

Republic of Yemen
Ministry of Higher Education & Scientific Research
21 September University for Medicals and Applied Sciences



Faculty of Clinical Pharmacy

Bachelor of Clinical Pharmacy & Pharm. D.

Course Specification of

Pharmaceutics (2)

Course Code. (02.02.231)

2022



T4: This Template is Developed and Approved by CAQA-Yemen, 2024

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr. Mohammed Addoais	Dr. Hamoud Al-bayley	Dr. -----	Dr. Abdulelah Thabet	Dr. Ali Alyahawi



I. General Information:

1.	Course Title:	Pharmaceutics (2)			
2.	Course Code:	02.02.231			
3.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours
			Lecture	Tutorial/Seminar	Lab Clinical
		3	2		1 -
4.	Level/ Semester at which this Course is offered:	3 rd Level / 1 st Semester			
5.	Pre –Requisite (if any):	Physical pharmacy –Pharmaceutics (1)			
6.	Co –Requisite (if any):	-			
7.	Program (s) in which the Course is Offered:	Bachelor of Clinical Pharmacy & Pharm. D.			
8.	Language of Teaching the Course:	English			
9.	Location of Teaching the Course:	Faculty of Clinical Pharmacy			
10.	Prepared by:	Mohammed Addoais			
11.	Date and Number of Approval by Council:	2022			

II. Course Description:

This course provides pharmacy students with the basic principles of the formulation, design and preparation of a different pharmaceutical dosage forms such as aerosols, suppositories, parenteral, ophthalmic and semisolid dosage forms like ointments, creams, paste and gel. It also covers the different sterilization methods as well as the quality control of finished products.



II. Course Intended Learning Outcomes (CILOs) :				Referenced PILOs
Upon successful completion of the course, students will be able to:				
A. Knowledge and Understanding:				I, P or M/A
a1	List the different bases used in formulation of ointments, creams suppositories.			A1, A2
a2	Identify the specifications of parenteral and ophthalmic products.			A3
B. Intellectual Skills:				
b1	Demonstrate solving problems encountered in the formulation of different dosage forms			B4
b2	Design the process of formulation of safe effective medicines and dealing with new drug delivery systems.			B4
C. Professional and Practical Skills:				
c1	Prepare ointments, suppositories and other topical formulations.			C2
c2	Examine the necessary quality control tests of parenteral and other sterile products.			C2, C3
D. Transferable Skills:				
d1	Write scientific report concerning course topics.			D2
d2	Use internet effectively to obtain pharmaceutical formulation information.			D3
I= Introduced, P=Practiced or M/A= Mastered/Advanced				

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:			
Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
a1	List the different bases used in formulation of ointments, creams suppositories.	- Lecture - Instructor – student Interactive - Office hour	- Exam - Assignment - Quiz
a2	Identify the specifications of parenteral and ophthalmic products.	- Lecture - Instructor – student Interactive - Office hour	- Exam - Assignment - Quiz
(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:			



Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
b1	Demonstrate solving problems encountered in the formulation of different dosage forms	- Lecture - Instructor – student Interactive - Exercises - Solving Problem Methods	- Problem-Solving Exercises. - Assignment - Quiz
b2	Design the process of formulation of safe effective medicines and dealing with new drug delivery systems.	- Lecture - Instructor – student Interactive - Exercises - Solving Problem Methods	- Problem-Solving Exercises. - Assignment - Quiz
(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:			
Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
c1	Prepare ointments, suppositories and other topical formulations.	- Lecture - Instructor – student Interactive - Self-Learning	- Exam - Assignment - Quiz
c2	Examine the necessary quality control tests of parenteral and other sterile products.	- Lecture - Instructor – student Interactive - Self-Learning	- Exam - Assignment - Quiz
(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:			
Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	Write scientific report concerning course topics.	- Self-Learning - Seminar - Exercises	- Presentation - Assignment - Quiz
d2	Use internet effectively to obtain pharmaceutical formulation information.	- Seminar - Instructor–student Interactive - Exercises	Presentation



IV. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Parenteral preparation	a1, a2, b1, b2, c1, c2, d1, d2	- Definition - Advantages and disadvantages - Route of administration of injection - Formulation of sterile dosage forms - Classification of parenteral formulation - Requirements for parenteral preparation - Classification of vehicles - Preservatives and buffers - Tonicity adjusters and Isotonicity calculation - Containers and closures selection - Methods of Sterilization - Quality control of parenteral	3	6
2	Ophthalmic preparation	a1, a2, b1, b2, c1, c2, d1, d2	- Anatomy & physiology of the eye - Principles of ocular drug absorption. - Sterility and preservation - Ocular drug delivery systems. - Topical eye drops - Semisolid preparation - Occuserts and contact lenses - Formulation and formulation requirements of ophthalmic preparations - Packaging of ophthalmic preparations	3	6
3	Mid-term Exam			1	2
4	Pharmaceutical aerosols	a1, a2, b1, b2, c1, c2, d1, d2	- Definition and uses of therapeutic aerosols. - Advantages and disadvantages - Components of aerosols - Types of Aerosol propellants - Factors affecting Deposition of aerosols in the human respiratory tract. - Formulation and generation of aerosols - Types of aerosol Containers - Evaluation of pharmaceutical	2	4

