


Philadelphia University	 PHILADELPHIA UNIVERSITY <small>THE WAY TO THE FUTURE</small>	Approved Date: 10/2022
Faculty: Pharmacy		Issue: 1
Department:		Credit Hours: 3
Academic Year:2022/2023		Course Syllabus

Course Information

Course No.	Course Title	Prerequisite	
0520224	Physical Pharmacy	Physics (0211109)	
Course Type		Class Time	Room No.
<input type="checkbox"/> University Requirement <input type="checkbox"/> Faculty Requirement			
<input type="checkbox"/> Major Requirement <input type="checkbox"/> Elective <input checked="" type="checkbox"/> Compulsory			

Instructure Information

Name	Office No.	Phone No.	Office Hours	E-mail

Course Delivery Method

<input type="checkbox"/> Blended <input type="checkbox"/> Online <input checked="" type="checkbox"/> Physical			
Learning Model			
Percentage	Synchronous	Asynchronous	Physical
	0	0	100%

Course Description

The aim of this course is to provide the student with basic knowledge and understanding of the phase rule and its applications to different systems containing multiple components, calculating the concentration of drug in different dosage forms using different concentration units, understanding the properties of electrolytes and nonelectrolyte solutions, understanding the procedure of preparing a buffer including the relevant calculations, and understanding the methods for making isotonic dosage forms. In addition, the students will be also exposed to the concepts of solubility, drug release, drug dissolution, and zero and first order decomposition reactions of drugs

Course Learning Outcomes

Number	Outcome	Corresponding Program Outcomes	Corresponding Competencies
Knowledge			
K1	Acquire knowledge in Physicochemical principles and asses their role and applications in dosage forms	K _P 1, K _P 6	C1, C6
K2	Understand the concepts of diffusion, dissolution and explain their role in drug release	K _P 1, K _P 6	C1, C6
K3	Understand the different modes of drug decomposition and drug stability	K _P 1, K _P 6	C1, C6
Skills			
S1	Analyze and interpret problems regarding Physicochemical properties of drug substances	S _P 2, S _P 9	C8, C15
S2	carry out calculations and data analysis related to the Physicochemical characteristics of drug substances	S _P 2	C8

Learning Resources

Course Textbook	Martin's Physical Pharmacy and Pharmaceutical Sciences By : Patrick J. Sinko, Lippincott Williams & Wilkins , 2006, 5th Edition
Supporting References	<ol style="list-style-type: none"> 1. Applied Physical Pharmacy By: Mansoor M. Amiji & Beverly J. Sandmann, McGRAW-Hill, 2003. 2. Pharmaceutical Dosage Forms and Drug Delivery Systems by Loyd V. Allen, Jr., Nicolas G. Popovich & Howard C. Ansel, Lippincott Williams & Wilkins 8th Edition ,2005 3. Pharmaceutics The Science of Dosage Form Design, Edit.: Michael E. Aulton, Pub.: Churchill Livingstone, 2nd edition, 2002. 4. Merck Index: An Encyclopedia of Chemicals, Drugs, & Biologicals by Merck, Co, Maryadele J. Oneil (Editor), Ann Smith (Editor) 13th edition (October 2001), Merck & Co; ISBN: 0911910131 5. Physical Pharmacy: Physical Chemical Principles in the Pharmaceutical Sciences by Alfred Martin, Pilar Bustamante, A.H.C. Chun (Illustrator) 622 pages 4th edition (January 15, 1993), Lea & Febiger; ISBN: 0812114388 6. Remington: The Science and Practice of Pharmacy by Alfonso R. Gennaro (Editor) 20th edition (December 15, 2000), Lippincott, Williams & Wilkins; ISBN: 0683306472
Supporting Websites	http://library.philadelphia.edu.jo/st_en.htm
Teaching Environment	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> laboratory Learning Platform Other

Meetings and Subjects Timetable

Week	Topic	Learning Method*	Task	Learning Material
1	Course Syllabus Introduction States of matter - Binding Forces Between Molecules - Gases, The Ideal and general Gas Law, Aerosols, Liquefaction of Gases	Lecture		Course Syllabus Textbook
2	The Supercritical Fluid State - Liquids , Vapor Pressure of Liquids, Boiling Point, Latent Heats of Vaporization	Lecture		Textbook
3	Solids and the Crystalline State, Characterization of Crystalline Materials, The latent heat of fusion, Melting Point and Intermolecular Forces, Polymorphism, Polymorphism and solubility, Amorphous Solids	Lecture		Textbook
4	The Liquid Crystalline State Properties and Significance of Liquid Crystals - Thermal Analysis, Differential Scanning Calorimetry methods	Lecture Collaborative learning		Textbook
5	Phase Equilibria and the Phase Rule Phase rule, Systems Containing One Component, Two-Component Systems Containing Liquid Phases	Lecture		Textbook
6	Two-Component Systems Containing Solid and Liquid Phases: (Eutectic Mixtures), Three-Component Systems	Lecture		
7	Solutions True solution, Colloidal solutions, Coarse dispersion Nonelectrolytes solution, Ideal and Real Solutions Raoult's Law, Henry's Law	Lecture Problem solving based learning		
8	Buffered and Isotonic Solutions Activity Coefficients and the Buffer Equation Buffer Capacity, Preparation of buffers Buffered Isotonic Solutions	Lecture Collaborative learning		Textbook
9	Solubility and distribution phenomena General principles Solvent-solute interaction Solubility of gases in liquids Solubility of liquids in liquids Solubility of solids in liquids Distribution of solutes between miscible	Lecture		

