Faculty: Pharmacy	
Department: Pharmaceutical Sciences	**Program: Pharmaceutical Sciences MSc**
Academic year: 2023	**Semester:2nd**

Course Plan

First: Course Information

Course Title:	***Pharmaceutical Technology***			***Course No. 1101539***	
Credit Hours:	***2***	***Theoretical:***	***2***	***Practical:***	***0***
Prerequisite:		***Section No.:1***		***Lecture Time: Saturday 9:00 – 11:00***	
Level in JNQF	***9***		***Virtual hours in the JNQF***		***80***
Type Of Course:	☐ ***Obligatory University Requirement***			☐ ***Elective University Requirement***	
	☐ ***Obligatory Faculty Requirement***			☐ ***Elective Faculty Requirement***	
	☒ ***Obligatory Specialization Requirement***			☐ ***Elective Specialization requirement***	
	☐ ***Ancillary course***				
Type of Learning:	☒ ***Face-to-Face Learning*** ☐ ***Blended Learning (2 Face-to-Face + 1 Asynchronous)*** ☐ ***Online Learning (2 Synchronous + 1 Asynchronous)***				

Second: Instructor's Information

Course Coordinator: Jehad Nasereddin		
Name:	***Academic Rank: Assistant Professor***	
Office Number:234D	***Ext. Number:***	***E-mail: jnasereddin@zu.edu.jo***
Course Instructor:		
Name:	***Academic Rank:***	
Office Number:	***Ext. Number:***	***E-mail:***

Office Hours:	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*
	11:00-12:00	*11:00-12:00*	*11:00-12:00*	*11:00-12:00*	*N/A*

Third: Course Description

This course covers the fundamentals of drug delivery systems and novel dosage form design. It starts by providing the students with the basic knowledge of drug delivery in addition to technologies, different approaches and factors affecting the design of novel delivery systems. The course also emphasizes the diverse dosage form designs intended for different routes of administration as oral, transdermal, ophthalmic, and nasal routes. The use of different drugcarriers (as liposomes, and micro- &nano- carriers) for drug targeting will be illustrated.

Fourth: Course objectives

1) Understand the importance of novel drug delivery
2) Define different routes of drug delivery
3) Understand the influence of physiological factors on drug absorption
4) Understand the influence of the physicochemical properties of the drug and dosage form on drug absorption

Fifth: Learning Outcomes

Level descriptor according to (JNQF)	***CILOs Code***	***CILOs*** If any CLO will not be assessed in the course, mark NA.	***Associated PILOs Code*** *Choose one PILO for each CILO**	***Assessment method*** *Choose at least two methods*	***Scores out of 100*** State the total score identified for each CILO	***Minimum acceptable Score/percentage (%)*** *The percentage should not be less than 70% **
Knowledge	**K1**	*define* the key terms and concepts associated with Pharmaceutical technology, dosage forms, formulation principles, regulatory compliance, and diverse drug delivery systems.	**PK1**	Exams Assignment	34	20
Skills	**S1**	*apply* pharmaceutical technology principles, including analysis of case studies, desig of effective dosage forms, evaluation of drug delivery systems, navigation of regulatory requirements, formulating solutions, and assessment of healthcare impact.	**PS1**	Exams Presentations	20	14
	S2	*evaluate* research methodologies and innovatation in pharmaceutical technology	**PS3**	Exams Presentations	20	14
Competencies	**C1**	*articulate* complex current challenges in pharmaceutical technology.	**PC1**	Assignments Presentations	6	4
	C2	*apply* pharmaceutical technology principles comprehensively, including case studies analysis, effective dosage forms design, drug delivery systems evaluation, navigation of regulatory requirements, formulating	**PC3**	Assignments Presentations	10	7

		solutions, and assessment of healthcare impact.				
	C3	*develop* self-directed learning by setting goals, seeking feedback, and reflecting on experiences in pharmaceutical technology	**PC4**	Assignments Presentations	10	7

*For each CILO, the PILO could be the same or different.

Sixth: Learning Source

Main Reference:	***Aulton's pharmaceutics, Fourth edition, Edited by Micheal E. Aulton and Kevin M.G. Taylor***				
Author: Edited by Micheal E. Aulton and Kevin M.G. Taylor		***Issue No.: 6th***	***Print:*** Sixth edition	***Publication Year: 2021***	
Additional Sources &Websites:	• •				
Teaching Type:	☒ ***Classroom***	☐ ***Laboratory***	☐ ***Workshop***	☐ ***MS Teams***	☐ ***Moodle***

Seventh: Course Structure

Lecture Date	Intended Teaching Outcomes (CILOs)	Topics	Teaching Procedures*	Teaching Methods**	References***
09/03/2024	K1, S1, S2	Quality by Design	Face to Face	Lecture	Published Research Articles
16/03/2024	K1, S1, S2	Tablet Coating	Face to Face	Lecture	Published Research Articles
23/03/2024	K1, S1, S2	Spheronization	Face to Face	Lecture	Published Research Articles
30/03/2024	K1, S1, S2	Spray Drying	Face to Face	Lecture	Published Research Articles
06/04/2024	C1, C2, C3	Assignment	Face to Face	Coursework	Published Research Articles
13/04/2024	N/A	Eid Al-Fitr	N/A	N/A	N/A
20/04/2024	N/A	Midterm	N/A	N/A	N/A
27/04/2024	K1, S1, S2	Freeze Drying	Face to Face	Lecture	Published Research Articles
04/05/2024	K1, S1, S2	Solvent Casting	Face to Face	Lecture	Published Research Articles
11/05/2024	K1, S1, S2	Melt Extrusion	Face to Face	Lecture	Published Research Articles

18/05/2024	K1, S1, S2	3D Printing	Face to Face	Lecture	Published Research Articles
25/05/2024	C1, C2, C3	Assignment	Face to Face	Coursework	Published Research Articles
01/06/2024	S1, S2, C1, C2, C3	Student Presentations	Face to Face	Presentations	N/A
08/06/2024	S1, S2, C1, C2, C3	Student Presentations	Face to Face	Presentations	N/A
15/06/2024	S1, S2, C1, C2, C3	Student Presentations	Face to Face	Presentations	N/A
22/06/2024	S1, S2, C1, C2, C3	Student Presentations	Face to Face	Presentations	N/A

Teaching procedures: (Face-to-face, synchronous, asynchronous). * * Teaching methods: Lecture, video…..). *** Reference: Pages of the book, recorded lecture, video….)

Eighth: Assessment methods

Methods	Online Learning	Blended Learning	Face-To-Face Learning	Specific Course Output to be Assessed *State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA.												
				K1	K2	K3	S1	S2	S3	S4	S5	C1	C2	C3	C4	C5
Mid-term Exam			30	10			10	10								
Final Exam			40	20			10	10								
Assignments			15	2								3	5	5		
Presentations			15	2								3	5	5		
Total out of 100			100	34			20	20				6	10	10		

***Refer to document (CC-2023-03)**

Ninth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).
- Meeting the deadline for the lecture.
- Commitment to interaction and participation.
- Interactive lectures will be given through a platform (MS Teams).
- Duties and tests will be given through a platform (Moodle).
- Commitment to the right appearance with the proper background in front of the camera.
- University regulations for attendance and absence from lectures and examinations are in force.
- Academic Integrity: According to university regulations and instructions, fraud or moral impersonation is unacceptable and punishable.

Approval	Name	Date	Signature
Head of Department			
Faculty Dean			