1.2, 1.1.3, 1.1.4,	Lectures, E-learning, and discussion	Written exams

		2.1.2, 2.1.5, 4.3.2 2.5.1 .		
Week # 7	**Periodical exam**			
Week # 8	**المواد المؤثرة علي الحالة النفسية**	1.1.1, 1.1.3, 1.1.4 2.1.1, 2.1.2 , 2.1.3 , 2.1.4, 2.6.1, 4.2.1, 4.2.4 .	Lectures, and presentation	Written exams
Week # 9	**جداول المواد المؤثرة علي الحالة النفسية**	1.1.1, 1.1.3, 1.1.4 2.1.1, 2.1.2 , 2.1.3 , 2.1.4, 2.6.1 .	Lectures, E-learning, and class activities	Written exams
Week # 10	**قواعد تكليف الصيادلة**	1.1.1, 1.1.2 ,1.1.3 , 2.2.1, 2.1.2 ,2.1.6, 2.5.1 ,4.3.1, 4.3.2 .	Lectures and Assignment	Written exams
Week # 11	**قانون مكافحة المخدرات وتنظيم استعمالها والاتجار فيها**	1.1.1, , 1.1.2, 1.1.3, 2.1.3, 2.1.5, 2.5.1, 2.5.2, 2.6.1, 4.1.1, 4.1.3, 4.1.4 ,4.2.1.	Lectures, E-learning, seminars	Written exams
Week # 12	**جداول قانون مكافحة المخدرات**	1.1.1, , 1.1.2, 1.1.3, 2.1.3, 2.1.5, 2.5.1, 2.5.2, 2.6.1, 4.1.1, 4.1.3, 4.1.4, 4.3.2.	Lectures, Assignment	Written exams
Week # 13	**جداول قانون مكافحة المخدرات** (تكمله)	1.1.1, , 1.1.2, 1.1.3, 2.1.3, 2.1.5, 2.5.1, 2.5.2, 2.6.1, 4.1.1, 4.1.3, 4.1.4.	Lectures and E-learning	Written exams
Week # 14	**جداول قانون مكافحة المخدرات** (تكمله)	1.1.1, , 1.1.2, 1.1.3, 2.1.3, 2.1.5, 2.5.1, 2.5.2, 2.6.1,	Lectures and E-learning	Written exams

		4.1.1, 4.1.3, 4.1.4.		
Week # 15	**Revision**	1.1.1, , 1.1.2, 1.1.3, 2.1.3, 2.1.5, 2.5.1, 2.5.2, 2.6.1, 4.1.1, 4.1.3, 4.1.4.	Discussion and Assignment	Written exams

Name and Signature **Course Coordinator** Prof. Abd El-Aziz EL-said Ass. Prof. Eman Mazyed	**Name and Signature** **Program Coordinator** Ass. Prof. Ahmed Amin Ali

Course Specification
(2025)

1. Basic Information

Course Title (according to the bylaw)	Cosmetic Preparations			
Course Code (according to the bylaw)	PT E11			
Department/s participating in delivery of the course	Pharmaceutics & Pharmaceutical Technology			
Number of credit hours/points of the course (according to the bylaw)	**Theoretical**	**Practical**	**Other (specify)**	**Total**
	1	1	----	2
Course Type	Elective			
Academic level at which the course is taught	Fourth Level, Semester (2)			
Academic Program	Bachelor of Pharmacy (PharmD) (Clinical Pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Prof. Abdelaziz Elsayed Ass. Prof. Eman Mazyad			
Course Specification Approval Date	9/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)	Department council			

