



Course Specification

(Bachelor)

Course Title: Pharmaceutics-III

Course Code: PHCU 534

Program: Pharmaceutical Sciences

Department: Pharmaceutics

College: Pharmacy

Institution: Najran University

Version: 3

Last Revision Date: 18/08/2024

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A. General information about the course:

1. Course Identification

1. Credit hours: 3 hours (2+1)

2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☒ Program
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 9/ 5th year)

4. Course general Description:

The course is designed to familiarize the students with drug absorption, factor influencing bioavailability and drug disposition. Pharmacokinetics including absorption, distribution, metabolism, elimination and protein binding of drug. Calculation of pharmacokinetics parameters. Assessment of bioavailability. Pharmacokinetics in drug discovery and development: bioequivalence testing, drug product selection and biopharmaceutical classification system.

5. Pre-requirements for this course (if any):

Pharmaceutics-II (PHCU 433)

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

- I. To study the biopharmaceutical principles of drug delivery
- II. To understand the impact of formulation/dosage forms design on the pharmacokinetic of drug

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		





3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Demonstrate concept and knowledge of biopharmaceutics and novel drug delivery system	K1	Lecture, Laboratory work	Written exams (short-answer question, MCQ); Practical exam; Assignments
1.2	Demonstrate understanding related to pharmaceutical dosage forms influencing biopharmaceutical performance of drug	K3	Lecture, Laboratory work	Written exams; Practical exam; Assignments
...				
2.0	Skills			
2.1	Demonstrate ability to solve problems related to influence of various factors on biopharmaceutical performance of drug and pharmacokinetic calculation	S3	Lecture, Group discussion, Laboratory work	Written exams; Practical exam; Assignments Reports
2.2				
3.0	Values, autonomy, and responsibility			





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Demonstrate ability to professional attitude, confidence, and judgment	V1	Lecture, Group discussion, Problem-based learning	Observation card, Assignment
3.2				
...				

C. Course Content

No	List of Topics (Theory)	Contact Hours
1.	Introduction to Biopharmaceutics	1
2.	Absorption of drug "main factors affecting oral absorption"	1
3.	Physiologic Factors Related to Drug Absorption	2
4.	Anatomic and Physiologic Considerations of GIT for oral absorption of drug, gastric emptying rate and GIT motility affecting oral drug absorption, effect of food on oral drug absorption	4
5.	Pharmaceutical factors affecting drug absorption	2
6.	Physicochemical factors affecting drug absorption	2
7.	Drug distribution and factors affecting the process	4
8.	Pharmacokinetic modeling: Non-compartmental and compartmental method	2
9.	Protein-binding of drug and factors affecting the process	2
10.	Metabolism of drug and factors affecting the process	2
11.	Excretion of drug and factors affecting the process	2
12.	Concept of Bioavailability and Bioequivalence	2
13.	Introduction to modified-drug release system, drug product selection and Biopharmaceutics classification system (BCS)	4
Total		30

No	List of Topics (Practical)	Contact Hours
1.	Introduction	2
2.	Common routes of drug administration	2
3.	Factors affecting absorption of drug	2
4.	Diagrammatic representation of plasma drug concentration of different routes of administration	2
5.	Diagram Resulted after plotting the plasma drug concentration versus time and estimating the route of administration.	4





6.	Diagrammatic discussion of Minimum effective concentration, Minimum safe concentration, Therapeutic index, Duration of action, Dose regimen, C_{max} , onset of action, onset time, lag time.	2
7.	Area Under curve, Slope, K_{el}	2
8.	Determination of area under curve (AUC) by trapezoidal method	2
9.	Bioavailability and related numerical problem	2
10.	Determination of Bioavailability by AUC method	4
11.	Determination of Bioavailability by area method	2
12.	Determination of Bioavailability by cut and weight method.	2
13.	Revision	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz exam -I	5	05%
2.	Midterm exam	7-9	20%
3.	Quiz exam -II	12	05%
4.	Assignments	15	05%
5.	Laboratory note book and practical quiz	15	10%
6.	Observation card in lab	1-15	05%
7.	Final Practical exam	16	10%
8.	Final Theory exam	17	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	<ol style="list-style-type: none"> 1. Applied Biopharmaceutics & Pharmacokinetics, 7th edition, 2015, edited by Leon Shargel, Andrew B.C. Yu. 2. Pharmaceutics - The Science of Dosage Form Design, 2nd edition, 2002, edited by Michael E. Aulton. 3. Power point slides/word file
Supportive References	<ol style="list-style-type: none"> 1. Remington: The Science and Practice of Pharmacy, 22nd Edition, 2013, edited by Loyd V. Allen Jr.
Electronic Materials	https://sdl.edu.sa/SDLPortal/en/Publishers.aspx http://dlaf.nu.edu.sa/en/e-libraries
Other Learning Materials	Excel software for calculations





2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. Suitable lecture room equipped with data show and internet and sufficient number of seats. 2. Suitable laboratories equipped with health and safety tools, internet and sufficient number of seats.
Technology equipment (projector, smart board, software)	Computers, data show, sound systems and internet
Other equipment (depending on the nature of the specialty)	1. Dissolution apparatus 2. UV-Spectrophotometer 3. Vortex mixer 4. Hot plate with magnetic stirrer 5. Water bath 6. Tablet Friablator 7. Tablet disintegrating apparatus

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	Examination committee	Direct
Quality of learning resources	Course coordinator and students	Indirect
The extent to which CLOs have been achieved	Course coordinator	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Pharmaceutics Department Council
REFERENCE NO.	14460216-1060-00001
DATE	21/08/2024

