

Kafr el-Sheikh University
Faculty of Pharmacy
Pharm-D program
Course Specification
2025/2026



Pharm-D program Course Specification 2025/2026 Fourth Level Second Semester

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Course Specification

(2025)

Course Title (according to the bylaw)	Clinical Pharmacokinetics			
Course Code (according to the bylaw)	PP801			
Department/s participating in delivery of the course	Clinical Pharmacy Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretic al	Practical	Other (specify)	Total
	222	1	----	3
Course Type	obligatory			
Academic level at which the course is taught	Fourth level, second semester			
Academic Program	Bachelor of Pharmacy (Pharm D)			
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)

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		By the end of the Clinical Pharmacokinetics course, the student will be able to <ul style="list-style-type: none">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. <p>This competency will be developed via the following key elements:</p>	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.1.1	Relate ADME processes to PK models (single dose IV/oral, multiple dosing, infusion, two-compartment model).
		1.1.2	Apply physiology and pathophysiology to predict drug behavior in patients.
		1.1.3	Connect basic sciences with clinical dosing decisions
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness,	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.

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
	effectiveness, and safety in individuals and populations.	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		<p>By the end of the Clinical Pharmacokinetics course, the student will be able to</p> <ul style="list-style-type: none"> • 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. <p>This competency will be developed via the following key elements:</p>	
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis,	2.2.1	Perform dose and interval calculations for various administration routes.

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
	bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice	2.2.2	Use statistical tools to analyze PK study results.
		2.2.3	Interpret bioequivalence studies to ensure interchangeability
2-5- COMPETENCY		<p>By the end of the Clinical Pharmacokinetics course, the student will be able to</p> <ul style="list-style-type: none"> • 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. <p>This competency will be developed via the following key elements:</p>	
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		<p>By the end of the Clinical Pharmacokinetics course, the student will be able to</p> <ul style="list-style-type: none"> • 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, therapeutic uses, dosage, contraindications, adverse drug reactions and drug interactions.	3.2.1	Combine mechanism of action with PK to explain dosing choices.
		3.2.2	Counsel on dosing schedules to improve adherence.
		3.2.3	Identify risks of toxicity from PK accumulation (digoxin, lithium).

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
3.2.2	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 <ul style="list-style-type: none"> 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. <p>This competency will be developed via the following key elements:</p>	
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 <ul style="list-style-type: none"> Communicate dosing recommendations clearly to healthcare teams using verbal, written, and electronic formats. 	

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
		<ul style="list-style-type: none"> Present pharmacokinetic concepts and case solutions effectively to peers and professionals. <p>This competency will be developed via the following key elements:</p>	
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		<p>By the end of the Clinical Pharmacokinetics course, the student will be able to</p> <ul style="list-style-type: none"> 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.
		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/	Other (to be determined)

					Projects/ ...)	
1	Introduction (basic pharmacokinetics, rates and orders)	4	2	2	---	---
2	Single IV bolus & oral pharmacokinetics	4	2	2	---	---
3	Multiple IV&oral pharmacokinetics	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%

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course	Basic Pharmacokinetics, Mohsen A. Hedaya 3rd Edition,2023 Shargel and Yu's Applied Biopharmaceutics & Pharmacokinetics, 8th Edition, 8th Edition.2022 Casebook in Clinical Pharmacokinetics and Drug Dosing, 1st Edition,2014
	Other References	Notes in clinical pharmacokinetics Practical notes in Clinical pharmacokinetics.
	Electronic Sources	<u>RxKinetics Pharmacokinetics and Nutrition Software for Pharmacists</u> <u>Pharmaceutical Press Essential Pharmaceutical Knowledge</u> <u>www.medscape.com</u>
	Learning Platforms	<u>https://lms3.kfs.edu.eg/pharm/login/index.php</u>
	Other	Clinical Pharmacokinetics, 7th Edition & Workbook,2021

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	- Data show. - Computers. - Library. - Internet. - Interactive boards and a 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: Clinical Pharmacokinetics

Course code: P801

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, 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, 4.2.3, 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 # 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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		2.5.1,2.5.2,2.5.3,3.2.1.,3.2.2,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1,4.1.2,4.1.3,4.1.5,4.1.6,4.2.1,4.2.2,4.2.3,4.2.4,4.2.5,4.3.1,4.3.2,4.3.3,4.3.4,4.3.4,4.3.5,4.3.6		
Week # 3	Multiple IV&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.,3.2.2,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1,4.1.2,4.1.3,4.1.5,4.1.6,4.2.1,4.2.2,4.2.3,4.2.4,4.2.5,4.3.1,4.3.2,4.3.3,4.3.4,4.3.4,4.3.5,4.3.6	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.,3.2.2,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1,4.1.2,4.1.3,4.1.5,4.1.6,4.2.1,4.2.2,4.2.3,4.2.4,4.2.5,4.3.1,4.3.2,4.3.3,4.3.4,4.3.4,4.3.5,4.3.6	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.,3.2.2,3.2.3,3.2.4,3.2.5,3.2.6,4.1.1,4.1.2,4.1.3,4.1.5,4.1.6,4.2.1,4.2.2,4.2.3,4.2.4,4.2.5,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.3.1,4.3.2,4.3.3,4.3.4,4.3 .4,4.3.5,4.3.6		
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 ,4.1.1,4.1.2, 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 # 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,	Lectures, E-learning, seminars and practical training	

		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		
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

Associate. Prof/Noha El Khodary



Name and Signature

Program Coordinator

Prof./ Abdelaziz Eleshmawy





Course Specification

2025

1. Basic Information

Course Title (according to the bylaw)	Drug information			
Course Code (according to the bylaw)	PO 805			
Department/s participating in the delivery of the course	Clinical pharmacy department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	To tal
	1	1	---	2
Course Type	Compulsory			
Academic level at which the course is taught	fourth level			
Academic Program	Bachelor of Pharmacy (Pharm D.)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate. Prof. Ahmed Amin Ali			
Course Specification Approval Date	31/8/2025			
Course Specification Approval	Department Council			

2. Course Overview (Brief summary of scientific content)

This course introduces the student to the concept and need of drug information, types of drug information resources (primary, secondary and tertiary literature), computerized and online drug information, literature evaluation and critical appraisal, and retrieval of information. It also aims at providing the students with the professional skills required to answer medication effectively and accurately- related questions in a systematic and evidence-based approach.

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, Graduates will be able to integrate knowledge of drug information systems, biomedical literature, and evidence-based medicine principles to provide accurate, reliable, and clinically relevant therapeutic recommendations. 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 role of drug information in improving patient-centered and evidence-based care.
		1.1.2	Describe the principles of the 5-step evidence-based medicine (EBM) process (PICO, literature search, appraisal, application).
		1.1.3	Recognize the importance of administrative structures in Drug Information Centers (DICs).

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
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	1.1.4	Apply standardized abbreviations and symbols when documenting drug information requests.
		1.1.5	Interpret common medical terms used in drug information resources and clinical practice.
		1.1.6	Use appropriate terminology when drafting drug information responses, newsletters, and clinical reports.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.1.7	Correlate pharmacological data with evidence-based literature to evaluate drug therapy.
		1.1.8	Assess the appropriateness of drug use using tertiary resources (Lexicomp, Micromedex, Clinical Pharmacology, Facts & Comparisons).
		1.1.9	Interpret clinical study outcomes to judge drug efficacy and safety.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	1.1.10	Formulate clinical questions using the PICO framework.
		1.1.11	Retrieve relevant evidence from PubMed, Cochrane, and other primary sources.
		1.1.12	Apply search strategies to obtain high-quality drug information.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.13	Critically appraise the validity and reliability of clinical studies.
		1.1.14	Compare and contrast different levels of evidence in the medical literature.
1.1.7	Identify and critically analyze newly emerging issues influencing the pharmaceutical industry and patient health care.	1.1.15	Evaluate the impact of newly approved drugs on existing therapy guidelines.
		1.1.16	Analyze emerging challenges such as misinformation in online resources.
		1.1.17	Critically assess the role of Pharmacoeconomics in drug information decision-making.

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, graduates will be able to work collaboratively within inter-professional healthcare teams to deliver unbiased, ethical, and patient-centered drug information services. 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	Describe the pharmacist's responsibilities within a Drug Information Center.
		2.1.2	Collaborate with physicians and nurses to provide reliable information.
		2.1.3	Apply national and institutional regulations in drug information practice.
2.1.2	Adopt the ethics of health care and the pharmacy profession, respecting patients' rights and valuing people's diversity.	2.1.4	Ensure confidentiality when handling drug information requests.
		2.1.5	Respect cultural differences in the communication of drug information.
		2.1.6	Address ethical dilemmas in providing unbiased drug information.
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.	2.1.7	Identify complex drug information requests requiring specialist referral.
		2.1.8	Seek guidance from clinical experts when appropriate.
		2.1.9	Demonstrate humility and responsibility in interprofessional collaboration.
2-4- COMPETENCY		Upon finishing this course, graduates will be able to actively respond to urgent or critical drug information requests, provide accurate evidence-based answers in	

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
		<p>clinical emergencies, and contribute to safe medication use decisions.</p> <p>This competency will be developed via the following key elements:</p>	
2.4.2	Demonstrate understanding of the first aid measures needed to save patient's life.	2.4.1	Apply knowledge of antidotes and first-aid measures in DI responses.
		2.4.2	Provide immediate guidance on poisoning management through DI services.
		2.4.3	Incorporate toxicology databases in evidence-based responses.
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	2.4.4	Detect and resolve medication errors using DI resources.
		2.4.5	Counsel healthcare providers on rational prescribing practices.
		2.4.6	Provide evidence-based solutions for adverse drug reactions.
2.4.4	Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.	2.4.7	Retrieve toxicity information from specialized resources.
		2.4.8	Evaluate case reports of poisoning and overdoses.
2-5- COMPETENCY		<p>Upon finishing this course, graduates will be able to contribute to research and scholarly activities by critically evaluating clinical studies, applying evidence-based medicine steps, and engaging in scientific writing and publication of drug information outputs. This competency will be developed via the following key elements:</p>	
2.5.1	Fulfill the requirements of the regulatory framework to authorize a medicinal product including	2.5.1	Explain regulatory requirements for drug approval and DI documentation.
		2.5.2	Critically analyze safety, efficacy, and quality data in drug dossiers.

