Philadelphia University	PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	**Approved Date: 10/2022**
Faculty: Pharmacy		**Issue: 1**
Department: -		**Credit Hours: 2**
Academic Year:2022/2023	**Course Syllabus**	**Bachler**

Course Information

Course No.	Course Title	Prerequisite
0521424	Pharmaceutical Technology	Industrial Pharmacy (0520420)

Course Type	Class Time	Room No.
☐ Univirsity Requirement ■ Faculty Requirement ☐ Major Requirement ☐ Elective ■ Compulsory		

Instructure Information

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

Course Delivery Method

☐ Blended	☐ Online	■ Physical
Learning Model		
Percentage	**Synchronous**	**Asynchronous**	**Physical**
	0	**0**	**100%**

Course Description

This is a major requirement course which provides a comprehensive understanding of the theory and practice for the production of tablets and capsules. In this course, tablet manufacturing, excipients and quality attributes will be discussed in addition to other related issues along with the detailed explanation on manufacture and formulation of hard and soft gelatin capsules. The course will also briefly discuss modified release technologies in addition to some focus on pharmaceutical preformulation studies.

Course Learning Outcomes

Number	Outcome	Corresponding Program Outcomes	Corresponding Competencies
Knowledge			
K1	Gain knowledge related to the basis of the formulation of solid dosage forms	K_P1, K_P6	C1, C6
K2	Describe pharmaceutical equipment and apparatus used in the pharmaceutical production of solid dosage forms	K_P1, K_P6	C1, C6
K3	Understand the basis and techniques of the quality control of the solid pharmaceutical preparations.	K_P1, K_P6	C1, C6
K4	Gain knowledge on the mechanisms of drug release	K_P1, K_P6	C1, C6
K5	Understand the fundamental principles of prefomulation studies	K_P1, K_P6	C1, C6
Skills			
S1	Perform analysis and interpretation of data related to formulation, production and quality control testing of solid dosage forms in addition to preformulation	S_P2	C8
S2	Be able to select suitable formulation approaches and production techniques for solid dosage forms	S_P2, S_P9	C8, C15
S3	Identify and solve problems arising in the pharmaceutical preparation of solid dosage forms	S_P2, S_P9	C8, C15
S4	Demonstrate ability to represent data and prepare relevant reports in a clear systematic way.	S_P6	C12

Learning Resources

Course Textbook	**Aulton's Pharmaceutics: The Design and Manufacture of Medicines**, Edit.: Michael E. Aulton and Kevin M. G. Taylor. Pub.: Churchill Livingstone, 4nd edition, 2013. ISBN: 978-0-7020-4290-4
Supporting References	1. Martin's Physical Pharmacy and Pharmaceutical Sciences By : Patrick J. Sinko**,** Lippincott Williams & Wilkins , 2006, 5th Edition 2. Modern Pharmaceutics by Gilbert S. Banker (Editor), Christopher T. Rhodes (Editor) 4th edition (June 15, 2002), Marcel Dekker; ISBN: ISBN: 0824706749 3. 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 4. The Theory and Practice of Industrial Pharmacy by Leon Lachman, Herbert A. Lieberman, Joseph L. Kanig. 3rd edition (August 1986), Lea & Febiger; ISBN: 0812109775 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. Handbook of Pharmaceutical Excipients by Arthur H. Kibbe (Editor), Ainley Wade, Paul J. Weller

	665 pages 3rd edition Vol 3 (January 15, 2000), Amer. Pharmaceutical Assoc.; ISBN: 091733096X 7. Remington: The Science and Practice of Pharmacy by Alfonso R. Gennaro (Editor) 20th edition (December 15, 2000), Lippincott, Williams & Wilkins; ISBN: 0683306472
Supporting Websites	
Teaching Environment	■ **Classroom** ☐ **laboratory** ☐ **Learning Platform** ☐ **Other**