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			aerosols		
5	Pharmaceutical semisolid dosage forms	a1, a2, b1, b2, c1, c2, d1, d2	• Skin anatomy and physiology • Percutaneous absorption and factors affecting it. • Ointments ○ Classification of ointment bases ○ Additives included in ointment bases • Creams ○ Definition ○ Classification of creams • Pastes ○ Definition ○ Composition ○ Examples of medicated pastes • Gels ○ Composition and uses. • Formulation of semisolid dosage forms • Methods of Preparation of semisolid and packaging. • Methods of preparation ▪ Evaluation of drug release from ointment and cream bases.	3	6
6	Suppositories	a1, a2, b1, b2, c1, c2, d1, d2	• Introduction • Advantages and disadvantages • Anatomy and physiology of rectum • Factors affecting rectal drug absorption. • Shapes and size of suppositories. • Types of suppository bases. • Methods of Preparation of suppositories. • Displacement value • Calibration of suppository mold with bases.	3	6
7	Final exam	a1, a2, b1, b2, c1, c2	•	1	2
Number of Weeks /and Units Per Semester				16	32

B. Practical Aspect (Lab/Clinical) (if any):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
1.	Yellow Simple ointment (ointment base)	1	2	c1, c2, d1, d2
2.	Zinc oxide ointment (Oleaginous base)	1	2	c1, c2, d1, d2
3.	White field ointment (Absorption base)	1	2	c1, c2, d1, d2
4.	Preparation of white field /cetrimide ointment	1	2	c1, c2, d1, d2
5.	Preparation of atropine sulfate eye ointment 1%	1	2	c1, c2, d1
6.	Midterm practical exam	1	2	c1, c2, d1
7.	Vanishing Cream and Cold Cream	1	2	c1, c2, d1, d2
8.	Aqueous cream/ Sulfur and salicylic acid cream.	1	2	c1, c2, d1, d2
9.	Preparation of emulsifying ointment	1	2	c1, c2, d1, d2
10.	Zinc gelatin paste (Unna's paste).	1	2	c1, c2, d1, d2
11.	Determination of the displacement value	1	2	c1, c2, d1, d2
12.	Cocoa butter suppositories	1	2	c1, c2, d1, d2
13.	Glycerogelatin suppositories	1	2	c1, c2, d1, d2
14.	Final exam	1	2	c1, c2, d1
Number of Weeks /and Units Per Semester		16	32	

VII. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Assignment 1	6th	5	a1, a2, b1, b2, c1, c2, d1, d2
Total				5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	6 th	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
2	Practical Reports	2 nd -13 th	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
3	Midterm Exam (Theory)	Week 7	15	15%	a1, a2, b1, b2, c1, c2,
4	Midterm Exam (Practical)	Week 7	10	10%	a1, a2, b1, b2, c1, c2, d1
5	Final Practical Exam	14 th	15	15%	a1, a2, b1, b2, c1, c2
6	Final Exam (Theory)	Week 16	50	50%	a1, a2, b1, b2, c1, c2, d1, d2

VII. Learning Resources:

1- Required Textbook(s):

- 1- Michael E. Aulton Kevin G Taylor. (2013). Pharmaceutics, the design and manufacture of medicines, 4th edition, Churchill Livingstone.
- 2- H.C. Ansel (2011). Pharmaceutical Dosage Forms and drug Delivery Systems, 9th ed. Philadelphia; London. Lea & Febiger.
- 3- E.A. Rawlins (2010) . Bentley's textbook of pharmaceutics. 8th ed. India, Elsevier.

2- Essential References.

- 1- Loyd v.allen (2015). Remington : The science of practice of pharmacy. 22nd ed. Pharmaceutical press.
- 2- Alison Bradfield (2017). Martindale the complete drug reference. 39th ed. Pharmace press.

3- Electronic Materials and Web Sites etc.

1. <http://www.pharmatutor.org>
2. <http://www.usp.org>

VIII. Course Policies: (Based on the Uniform Students' By law (2007))

1	Class Attendance: Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	Tardiness: A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	Exam Attendance/Punctuality: No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	Assignments & Projects: Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	Cheating: Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	Forgery and Impersonation: Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	Other policies: The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

Faculty of Clinical Pharmacy

Bachelor of Clinical Pharmacy & Pharm. D.