10	Diffusion Steady state diffusion , Fick's laws of diffusion	Lecture		
11	Midterm Exam Diffusion Steady state diffusion , Fick's laws of diffusion	Lecture Collaborative learning		Textbook
12	Drug release and dissolution Noyes – Whitney equation, Higuchi model	Lecture		
13	Chemical kinetics and stability Zero order reactions	Lecture		
14	Chemical kinetics and stability First order reactions	Lecture		
15	Temperature effect	Lecture		Textbook
16	Final Exam Week			

*Includes: lecture, flipped Class, project-based learning, problem solving based learning, collaboration learning

Course Contributing to Learner Skill Development

Using Technology
<ul style="list-style-type: none"> • Represent data in tabular and graphical manners. • Perform good analysis for the represented data and calculate related statistical values. • Come out with the best interpretation and understanding of machinery-produced data and graph sheets. • Be able to search and extract relevant information from literature.
Communication Skills
<ul style="list-style-type: none"> • Be able to represent and explain various issues related to the pharmaceutical operations in industrial manufacture of drug products. • Demonstrate ability to prepare relevant reports in a clear systematic way. • Be able to adapt and accommodate team working. • Access resources related to the description and application of the methods used for various unit operations.
Application of Concept Learnt
<ul style="list-style-type: none"> • Practical application in the corresponding practical course.

Assessment Methods and Grade Distribution

Assessment Methods	Grade	Assessment Time (Week No.)	Course Outcomes to be Assessed
Mid Term Exam	% 30	11th week	K1, K2, S1, S2
Term Works*	% 30	Continuous	S1-S2
Final Exam	% 40	16th week	K1-K3 S1- S2
Total	%100		

* Include: quizzes, in-class and out of class assignment, presentations, reports, videotaped assignment, group, or individual project.

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Corresponding Competencies	Learning Method*	Assessment Method**
Knowledge				
K1	Acquire knowledge in Physicochemical principles and asses their role and applications in dosage forms	C1, C6	Lecture	Exam/Quiz questions

K2	Understand the concepts of diffusion, dissolution and explain their role in drug release	C1, C6	Lecture	Exam/Quiz questions
K3	Understand the different modes of drug decomposition and drug stability	C1, C6	Lecture	Exam/Quiz questions
Skills				
S1	Analyze and interpret problems regarding Physicochemical properties of drug substances	C8, C15	Problem solving based learning	Exam/Quiz questions
S2	carry out calculations and data analysis related to the Physicochemical characteristics of drug substances	C8	Problem solving based learning	Exam/Quiz questions

*Include: lecture, flipped class, project-based learning, problem solving based learning, collaboration learning.

** Include: quizzes, in-class and out of class assignments, presentations, reports, videotaped assignments, group or individual projects.

Course Polices

Policy	Policy Requirements
Passing Grade	The minimum pass for the course is (50%) and the minimum final mark is (35%).
Missing Exams	<ul style="list-style-type: none"> • Anyone absent from a declared semester exam without a sick or compulsive excuse accepted by the dean of the college that proposes the course, a zero mark shall be placed on that exam and calculated in his final mark. • Anyone absent from a declared semester exam with a sick or compulsive excuse accepted by the dean of the college that proposes the course must submit proof of his excuse within a week from the date of the excuse's disappearance, and in this case, the subject teacher must hold a compensation exam for the student. • Anyone absent from a final exam with a sick excuse or a compulsive excuse accepted by the dean of the college that proposes the material must submit proof of his excuse within three days from the date of holding that exam.
Attendance	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lecture days (n t) and seven lectures (days). If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory or compulsive excuse accepted by the dean of the faculty, he is prohibited from taking the final exam and his result in that subject is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college that The article is introduced, it is considered withdrawn from that article, and the provisions of withdrawal shall apply to it.
Academic Integrity	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as cheating, plagiarism (academic theft), collusion, intellectual property rights.

Program Learning Outcomes to be Assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Targeted Performance level

Description of Program learning Outcomes Assessment Method

Number	Detailed Description of Assessment

Assessment Rubric of the Program Learning Outcomes

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