Meetings and Subjects Time Table

Week	Topic	Learning Method*	Task	Learning Material
1	**Vision and Mission of Faculty of Pharmacy** **Course Syllabus** **Granulation:** Definition and reasons for granulation	Lecture		Vision and Mission of Faculty of Pharmacy Course Syllabus Text book, part 5, Chapter 28
2	Methods of granulation Mechanisms of granulation Pharmaceutical Granulation Equipment	Lecture Flipped learning		Text book, part 5, Chapter 28
3	**Tablets and Compaction:** Introduction Biopharmaceutics classification system Quality attributes of tablets	Lecture	Homework	Text book, part 5, Chapter 30
4	Tablet manufacturing	Lecture		
5	Tablet excipients	Lecture		
6	Tablet types	Lecture		
7	Extended release tablets	Lecture Project based learning	Short presentation	
8	Tablet Testing	Lecture		
9	**Midterm Exam**			
10	**Coating of Tablets and Multiparticulates:** Definition, Types and reasons of coating Film coating	Lecture		Text book, part 5, Chapter 32
11	Sugar coating Press coating Functional coating	Lecture Problem solving based learning	Short report	
12	**Hard Gelatin Capsules:** Introduction Raw materials and process aids Manufacture	Lecture		Text book, part 5, Chapter 33
13	Capsule filiing Formulation	Lecture	Video taped assignment	

14	**Soft Gelatin Capsules:** Description of soft gels Rationale foe selection of softgel as dosage form Manufacture Formulation	Lecture		Text book, part 5, Chapter 34
15	**Preformulation:** Characteerization of physicochemical properties of drugs **In Vitro- In Vivo Correlation:** Importance of Dissolution in IVIVC	Lecture Collaborative learning	Case study	Text book, part 5, Chapter 23
16	**Final Exam**			

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

Course Contributing to Learner Skill Development

Using Technology
• Using Excel to construct tables and plots • Using power point or any other relevant programs for preparing presentations • Operating equipment of granulation and tablet press in addition to tablet quality testing equipment
Communication Skills
• Report writing • Oral presentation of selected topics
Application of Concept Learnt
• Practical application of tablet compaction and quality control testing 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**	**9th week**	**K1, K2, K4 S1, S2, S3**
Term Works*	**% 30**	**Continous**	**S1-S4**
Final Exam	**% 40**	**16th week**	**K1-K5 S1, S2, S3**
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	Gain knowledge related to the basis of the formulation and of solid dosage forms	C1, C6	Lecture Problem solving based learning Flipped learning	Subjective Quiz Exam/Objective questions Homework evaluation videotaped assignment evaluation
K2	Describe pharmaceutical equipment and apparatus used in the pharmaceutical production of solid dosage forms	C1, C6	Lecture	Exam/Objective questions
K3	Understand the basis and techniques of the quality control of the solid pharmaceutical preparations.	C1, C6	Lecture	Exam/Subjective and Objective questions
K4	Gain knowledge on the mechanisms of drug release mechanisms	C1, C6	Lecture Project based learning	Exam/Subjective questions Oral presentation evaluation
K5	Understand the fundamental principles of prefomulation studies	C1, C6	Lecture Collaborative learning	Subjective Quiz Exam/Objective questions
Skills				
S1	Perform analysis and interpretation of data related to formulation, production and quality control testing of solid dosage forms in addition to preformulation	C8	Problem solving based learning	Subjective Quiz Exam/Subjective questions Case study evaluation
S2	Be able to select suitable formulation approaches and production techniques for solid dosage forms	C8, C15	Problem solving based learning	Exam/Subjective questions
S3	Identify and solve problems arising in the pharmaceutical preparation of solid dosage forms	C8, C15	Problem solving based learning	Exam/Subjective questions

S4	Demonstrate ability to represent data and prepare relevant reports in a clear systematic way.	C12	Project based learning Collaborative learning	Report writing Oral presentation evaluation

*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	• 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