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
	quality, safety, and efficacy requirements.	2.5.3	Apply international regulatory standards (FDA, EMA, WHO) to DI practice.
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession	2.5.4	Perform literature searches with advanced filters.
		2.5.5	Critically appraise journal articles for bias and validity.
		2.5.6	Summarize drug monographs based on evidence.
2-6- COMPETENCY		Upon finishing this course, graduates will be able to apply principles of pharmacoeconomics, communication, and business skills in the development of educational newsletters, presentations, and drug information services. 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	Evaluate promotional drug materials for accuracy and bias.
		2.6.2	Apply pharmacoeconomic principles in DI responses.
		2.6.3	Communicate cost-effectiveness data to clinicians.
3-2- COMPETENCY		Upon finishing this course, graduates will be able to provide education and training to healthcare professionals and communities on the safe and rational use of medicines by utilizing drug information resources and evidence-based medicine practices. This competency will be developed via the following key elements:	
3.2.1	Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic	3.2.1	Interpret drug interactions, contraindications, and precautions from DI resources.
		3.2.2	Correlate drug pharmacology with clinical evidence in DI responses.

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
	uses, dosage, contra-indications, adverse drug reactions and drug interactions	3.2.3	Provide comparative data on therapeutic alternatives.
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.2.4	Identify and report adverse drug reactions using DI resources.
		3.2.5	Apply pharmacovigilance data in drug information reports.
		3.2.6	Provide recommendations for rational use of new medicines.
3.2.3	Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals	3.2.7	Evaluate herb-drug interaction data from evidence-based sources.
		3.2.8	Critically appraise complementary and alternative medicine literature.
3.2.4	Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control.	3.2.9	Retrieve toxic profiles from DI and toxicology databases.
		3.2.10	Summarize management protocols for overdoses.
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	Provide clear responses to patient-specific DI inquiries.
		3.2.12	Counsel healthcare teams on safe use of OTC and prescription drugs.
		3.2.13	Design newsletters and bulletins on drug safety issues.
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse.	3.2.14	Educate the public on risks of self-medication.
		3.2.15	Disseminate DI bulletins on substance abuse.
DOMAIN 4: Personal Practice 4-1- COMPETENCY		Upon finishing this course, graduates will be able to demonstrate leadership, teamwork, critical thinking, and problem-solving skills in managing drug information requests and services. 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	Lead group DI case presentations.
		4.1.2	Coordinate collaborative projects on DI newsletter publication.

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
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.4	Independently conduct complex DI searches.
		4.1.5	Critically analyze case reports in DI practice.
		4.1.6	Collaborate in multidisciplinary problem-solving sessions.
	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.1.7	Design innovative DI services (e.g., mobile apps, online platforms).
		4.1.8	Initiate DI awareness campaigns.
4-2- COMPETENCY		Upon finishing this course, graduates will be able to communicate effectively through oral presentations, written scientific reports, newsletters, and professional documentation of drug information. 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	Present DI responses clearly to patients and professionals.
		4.2.2	Write structured DI reports and newsletters.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.3	Deliver presentations using DI software and multimedia tools.
		4.2.4	Create electronic newsletters for DI dissemination.
4-3- COMPETENCY		Upon finishing this course, graduates will be able to practice self-awareness and engage in continuous professional development to stay updated with evolving drug information resources, evidence-based practice, and healthcare innovations. 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 the quality of DI responses provided.
		4.3.2	Identify personal gaps in DI search and appraisal skills.

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	Stay updated with new DI resources.
		4.3.4	Engage in CPD programs on evidence-based medicine.
		4.3.5	Build a portfolio of DI case reports.

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	Introduction to Drug Information and evidence-based practice	3	1	2	---	---
2	Introduction to Drug Information and evidence-based practice (cont.)	3	1	2	---	---
3	5-Step Evidence-Based Medicine Process	3	1	2	---	---
4	Drug information resources	3	1	2	---	---
5	Drug information resources (cont.)	3	1	2	---	---
6	The four most common tertiary resources of information	3	1	2	---	---
7	The four most common tertiary resources of information (cont.)					
8	Mid-term exam	3	1	2	---	---
9	How to respond to the question in DIC or PIC	3	1	2	---	---
10	Lexicomp	3	1	2	---	---
11	Clinical studies	3	1	2	---	---
12	Scientific writing	3	1	2	---	---
13	presentation skills	3	1	2	---	---

14	Newsletter publication	1	1	Practical exam	---	---
15	Newsletter publication (cont.)	1	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	Week 7	15 marks	15%
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/ 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	A Guide for Pharmacists (2021). Malone PM, Malone MJ, Witt BA, Peterson DM (Eds). McGraw-Hill Education. 7th Edition Drug Information: A Guide for Pharmacists (2021). Malone PM, Malone MJ, Witt BA, Peterson DM (Eds). McGraw-Hill Education. 7th Edition.
	Other References	The Clinical Practice of Drug Information (2022). Gabay M. McGraw-Hill Education. Notes on drug information for fourth-year students. - Practical notes in drug information for fourth year students.
	Electronic Sources	https://pubmed.ncbi.nlm.nih.gov https://www.micromedexsolutions.com https://www.drugs.com https://www.lexicomp.com

		https://www.rxlist.com www.medscape.com http://www.sciencedirect.com/ http://www.ncbi.nlm.nih.gov/ http://www.FDA.gov
	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other	AHFS Drug Information 2025
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	<ul style="list-style-type: none"> - Data show. - Computers. -Library. -Internet. -Interactive boards and distant learning unit -sphygmomanometer. -peak flow meter. -spirometry.
	Supplies	<ul style="list-style-type: none"> Classrooms. -Educational pharmacy.
	Electronic Programs	https://www.mdcalc.com www.medscape.com/
	Skill Labs/ Simulators	<ul style="list-style-type: none"> -Educational pharmacy

Course Plan

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

Course title: Drug Information

Course code: PO 805

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Introduction to Drug Information and Evidence-Based Practice	1.1.1 , 1.1.2 , 1.1.3, 1.1.4, 1.1.5, 2.1.1 , 2.1.2 , 2.1.3	Lectures, E-learning	Written, practical and oral exams
Week # 2	Introduction to Drug Information and Evidence-Based Practice (cont.)	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, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6 , 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.5.1, 2.5.2, 2.5.3, 2.6.3, 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, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 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	5-Step Evidence-Based Medicine Process	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, 1.1.15, 1.1.16, 1.1.17, 2.1.4, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.9, 2.4.1, 2.4.2, 2.4.3, 2.5.4, 2.5.5,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		2.5.6, 2.6.1, 2.6.2, 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, 3.2.14, 3.2.15, 4.1.1, 4.1.2, 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, 4.3.5		
Week # 4	Drug information resources	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, 25.3, 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, 4.1.4, 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 # 5	Drug information resources (cont.)	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, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.5.1, 25.2, 25.3, 2.6.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		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, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 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 # 6	The four most common tertiary resources of information	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, 1.1.15, 1.1.16, 1.1.17, 2.1.4, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.9, 2.4.1, 2.4.2, 2.4.3, 2.5.4, 2.5.5, 2.5.6, 2.6.1, 2.6.2, 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, 3.2.14, 3.2.15, 4.1.1, 4.1.2, 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, 4.3.5	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 7	The four most common tertiary resources of information (cont.)			
Week # 8	Mid-term exam	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, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		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, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 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	How to respond to the question in DIC or PIC	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, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.5.1, 2.5.2, 2.5.3, 2.6.3, 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, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 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	Lexicomp	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, 1.1.15, 1.1.16, 1.1.17, 2.1.4, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.9, 2.4.1, 2.4.2, 2.4.3, 2.5.4, 2.5.5, 2.5.6, 2.6.1, 2.6.2, 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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		3.2.10, 3.2.11, 3.2.14, 3.2.15, 4.1.1, 4.1.2, 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, 4.3.5		
Week # 11	Clinical studies	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, 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, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 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, seminars and class activities	Written, practical and oral exams
Week # 12	Scientific writing	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, 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, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2 4.1.4, 4.2.1, 4.2.2,	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

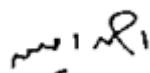
		4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 13	presentation skills	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 1.1.11, 1.1.12, 1.1.13, 1.1.14, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.5.1, 2.5.2, 2.5.3, 2.6.3, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 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	Newsletter publication	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, 1.1.15, 1.1.16, 1.1.17, 2.1.4, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.9, 2.4.1, 2.4.2, 2.4.3, 2.5.4, 2.5.5, 2.5.6, 2.6.1, 2.6.2, 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, 3.2.14, 3.2.15, 4.1.1, 4.1.2 4.1.4, 4.2.1, 4.2.2, 4.2.3, 4.2.4,	Lectures and E-learning	Written and oral exams

		4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5		
Week # 15	Newsletter publication (cont.)	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, 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, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 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 and oral exams

Name and Signature

Course Coordinator

Associate. Prof. Ahmed Amin Ali



Name and Signature

Program Coordinator

Prof. Abdelaziz El Ashmawy





Course Specification

(2025)

1. Basic Information

Course Title (according to the bylaw)	basic and clinical toxicology			
Course Code (according to the bylaw)	PO806			
Department/s participating in delivery of the course	Pharmacology & Toxicology 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)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Prof. Sherin Zakaria			
Course Specification Approval Date	9/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department of Pharmacology & Toxicology Council			

2. Course Overview (Brief summary of scientific content)

This course defines the general principles of basic toxicology taking into consideration mutagenesis, carcinogenesis and teratogenesis. It estimates the risk of different toxicities including, heavy metals, poisoning with common drugs, poisoning with common chemicals, radiation and radioactive material toxicity. It also demonstrates clinical toxicology of specific drug groups as well as specific organ toxicities. Moreover, it recognizes general management of toxicity with natural toxins, gases, animals and plant toxins, maternal, fetal and neonatal toxicity.

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 pharmaceutical science to formulate different classes of semisolid dosage forms as a preliminary step in the manufacture of therapeutic and cosmetic products. 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 the principles of basic and applied toxicology
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations	1.1.2	Demonstrate understanding of the clinical picture of different toxins as well as the used each toxin antidote in each toxin
		1.1.3	select the toxicological tests that are commonly used for the evaluation of teratogenicity and mutagenicity
		1.1.4	Evaluate and manage various types of

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
			poisonous agents.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decision.	1.1.5	Retrieve and interpret scientific literature on the principles of toxicology, including mutagenesis, carcinogenesis, teratogenesis, and organ-specific toxicities, to support accurate risk assessment and clinical decision-making.
		1.1.6	Collect and analyze data on toxicities from heavy metals, drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures to guide evidence-based management strategies.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-1- COMPETENCY		Upon finishing this course, students will be able to 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	Apply the general principles of basic toxicology in a manner that upholds ethical standards, respects patients' rights, and values cultural and individual diversity when assessing and managing toxic exposures.
		2.1.2	Estimate and manage the risks of toxicities while ensuring culturally sensitive care and equitable treatment across diverse patient populations.
2.1.3	Recognize 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 professional limits in toxicology and refer or seek guidance from appropriate specialists when managing complex or uncertain toxicity cases.
		2.1.4	Collaborate with the healthcare team in assessing and managing toxicities, ensuring safe and effective interdisciplinary patient

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
			care.
2-4- COMPETENCY		<p>Upon finishing 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.</p> <p>This competency will be developed via the following key elements:</p>	
2.4.1	Ensure safe handling/use of poisons to avoid their harm to individuals and communities.	2.4.1	Apply general principles of toxicology to ensure safe handling and use of poisons, considering mutagenesis, carcinogenesis, teratogenesis, and specific organ toxicities to prevent harm to individuals and communities
		2.4.2	Assess and control risks from heavy metals, drugs, chemicals, radiation, natural toxins, gases, and maternal/fetal/neonatal exposures to protect public health and community safety
2.4.2	Demonstrate understanding of the first aid measures needed to save patient's life.	2.4.3	Recognize life-threatening toxicities and apply the general principles of toxicology to guide immediate first aid measures for poisonings, including those caused by drugs, chemicals, radiation, and natural toxins.
		2.4.4	implement emergency management protocols for specific organ toxicities and maternal/fetal/neonatal exposures, ensuring timely interventions to save the patient's life.
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	2.4.5	Identify and resolve toxicity-related problems by applying general principles of toxicology, including mutagenesis, carcinogenesis, teratogenesis, and specific organ toxicities, to medicine-related adverse effects.

