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

Course Information

Course No.	Course Title	s
0520516	Clinical Pharmacokinetics	0520431 Biopharmaceutics and Pharmacokinetics

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

Instructure Information

Name	Office No.	Phone No.	Office Hours	E-mail
Dr. Yazan Bataineh	530	2281		ybatineh@philadelphia.edu.jo

Course Delivery Method

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

Course Description

This course provides students with a basic intuitive understanding of the pharmacokinetic principles, terminology, models, equations and factors affecting drug absorption, distribution, metabolism and excretion and its importance in drug therapeutic or toxic effects. Emphasis will be placed upon the prediction of plasma levels of drugs under varying conditions applying different pharmacokinetic parameters. Handling pharmacokinetic parameters of drugs in the body and solving problems

Course Learning Outcomes

Number	Outcome	Corresponding Program Outcomes	Corresponding Competencies
Knowledge			
K1	Understanding mathematics of the time course ofAbsorption, Distribution, Metabolism, and Excretion (ADME) of drugs in the body	**Kp1,**	**C1**
K2	Understand drug absorption, distribution and elimination	**Kp1**	**C1**
K3	Understand pharmacokinetics and biopharmaceutics after I.V bolus, I.V infusion, and oral administration of drugs.	**Kp1, Kp2, Kp3**	**C1, C2, C3**
K4	Understand protein binding and its effects	**Kp1, Kp2, Kp3**	**C1, C2, C3**
K5	Understand Pharmacokinetic variability in case ofrenal and hepatic diseases, geriatrics, pediatrics, obesity, pregnancy and change in plasma protein binding	**Kp1, Kp2, Kp3**	**C1, C2, C3**
K6	Individualization of therapy and therapeutic drugmonitoring.	**Kp1, Kp2, Kp3**	**C1, C2, C3**
Skills			
S1	Use raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution and elimination.	**Sp1, Sp2**	**C7. C8**
S2	Communicating dosage adjustment with physicians and patients.	**Sp1, Sp2**	**C7. C8**
S3	Suggesting therapeutic monitoring plans for clinicians.	**Sp1, Sp2**	**C7. C8**

Learning Resources

Course Textbook	• Applied Biopharmaceutics and Pharmacokinetics., Shargel and A.B.C. Yu., Appleton & Lange/MacGraw-Hill, New York., 7thedition 2016. ISBN: 978-0-07-182964-9 • Applies clinical pharmacokinetics, Bauer, Larry A. Appleton & Lange/MacGraw-Hill, New York., 2nd edition 2008. 10.1036/0071476288 • Clinical Pharmacokinetics Concepts and Application s. MALCOlM ROWlAND and THOMASN. TOZER., 1994, 3rd edition. LIPPINCOTT WILLIAMS&WILKINS
Supporting References	1.Specialized softwares as WinNonlin® standard and PowerPoint presentations. 2.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
	3. 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
	4. Remington: The Science and Practice of Pharmacy by Alfonso R. Gennaro (Editor) 20th edition (December 15, 2000), Lippincott, Williams & Wilkins; ISBN: 0683306472
Supporting Websites	• PHARMACOKINETICS – CALCULATORS, TOOLS, ETC. HTTPS://GLOBALRPH.COM/PHARMACOKINETICS/ • Drug Half Life Calculator • HTTPS://WWW.OMNICALCULATOR.COM/HEALTH/DRUG-HALF-LIFE • COMPUTERISED BAYESIAN DOSE CALCULATION
Teaching Environment	■ **Classroom** ☐ **Laboratory** ☐ **Learning Platform** ☐ **Other**

Meetings and Subjects Time Table

Week	Topic	LearningMethod*	Task	Learning Material
1	• Vision and Mission of Faculty of Pharmacy • Course Syllabus • Introduction	Lecture		Vision and Mission of Faculty of Pharmacy Course Syllabus Text book, Chapter 1
2	• IN Infusion: Intravenous Bolus Administration: One-Compartment Model: Pharmacokinetics Parameters: Half-Life, Rate Constants, Volume of Distribution, Area Under the Curve, Practice Problems	• Lecture • Problemsolving based learning		Text book, part 1, Chapter 6
3	• IN Infusion: Intravenous Bolus Administration: Two-Compartment Model: Pharmacokinetics Parameters:Half-Life, Rate Constants, Volume ofDistribution, Area Under the Curve, Practice Problems	• Lecture • Problemsolving based learning		Text book, part 2, Chapter 6

