مركز الاعتماد وضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER

Course Syllabus

1	**Course title**	Physical pharmacy
2	**Course number**	1202235
3	**Credit hours**	2, Theoretical
	Contact hours (theory, practical)	2, Theoretical
	Course Level/Hours according to Jordan National Qualifications Framework (JNQF) Standards	7th/ 80 hr
4	**Prerequisites/corequisites**	Physicochemical principles of pharmacy (1202134)
5	**Program title**	BSc in Pharmacy; Doctor of Pharmacy (Pharm. D)
6	**Program code**	
7	**Awarding institution**	The University of Jordan
8	**School**	School of Pharmacy
9	**Department**	Pharmaceutics and Pharmaceutical Technology
10	**Course level**	Bachelor degree
11	**Year of study and semester (s)**	2nd year; Second semester
12	**Other department (s) involved in teaching the course**	NA
13	**Main teaching language**	English
14	**Delivery method**	☒Face to face learning ☐Blended ☐Fully online
15	**Online platforms(s)**	☒Moodle s ☐Microsoft Teams ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	23/2/2023

17 Course Coordinator:

Name: Prof. Samer Abulateefeh	Contact hours: Sun/Tue: 3:30-4:30 p.m.

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18 Other instructors:

Name: Prof. Hatem AlKhatib

Office number:

Phone number:

Email:

Contact hours:

Name: Prof. Rana Obeidat

Office number:

Phone number:

Email:

Contact hours:

19 Course Description:

As stated in the approved study plan: Study of physico-chemical properties that control complex formation including drug stability and factors affecting it and shelf-life determinations. In addition, diffusion and absorption will be discussed.

Detailed description: Explore critical concepts and phenomena in Physical Chemistry with relevance to pharmaceutical systems such as: partitioning, complexation, reaction kinetics/drug stability, diffusion, dissolution and interfacial phenomena. Moreover, you will be introduced to the applications/implications of each phenomenon in pharmaceutical systems. This course provides you with the fundamental knowledge that is required to understand/solve relevant systems/problems that might be encountered in future practice.

20 Course aims and outcomes:

A- Aims:

- This course aims to:

- Provide students with knowledge on the following physical phenomenal from a pharmaceutical perspective: partitioning, complexation, reaction kinetics/drug stability, diffusion, dissolution and interfacial phenomena.
- Strengthen student's ability to apply the gained knowledge (in aim 1) in further pharmaceutical applications such as: drug design, dosage form development, biopharmaceutical prediction and drug stability evaluation.

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

Discriptors	CLO No.	SLOs of the program (PLOs) / SLOs of the course (CLOs)	PLO (1) Learner	PLO (2) Problem-Solver	PLO (3) Manufacturer	PLO (5) Professional
Knowledge	**K1**	Illustrate the basis of different physical phenomena including distribution, complexation, degradation kinetics, diffusion, dissolution, and interfacial phenomena and their relevance to pharmaceutical applications.				
Skills	**S1**	Solve calculations related to different physical phenomena including distribution, complexation, degradation kinetics, diffusion, dissolution, and interfacial phenomena.				
	S2	Evaluate the shelf-life and drug release kinetics of different pharmaceutical dosage forms.				
Competencies	**C1**	Show responsibility, accountability and commitment by complying with tutor's instructions and relevant university regulations				

