



T-104
2022

Course Specification



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Course Title:	Clinical Pharmacokinetics
Course Code:	456-PHP-2
Program:	Pharmaceutical Sciences
Department:	Clinical Pharmacy
College:	Pharmacy
Institution:	Najran University
Version:	<i>Course Specification Version Number</i>
Last Revision Date:	17/12/2023

Table of Contents:

Content	Page
A. General Information about the course	3
1. Teaching mode (mark all that apply)	3
2. Contact Hours (based on the academic semester)	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	5
Course Content	6
D. Student Assessment Activities	7
E. Learning Resources and Facilities	8
1. References and Learning Resources	8
2. Required Facilities and Equipment	8
F. Assessment of Course Quality	8
G. Specification Approval Data	9

A. General information about the course:

Course Identification	
1. Credit hours:	2
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input type="checkbox"/> Track <input type="checkbox"/> Others <input checked="" type="checkbox"/>
b.	Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
3. Level/year at which this course is offered:	
4. Course general Description This course provides an in-depth understanding of the principles and applications of pharmacokinetics in clinical practice. Students will gain the knowledge and skills to interpret drug disposition data, predict drug response, optimize dosing regimens, and identify potential drug interactions. The course emphasizes the application of pharmacokinetic principles to individualize drug therapy and improve patient outcomes.	
5. Pre-requirements for this course (if any): Basic knowledge of pharmacology and physiology. Basic Pharmacokinetics.	
6. Co- requirements for this course (if any):	
7. Course Main Objective(s) <ul style="list-style-type: none"> • Apply fundamental pharmacokinetic concepts to drug administration, absorption, distribution, metabolism, and excretion. • Analyze pharmacokinetic data and interpret drug concentration-time profiles. • Predict drug response and potential dose-related adverse effects. • Design and evaluate individualized drug dosing regimens based on patient-specific factors. • Identify and understand the mechanisms of potential drug interactions. • Apply clinical pharmacokinetic principles to the management of various disease states. • Critically evaluate the latest research and literature in clinical pharmacokinetics. 	

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	60	100

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	25
2.	Tutorial	

3.	Group Discussion	
4.	Case studies	
5.	Computer Simulation	5
6.	Problem Solving	
	Total	30



B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Demonstrate knowledge and understanding the basic principles of pharmacokinetic modeling and simulation.	K1	<ul style="list-style-type: none"> Lectures Problem-based learning Group discussion Case studies or multimedia instructions 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics) Presentations (using rubrics)
1.2	Demonstrate an in-depth knowledge of the concepts of pharmacy practice settings about the role of pharmacokinetic in clinical settings.	K2	<ul style="list-style-type: none"> Lectures Problem-based learning Group discussion Case studies or multimedia instructions 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics) Presentations (using rubrics)
2.0	Skills			
2.1	Integrate pharmaceutical, and clinical sciences with information obtained from different resources to provide accurate recommendations about medication use.	S1	<ul style="list-style-type: none"> Lectures Data interpretation exercises Problem-based learning Group discussion Case studies or multimedia instructions 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics). Presentations (using rubrics)
2.2	Evaluate scientific and professional literature critically to be utilized in evidence-based Practice.	S2	<ul style="list-style-type: none"> Lectures Data interpretation exercises Active learning Problem-based learning Group discussion Case studies or multimedia instructions 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics). Presentations (using rubrics)
2.4	Utilize appropriate information technologies to optimize safe medication use and patient care.	S4	<ul style="list-style-type: none"> Lectures Data interpretation exercises Active learning Problem-based learning Group discussion Case studies or multimedia instructions 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics). Presentations (using rubrics)
3.0	Values, autonomy, and responsibility			
3.2	Advocate patient rights to safe and effective medication use in relevant practice settings.	V2	<ul style="list-style-type: none"> Practice sessions Problem-based learning Lectures or tutorials Small group discussion 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics). Presentations (using rubrics)
3.3	Engage in self-learning practices and inter-professional healthcare education activities.	V3	<ul style="list-style-type: none"> Practice sessions Problem-based learning 	<ul style="list-style-type: none"> Written exam Assignments (using rubrics).





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.4	Demonstrate managerial skills, in addition to accountability, confidence, reflective reasoning and independent thinking to respond to routine or unanticipated circumstances.	V4	<ul style="list-style-type: none"> • V Lectures or tutorials • Small group discussion • Practice sessions • Problem-based learning • Lectures or tutorials • Small group discussion 	<ul style="list-style-type: none"> • Presentations (using rubrics) • Written exam • Assignments (using rubrics). • Presentations (using rubrics)

B. Course Content

A. Theoretical Part

No	List of Topics	Contact Hours
1.	Introduction to Clinical Pharmacokinetics: Definition, scope, importance, applications.	1
2.	Pharmacokinetic Principles: ADME processes, compartmental models, pharmacokinetic parameters.	2
3.	Drug Absorption: Routes of administration, factors affecting absorption.	1
4.	Drug Distribution: Binding, protein binding, volume of distribution, drug distribution in specific tissues.	1
5.	Drug Metabolism: Phase I and Phase II metabolic pathways, drug-metabolizing enzymes, organ-specific metabolism.	1
6.	Drug Elimination: Renal and non-renal clearance mechanisms, elimination half-life.	1
7.	Pharmacokinetic Calculations: Dose calculations, clearance calculations, steady-state concentrations.	3
8.	Individualized Dosing: Factors affecting dosing, adjusting dosing regimens in special populations (renal, hepatic impairment, pediatrics, geriatrics).	3
9.	Drug Interactions: Mechanisms of drug interactions, pharmacokinetic and pharmacodynamic interactions, clinical significance.	3
10.	Therapeutic Drug Monitoring (TDM): Drugs with narrow therapeutic windows, TDM principles, interpretation of drug concentrations.	4
11.	Clinical Applications of Pharmacokinetics: Pharmacokinetics in specific disease states (cardiovascular, respiratory, infectious diseases, etc.).	5
12.	Emerging Trends in Clinical Pharmacokinetics: Pharmacogenomics, personalized medicine, modeling and simulation.	5
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Continuous	10%
2.	Assignment/Project	2 - 11	15%
3.	Midterm Exam	7	25%
4.	Presentations	8	10%
5.	Final Exam	15	40%
	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<i>Clinical Pharmacokinetics, by Shargel and Wu</i> <i>Applied Clinical Pharmacokinetics, by Walker and Lyall</i>
Supportive References	
Electronic Materials	Saudi Digital Library
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. Classroom containing 30 seats. 2. Computer lab.
Technology equipment (projector, smart board, software)	projector, smart board, software (Modeling and Simulation)
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Head of department and students	Indirect Indirect (Questionnaires)
Effectiveness of students assessment	Faculty members and students	Indirect Indirect (Questionnaires)
Quality of learning resources	Students	Indirect (Questionnaires)
The extent to which CLOs have been achieved	Student peer reviewer	Direct Indirect
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)



G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

