

Course Description Form

1. Course Name:					
Physical pharmacy I (Theoretical+ Practical)					
2. Course Code:					
Phind23 214--					
3. Semester / Year:					
1 st Semester/2 nd year					
4. Description Preparation Date:					
01/9/2023					
5. Available Attendance Forms:					
Students' signature on attendance sheet					
6. Number of Credit Hours (Total) / Number of Units (Total)					
3 hours Theoretical + 2 hours Practical (75) /4 units					
7. Course administrator's name					
Theoretical					
Name: Lec. Dr. Ali Alazzo Email: alialazzo@uomosul.edu.iq					
Practical					
Name: Lec. Amina Mudhafar Al-Nima Email: amnah.mudhafar@uomosul.edu.iq Name: Assis. Lec. Rasha Khalid Shakir Email: rasha.kh@uomosul.edu.iq					
8. Course Objectives					
Course Objective		<ul style="list-style-type: none"> • Learning the physical principles that guide the pharmaceutical dosage form. • Understanding the basis of solubility, kinetics and drug delivery. 			
9. Teaching and Learning Strategies					
Strategy		Lecturing Seminars Homework Practical laboratory demonstrations and team lab work			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	1. Understand the nature of the intra- and intermolecular forces that are involved in stabilizing molecular and physical structures. 2. Understand the differences in these forces and their relevance to different types of molecules.	States of matter, binding forces between molecules.	Theoretical lectures. Laboratory experiments	Paper-based exams

		3. Appreciate the differences in the strengths of the intermolecular forces that are responsible for the stability of structures in the different states of matter.			
2	3+2	1. Understand the properties of the different states of matter. 2. Describe the pharmaceutical relevance of the different states of matter to drug delivery systems by reference to specific examples given in the text boxes. 3. Describe the solid state, crystallinity, solvates, and polymorphism.	Gases, liquids, solids and crystalline materials	Theoretical lectures. Laboratory experiments	Paper-based exams
3	3+2	1. Understand phase equilibria and phase transitions between the three main states of matter. 2. Understand the phase rule and its application to different systems containing multiple components.	phase equilibria, phase rule and Thermodynamic analysis	Theoretical lectures. Laboratory experiments	Paper-based exams
4	3+2	1. Understand the theory of thermodynamics and its use for describing energy-related changes in reactions. 2. Understand the first law of thermodynamics and its use.	Thermodynamics, first law, thermochemistry, second law, third law, free energy function and applications	Theoretical lectures. Laboratory experiments	Paper-based exams

5	3+2	<p>1.Understand the second law of thermodynamics and its use.</p> <p>2.Understand the third law of thermodynamics and its use.</p> <p>3.Define and calculate free energy functions and apply them to pharmaceutically relevant issues.</p>	Thermodynamics, first law, thermochemistry, second law, third law, free energy functions and applications	<p>Theoretical lectures.</p> <p>Laboratory experiments.</p>	Paper-based exams
6	3+2	<p>1.Identify and describe the four colligative properties of nonelectrolytes in solution.</p> <p>2.Understand the various types of pharmaceutical solutions.</p>	Solutions of non-electrolytes, properties	<p>Theoretical lectures.</p> <p>Laboratory experiments</p>	Paper-based exams
7	3+2	<p>1.Define ideal and real solutions using Raoult's and Henry's laws.</p> <p>2.Calculate vapor pressure lowering, boiling point elevation, freezing point lowering, and pressure for solutions of nonelectrolytes.</p>	ideal and real colligative properties, molecular weight determination	<p>Theoretical lectures.</p> <p>Laboratory experiments</p>	Paper-based exams
8	Mid-term exam				
9	3+2	<p>1.Understand the important properties of solutions of electrolytes.</p> <p>2.Calculate the conductance of solutions, the equivalent conductance,</p>	Solution of electrolytes, properties	<p>Theoretical lectures.</p> <p>Laboratory experiments.</p>	Paper-based exams

		and the equivalent conductance of electrolytes. 3. Apply the Arrhenius theory of electrolytic dissociation.			
10	3+2	1. Calculate ionic strength. 2. Calculate osmotic coefficients, osmolality, and osmolarity. 3. Understand the differences between osmolality and osmolarity.	Ionic strength, Debye-Hückle theory, coefficients for expressing colligative properties	Theoretical lectures. Laboratory experiments	Paper-based exams
11	3+2	1. Describe the Brønsted-Lowry and Lewis electronic theories. 2. Understand the concepts of acid-base equilibria and the ionization of weak acids and weak bases.	Ionic equilibria, modern theories of acids, bases and salt acid-base equilibria.	Theoretical lectures. Laboratory experiments	Paper-based exams
12	3+2	1. Calculate dissociation constants K_a and K_b and understand the relationship between K_a and K_b . 2. Understand the concepts of pH, pK, and pOH and the relationship between hydrogen ion concentration and pH.	calculation of pH, acidity constants, the effect of ionic strength and free energy	Theoretical lectures. Laboratory experiments	Paper-based exams
13	3+2	1. Understand the common ion effect. 2. Discuss the factors influencing the pH of buffer solutions.	Buffered and isotonic solutions: Buffer equation; buffer capacity	Theoretical lectures. Laboratory experiments	Paper-based exams

14	3+2	1.Describe the concept of tonicity and its importance in pharmaceutical systems. 2.Calculate solution tonicity and tonicity adjustments.	isotonic solutions	Theoretical lectures. Laboratory experiments	Paper-based exams
15	Students' seminars				
11. Course Evaluation					
<ul style="list-style-type: none"> • 20 M Theoretical assessment; (paper-based mid-term exam + quiz + attendance + seminar) • 20 M practical assessment (attendance + quiz + practice) • 60 M paper-based theoretical final exam <hr style="width: 20%; margin-left: 0;"/> <p style="margin-left: 20px;">100 M total</p>					
12. Learning and Teaching Resources					
Required textbooks		1- Alfred Martin et al, Physical Pharmacy,6th edition,2010. 2- Laboratory Manual for Practical Physical pharmacy adopted by the department.			
Main references (sources)		1- Physicochemical Principles of Pharmacy Alexander Taylor Florence and David Attwood 2- Fast track: Physical Pharmacy by Alexander Tay Florence and David Attwood.			
Electronic References, Websites					