21. Topic Outline and Schedule:

Topic	Week(s)	Achieved CLOs	Teaching Methods*/ platform	Evaluation Methods	Reference
Partitioning and distribution phenomena: 1. Introduction and pharmaceutical relevance 2. Effect of ionic dissociation on partitioning 3. Preservative action in oil/water system 4. Extraction	1+2	K1 & S1	Face to face	Exams/ Assignments	Textbook, handouts
Complexation phenomena and protein binding: 1. Introduction and pharmaceutical relevance 2. Types of complexes (metal, organic, inclusion/occlusion) 3. Method of complexation analysis (distribution and solubility methods) 4. Method of protein binding analysis (equilibrium dialysis and ultrafiltration methods).	3+4+5(1/2)	K1 & S1			
Reaction kinetics and pharmaceutical stability: 1. Introduction and pharmaceutical Relevance 2. Rates and orders of reactions 3. Determination of reaction order (half-life method) 4. Influence of temperature on reaction rate 5. Collision theory 6. Transition state theory 7. Catalysis 8. Acid – Base Catalysis	5(1/2)+6+7 +8	K1, S1, S2 & C1			
Diffusion phenomena: 1. Definition, mechanism, related phenomena and processes 2. Fick's First Law of diffusion 3. Fick's Second Law of diffusion 4. Steady state diffusion	9+10(1/2)	K1 & S1			
Dissolution phenomena: 1. Introduction and pharmaceutical Relevance	10(1/2)+ 11	K1 & S1			

2. Drug Release from dosage forms 3. Percutaneous absorption of drugs					
Interfacial Phenomena: 1. Introduction and pharmaceutical Relevance 2. Adsorption at liquid interfaces 3. HLB classification 4. Adsorption at solid interfaces 5. Langmuir isotherm 6. Freundlich isotherm 7. BET isotherm 8. Solid-Liquid interfaces	12+13+ 14	K1 & S1			

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLOs	Period (Week)	Platform
Mid Exam	30	Topics covered in Weeks 1-8	K1 & S1	8th or 9th	On Campus
Final Exam	50	All topics	K1, S1 & S2	16th	On Campus
Quiz	10	Partitioning	K1 & S1	5th	On Campus
Assignment	10	Reaction rates	K1, S1, S2 & C1	12th	On Campus

23 Course Requirements

Students should have a computer/mobile phone with internet connection, account on JU-e-learning, JU-exams and Microsoft teams.

24 Course Policies:

A- Attendance policies:
Attendance: Mandatory.

Failing in the subject – with 5 absences

B- Absences from exams and handing in assignments on time:
Will result in zero achievement unless health report or other significant excuse is documented.

C- Health and safety procedures:
Complies with the University/School protocols and guidelines.

D- Honesty policy regarding cheating, plagiarism, misbehaviour:
The participation, the commitment of cheating will lead to applying all following penalties together
1) Failing the subject he/she cheated at
2) Failing the other subjects taken in the same course
3) Not allowed to register for the next semester. The summer semester is not considered as a semester

E- Grading policy:

Mid Exam:	30 points
Quizzes, assignments and presentations:	20 points
Final Exam:	50 points
Total	100 points

F- Available university services that support achievement in the course:
Library, access to electronic platforms.

25 References:

A- Required book (s), assigned reading and audio-visuals:

1. Martin's Physical Pharmacy and Pharmaceutical Sciences. 8th edition. 2023 published by Wolters Kluwer Health, USA.

2. Martin's Physical Pharmacy and Pharmaceutical Sciences. 6th edition. 2011 published by Lippincott Williams & Wilkins, USA.

B- Recommended books, materials, and media:

1. Physicochemical Principles of Pharmacy by A.T. Florence and D. Attwood. 4th Edition. 2005. Published by Pharmaceutical Press, UK.
2. Pharmaceutics, The Science of Dosage Form Design by M.E. Aulton. 2nd Edition. 2002. Published by Churchill Livingstone, USA.
3. Pharmaceutical Calculations. Howard C. Ansel and Mitchell J. Stoklosa. 12th Edition. 2006. Published by Lippincott Williams & Wilkins, USA.
4. Bently's Text Book of Pharmaceutics, by E.A.Rawlins, 8th Edition, 1984. Published by EI, BS.UK.

26 Additional information:

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Expected workload:

On average you should expect to spend between 3 and 5 hours per week on this course.

Name of Course Coordinator: Samer Abulateefeh Signature: ---------- Date: 25/2/2023
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------