Philadelphia University	PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	**Approved Date: 24/10/2022**
Faculty: Pharmacy		**Issue: 1**
Department:- Pharmacy		**Credit Hours: 3**
Academic Year:2022/2023	**Course Syllabus**	**Bachler: Pharmacy**

Course Information

Course No.	Course Title	Prerequisite	
0510310	Pharmaceiutical medicinal chemistry 1	Pharmaceutical Organic Chemistry-2 (0510210)	
Course Type		**Class Time**	**Room No.**
☐ Univirsity Requirement ■ Fuclty 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**
		100%

Course Description

The first part of this course deals with the understanding of molecular dynamics and its correlation with molecular kinetics whether it is observed outside (physical properties) or inside human body (pharmacokinetics) as well as how to correlate those observations with molecular structure. Therefore, it covers structural properties like lipophilicity, acidity, intermolecular interactions respectively. The second part of the course deals with the biotransformation reactions of drug molecular structure inside the human body (drug metabolism reactions). The third part includes applications of the previously discussed principles on drugs affecting cholinergic and adrenergic receptors. Accordingly, intermolecular interactions, mechanism of action, switching receptor on (agonistic) or off (antagonistic), and stucture-activity relationships are also discussed.

Course Learning Outcomes

Number	Outcome	Corresponding Program Outcomes	Corresponding Competencies
Knowledge			
K1	To develop knowledge about the basic principle of medicinal chemistry and apply it to explain the drug properties and action.	K_P1	C1
K2	Study the important drug physicochemical properties and their effect on drug pharmacokinetic and pharmacodynamic.	K_P1	C1
K3	Describe the concept of prodrug, and logical structural modifications of drugs to alter their activity (SAR) and their Pharmacodynamic and pharmacokinetics properties.	K_P1	C1
K4	Understand the concept of drug Metabolism and its effect on drug absorption, distribution, excretion and drug target interactions.	K_P1	C1
K5	To identify the main requirenment for adrenergic drugs, their SAR and classes into agonist and antagonist.	K_P1	C1
K6	To identify the main requirenment for cholinergic drugs, their SAR and classes into agonist and antagonist.	K_P1	C1
K7	To acquire basic knowledge about computer aided drug design, lead modification, receptors, enzymes and different type of antagonist	K_P1	C1
Skills			
S1	Figure out the level of ionization, acid strength and lipophilicity of drugs and its impact on pharmacokinetic properties and drug target interactions	S_P2	C8
S2	Work within groups to study examples of available drugs in the market; pharmacokinetic and dynamics, metabolism, pharmacological effects and any possible modification to improve activity and minimize side effects	S_P6	C12

Learning Resources

Course Textbook	1- An introduction to Medicinal Chemistry by Graham L. Patrick. fifth edition, Oxford, 2018 2- Wilson and Gisvolds text book of organic medicinal and pharmaceutical chemistry by John H. Black and John M. Beale, jr. Twelfth edition, Lippincott Williams and Wilkings 2011.
Supporting References	- Foyes principle of medicinal chemistry by David H. Williams, Thomas L. Leuke, Williams O. Foye. Lippincott William and Wilkins. Seventh edition, 2013
Supporting Websites	www.scinecedirect.com, www.youtube.com
Teaching Environment	■ **Classroom** ☐ **laboratory** ☐ **Learning Platform** ☐ **Other**

Meetings and Subjects Time Table

Week	Topic	Learning Method*	Task	Learning Material
1	Introduction to medicinal chemistry	Lecture		Vision and Mission of faculty of pharmacy Course syllabus Text Book, chapter 1.
2	The molecular properties of drugs Pharmacokinetic and Pharmacodynamic properties	Lecture		Text Book, chapter 1.
3	Lipophilicity of drugs	Lecture	Quiz	Text Book, chapter 1.
4	The molecular properties of drugs Acidity and basicity of drugs Route of administration	Lecture Problem solving		Text Book, chapter 1.
5	Drug metabolism Introduction Phase-I metabolism	Lecture		Text Book, chapter 3.
6	Drug metabolism	Lecture	Quiz	Text Book,

	Phase-II metabolism	**Problem solving**		**chapter 3.**
7	**Factors affecting drug metabolism**	**Lecture**	**Midterm Exam**	**Text Book, chapter 3.**
8	**Introduction to drug design**	**Lecture**		**Graham Patrick, chapters 12 ,13&14.**
9	**Introduction to drug design**	**Lecture**		**Graham Patrick, chapters 12 ,13&14.**
10	**Drugs acting on cholinergic receptors**	**Lecture**	**Quiz**	**Graham Patrick,, chapter 22.**
11	**Drugs acting on cholinergic receptors**	**Lecture**		**Graham Patrick, chapter 22.**
12	**Drugs acting on adrenergic receptors**	**Lecture**	**Quiz**	**Graham Patrick, chapter 23.**
13	**Drugs acting on adrenergic receptors**	**Lecture**		**Graham Patrick, chapter 23.**
14	**Drugs acting on adrenergic receptors**	**Lecture**		**Graham Patrick, chapter 23.**
15	**Drugs acting on adrenergic receptors**	**Lecture**		**Graham Patrick, 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 Microsoft programs (word, power point), YouTube videos, Google and scientific websites, chemdraw and protein display in Protein data bank
Communication Skills
Videos and home works discussion
Application of Concept Learnt

Assessment Methods and Grade Distribution

Assessment Methods	Grade	Assessment Time (Week No.)	Course Outcomes to be Assessed
Mid Term Exam	**% 30**	6 th	
Term Works*	**% 30**	Continuous	
Final Exam	**% 40**	16 th	
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 Compatienes	Learning Method*	Assessment Method**
Knowledge				
K1	To develop knowledge about the basic principle of medicinal chemistry and apply it to explain the drug properties and action	C1	Lecture	Quizzes Exam
K2	Study the important drug physicochemical properties and their effect on drug pharmacokinetic and pharmacodynamic	C1	Lecture problem solving based learning	Exam
K3	Describe the concept of prodrug and logical structural modifications of drugs to alter their activity (SAR) and their Pharmacodynamic and pharmacokinetics properties.	C1	Lecture Collaborative learning	Exam
K4	Understand the concept of drug Metabolism and its effect on drug absorption, distribution, excretion and drug target interactions.	C1	Lecture problem solving based learning	Individual or group assignment
K5	To identify the main requirenment for adrenergic drugs, their SAR and	C1	Lecture	Quizzes

	classes into agonist and antagonist.			Exam
K6	To identify the main requirenment for cholinergic drugs, their SAR and classes into agonist and antagonist.	C1	Lecture	Quizzes Exam
K7	To acquire basic knowledge about computer aided drug design, lead modification, receptors, enzymes and different type of antagonist	C1	Lecture	Quizzes Exam
Skills				
S1	Figure out the level of ionization, acid strength and lipophilicity of drugs and its impact on pharmacokinetic properties and drug target interactions	C8	Lecture	Out of class assignement
S2	Work within groups to study examples of available drugs in the market; pharmacokinetic and dynamics, metabolism, pharmacological effects and any possible modification to improve activity and minimize side effects	C12	Lecture	Group projects

*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