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
		2.4.6	Develop and implement management plans for toxicities from heavy metals, drugs, chemicals, radiation, and natural toxins, ensuring safe and effective pharmaceutical care for all patient groups, including maternal, fetal, and neonatal cases.
2.4.4	Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens	2.4.7	Apply general toxicology principles to assess the toxicity profiles of xenobiotics, considering mutagenesis, carcinogenesis, teratogenesis, and specific organ toxicities.
		2.4.8	Detect and identify poisons in biological specimens related to heavy metals, drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures to support accurate diagnosis and management
2-5- COMPETENCY		<p>Upon finishing this course, students will be able to contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products.</p> <p>This competency will be developed via the following key</p>	
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession	2.5.1	Retrieve and interpret scientific data on the general principles of toxicology, including mutagenesis, carcinogenesis, teratogenesis, and specific organ toxicities, to support evidence-based practice.
		2.5.2	Critically evaluate research and clinical evidence on the risks, diagnosis, and management of toxicities from heavy metals, drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures for informed decision-making in 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
	<p>Domain 3: Pharmaceutical care</p> <p>3-2- COMPETENCY</p>		<p>Upon finishing this course, students will be able to provide counseling and education services to patients and communities about safe and rational use of medicines and medical devices.</p> <p>This competency will be developed via the following key</p>
3.2.4	provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control	3.2.1	Describe toxic profiles of CN, CO, methanol, paracetamol, salicylate, heavy metals, organophosphorus, and corrosive by outlining their sources, mechanisms of toxicity, and potential effects
		3.2.2	Identify, recognize symptoms, and manage toxicities from heavy metals, drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures using appropriate control and treatment strategies.
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse.	3.2.3	Apply toxicology principles to explain the health risks and social hazards of drug misuse and abuse, including mutagenic, carcinogenic, teratogenic, and organ-specific effects.
		3.2.4	Promote public awareness and prevention strategies for toxicities related to drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures to reduce community health risks
	<p>Domain 4: Personal Practice</p> <p>4-1- Competency</p>		<p>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.</p> <p>This competency will be developed via the following key elements:</p>
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express	4.1.1	Coordinate and oversee team tasks in applying general toxicology principles to assess and manage toxicities, ensuring timely

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
4.1.2	time management skills.		and accurate evaluation of cases involving mutagenesis, carcinogenesis, teratogenesis, and organ-specific effects.
		4.1.2	Contribute to peer evaluation and collaborative problem-solving in managing toxicities from heavy metals, drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures, while demonstrating effective time management in toxicology-related activities
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.3	Analyze data critically and information from different sources.
4-2- Competency		<p>Upon finishing this course, students will be able to effectively communicate verbally, non-verbally and in writing with individuals and communities.</p> <p>This competency will be developed via the following key elements:</p>	
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.	4.2.1	Effectively communicate toxicology information verbally, non-verbally, and in writing to healthcare teams, patients, and communities.
4.2.2	Use contemporary technologies and media to demonstrate effective	4.2.2	Utilize contemporary technologies and media

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
	presentation skills.		to present information on the principles, risks, symptoms, and management of toxicities from drugs, chemicals, radiation, natural toxins, and maternal/fetal/neonatal exposures in an effective and engaging manner.
4-3- Competency		<p>Upon finishing this course, students will be able to Express self-awareness and be a life-long learner for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Self-assess knowledge and skills in toxicology to improve competence in risk assessment, diagnosis, and management of diverse toxicities.
4.3.2	Practice independent learning needed for continuous professional development.	4.3.2	Engage in independent learning to update and expand knowledge on principles of basic and clinical toxicology, including risk assessment and management of toxicities from chemicals, drugs, radiation, natural toxins, and specific organ systems.

4. Teaching and Learning Methods

1. Lectures
2. E-learning
3. Practical training/ laboratory
4. Case study
5. Brain storming
6. Assignment
7. Discussion
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	General Principles of Toxicology (acute and chronic toxicity)	4	2	2		
2	Teratogenesis	4	2	2		
3	Teratogenesis	4	2	2		
4	Target organ toxicity (Hepatotoxicity & Nephrotoxicity)	4	2	2		
5	Target organ toxicity (Nervous system toxicity, Pulmonary toxicity)	4	2	2		
6	Alcohol toxicity	4	2	2		
7	Semester work					
8	Toxicology of Pesticide	4	2	2		
9	Toxicity of thallium	4	2	2		
10	Heavy metals	4	2	2		
11	Heavy metals	4	2	2		
12	Cyanide toxicity	4				

			2	2		
13	Corrosives toxicity	4	2	Revision		
14	Carbon monoxide toxicity	2	2	Practical exam		
15	Revision	2	2	Practical exam		

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks(%)
1	Exam 1 written (formative exam)	4 th week	5	5
2	Periodical exam	7 th week	10	10
3	Final Practical/Clinical/... Exam	14 th ,15 th	25	25
4	Final Written Exam	16 th ,17 th	50	50
5	Final Oral Exam	16 th ,17 th	10	10

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)	-Casarett & Doull's Essentials of Toxicology, Third Edition (Lange), 3rd edition, 2015. - The Pharmacological Basis of Therapeutics (2008). Goodman & Gilman's. 12 th edition. The McGraw-Hill Companies
	Other References	Notes and Lab manual prepared by the department staff.
	Electronic Sources (Links must be added)	www.ncbi.nlm.nih.gov/pubmed Google scholar: https://scholar.google.com.eg/ 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 - Board - Internet
	Supplies	notebooks.
	Electronic Programs	----
	Skill Labs/ Simulators	----
	Virtual Labs	----
	Other (to be mentioned)	Class rooms. Library.

Course Plan

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

Course title: basic and clinical toxicology

Course code: PO806

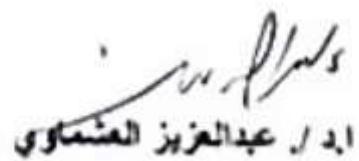
Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week #	Course Contents	Key Elements	Teaching and Learning Methods	Student Assessment Methods
1	General Principles of Toxicology (acute and chronic toxicity)	1.1.1, 2.1.1, 2.1.3, 2.4.1, 2.4.3, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures and practical training	Written, practical and oral exams
2	Teratogenesis	1.1.1, 1.1.3, 1.1.5, 1.1.6, 2.1.1, 2.1.3, 2.1.4, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2,	Lectures and practical training, discussion	Written, practical and oral exams

		4.1.3		
3	Mutagenesis	1.1.1, 1.1.3, 1.1.5,1.1.6,2.1.1, 2.1.3, 2.1.4, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures and practical training	Written, practical and oral exams
4	Target organ toxicity (Hepatotoxicity & Nephrotoxicity)	1.1.1, 1.1.5,1.1.6, 2.1.1, 2.1.2, 2.1.3, 2.4.1, 2.4.4, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures and practical training, discussion	Written, practical and oral exams
5	Target organ toxicity (Nervous system & Pulmonary toxicity)	1.1.1, 2.1.1, 2.1.2, 2.1.3, 2.4.1, 2.4.4, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures and practical training	Written, practical and oral exams
6	Alcohol toxicity	1.1.1,1.1.5,1.1.6, 2.1.1, 2.1.2, 2.1.3, 2.4.1, 2.4.3, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, e-learning, discussion	Written, practical and oral exams
7	Semester work	—	—	—
8	Toxicology of Pesticides	1.1.1, 1.1.2, 2.1.1, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, e-learning, case study	Written, practical and oral exams

9	Toxicity of Thallium	1.1.1, 1.1.2, 2.1.1, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, brainstorming	Written, practical and oral exams
10	Heavy metals	1.1.1, 1.1.2, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, case study, brainstorming	Written, practical and oral exams
11	Heavy metals	1.1.1, 1.1.2, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, case study, brainstorming	Written, practical and oral exams
12	Cyanide toxicity	1.1.1, 1.1.2, 2.1.1, 2.1.3, 2.1.4, 2.4.1, 2.4.3, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, case study	Written, practical and oral exams
13	Corrosives toxicity	1.1.1, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, practical training, case study	Written, practical and oral exams
14	Carbon monoxide toxicity	1.1.1, 1.1.2, 2.1.3, 2.4.1, 2.4.5, 3.2.1, 3.2.2, 4.1.1, 4.1.2, 4.1.3	Lectures, brainstorming, case study	Written and oral exams

Name and Signature
Course Coordinator
Prof. Dr. Sherin Zakaria

Name and Signature
Program Coordinator
Prof. Dr. Abdel Aziz El-Ashmawy



د. عبد العزيز العشماوى

Course Specification

(2025)

Course Title (according to the bylaw)	Hospital Pharmacy			
Course Code (according to the bylaw)	PP802			
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	-----	2
Course Type	Obligatory			
Academic level at which the course is taught	Fourth level, semester 8			
Academic Program	BSc in pharmacy (pharm-D General)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate Prof. Khaled Sobhy Abdelkawy			
Course Specification Approval Date	31/8/2025			
Course Specification Approval	Department Counsil			

2. Course Overview (Brief summary of scientific content)

Organization and structure of a hospital pharmacy, hospital pharmacy facilities and services (inpatient and outpatient services), transfer of care, patient's medication record, and rational medication use, hospital formulary, pharmacy and therapeutic committee, I.V. admixtures and

incompatibilities, parenteral nutrition, handling of cytotoxic drugs, therapeutic drug monitoring, patient counselling and safety, and risk management.

