Jordan University of Science and Technology
Faculty of Pharmacy
Pharmacy Department

PHAR252 Pharmaceutics 1 - JNQF Level: 7

First Semester 2024-2025

Course Catalog
3 Credit Hours. - This course introduces students to the basics of physico-chemical principles such as ideal and nonideal solutions, non-ideality corrections, colligative properties, concentration expressions, solubility, ionic equilibria, buffers, solute-solvent interaction forces, and isotonicity. - Based on the previous description, the course also deals with applications of these physico-chemical principles in the design of pharmaceutical solutions such as oral, nasal, ophthalmic, and topical preparations.
Teaching Method: On Campus

Text Book	
Title	Martin`s Physical Pharmacy and Pharmaceutical Sciences
Author(s)	Patrick J. Sinko
Edition	5th Edition
Short Name	Martin`s Physical Pharmacy
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ansel's Pharmaceutical Dosage Forms	Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems	Loyd V. Allen, Jr., Nicolas G. Popovich & Howard C. Ansel	10th Edition	

Instructor	
Name	**Prof. Khouloud Alkhamis**
Office Location	P2L1
Office Hours	
Email	khou@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: P1102

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
302212	PHAR221 Pharmaceutical Instrumental Analysis	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Solutions of non-electrolytes -Concentration expressions -Ideal and real solutions and Raoult`s low	From **Martin`s Physical Pharmacy**
Week 2	Solutions of non-electrolytes -Henry's Law -Colligative properties	**Chapter 5 (5th) edition** From **Martin`s Physical Pharmacy**
Week 3	Solutions of electrolytes -Theory of strong electrolytes	**Chapter 6 (5th) edition** From **Martin`s Physical Pharmacy**
Week 4	Ionic equilibria: pH of solutions -The modern theory of acids, bases, and salts -Acid-base equilibrium -Sorensen's pH scale	**Chapter 7 (5th) edition** From **Martin`s Physical Pharmacy**
Week 5	Ionic equilibria: pH of solutions -Calculation of pH	**Chapter 7 (5th) edition** From **Martin`s Physical Pharmacy**
Week 6	Buffers -The buffer equation -Buffer capacity -Buffers in pharmaceutical and biologic systems	**Chapter 9 (5th) edition** From **Martin`s Physical Pharmacy**
Week 7	Isotonic solutions -Measurement of tonicity -Calculating tonicity using Liso values -Methods of adjusting tonicity	**Chapter 9 (5th) edition** From **Martin`s Physical Pharmacy**

Week 8	Solubility and distribution phenomena -General principles -Solvent-solute interaction -Solubility of gases in liquids	**Chapter 10 (5th) edition** From **Martin`s Physical Pharmacy**
Weeks 9, 10	Solubility and distribution phenomena -Solubility of liquids in liquids -Solubility of solids in liquids -Distribution of solutes between miscible solvents	**Chapter 10 (5th) edition** From **Martin`s Physical Pharmacy**
Week 11	Pharmaceutical solutions -Introduction -Solvents and vehicles -Preparation of solutions -Formulation considerations	**Chapter 13** From **Ansel's Pharmaceutical Dosage Forms**
Week 12	Pharmaceutical solutions -Oral solutions -Syrups -Elixirs -Tinctures	**Chapter 13** From **Ansel's Pharmaceutical Dosage Forms**
Week 13	Other types of solution preparations -Nasal solutions -Otic solutions -Topical solutions -Vaginal and rectal solutions	**Chapter 13 and 17** From **Ansel's Pharmaceutical Dosage Forms**
Week 14	Ophthalmic preparations - Pharmaceutical requirements - Packaging ophthalmics - Proper administration -Contact lens and care and use solutions	**Chapter 17** From **Ansel's Pharmaceutical Dosage Forms**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Determine concentration expressions and their conversions including milliequivalents [1PLO1.1] [1L7K1]	7%	
Evaluate the effect of various substances and their concentrations on the colligative properties of solutions [1PLO1.1] [1L7K1]	6%	
Differentiate between ideal and non-ideal solutions [1PLO1.1] [1L7K1]	6%	
Assess the mean ionic activity and mean activity coefficients of electrolytic solutions [1PLO1.1] [1L7K1]	7%	
Compute pH of solutions and buffers [1PLO1.1] [1L7K1, 1L7S1]	24%	
Discuss osmolarity and isotonicity adjustment [1PLO1.1] [1L7K1, 1L7S1, 1L7S3]	5%	
Define solubility and factors affecting solute-solvent interactions [1PLO1.1] [1L7K1, 1L7S2]	7%	
Discuss the solubility of gases, liquids, and solids in a liquid along with factors affecting this solubility and relevant phase diagrams [1PLO1.1] [1L7K1, 1L7S2]	13%	
Identify pharmaceutical liquid dosage form and their advantages and limitations encountered during the formulation of liquid dosage forms [1PLO5.1] [1L7K1, 1L7S2, 1L7S3]	25%	

PLO1.1	PLO2.1	PLO3.2	PLO3.3	PLO2.2	PLO2.3	PLO2.4	PLO3.1	PLO3.4	PLO3.5	PLO3.6	PLO4.1	PLO4.2	PLO4.3	PLO4.4	PLO5.1	PLO-PT1.1	PLO-PT2.1	PLO-PT2.2	PLO-PT3.1
75															25				

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S1	L7S2	L7S3
58	13.67	18.33	10

Evaluation	
Assessment Tool	**Weight**
First exam 2023	25%
second exam 2023	30%
active learning	5%
Final Eam	40%

Policy	
Exams	- All exams are closed books and notes. - The final exam is comprehensive (covers all the material). - The first and second exams need approval from the departments' heads. - The final incomplete exam needs approval from the Dean.
Cheating	Prohibited; The commitment of the acts of cheating and deceit such as copying during examinations, altering examinations for re-grade, plagiarism of homework assignments, and in any way representing the work of others as your own is dishonest and will not be tolerated. Standard JUST policy will be applied. المادة 7: إذا ضُبط الطالب أثناء الامتحان أو الاختبار متلبساً بالغش فتوقع عليه العقوبات التالية مجتمعة: أ- اعتباره راسباً في ذلك الامتحان أو الاختبار. ب- الغاء تسجيله في بقية المساقات المسجل لها في ذلك الفصل. جـ- فصله من الجامعة لمدة فصل دراسي واحد، و هو الفصل التالي للفصل الذي ضبط فيه.
Attendance	- Attendance is mandatory and will be recorded regularly. - Excellent attendance is expected. - Students who miss more than 20% of the classes will be dropped from the course as per JUST policy. - If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed.
Active learning and students? participation	- Students are expected to actively participate in class discussions
Withdraw	The last day of courses withdrawal (without reimbursement of tuition fees): 10/1/2025