Course Plan (Syllabus) of **Pharmaceutics (2)**

Course Code. 02.02.231

I. Information about Faculty Member Responsible for the Course:									
Name of Faculty Member:	Mohammed addoais			Office Hours					
Location& Telephone No.:	776440327								
E-mail:	<u>Addoais1@gmail.com</u>			SAT	SUN	MON	TUE	WED	THU

2022- 2023

II. Course Identification and General Information:

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2.	Course Code:	02.02.231			
3.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours
			Lecture	Tutorial/ Seminar	Lab Clinical
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4.	Level/ Semester at which this Course is offered:	3 rd Level / 1 st Semester			
5.	Pre –Requisite (if any):	Physical pharmacy –Pharmaceutics (1)			
6.	Co –Requisite (if any):	None			
7.	Program (s) in which the Course is Offered:	Bachelor of Clinical Pharmacy & Pharm. D.			
8.	Language of Teaching the Course:	English			
9.	Location of Teaching the Course:	Faculty of Clinical Pharmacy			
10.	Prepared by:	Mohammed Addoais			
11.	Date and Number of Approval by Council:	2022			

III. Course Description:

This course provides pharmacy students with the basic principles of the formulation, design and preparation of a different pharmaceutical dosage forms such as aerosols, suppositories, parenteral, ophthalmic and semisolid dosage forms like ointments, creams, paste and gel. It also covers the different sterilization methods as well as the quality control of finished products.

IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

A. Knowledge and Understanding:

a1	Demonstrate solving problems encountered in the formulation of different dosage forms
a2	Design the process of formulation of safe effective medicines and dealing with new drug delivery systems.

B. Intellectual Skills:

b1	Demonstrate solving problems encountered in the formulation of different dosage forms
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C. Professional and Practical Skills:

c1	Prepare ointments, suppositories and other topical formulations.
c2	Examine the necessary quality control tests of parenteral and other sterile products.

D. Transferable Skills:

d1	Write scientific report concerning course topics.
d2	Use internet effectively to obtain pharmaceutical formulation information..

V. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
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			- calculation - Containers and closures selection - Methods of Sterilization - Quality control of parenteral		
2	Ophthalmic preparation	a1, a2, b1, b2, c1, c2, d1, d2	- Anatomy & physiology of the eye - Principles of ocular drug absorption. - Sterility and preservation - Ocular drug delivery systems. - Topical eye drops - Semisolid preparation - Occuserts and contact lenses - Formulation and formulation requirements of ophthalmic preparations - Packaging of ophthalmic preparations	3	6
3	Mid-term Exam			1	2
4	Pharmaceutica l aerosols	a1, a2, b1, b2, c1, c2, d1, d2	- Definition and uses of therapeutic aerosols. - Advantages and disadvantages - Components of aerosols - Types of Aerosol propellants - Factors affecting Deposition of aerosols in the human respiratory tract. - Formulation and generation of aerosols - Types of aerosol Containers - Evaluation of pharmaceutical aerosols	2	4
5	Pharmaceutica l semisolid dosage forms	a1, a2, b1, b2, c1, c2, d1, d2	• Skin anatomy and physiology • Percutaneous absorption and factors affecting it. • Ointments ○ Classification of ointment bases ○ Additives included in ointment bases • Creams ○ Definition ○ Classification of creams • Pastes ○ Definition ○ Composition ○ Examples of medicated pastes • Gels	3	6

			○ Composition and uses. • Formulation of semisolid dosage forms • Methods of Preparation of semisolid and packaging. • Methods of preparation ▪ Evaluation of drug release from ointment and cream bases.		
6	Suppositories	a1, a2, b1, b2, c1, c2, d1, d2	• Introduction • Advantages and disadvantages • Anatomy and physiology of rectum • Factors affecting rectal drug absorption. • Shapes and size of suppositories. • Types of suppository bases. • Methods of Preparation of suppositories. • Displacement value • Calibration of suppository mold with bases.	3	6
	Final exam	a1, a2, b1, b2, c1, c2	•	1	2
Number of Weeks /and Units Per Semester				16	32

B. Practical Aspect (Lab/Clinical) (if any):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
15.	Yellow Simple ointment (ointment base)	1	2	c1, c2, d1, d2
16.	Zinc oxide ointment (Oleaginous base)	1	2	c1, c2, d1, d2
17.	White field ointment (Absorption base)	1	2	c1, c2, d1, d2
18.	Preparation of white field /cetrimide ointment	1	2	c1, c2, d1, d2
19.	Preparation of atropine sulfate eye ointment 1%	1	2	c1, c2, d1, d2
20.	Midterm practical exam	1	2	c1, c2, d1
21.	Vanishing Cream and Cold Cream	1	2	c1, c2, d1, d2
22.	Aqueous cream/ Sulfur and salicylic acid cream.	1	2	c1, c2, d1, d2
23.	Preparation of emulsifying ointment	1	2	c1, c2, d1, d2
24.	Zinc gelatin paste (Unna's paste).	1	2	c1, c2, d1, d2



No.	Tasks/ Experiments	Number of Weeks	Contact Hours	Learning Outcomes (CILOs)
25.	Determination of the displacement value	1	2	c1, c2, d1, d2
26.	Cocoa butter suppositories	1	2	c1, c2, d1, d2
27.	Glycerogelatin suppositories	1	2	c1, c2, d1, d2
28.	Final exam	1	2	c1, c2, d1
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