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		<p>Upon completing this course, students will be able to define the structure of hospitals and hospital pharmacy departments, describe the roles of I.V. admixtures, therapeutic committees, hospital formulary, and radiopharmaceuticals, and identify manufacturing units. They will recognize how to receive and classify medication requests, recall techniques to obtain patient information, and list the needs of various patient groups in prescription filling and counseling. Students will also name surgical dressings, sutures, plasma substitutes, and outline the management of the central sterile supply unit, including the steps to prepare sterile and non-sterile products.</p> <p>This competency will be developed via the following key elements:</p>	
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.1.1	Define the concept and structure of hospital pharmacy in various hospital types.
		1.1.2	Explain the organization of pharmacy services in inpatient, outpatient, and emergency units..
		1.1.3	Distinguish between sterile and non-sterile preparation principles.
		1.1.4	Explain the pharmaceutical supply chain in hospitals.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their	1.1.5	Evaluate the rationale for drug selection based on patient condition and hospital formulary.

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
	appropriateness, effectiveness, and safety in individuals and populations.	1.1.6	Describe the role of IV admixtures and parenteral nutrition in patient care.
		1.1.7	Recognize medication safety practices including high-alert medications and LASA drugs.
		1.1.8	Explain the principles of rational drug use in various hospital departments.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	1.1.9	Identify therapeutic alternatives using hospital formulary and evidence-based guidelines.
		1.1.10	Apply pharmacokinetics and pharmacodynamics knowledge to dose adjustment in special populations.
		1.1.11	Solve case scenarios involving drug selection or IV admixture preparation.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.12	Search and interpret current clinical guidelines for hospital-based pharmacotherapy.
		1.1.13	Retrieve drug information to answer inquiries from healthcare professionals.
		1.1.14	Use clinical databases and formularies for decision-making in patient care.
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.1.15	Discuss new technologies in sterile preparation and IV compounding (e.g., automated IV workflow).
		1.1.16	Recognize the impact of antimicrobial stewardship programs on hospital practice.
		1.1.17	Analyze current trends in hospital pharmacy practice, including pharmacoeconomics and clinical audits.

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
		1.1.13	Analyze regulatory updates on drug safety in dermatologic, reproductive or musculoskeletal care.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-1- COMPETENCY		<p>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.</p> <p>This competency will be developed via the following key elements:</p>	
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.1.1	Apply ethical principles in patient care and pharmacy services.
		2.1.2	Respect patient autonomy, confidentiality, and rights in all interactions.
		2.1.3	Value cultural, social, and individual diversity in healthcare delivery.
		2.1.4	Respect patient autonomy in decisions about cosmetic and hormone therapies
		2.1.5	Acknowledge personal and professional limitations in clinical practice.
		2.1.6	Accept the need for referral and collaboration for optimal patient care
		2.1.7	Seek guidance or consultation when situations exceed personal competence.
2-2- COMPETENCY		<p>In the Hospital Pharmacy course, students gain the ability to apply scientific and professional principles to ensure the quality, safety, and effective use of medicines in hospital settings. They learn:</p> <ul style="list-style-type: none"> • How to evaluate and standardize raw materials and pharmaceutical products according to hospital quality standards and regulatory guidelines. • How to compound and prepare individualized formulations (e.g., pediatric doses, parenteral nutrition, IV admixtures) tailored to patient-specific needs. 	

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
		<ul style="list-style-type: none"> • How to ensure proper storage conditions for high-alert or temperature-sensitive medications (e.g., insulin, chemotherapy agents, vaccines). • How to participate in hospital dispensing systems including unit-dose distribution, automated systems, and patient counseling.. <p>This competence will be developed via the following key elements:</p>	
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	Apply pharmaceutical calculations to design appropriate dosage regimens and adjust doses for special populations.
		2.2.2	Interpret pharmacokinetic and biopharmaceutical data to assess drug absorption, distribution, metabolism, and excretion in the context of clinical practice and new drug delivery systems.
		2.2.3	Utilize biostatistics and bioinformatics tools to analyze drug-related data and evaluate bioequivalence and therapeutic efficacy.
2-4- COMPETENCY		<p>In the hospital pharmacy course, students are trained to take prompt and responsible actions in emergency situations such as poisoning and drug-related complications. They develop the ability to manage antidotes, handle cytotoxic and hazardous drugs safely, and participate in clinical decision-making to ensure patient safety. The course also prepares students to collaborate effectively with healthcare teams in critical and forensic scenarios, supporting life-saving interventions and contributing to accurate medication-related assessments.</p>	

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:	
2.4.1	Ensure safe handling/use of poisons to avoid their harm to individuals and communities.	2.4.1	Apply appropriate safety protocols in the handling and disposal of toxic substances.
		2.4.2	Demonstrate the correct use of personal protective equipment (PPE) during exposure scenarios
		2.4.3	Implement standard operating procedures (SOPs) to prevent accidental poisoning or contamination.
2.4.2	Demonstrate understanding of the first aid measures needed to save patient's life.	2.4.4	Identify clinical signs and symptoms of acute poisoning.
		2.4.5	Describe the steps of first aid management for common poisoning cases.
		2.4.6	Apply first aid procedures in simulated emergency scenarios to manage poison exposure.
2.4.3	Take actions to solve any identified medicine-related and pharmaceutical care problems .	2.4.7	Evaluate patient medication profiles to identify potential toxic drug interactions.
		2.4.2	Collaborate with healthcare professionals to resolve pharmaceutical care issues related to poisoning.
		2.4.3	Address nonadherence in long-term regimens.
2-5- COMPETENCY		The hospital pharmacy course enables students to retrieve and critically appraise evidence-based information to support clinical decisions and optimize patient care. It also equips them with the skills to contribute effectively to planning and conducting research using appropriate methodologies relevant to hospital and toxicology 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
		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	Retrieve up-to-date, evidence-based clinical guidelines related to hospital pharmacy practices.
		2.5.2	Interpret clinical data to support therapeutic decisions
		2.5.3	Critically evaluate research studies and drug information to ensure optimal patient care.
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies.	2.5.4	Formulate research questions addressing challenges in hospital pharmacy or toxicology practice
		2.5.5	Select and apply appropriate research methodologies and statistical tools.
		2.5.6	Participate in the design, implementation, and interpretation of hospital-based clinical or observational studies.
DOMAIN 3: Pharmaceutical Care 3-1- COMPETENCY		In the hospital pharmacy course, students gain the ability to apply scientific and professional principles to ensure the quality, safety, and effective use of medicines in hospital settings. They learn: <ul style="list-style-type: none"> • How to evaluate and standardize raw materials and pharmaceutical products according to hospital quality standards and regulatory guidelines. • How to compound and prepare individualized formulations (e.g., pediatric doses, parenteral nutrition, IV admixtures) tailored to patient-specific needs. • How to ensure proper storage conditions for high-alert or temperature-sensitive medications (e.g., insulin, chemotherapy agents, vaccines). • How to participate in hospital dispensing systems 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
		unit-dose distribution, automated systems, and patient counseling. 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 physiological mechanisms of major body systems and their relevance to disease progression in hospitalized patients.
		3.1.2	Interpret genomic data to predict patient susceptibility to certain diseases or drug responses.
		3.1.3	Integrate pathophysiology and genetic factors to develop patient-specific therapeutic plans in a hospital setting.
		3.1.4	Evaluate the impact of genetic polymorphisms on drug metabolism and efficacy.
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/diseases.	3.1.5	Perform standard microbiological techniques to identify pathogens in clinical specimens..
		3.1.6	Interpret antimicrobial susceptibility testing results to guide therapy.
		3.1.7	Monitor microbial growth patterns and evaluate antimicrobial stewardship strategies.
		3.1.8	Collaborate with clinical teams to adjust therapy based on microbiological findings.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches	3.1.9	Correlate clinical symptoms with laboratory diagnostic results to confirm infection type.
		3.1.10	Relate disease pathogenesis with drug regimen selection and monitoring.
		3.1.11	Select appropriate antimicrobial or antiviral therapy based on disease etiology and patient-specific factors.

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
		3.1.12	Educate healthcare staff and patients on prevention and treatment strategies for infectious diseases in hospitals.
		3.1.13	Monitor patient progress and adjust pharmacotherapy according to clinical and laboratory outcomes.
3-2- COMPETENCY		<p>Upon finishing this course, students will be able to</p> <p>Provide counselling and education services to patients and communities</p> <p>about safe and rational use of medicines and medical devices.</p> <p>This competency will be developed via the following key elements:</p>	
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	Correlate the pharmacological properties of drugs—including mechanisms of action, therapeutic uses, dosages, contraindications, adverse reactions, and interactions—with patient-specific factors in hospital settings.
		3.2.2	Apply this integration in medication chart review, prescription verification, and multidisciplinary clinical rounds.
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.2.3	Implement principles of clinical pharmacology to ensure rational and individualized drug therapy.
		3.2.4	Monitor, detect, and report adverse drug reactions and medication errors according to hospital pharmacovigilance protocols.□
		3.2.5	Evaluate and adjust therapy based on therapeutic drug monitoring and patient outcomes.
3.2.3	Provide evidence-based information about safe use of complementary	3.2.6	Critically appraise and communicate evidence on the safe and effective use of

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
	medicine including phytotherapy, aromatherapy, and nutraceuticals		complementary medicine, including phytotherapy, aromatherapy, and nutraceuticals, in hospital inpatients and outpatients.
		3.2.7	Identify potential interactions between complementary products and prescribed medications.
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	Demonstrate patient counseling techniques for safe and effective use of prescribed, OTC medications, and medical devices in hospital settings.
		3.2.12	Communicate evidence-based drug information to healthcare teams to optimize patient therapy and prevent medication errors.
		3.2.13	Educate patients and caregivers on correct medication administration, storage, and adherence strategies to improve therapeutic outcomes.
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse	3.2.14	Explain the risks and consequences of prescription drug misuse, OTC medication overuse, and illicit substance abuse in hospital and community contexts.

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
		3.2.15	Develop patient education plans to prevent drug misuse and promote safe medication practices during hospital discharge counseling.
		3.2.16	Participate in awareness campaigns within hospital and community settings to reduce the incidence of drug abuse.
DOMAIN 4: Personal Practice 4-1- COMPETENCY		<p>Upon finishing this course, students will be able to express leadership, time management, critical thinking, problem solving, independent and teamwork, creativity and entrepreneurial skills.</p> <p>This competency will be developed via the following key elements:</p>	
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 managing dermatological, reproductive or MSK care and prioritize patient cases with urgent concerns.
		4.1.2	Manage tasks in collaborative projects on chronic disease monitoring and evaluate peer contributions during group assignments.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.3	Research treatment guidelines for rare disorders and independently assess medication plans.
		4.1.4	Solve therapeutic dilemmas in conflicting comorbidities and demonstrate initiative in tackling nonadherence issues.
4-2- COMPETENCY		<p>Upon finishing this course, students will be able to Effectively communicate verbally, non-verbally and in writing with individuals and communities.</p> <p>This competency will be developed via the following key elements:</p>	

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	Apply appropriate verbal and non-verbal communication techniques during patient interviews, ward rounds, and interdisciplinary meetings.
		4.2.2	Document patient information accurately and concisely in medical records, progress notes, and discharge summaries.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.3	Utilize hospital information systems and digital tools to prepare and deliver case presentations.
		4.2.4	Present patient cases and clinical findings effectively to healthcare teams using visual aids and structured formats.
4-3- COMPETENCY		<p>Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Evaluate personal strengths and weaknesses in relation to professional practice.
		4.3.2	Identify improvement areas after peer evaluation and plan steps to improve therapeutic counseling skills.
4.3.2	Practice independent learning is needed for continuous professional development.	4.3.3	Seek new research on emerging therapies and track the continuous updates with respect to new regulations and guidelines.
		4.3.4	Apply self-directed learning methods to achieve targeted professional growth.