2. Course Overview (Brief summary of scientific content)

This course covers an introduction to cosmetics, creams, face preparations, face and eye make-up, shaving preparations, sunscreen products, nails and nail products, deodorant and anti-Perspirant, hair preparations, dandruff and its control, tooth and oral health, quality control of cosmetic products and using nanotechnology for formulation of cosmetics.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		**Course Learning Outcomes** Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
DOMAIN 1: FUNDAMENTAL KNOWLEDGE **1-1-COMPETENCY**		**Upon finishing this course, students will be able to integrate knowledge from basic cosmetics sciences to formulate different cosmetic formulations.** **This competency will be developed through the following key elements:**	
1-1-1-	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	**1.1.1.**	Recognize the nature of different cosmetic formulations.
1-1-3-	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical materials/products.	**1.1.2.**	Identify the formulation procedure and formulation additives of different cosmetic formulations.
		1.1.3.	Record the specifications of healthy skin and hair, and how to maintain this healthy state.
1-1-6-		**1.1.4.**	Point out the principles of controlling the body odour.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
	Utilize scientific literature and collect and interpret information to enhance professional decision.	**1.1.5.**	List the basics of dental problems and how to maintain dental and oral health and appearance.
		1.1.6.	Recognize the quality measures of different cosmetic formulations.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE **2-2- COMPETENCY**		**Upon finishing this course, students will be able to standardize pharmaceutical materials, formulate and manufacture different cosmetic products, participate in systems for dispensing, storage, and distribution of cosmetics.** **This competency will be developed via the following key elements:**	
2-2-2-	Apply the basic requirements of quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/ products considering various incompatibilities.	**2.2.1.**	Understand the fundamental aspects of cosmetic formulations, which include all formulations intended for cleansing and/or beautifying the human body.
		2.2.2.	Formulate different cosmetic products based on pharmaceutical knowledge.
		2.2.3.	Apply the rules of manufacturing, storage and transportation of different cosmetic products.
2-2-3-	Recognize the principles of various tools and instruments and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	**2.2.4.**	Recognize factors affecting the stability of different cosmetic products.
		2.2.5.	Select suitable method for characterization of different cosmetic products, active ingredient and excipients.
		2.2.6.	Predict drug interaction with different bases.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
		2.2.7.	Recognize principles of pharmaceutical calculation for preparation of different cosmetic products.
2-2-4-	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	**2.2.8.**	Recognize recent knowledge in pharmaceutical technology to design new cosmetic products.
		2.2.9.	Assess the quality of different cosmetic products.
2-3- COMPETENCY		**Upon finishing this course, students will be able to handle and dispose of different cosmetic products effectively and safely with respect to relevant laws and legislations. This competency will be developed via the following key elements:**	
2-3-1-	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.	**2.3.1.**	Handle safely different chemicals to avoid harm to the students.
		2.3.2.	Demonstrate the safe use and storage of different cosmetic products.
2-3-2-	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biological and pharmaceutical materials/products.	**2.3.3.**	Recognize and adopt MSDS safety guidelines for safe and appropriate handling and disposal of pharmaceutical chemical materials

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
Domain 4: PERSONAL PRACTICE **4-1- COMPETENCY**		**Upon finishing this course, students will be able to express leadership, time management, critical thinking, problem solving, independent and teamworking, creativity and entrepreneurial skills.** **This competency will be developed via the following key elements:**	
4-1-1-	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	**4.1.1.**	Participate in interdisciplinary teams.
		4.1.2.	Develop natural cosmetic products designed and prepared by them.
4-1-2-	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	**4.1.3.**	Analyze potential problems that may arise between the active ingredient and the excipients in different cosmetic preparations.
4-2- COMPETENCY		**Upon finishing this course, students will be able to effectively communicate verbally, non-verbally and in writing with individuals and communities.** **This competency will be developed via the following key elements:**	
4-2-1-	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care teams, patients, and communities.	**4.2.1.**	Communicate counseling information clearly to patients and discuss differences between the available cosmetic products.
		4.2.2.	Perform presentation on the advanced drug delivery systems and their benefits in cosmetic field.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	**Text**	**Code**	**Text**
4-2-2-	Use contemporary technologies and media to demonstrate effective presentation skills.	**4.2.3.**	Acquire effective presentation skills in modern technology and media to create engaging and memorable experiences. This includes using interactive slides, incorporating multimedia (videos, images, audio), and employing tools for real-time feedback and collaboration. By integrating these elements, students can enhance audience engagement, clarify complex information, and leave a lasting impact.
4-3- COMPETENCY		**Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement.** **This competency will be developed via the following key elements:**	
4-3-2-	Practice independent learning needed for continuous professional development.	**4.3.1.**	Identify and utilize credible information sources.
		4.3.2.	Apply critical thinking in evaluating information and solving problems.
		4.3.3.	Adapt to new tools, methods, and professional demands.
		4.3.4.	Apply newly acquired knowledge and skills in professional practice.

4. Teaching and Learning Methods

1. Lectures (√)
2. Data Show (√)
3. Smart Board (√)

4. Practical training (√)
5. Seminar / Workshop (√)
6. E-learning (√)
7. Brainstorming (√)
8. Presentation (√)
9. Discussion (√)
10. Assignment (√)