4	• Oral Administration: Two- Compartment Model: Pharmacokinetics Parameters: Half-Life, Rate Constants	• Lecture • Problemsolving based learning	Case study	Text book,part 1, Chapter 8
5	• Oral Administration: Two- Compartment Model: Pharmacokinetics Parameters: Volume Of Distribution, Area Under The Curve	• Lecture • Problemsolving based learning	Case study	Text book,part 2, Chapter 8
6	• Oral Administration: Two- Compartment Model: PracticeProblems	• Lecture Problemsolving based learning		Text book,part 3, Chapter 8
7	• Physiologic Factors Related To Drug Absorption 1) Renal Drug Excretion 2) Drug Clearance I) Determination Of Renal Clearance	• Lecture • Problemsolving based learning	Case study	Text book,part 1, Chapter 11
8	• Physiologic Factors Related To Drug Absorption ii) Determination Of Hepatic Clearance	• Lecture Problemsolving based learning		Text book,part 2, Chapter 11
9	Renal drug elimination and clearance:Practice problems	• Lecture • Problemsolving based learning		Text book,part 1, Chapter 12
10	• Hepatic drug elimination and clearance: Practice problems	• Lecture • Problemsolving based learning Collaborative learning		Text book,part 2, Chapter 12
11 Mid exam	Measurement Of Glomerular FiltrationRate	• Lecture • Problemsolving based learning Collaborative learning		Text book,part 1, Chapter 7

12	Fraction Of Drug Excreted Unchanged(Fe) Methods	• Lecture • Problemsolving based learning Collaborative learning	Case study	Text book, part 2, Chapter 7
13	Dosing in renal impairment	• Lecture Problemsolving based learning	Pharmacokinetics – Calculators, Tools	Text book, part 1, Chapter 24
14	Effect of hepatic disease onpharmacokinetics	• Lecture Problemsolving based learning		Text book, part 2, Chapter 24
15	Dosing of drugs in elderly, obesepatients and infants	• Lecture • Problemsolving based learning		Text book, Chapter 23
16	**Final Exam**			

- Case Study: Prepared by the lecturer, adapted from the text book and other references.
- Includes: lecture, flipped Class, project based learning, problem solving based learning, collaboration learning.

Course Contributing to Learner Skill Development

Using Technology
• Using powerpoint or any relevant program for preparing presentations
• Using smart application for dosing regimens
• Using online application for dosing regimens for pharmacokinetic calculations
Communication Skills
• Interaction in class while solving case-study
Application of Concept Learnt
• Apply the knowledge obtained from this course to evaluate individualization of the dose
• Apply the knowledge obtained from this course to solve problems disease state, drug-drug interaction and different dosage form

Assessment Methods and Grade Distribution

Assessment Methods	Grade	Assessment Time (Week No.)	Course Outcomesto be Assessed
Mid Term Exam	**30%**	**11th Week**	**K1, K2, K3,**
Term Works*	**30%**	**Continous**	**K1, K2, K4, K5,S1, S2**

Final Exam	40%	16th Week	K1, K2, K3, K4, K5, K6, K7, 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	Understanding mathematics of the timecourse of Absorption, Distribution, Metabolism, and Excretion (ADME) of drugs in the body	C1	• Lectures • Problem-solving based learning	Subjective quiz Exam/Objective questions
K2	Understand drug absorption, distribution and elimination	C1	• Lectures • Problem-solving based learning	Subjective quiz Exam/Objective questions
K3	Understand pharmacokinetics andbiopharmaceutics after I.V bolus, I.V infusion, and oral administrationof drugs.	C1, C2, C3	• Lectures • Problem-solving based learning • Collaborative learning	Case Study Exam/Objective questions
K4	Understand protein binding and its effects	C1, C2, C3	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objective questions
K5	Understand Pharmacokinetic variability in case of renal and hepatic diseases, geriatrics, pediatrics, obesity, pregnancy and change in plasma protein binding	C1, C2, C3	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objective questions

K6	Individualization of therapy and therapeuticdrug monitoring.	**C1, C2, C3**	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objective questions
Skills				
S1	Use raw data and derive the Pharmacokinetic models and parameters that best describe the process of drug absorption, distribution and elimination.	**C7. C8**	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objectivequestions
S2	Communicating dosage adjustment with physicians and patients.	**C7. C8**	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objective questions
S3	Suggesting therapeutic monitoring plans forclinicians.	**C7. C8**	• Lectures • Problem-solving based learning	Case Study Subjective quiz Exam/Objective questions Pharmacokinetics – Calculators,Tools

*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, groupor 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 hisfinal 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 mustsubmit 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