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	Responsibilities of hospital staff	4	2	2	---	---
2	Hospital and its organization	4	2	2	---	---
3	Pharmacy and therapeutic committee	4	2	2	---	---
4	Hospital formulary	4	2	2	---	---
5	In-patient pharmacy	4	2	2	---	---
6	Out-patient pharmacy	4	2	2	---	---
7	Periodical exam					
8	IV admixture	4	2	2	---	---
9	Handling of Cytotoxic Drugs	4	2	2	---	---
10	Handling of Cytotoxic Drugs	4	2	2	---	---
11	Pharmacist and radioisotopes	4	2	2	---	---
12	Drug incompatibility	4	2	2	---	---
13	Bed round of the clinical pharmacist	4	2	2	---	---
14	Responsibilities of hospital staff	4	2	Practical exam		
15	Hospital and its organization	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	10 marks	10%
5	Assignments / Project /Portfolio/ 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	Ansen KN, McCartney RR. Handbook of Institutional Pharmacy Practice. 6th ed. Bethesda: American Society of Health-System Pharmacists; 2024
	Other References	Tatro DS. Drug Interaction Facts 2024: The Authority on Drug Interactions. 2024 ed. Bethesda: Wolters Kluwer Health. Polovich M (ed). Safe Handling of Hazardous Drugs. 4th ed. Pittsburgh: Oncology Nursing Society; 2023. Whaley AB. Compounding Sterile Preparations. 5th ed. Bethesda: American Society of Health-System Pharmacists; 2023.
	Electronic Sources	www.biomedcentral.com www.medscape.com http://www.sciencedirect.com/ http://www.ncbi.nlm.nih.gov/ http://www.FDA.gov
	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php

	Other	Applied Therapeutics, The clinical Use of Drugs(2009) Koda-Kimble MA(Ed). Lippincott Williams and Wilkins, 9th Edition. Pharmacotherapy. DiPiro JT et al (Ed). McGraw Hill, 11th Edition.
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 - IV Admixture unit

Course Plan

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

Course title: Management of dermatological, reproductive and musculoskeletal diseases. **Course code: P009**

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Responsibilities of hospital staff	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	Hospital and its organization	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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		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, 4.2.2.2.2.4, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 3	Pharmacy and therapeutic committee	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	Hospital formulary	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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		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		
Week # 5	In-patient pharmacy	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 # 6	Out-patient pharmacy	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,	Lectures, E-learning, practical	Written, practical and oral exams

		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	training and class activities	
Week # 7	Periodical exam			
Week # 8	IV admixture	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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
Week # 9	Handling of Cytotoxic 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 , 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, 4.3.2, 4.3.3, 4.3.4	Lectures, E-learning, practical training and class activities	
Week # 10	Handling of Cytotoxic 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 , 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,	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

		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 # 11	Pharmacist and radioisotopes	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, 3.2.134.1.1, 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	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams
Week # 12	Drug incompatibility	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, seminars and practical training	Written, practical and oral exams

		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		
Week # 13	Bed round of the clinical pharmacist	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	Responsibilities of hospital staff	1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9,	Lectures and E-learning	Written and oral exams

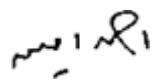
		1.1.10, 1.1.11, 1.1.12, 1.1.13, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.2.1, 2.2.2, 2.4.1, 2.4.2, 2.4.3, 2.5.1, 25.2, 2.5.3, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1,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

		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, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.4		
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Name and Signature

Course Coordinator

Associate.Prof/Ahmed Amin



Name and Signature

Program Coordinator

Prof. Abd Elaziz Elashmawoy



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Course Specification

2025

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutical technology II			
Course Code (according to the bylaw)	PT 809			
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
	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)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Prof. Abd El-Aziz EL-said Lecturer. Ahmed Adel			
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 is a continuation of the study of the various unit operations in pharmaceutical industry with emphasis on size reduction, size separation, size analysis and size enlargement involved in the process development, scale-up and manufacturing of pharmaceutical drug products in industry (conventional / advanced nanotechnology based). In addition to the container/closure systems, some of the packaging processing methods are covered. Moreover, the vision about designing a quality product and its manufacturing process to consistently deliver the intended performance of the product to meet patient needs is discussed by applying Quality-by-Design principles.

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 sciences to formulate and manufacture conventional and new drug products. 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	Identify the mechanisms of various unit operations, including size reduction, size separation, size analysis, size enlargement, mixing, labelling, and Packaging.
		1.1.2	List all factors affecting the abovementioned unit operations.

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
1.1.3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical materials/products.	1.1.3	Classify all equipment used in the abovementioned unit operations.
		1.1.4	Identify the applications of the abovementioned unit operations during the production of different dosage forms.
		1.1.5	Understand powder technology in terms of solid/fluid interactions, inter-particle contact, and cohesion between particles.
		1.1.6	Understand how to conduct pyrogen testing for various sterile preparations and analyze the results.
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.1.7	Describe the construction of the most recent industrial equipment used in pharmaceutical manufacturing, their working principles, and applications.
		1.1.8	Understand the process of packaging development, critical issues with the packaging operation, packaging line unit operations, critical processing parameters, extractables and leachables, poison prevention packaging, and cGMP requirements for labels.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-2- COMPETENCY		Upon completing this course, students will be able to apply the working principles of these major industrial unit operations in pharmaceutical product development and design. 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
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	Construct methods of isolation, purification, and crystallization of different raw materials
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.	2.2.2	Operate pharmaceutical equipment in industrial production lines
		2.2.3	Apply different pharmaceutical technologies in recent drug delivery systems.
2-3- COMPETENCY		<p>Upon finishing this course, students will be able to Apply appropriate procedures for the handling and disposal of biological and pharmaceutical materials—both synthetic and natural—ensuring compliance with current Good Manufacturing Practices (cGMP), environmental regulations, and biosafety standards.</p> <p>This competency will be developed via the following key elements:</p>	
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	Safely handle different chemicals to avoid harm to the students.

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		<p>Upon finishing this course, students will be able to Contribute to pharmaceutical research and clinical development activities essential for the regulatory approval and market authorization of medicinal products</p> <p>This competency will be developed via the following key elements:</p>	
2.5.1	Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.	2.5.1	Achieve regulatory approval for a medicinal product by presenting validated data supporting its manufacturing quality, non-clinical and clinical safety, and therapeutic effectiveness.
Domain 4: Personal Practice 4-1- Competency		<p>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</p> <p>This competency will be developed via the following key elements:</p>	
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.1.1	Contribute to team success by being accountable for group performance, offering constructive feedback to peers, and effectively managing time to meet project goals
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.2	Source and critically evaluate relevant data, identify and implement systematic solutions, and operate autonomously with strong collaboration in cross-functional teams
4.1.3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.1.3	Demonstrate strategic thinking and creative problem-solving within a simulated pharmaceutical commercialization or start-up scenario.

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- Competency		<p>Upon completing this course, students will be able to effectively communicate verbally, non-verbally, and in writing with individuals in pharmaceutical plants.</p> <p>This competency will be developed via the following key elements:</p>	
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.1	Retrieve information from different sources and set realistic targets and time plan to accomplish a required mission in deadlines
4-3- Competency		<p>Upon completing this course, students will be able to Express self-awareness and be a life-long learner for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Conduct regular self-assessments to drive growth in pharmaceutical knowledge, compliance standards, and collaborative skills.
4.3.2	Practice independent learning needed for continuous professional development	4.3.2	Demonstrate knowledge of independent learning strategies required for continuous professional development in pharmacy practice

4. Teaching and Learning Methods

- 1- Lectures (✓)
- 2- E-learning (✓)
- 3- Practical training/ laboratory (✓)

4- discussion (✓)
 5- Brainstorming (✓)
 6- Assignment (✓)
 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	Introduction	4	2	2	-----	-----
2	Size Reduction	4	2	2	-----	-----
3	Size reduction	4	2	2	-----	-----
4	Granulation	4	2	2	-----	-----
5	Powder Properties	4	2	2	-----	-----
6	Powder Properties	4	2	2	-----	-----
7	Semester works					
8	Powder Properties	4	2	2	-----	-----
9	Mixing	4	2	2	-----	-----
10	Mixing	4	2	2	-----	-----
11	Mixing	4	2	2	-----	-----
12	Packaging	4	2	2	-----	-----
13	Packaging	4	2	2	-----	-----
14	Pyrogen Testing	4	2	Practical exam	-----	-----
15	Pyrogen Testing	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	7	15	15%
2	Final Practical/Clinical/... Exam	14,15	15	15%
3	Final Written Exam	16,17	50	50%
4	Final Oral Exam	16,17	10	10%
	Assignments / Project /Portfolio/ Logbook	All semester long	10	10%

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)	Notes and Lab manual prepared by the department staff
	Other References	Essentials of Industrial Pharmacy Basics of Pharmaceutical Manufacturing and Quality Operations
	Electronic Sources (Links must be added)	https://www.fda.gov/ https://www.ich.org/
	Learning Platforms (Links must be added)	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other (to be mentioned)	Pharmaceutical Manufacturing Handbook: Production and Processes
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Laboratory facilities (Equipment of factory).
	Supplies	----
	Electronic Programs	---
	Skill Labs/ Simulators	---
	Virtual Labs	----

	Other (to be mentioned)	Data shows, smart board, Unit for distance learning, Computers, Internet and Library.
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Course Plan

