



Course Specification

(Bachelor)

Course Title: Physical Pharmacy

Course Code: PHCU 231

Program: Pharmaceutical Sciences (B. Pharm.SC)

Department: Pharmaceutics

College: Pharmacy

Institution: Najran University

Version: 3

Last Revision Date: 21 August 2024



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A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2+1)

2. Course type

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

3. Level/year at which this course is offered: (3rd Level / 2nd year)

4. Course general Description:

This course is designed to introduce the quantities and theoretical physical principles of science to pharmacy students that can be applied to pharmacy practice. Principles of chemistry, physics and mathematics are applied to pharmaceutical sciences.

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

None

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

None

7. Course Main Objective(s):

At the end of this course the student will be able to:

1. Acquire knowledge in Physical principles of states of matter and phase rule.
2. To develop knowledge of the fundamental physicochemical properties of different states of matter and assess their role and applications in dosage forms.
3. To learn the methodology of preparing buffered isotonic solution with proper capacity.
4. To be able to carry out calculations that is vital in pharmacy such as: pH, concentration, isotonicity. etc.
5. Understand the concepts of diffusion, dissolution and explain their role in drug release
6. Understand the different modes of drug decomposition and drug stability.

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 the concept of physicochemical properties of drugs and excipients in pharmaceutical dosage form design	K3	Lectures	1. Written exam 2. MCQ 3. Assignments
1.2				
...				
2.0	Skills			
2.1	Demonstrate the evaluation of physicochemical	S3	Lectures Lab. works	Written exam Practical exam





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
	properties that govern dosage form design of pharmaceutical products			
2.2				
...				
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate ability to confidence and independent thinking	V4	Problem-based learning	Lab reports Observation cards
3.2				
...				

C. Course Content (theoretical)

No	List of Topics	Contact Hours
1.	Pharmaceutical dosage forms	2
2.	Pharmaceutical calculations (density, percentage strength, dilution and concentration)	4
3.	Rheology: Definition, the concept of viscosity, Newtonian and non-Newtonian systems (plastic, pseudoplastic and dilatant systems),	4
4.	Rheology: Measurement of viscosity, types of Viscometers, kinematic viscosity, fluidity, thixotropy and applications of rheology.	2
5.	Buffers and isotonic solution: Definition, types, components, buffer capacity and factors affecting it, calculation of pH and applications of buffers.	4
6.	Surface and interfacial phenomenon: Surface and interfacial tension, surface-free energy,	2
7.	Surface tension and interfacial phenomenon: Determination of surface tension, spreading coefficient, HLB, wetting, wetting agent.	2
8.	Dispersed system: Suspension, deflocculated suspension, flocculated suspension, theory of sedimentation, sedimentation parameter, Emulsion	4
9.	Solubility (solvent-solvent interaction, solubility of liquid in liquid, solubility of solid in liquid, solubility of gas in liquid)	4
10.	Revision	2
Total		30

Course Content (Practical)





No	List of Topics	Contact Hours (P)
1.	Introduction (lab rules and safety)	2
2.	Viscosity measurement (Ostwald viscometer)	4
3.	Surface tension (drop weigh method)	4
4.	Surface tension (drop count method)	4
5.	Critical Micelle Concentration (Stalagmometer)	4
6.	Physical Stability of Suspension	4
7.	Adsorption	4
8.	Determination of Solubility	2
9.	Revision	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1	4	5
2.	Midterm	7-9	20
3.	Quiz 2	12	5
4.	Assignment	1-15	5
5.	Observation card	1-15	5
6.	Practical continuous evaluation	1-15	10
7.	Practical final exam	16	10
8.	Final theoretical exam	19	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"> Martin's Physical Pharmacy and Pharmaceutical Sciences, Ed., Sinko, PJ, 8th ed., Lippincott Williams & Wilkins, Philadelphia. Applied physical pharmacy, 3e. by W. Cary Mobley, Mansoor M. Amiji, Thomas J. Cook
Supportive References	<ol style="list-style-type: none"> Pharmaceutical Dosage Forms and Drug Delivery by H. C. Ansel, N. G. Popovich. 9th edition 2011.





	<ol style="list-style-type: none"> Pharmaceutical and Clinical Calculations, Mansoor A. Khan, Indra K. Reddy, 2nd Edition, 2000, CRC Press LLC Pharmaceutics, the Science of dosage form design, Michael E. Aulton 2005.
Electronic Materials	<ol style="list-style-type: none"> www.pharmacist.com (American Pharmacists Association) www.ashp.org (American Society of Health-System Pharmacists) www.sciencedirect.com www.pubmed.com https://sdl.edu.sa/SDLPortal/ar/Publishers.aspx
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> A lecture hall containing at least 25 seats for students A laboratory containing at least 20 seats for the student.
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> Projector for PowerPoint presentations with the internet. Smartboard
Other equipment (depending on the nature of the specialty)	<ol style="list-style-type: none"> Beaker Measuring cylinder Ostwald viscometer Stalagmometer Sieve shaker

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	21/8/2024