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/ discussion groups/ .....)	Training (Practical/ Clinical/ .....)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Introduction to cosmetics	3	1	2	------	------
2	Creams	3	1	2	------	------
3	Face preparations	3	1	2	------	------
4	Face and eye makeup	3	1	2	------	------
5	Shaving preparations	3	1	2	------	------
6	Sunscreen products	3	1	2	------	------
7	Periodical exam					
8	Nails and nails products	3	1	2	------	------
9	Deodorants and anti-Perspirants	3	1	2	------	------
10	Hair preparation: shampoos and conditioners	3	1	2	------	------
11	Hair preparation: tonics and colorants	3	1	2	------	------
12	Dandruff and its control	3	1	2	------	------
13	The tooth and oral health – Dentifrices	3	1	2	------	------
14	Foot Preparations Quality control of cosmetic products	3	1	Practical exam	------	------
15	Revision	3	1	Practical exam	------	------

5. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Periodical exam	7	15	15 %
2	Practical Assignments	During practical work	5	5 %
3	Final Practical Exam	14.15	20	20 %
4	Final Written Exam	16.17	50	50 %
5	Final Oral Exam	16.17	10	10 %
	Total	-----	100	100 %

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	**The main (essential) reference for the course** (must be written in full according to the scientific documentation method)	Dreher, F., Jungman, M., Sakamoto, F., & Maibach, H. I. (Eds.). Handbook of cosmetic science and technology (5th ed.) (2022). Baran, R., & Maibach, H. I. (Eds.). Textbook of cosmetic dermatology (2024).
	Other References	Notes on cosmetic preparations prepared by the department staff.
	Electronic Sources (Links must be added)	http://www.FDA.gov /https://www.sciencedirect.com
	Learning Platforms (Links must be added)	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other (to be mentioned)	----------
Supportive facilities & equipment for teaching and learning	**Devices/Instruments**	- Data show - Computers - Library - Internet - Distant learning unit - Smart board

		- Educational Factory
	Supplies	- Classrooms - Water bath - digital balances and other lab instruments
	Electronic Programs	----------
	Skill Labs/ Simulators	----------
	Virtual Labs	----------
	Other (to be mentioned)	----------

Course Plan

Matrix of course learning outcomes CLOs – Teaching and Learning Strategy and Student Assessment

Course title: Cosmetic Preparations **Course code:** PT E13

Week	Course Contents	Key elements	Teaching and Learning Methods	Student Assessment Methods
1	Introduction to cosmetics	1.1.1, 1.1.2, 2.2.2, 2.2.5, 2.2.7, 2.3.1, 2.3.2, 4.1.1, 4.1.2, 4.3.1	Lectures, Discussion, practical training and class activities	Written and oral exams
2	Creams	1.1.1, 1.1.2, 1.1.4, 2.2.1, 2.2.2, 2.2.6, 2.3.1,4.1.3, 4.2.1, 4.3.2, 4.3.3	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
3	Face preparations	1.1.1, 1.1.2, 2.2.1, 2.2.2, 2.2.4, 2.3.2, 4.1.1, 4.3.4	Lectures, Brainstorming, practical training and class activities	Written, practical and oral exams
4	Face and eye makeup	1.1.1, 1.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.9, 2.3.1,4.1.2, 4.2.1, 4.3.1	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
5	Shaving preparations	1.1.3, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.3.2, 4.1.1, 4.1.2, 4.2.3, 4.3.2	Lectures, Presentation, practical training and class activities	Written, practical and oral exams
6	Sunscreen products	1.1.5, 2.2.1, 2.2.2, 2.2.3, 2.3.3, 4.1.3, 4.2.2, 4.2.3, 4.3.3	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
7	Periodical exam			
8	Nails and nails products	1.1.5, 2.2.1, 2.2.2, 2.2.6, 2.3.1, 4.1.1, 4.1.2	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
9	Deodorants and anti-Perspirants	1.1.4,1.1.6 2.2.1,2.2.2, 2.2.3, 2.2.7, 2.2.8, 2.3.2,4.1.1,4.1.2, 4.1.3, 4.3.4	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

10	Hair preparation: shampoos and conditioners	1.1.4, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.3.3, 4.1.1	Lectures, Presentation, practical training and class activities	Written, practical and oral exams
11	Hair preparation: tonics and colorants	1.1.4, 2.2.1, 2.2.2, 2.2.7, 2.2.8, 2.3.1, 2.3.2, 4.1.2, 4.3.1	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
12	Dandruff and its control	1.1.6, 4.2.1, 4.2.2, 4.2.3, 4.3.2	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
13	The tooth and oral health - Dentifrices	1.1.6, 4.2.1, 4.2.2, 4.2.3, 4.3.3	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
14	Foot Preparations Quality control of cosmetic products	1.1.6, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.3.3, 4.1.3, 4.3.4	Lectures, brainstorming & educational factory	Written and oral exams
15	Revision	1.1.6, 2.2.1, 2.3.3 4.2.1, 4.2.2, 4.2.3	Lectures and discussion	Written and oral exams

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