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

Course title: Pharmaceutical Technology II

Course code: PT 809

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Introduction	1.1.1,1.12,1.1.4,1.15,1.1.7 ,2.2.1, 2.2.3, , 2.3.1,4.3.1	Lectures and discussion	Written, practical and oral exams
Week # 2	Size Reduction	1.1.1,1.12,1.1.4,1.15 ,1.1.7,2.2.1, 2.2.3 , 2.3.1,2.5.1,4.3.1	Lectures and practical training	Written, practical and oral exams
Week # 3	Size reduction	1.1.1,1.12,1.1.3,1.1.4, ,2.2.1, 2.2.3, 2.3.1,4.2.1,4.3.1	Lectures and practical training	Written, practical and oral exams
Week # 4	Granulation	1.1.2, 1.1.4,1.1.5, 2.2.1, 2.2.2, 2.2.3, 2.5.1,	Lectures, practical training and discussion.	Written, practical and oral exams
Week # 5	Powder Properties	1.1.1, 1.1.3, 1.15, 1.1.7,2.2.1, 2.2.2, 2.2.3, 4.1.3,4.2.1	Lectures and discussion.	Written, practical and oral exams
Week # 6	Powder Properties	1.1.2, 1.13, 1.14,1.1.7, 2.2.2, 2.3.1,2.5.1,4.1.2,	Lectures and brain storming.	Written, practical and oral exams
Week # 7	Semester works			
Week # 8	Powder Properties	1.1.1,1.1.3,1.1.4, 1.1.5 , 2.2.2, 2.3.1,4.1.3,4.2.1	Lectures and practical training	Written, practical and oral exams
Week # 9	Mixing	1.1.1,1.1.2, 1.1.4,1.1.5, 2.2.1, 2.2.2, , 2.3.1, 4.3.1,	Lectures and discussion.	Written, practical and oral exams

Week # 10	Mixing	1.1.1,1.1.2,1.1.3, 1.1.5,1.1.7,2.2.1, 2.2.2, 2.2.3, 2.5.1,4.1.1,4.1.2	Lectures	Written, practical and oral exams
Week # 11	Mixing	1.1.2,1.1.3,1.1.4, , 2.2.3, 2.5.1,4.1.1, 4.1.3 4.2.1	Lectures and class activity.	Written, practical and oral exams
Week # 12	Packaging	1.1.1,1.12,1.1.3,1.1.4,1.1.5,1.1.8, 2.2.1,2.2.3, 4.1.3,4.3.1	Lectures and class activity.	Written, practical and oral exams
Week # 13	Packaging	1.1.1,1.1.21.1.3,1.14, 1.1.8,2..2.1,2..2.3,2.5.1,4.1.3,4.2.1	Lectures and class activity.	Written, practical and oral exams
Week # 14	Pyrogen Testing	1.1.1,1.12,1.1.3, 1.15,1.1.6, 2.2.1, 2.2.2, 2.2.3, 2.5.1,4.1.1,4.1.2	Lectures and brainstorming	Written and oral exams
Week # 15	Pyrogen Testing	1.1.1,1.1.2,1.1.3 1.1.4,1.1.6, 2.2.1, 2.2.2, 2.2.3, 2..5.1,4.1.1,4.1.2	Lectures and discussion	Written and oral exams

Name and Signature

Course Coordinator

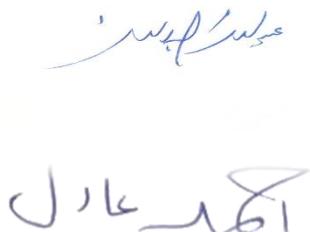
Prof. Abd El-Aziz EL-said

Lecturer. Ahmed Adel

Name and Signature

Program Coordinator

Prof. Abd El-Aziz EL-said




Course Specification

(2025)

Course Title (according to the bylaw)	Community Pharmacy Practice			
Course Code (according to the bylaw)	PP 803			
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			
Academic Program	BSc in pharmacy (pharm-D)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate. Prof. Noha Mahmoud El-Khodary			
Course Specification Approval Date	31/8/2025			
Course Specification Approval	Department Counsil			

2. Course Overview (Brief summary of scientific content)

This course covers the clinical situations that can be handled by the pharmacist in the community pharmacy (referral or using OTC medications) including upper respiratory tract, gastrointestinal, and musculoskeletal symptoms, skin, eyes, and ears, and childhood symptoms.

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 pharmaceutical, biomedical, and clinical sciences to design and implement patient-centered services in community pharmacy settings, including the selection, recommendation, and safe use of over the counter (OTC) medicines, ensuring effective and ethical care for individuals and the wider community. 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	Apply multidisciplinary knowledge to provide patient-centered pharmaceutical care in community settings.
		1.1.2	Integrate social, behavioral, and administrative sciences to improve patient engagement and pharmacy services.
		1.1.3	Relate biomedical and clinical sciences to the safe preparation, dispensing, and monitoring of medicines.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their	1.1.4	Explain the mechanism of action of medicines to support effective patient counseling and education.

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
	appropriateness, effectiveness, and safety in individuals and populations.	1.1.5	Assess the appropriateness and safety of medications for diverse patient groups in a community setting.
		1.1.6	Apply pharmacological and therapeutic principles to ensure optimal treatment outcomes.
1.1.5	Retrieve information from fundamental sciences to solve therapeutic problems.	1.1.7	Search and select relevant drug and disease information from trusted scientific sources.
		1.1.8	Apply retrieved information to address drug-related problems and optimize therapy.
		1.1.9	Adapt scientific knowledge to practical solutions for community pharmacy challenges.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.10	Collect and interpret patient data to guide medicine selection and counseling.
		1.1.11	Incorporate literature findings into daily decision-making in community pharmacy services.
1.1.7	Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.1.12	Monitor trends in medicine supply, regulation, and public health that affect community pharmacy operations.
		1.1.13	Evaluate the impact of new health issues on medication use, safety, and accessibility.
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:	
2.1.1	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	Apply national pharmacy laws, regulations, and professional standards in all community pharmacy activities.

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
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.1.2	Maintain patient confidentiality and privacy in all pharmacy transactions.
		2.1.3	Provide equitable pharmaceutical care that respects cultural, social, and personal diversity.
		2.1.4	Uphold ethical principles in medication dispensing, counseling, and decision-making.
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 situations that require referral to a physician or specialist for safe patient management.
2-2- COMPETENCY		<p>Upon finishing this course, students will be able to:</p> <p>Standardize pharmaceutical materials, formulate, and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines within the community pharmacy.</p> <p>This competence will be developed via the following key elements:</p>	
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	Apply pharmaceutical calculations to accurately prepare, dispense, and adjust medication doses in community pharmacy practice.
		2.2.2	Utilize bioequivalence concepts and emerging drug delivery technologies to guide generic substitution and patient counseling.

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		<p>Upon finishing this course, students will be able to</p> <p>contribute to pharmaceutical research studies and clinical trials needed to authorize medicinal products.</p> <p>This competency will be developed via the following key elements:</p>	
2.5.1	Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.	2.5.1	Counsel patients on the safe and appropriate use of medicines in accordance with regulatory guidelines.
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession	2.5.2	Use trusted databases and scientific resources to gather relevant drug and disease information.
		2.5.3	Critically appraise the quality of clinical evidence to support professional decisions in community pharmacy practice.
		2.5.4	Integrate evidence-based findings into patient counseling, medicine selection, and therapeutic problem-solving.
3-1- COMPETENCY		<p>Upon finishing this course, students will be able to</p> <p>Apply the principles of body functions to participate in improving health care services using evidence-based data within community pharmacy.</p> <p>This competency will be developed via the following key elements:</p>	
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.1.1	Recognize clinical features that guide the selection of the most appropriate OTC products.
		3.1.2	Provide evidence-based counseling on correct OTC product use, expected outcomes, and safety precautions to support effective and responsible self-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- COMPETENCY		<p>Upon finishing this course, students will be able to</p> <p>Provide counselling and education services to patients and communities about safe and rational use of medicines and medical devices.</p> <p>This competency will be developed via the following key elements:</p>	
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	Counsel patients on correct drug use by explaining mechanisms of action, therapeutic uses, and appropriate dosing in accessible language.
		3.2.2	Identify and prevent medication-related problems, including contraindications, adverse reactions, and potential interactions, during dispensing.
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.2.3	Monitor and report adverse drug reactions and medication errors observed in community pharmacy practice.
		3.2.4	Use clinical pharmacology principles to optimize therapy outcomes for walk-in patients and those with chronic conditions.
3.2.3	Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.	3.2.5	Recognize symptoms of drug toxicity and poisoning that require urgent referral from a community pharmacy setting.

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.	3.2.6	Provide first-aid advice and safety information to reduce the risk of exposure to toxic substances.
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.	3.2.7	Provide individualized counselling on prescription and OTC medicines, including correct dosage, administration, and potential side effects.
		3.2.8	Demonstrate proper use and maintenance of common medical devices (e.g., inhalers, glucometers, blood pressure monitors).
3.2.6	Maintain public awareness on social health hazards of drug misuse and abuse.	3.2.9	Deliver community health education sessions to promote rational and safe medicine use.
		3.2.10	Educate patients and the public about the risks and consequences of prescription and OTC drug misuse.
		3.2.11	Collaborate with healthcare providers and local authorities to detect, report, and address cases of drug misuse.
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	Work with classmates to complete projects or assignments on time and to a high standard.
		4.1.2	

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 critical thinking to solve practical problems in case studies or class projects.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.3	Create new ideas for pharmacy services or health awareness projects.
		4.1.4	Present a simple project to classmates, showing creativity and good organization.
4.1.3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity		
4-2- COMPETENCY		<p>Upon finishing this course, students will be able to Effectively communicate verbally, non-verbally and in writing with individuals and communities.</p> <p>This competency will be developed via the following key elements:</p>	
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care teams, patients, and communities	4.2.1	Speak clearly and confidently when explaining medicine use to patients or discussing with healthcare professionals.
		4.2.2	Use respectful and professional body language when interacting with others.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.3	Prepare professional presentations using tools like PowerPoint, Canva, or Prezi.
		4.2.4	Use visuals, videos, or interactive tools to make information more engaging.
4-3- COMPETENCY		<p>Upon finishing this course, students will be able to express self-awareness and be a life-long learner for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Identify personal strengths and areas for improvement in patient care, communication, and pharmacy practice skills and set specific,

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.		achievable goals to enhance academic and professional abilities.
		4.3.2	Use feedback and self-reflection to make continuous progress throughout the course, ensuring ongoing growth as a future community pharmacist.
		4.3.3	Search for and study new information about medicines, diseases, and pharmacy practice on your own by using online courses, books, and research articles to stay updated on the profession.

4. Teaching and Learning Methods

- 1- Lectures (✓)
- 2- E-learning (✓)
- 3- Practical training (✓)
- 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	Introduction to Community Pharmacy & Steps of Patient Counseling	4	2	2	---	---
2	Mouth Ulcers	4	2	2	---	---
3	Heartburn & Dyspepsia	4	2	2	---	---
4	Diarrhea	4	2	2	---	---
5	Constipation	4	2	2	---	---
6	Hemorrhoids	4	2	2	---	---
7	Periodical exam					
8	Irritable bowel syndrome	4	2	2	---	---
9	Intestinal Gas	4	2	2	---	---
10	Colds & Allergic Rhinitis	4	2	2	---	---
11	Cough	4	2	2	---	---
12	Musculoskeletal Pain	4	2	2	---	---
13	Diaper rash	4	2	2	---	---
14	Skin Hyperpigmentation	2	2	Practical exam		
15	Minor Burns & Sunburn	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	10 marks	10%

2	Quizzes / formative exam	Week 4. 8.12	5 marks	5%
3	Final Practical Exam	Week 14,15	15 marks	15%
4	Assignments / Project / Logbook	All semester long	10 marks	10%
5	Final Written Exam	Week 16,17	50 marks	50%
6	Final Oral Exam	Week 16,17	10 marks	10%

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course	DiPiro, J. T., Yee, G. C., Haines, S. T., Nolin, T. D., Ellingrod, V., & Posey, L. M. (Eds.). (2023). <i>Pharmacotherapy: A pathophysiologic approach</i> (12th ed.). McGraw-Hill Education.
	Other References	Lecture notes on community pharmacy practice prepared by department of clinical pharmacy. Practical notes on community pharmacy practice prepared by department of clinical pharmacy.
	Electronic Sources	www.biomedcentral.com www.medscape.com http://www.sciencedirect.com/ http://www.ncbi.nlm.nih.gov/ http://www.FDA.gov
	Learning Platforms	https://lms3.kfs.edu.eg/pharm/login/index.php
	Other	Koda-Kimble, M. A., & Young, L. Y. (Eds.). (2024). <i>Applied therapeutics: The clinical use of drugs</i> (12th ed.). Wolters Kluwer.

		Krinsky, D. L., Ferreri, S. P., Hemstreet, B. A., Hume, A. L., Rollins, C. J., & Tietze, K. J. (Eds.). (2021). <i>Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care</i> (20th ed.). American Pharmacists Association.
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	<ul style="list-style-type: none"> - Data show. - Computers. -Library. -Internet. -Interactive boards.
	Supplies	<p>Classrooms.</p> <p>Educational pharmacy</p>
	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: Community Pharmacy Practice

Course code: PP 803

Week	Topic	Key Elements	Teaching & Learning Methods	Student Assessment Methods
1	Introduction to Community Pharmacy & Steps of Patient Counseling	1.1.1, 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, 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 4.2.1	Lectures, E-learning, discussion, and brain storming	Written, and oral exams
2	Mouth Ulcers	3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 2.5.1, 2.5.2, 2.5.3, 2.5.4, 4.1.1, 4.1.2, 4.2.3, 4.2.4, 4.3.1, 4.3.3	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
3	Heartburn & Dyspepsia	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
4	Diarrhea	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.10,	Lectures, E-learning, practical and	Written, practical and oral exams

		1.1.11, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.7, 3.2.8, 3.2.9, 3.2.10	seminar presentation	
5	Constipation	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11	Lectures, E-learning, discussion, and brain storming	Written, practical and oral exams
6	Hemorrhoids	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.2	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
7	Periodical exam			
8	Irritable bowel syndrome	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, 1.1.7, 1.1.8, 2.5.2, 2.5.3, 2.5.4, 3.2.9, 3.2.10, 3.2.11	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
9	Intestinal Gas	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.9, 1.1.10, 1.1.11, 3.1.1, 3.1.2, 3.2.1,	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams

		3.2.2, 3.2.5, 3.2.7, 3.2.8, 3.2.9, 3.2.10		
10	Colds & Allergic Rhinitis	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
11	Cough	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.2.1	Lectures, E-learning, discussion and brain storming	Written, practical and oral exams
12	Musculoskeletal Pain	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.2	Lectures, E-learning, practical and seminar presentation	Written, practical and oral exams
13	Diaper rash	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.3.1	Lectures, E-learning, discussion, and brain storming	Written, practical and oral exams

14	Skin Hyperpigmentation	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 4.1.3	Lectures, E-learning, practical and seminar presentation	Written, and oral exams
15	Minor Burns & Sunburn	1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.9, 1.1.10, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10	Lectures, E-learning, discussion and brain storming	Written, and oral exams

Name and Signature

Course Coordinator

Associate. Prof. Noha Mahmoud El-Khodary



Name and Signature

Program Coordinator

Prof. Dr. Abdel Aziz El-Ashmawy



Course Specification (2025)

1. Basic Information

Course Title (according to the bylaw)	Drug Design			
Course Code (according to the bylaw)	PC 807			
Departments participating in the delivery of the course	Pharmaceutical Chemistry Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 1	Practical 1	Other (specify) -----	Total 2
Course Type	Compulsory			
Academic level at which the course is taught	Fourth level, Semester (2)			
Academic Program	Bachelor of Pharmacy (PharmD)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Kafrelsheikh University			
Name of Course Coordinator	Associate Prof. Wagdy Mohamed Eldehna			
Course Specification Approval Date	9/2025			
Course Specification Approval	Department Council			

2. Course Overview (Brief summary of scientific content)

This course covers basic principles, theoretical basis, and practical experience of different methods of drug design and different approaches in the field of design.

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 principles of rational drug design, including structure-based and ligand-based approaches.
		1.1.2	Relate drug chemical structures to their biological targets (enzymes, receptors, nucleic acids).
		1.1.3	Describe the pharmacological and clinical implications of structural modifications in drug molecules.
		1.1.4	Interpret how molecular properties (e.g., solubility, lipophilicity, ionization) affect drug action, distribution, and clinical use.
1.1.3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure the quality of	1.1.5	Use structure-activity relationship (SAR) analysis to guide molecular modifications.
		1.1.6	Employ computational chemistry and molecular modeling to predict binding affinity and optimize drug-target interactions.

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.	1.1.7	Evaluate physicochemical properties and ADMET (absorption, distribution, metabolism, excretion, toxicity) parameters during drug optimization.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.8	Retrieve and analyze updated drug design research from scientific databases and journals.
		1.1.9	interpret data on lead discovery, target validation, and molecular docking to support drug design decisions.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE 2-2- COMPETENCY		<p>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.</p> <p>This competency will be developed via the following key elements:</p>	
2.2.1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/natural pharmaceutical materials.	2.2.1	Design potential drug molecules through lead optimization strategies.
		2.2.2	Propose synthetic routes for novel drug candidates based on retrosynthetic analysis
		2.2.3	Apply computational techniques to predict and refine drug-target interactions
		2.2.4	Identify and validate structural features critical for drug activity and selectivity.
2.2.2	Apply the basic requirements of a quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/ products considering various incompatibilities.	2.2.5	Assess drug candidates for stability and chemical compatibility during development.
		2.2.6	Identify chemical and metabolic incompatibility during drug optimization.
2.2.3	Recognize the principles of various tools and instruments and select the	2.2.7	Utilize molecular docking, pharmacophore modeling, and QSAR tools in 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
	proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	2.2.8	Apply computational chemistry software (e.g., AutoDock, MOE, Schrödinger) for structural analysis.
		2.2.9	Select appropriate in vitro and in silico techniques to evaluate drug candidates.
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:	
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies.	2.5.1	Design computational and experimental methodologies for new drug discovery.
		2.5.2	Apply appropriate drug design strategies (de novo design, hybrid design, bioisosteric replacement) in research.
		2.5.3	Analyze and interpret research data to draw valid conclusions and propose further studies.
DOMAIN 4: Personal Practice 4-1- COMPETENCY		Upon completing 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	Collaborate effectively in team-based drug design projects.
		4.1.2	Manage time efficiently to complete molecular modeling and design assignments.
4.1.2	Retrieve and critically analyze information, identify and solve	4.1.3	Critically analyze literature on drug-target interactions and apply findings to design tasks.

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
	problems, and work autonomously and effectively in a team.	4.1.4	Collaborate in group discussions to solve complex medicinal chemistry design problems.
		4.1.5	Identify problems in drug discovery pipelines and propose rational design solutions.
4-2- COMPETENCY		<p>Upon completing this course, students will be able to effectively communicate verbally, non-verbally, and in writing with individuals and communities.</p> <p>This competency will be developed via the following key elements:</p>	
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.2.1	Prepare digital presentations illustrating drug design strategies and SAR studies.
		4.2.2	Use molecular visualization software to present drug-target interactions effectively.
		4.2.3	Develop posters and infographics summarizing drug design research.
		4.2.4	Deliver oral presentations integrating chemical, pharmacological, and computational data.
4-3- COMPETENCY		<p>Upon completing this course, students will be able to express self-awareness and be a lifelong learner for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Reflect on personal strengths and weaknesses in drug design skills (e.g., computational tools, SAR interpretation).
		4.3.2	Develop action plans for continuous improvement in drug design methodologies.
		4.3.3	Maintain updated knowledge of novel approaches in rational drug design.

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	Introduction to drug design, Drug Targets and Types of drug interactions	3	1	2	---	---
2	Design of agonists and antagonists, Bioisosterism, stereochemistry and biological activity	3	1	2	---	---
3	Stages of drug design	3	1	2	---	---
4	Lead optimization	3	1	2	---	---
5	Lead optimization	3	1	2	---	---
6	Drug Metabolism	3	1	2	---	---
7	Semester works					
8	Drug Metabolism	3	1	2	---	---
9	Prodrugs	3	1	2	---	---
10	Prodrugs	3	1	2	---	---
11	Molecular Modelling (Molecular Docking)	3	1	2	---	---
12	Molecular Modelling (Pharmacophore Modelling)	3	1	2	---	---
13	Quantitative Structure Activity Relationship (QSAR)	3	1	2	---	---
14	Combinatorial chemistry	1	1	Practical exam		
15	Revision	1	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	Week 7	15 marks	15%
2	Final Practical/Clinical/... Exam	Week 14,15	25 marks	25%
3	Final Written Exam	Week 16,17	50 marks	50%
4	Final Oral Exam	Week 16,17	10 marks	10%
	Total		100	100%

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	The main (essential) reference for the course	Notes on Drug Design prepared and distributed by Dept. of Pharmaceutical Chemistry. Lab Manual of Drug Design prepared and distributed by Dept. of Pharmaceutical Chemistry.
	Other References	Gerhard Klebe, Drug Design: Methodology, Concepts, and Mode-of-Action,2013, Springer, Berlin, Heidelberg Kenneth M. Merz, Charles H. Reynolds, "Drug Design: Structure- and Ligand-Based Approaches" 1 st edition ,2010, Cambridge University Press
	Electronic Sources	www.pdb.org http://www.sciencedirect.com/ https://pubmed.ncbi.nlm.nih.gov/
	Learning Platforms	https://ms3.kfs.edu.eg/pharm/login/index.php
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data show, Computers, Library, Internet.
	Supplies	Classrooms, Computer Lab
	Skill Labs/ Simulators	Computer Lab

Course Plan

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

Course title: Drug Design

Course code: PC 807

Course Contents		Key elements	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Introduction to drug design, Drug Targets and Types of drug interactions	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 2	Design of agonists and antagonists, Bioisosterism, stereochemistry and biological activity	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 3	Stages of drug design	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 4	Lead optimization	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 5	Lead optimization	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams

Week # 6	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, 1.1.9, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 7	Semester works			
Week # 8	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, 1.1.9, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training, and class activities	Written, practical, and oral exams
Week # 9	Prodrugs	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training and class activities	Written, practical and oral exams
Week # 10	Prodrugs	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training, and class activities	Written, practical, and oral exams
Week # 11	Molecular Modelling (Molecular Docking)	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, practical training, seminars and class activities	Written, practical and oral exams
Week # 12	Molecular Modelling (Pharmacophore Modelling)	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures, E-learning, seminars and practical training	Written, practical and oral exams

Week # 13	Quantitative Structure Activity Relationship (QSAR)	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures and E-learning	Written, practical and oral exams
Week # 14	Combinatorial chemistry	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures and E-learning	Written and oral exams
Week # 15	Revision	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, 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, 2.5.1, 2.5.2, 2.5.3, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.3.1, 4.3.2, 4.3.3.	Lectures and E-learning	Written and oral exams

Name and Signature

Course Coordinator

Associate. Prof. Wagdy Mohamed
Eldehna



Name and Signature

Program Coordinator

Prof. Abdelaziz Elsayed



Course Specification

(2025)

1. Basic Information

Course Title (according to the bylaw)	Clinical Nutrition			
Course Code (according to the bylaw)	PB E5			
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
	1	1		2
Course Type	Elective Course			
Academic level at which the course is taught	Fourth level- Second term			
Academic Program	Pharm D			
Faculty/Institute	Pharmacy			
University/Academy	KafrelSheikh			
Name of Course Coordinator	Dr/ Shimaa Ali			
Course Specification Approval Date	1/9/2025			
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 basic knowledge and skills necessary to maintain optimal health and prevent diseases through proper nutrition and trains the students to collaborate with other members of the health care team in the management of specialized nutrition conditions, illnesses, and problems.

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		<p>Upon finishing this course, students will be able to integrate knowledge from clinical sciences to understand human nutrition, including macronutrient and micronutrient requirements, energy balance, and the role of vitamins, minerals, and gut microbiota in health. It also covers dietary planning and nutritional care across different life stages and health conditions, integrating principles of nutrigenomics to personalize nutrition strategies.</p> <p>This competency will be developed via the following key elements:</p>
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.1.1	Recognize some basic background information about clinical nutrition, including BMR, energy balance, and RDA.
		1.1.2	Describe the role in metabolism and clinical significance of vitamins and minerals
		1.1.3	Discuss the enteral and parenteral nutrition and Electrolyte balance and imbalance
		1.1.4	Understand proper dietary care in different diseases, including diabetic patients, cardiovascular patients, renal patients, hepatic patients, and cancer patients

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
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations, and symbols in pharmacy practice.	1.1.5	Communicate efficiently and effectively with other healthcare teams using the proper pharmaceutical and medical terms, abbreviations, and symbols.
1.1.6	Utilize scientific literature and collect and interpret information to enhance professional decisions.	1.1.6	Recall information from different scientific literature to improve professional decision-making skills in the nutrition field.
1.1.7	Identify and critically analyze newly emerging issues influencing the pharmaceutical industry and patient health care	1.1.7	Estimate and investigate newly emerging issues affecting patient health care
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 the health care professional team.	2.1.1	Achieve responsibilities and authorities in accordance with the legal and professional framework and the defined role of all members of the health care team.
2.1.2	Adopt the ethics of health care and pharmacy profession, respecting patients' rights and valuing people diversity.	2.1.2	Acquire ethical manners of health care and pharmacy, respect patients' rights, and value people's diversity.
2.1.3	Recognize 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 health care colleagues.
2-5- COMPETENCY		Upon finishing this course, students will be able to Contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products. 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
2.5.2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.	2.2.1	Interpret patient clinical data needed in the clinical nutrition profession.
2.5.3	Contribute to planning and conducting research studies using appropriate methodologies.	2.2.2	Contribute to a research team to plan and carry out research studies using suitable methodologies.
DOMAIN 3: PHARMACEUTICAL CARE 3-1- COMPETENCY		Upon finishing this course, students will be able to apply the principles of body biochemistry to participate in improving healthcare 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	Make use of the basis of human physiology and genetics to help control different disorders and diseases by focusing on the nutritional aspect, to improve healthcare services.
3-2- COMPETENCY		Provide counseling and education services to patients and communities about safe and rational use of nutraceuticals. This competency will be developed via the following key elements:	
3.2.3	Provide evidence-based information about safe use of complementary medicine, including phytotherapy, aromatherapy, and nutraceuticals.	3.2.1	Develops individualized nutrition care plans based on disease pathophysiology (e.g., diabetes, obesity, renal disease, gastrointestinal disorders, cancer).
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	Works cooperatively and respectfully with team members.

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
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.1.2	Demonstrate critical thinking skills, including problem-solving, creativity, and time management, in team performance evaluation.
4-2- COMPETENCY		<p>Upon finishing this course, students will be able to effectively communicate verbally, non-verbally, and in writing with patients and the health care team.</p> <p>This competency will be developed via the following key elements:</p>	
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with a professional health care team, 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 nutrition data and topics effectively using recent technology.
4-3- COMPETENCY		<p>Upon finishing this course, students will be able to express self-awareness and be lifelong learners for continuous professional improvement.</p> <p>This competency will be developed via the following key elements:</p>	
4.3.1	Perform self-assessment to enhance professional and personal competencies.	4.3.1	Collect and analyze information from different sources to determine self-merits/ limitations and improve professional and personal skills.
4.3.2	Practice independent learning 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. Lectures (✓)
2. Practical training / laboratory (✓)
3. Seminar / Workshop (✓)
4. Class Activity (✓)
5. E-learning (✓)

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 clinical nutrition Basal metabolic rate (BMR) - Recommended daily allowance (RDA)	3	1	2		
2	Macronutrients and calculation of calories	3	1	2		
3	Vitamins and minerals (role in metabolism – clinical significance)	3	1	2		
4	Enteral and parenteral nutrition	3	1	2		
5	Electrolyte balance and imbalance	3	1	2		
6	Nutrition and health	3	1	2		
7	Mid-term exam	3	1	2		
8	Obesity	3	1	2		
9	Dietary care for diabetic patients	3	1	2		
10	Dietary care for cardiovascular patients	3	1	2		
11	Dietary care for renal patients	3	1	2		
12	Dietary care for hepatic patients	3	1	2		
13	Dietary care for cancer patients	3	1	2		
14	Dietary care for pregnant and lactating women Dietary care for athletics	3	1	2		
15	Nutrigenomics	3	1	2		

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Midterm exam	7 th week	10	%10
2	Final Written Exam	17 th week	50	%50
3	Final Practical Exam	15 th week	25	%25
4	Final Oral Exam	17 th week	10	%10

5	Assignments / Project /Portfolio/ Logbook	3th week, 5th week, 8th week and 10th one	5	%5
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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- Elia, M., Ljungqvist, O., Stratton, R. J., & Lanham-New, S. A. (Eds.). (2023). Clinical Nutrition (2nd ed.). Wiley-Blackwell.
	Other References	Walker S, Ashby P, Rae P, Beckett G (2010): Lecture Notes Clinical Biochemistry, 8th edition, Blackwell Pub.USA.
	Electronic Sources (Links must be added)	www.highwire.com , www.google.com , www.pubmed.com & www.biomed.net
	Learning Platforms (Links must be added)	
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	---
	Supplies	---
	Electronic Programs	---
	Skill Labs/ Simulators	---
	Virtual Labs	---
	Other (to be mentioned)	Classrooms - Computers - Internet -data show
		-Library - Smart board

Course Plan

Course title: Clinical nutrition

Course code: PB E5

Wk.	Topic	Key Elements	Teaching & Learning Methods	Student Assessment Methods
1	Introduction to clinical nutrition Basal metabolic rate (BMR) - Recommended daily allowance (RDA)	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, ,2.1.1,2.1.2,2.1.3 ,2.2.1, 2.2.2, 2.3.1,2.3.2 ,3.1.1 ,4.1.1,4.1.2,4.2.1 ,4.3.1	Lectures, E-learning and practical training	Written, practical and oral exams
2	Macronutrients and calculation of calories	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, ,2.1.1,2.1.2,2.1.3 ,2.2.1, 2.2.2, 2.3.1,2.3.2 ,3.1.1, 3.2.1, ,4.1.1,4.1.2,4.2.1 ,4.3.1	Lectures, E-learning practical training, discussion and brain storming	Written, practical and oral exams
3	Vitamins and minerals (role in metabolism – clinical significance)	1.1.1,1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2 ,2.3.1, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.2.2,4.3.1, 4.3.2,4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
4	Enteral and parenteral nutrition	1.1.1,1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2 ,2.3.1, 3.1.1, 3.2.1, 4.1.1,4.1.2,	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams

		4.2.1,4.2.2,4.3.1, 4.3.2,4.3.3		
5	Electrolyte balance and imbalance	1.1.1,1.1.2, 1.1.3,2.1.1,2.1.2, 2.3.1,2.3.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.2.2,4.3.1, 4.3.2,4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
6	Nutrition and health	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2, 2.2.2, 2.3.1,2.3.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.3.1,4.3.2, 4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
7	Mid-term exam			
8	Obesity	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2,2.3.1, 2.2.2, 2.3.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.3.1,4.3.2, 4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
9	Dietary care for diabetic patients	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2, 2.2.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.3.1,4.3.2, 4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams

10	Dietary care for cardiovascular patients	1.1.1,1.1.2,1.1.3, 2.1.1,2.1.2, 2.2.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.3.1,4.3.2, 4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
11	Dietary care for renal patients	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2, 2.2.2, 3.1.1,4.1.1,4.1.2, 4.1.3,4.2.1, 4.3.2,4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
12	Dietary care for hepatic patients	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2,2.2.1, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1,4.3.1,4.3.2, 4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
13	Dietary care for cancer patients	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2,2.2.1, 2.2.2, 3.1.1, 3.2.1, 4.1.1,4.1.2, 4.2.1, 4.3.1,4.3.2,4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written, practical and oral exams
14	Dietary care for pregnant and lactating women Dietary care for athletics	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2,2.2.1, 2.2.2,3.1.1, 3.2.1, 4.1.1,4.1.2,	Lectures, E-learning and practical training, discussion and brain storming	Written and oral exams

		4.2.1,4.2.2,4.3.1, 4.3.2,4.3.3		
15	Nutrigenomics	1.1.1,1.1.2,1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.1.1,2.1.2,2.2.1, ,3.1.1, 3.2.1, 4.1.1,4.1.2 ,4.2.1,4.2.2,4.3.1 ,4.3.2,4.3.3	Lectures, E-learning and practical training, discussion and brain storming	Written and oral exams

Name and Signature
Course Coordinator

Dr/ Shimaa Ali

Name and Signature
Program Coordinator

د/ عبد العزيز العسمرى