



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

Faculty : Pharmacy

Department: Clinical Pharmacy and Therapeutics

Academic Year: 2020-2021

Semester: First

(Course Syllabus)

Subject Name	Credit Hours	Course No.	Prerequisite	Concurrent course
Pharmacokinetics	2	906411	907322 Biopharmaceutics	906413 Pharmacokinetics laboratory

Coordinator Name	Lecturer/s	Room No.	E-mail	Course website	Office Hours
Muna Barakat, Ph.D.	Muna Barakat, Ph.D.	4218	M_barakat@asu.edu.jo	Biosystem for course outline. Microsoft Teams channels	As shown on the lecturer time table

Course Description:

This course investigates the basic principles of pharmacokinetics that affect the absorption, distribution, metabolism and excretion. The (Mathematical) models will be used to describe the pharmacokinetics of the drug in the body after oral administration, IV bolus dose, IV infusion, and multiple dosing. The students will learn how to design dosage regimens, evaluate pharmacologic response, identify patient factors that require a modification of the dosing regimen, and finally understand drug bioavailability and bioequivalence concepts.

Course objectives:

Upon successful completion of the course:

- 1- The students will be able to understand the terminology and fundamental concepts of pharmacokinetics that determine the timecourse of drug concentrations in the body, during single and multiple dosing of I.V. and oral drugs.
- 2- The students will be able to calculate the pharmacokinetic parameters for clinical cases.
- 3- The students will be able to identify patient-related factors that require a modification of the normal drug dosing regimen.
- 4- The students will be able to design dosage regimens and evaluate the pharmacologic response and determine the frequency of administration.
- 5- The students will be able to prepare the student for future work as a clinical pharmacist, to deal with pharmacokinetics calculations that are applied in the clinical setting, in the hospital



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

Intended Learning Outcomes:

Following the successful completion of this course, the student should be able to:

A. Knowledge and understanding:

- A1. Describe the physiological determinants of the primary pharmacokinetic parameters of clearance, the volume of distribution and half-life.
A2. Understand the difference between compartmental and non-compartmental analysis.

B. Subject-specific skills:

- B1. Calculate the pharmacokinetic parameters from plasma concentration-time plot and/or urinary data.
B2. Calculate a modified dosage regimen for a patient based on the physiological changes brought about by disease or concomitant drug therapy.

C. Cognitive and Intellectual skills:

- C1. The cumulative understanding of all the aforementioned fundamental pharmacokinetic principles and quantitative relationships will be used to design dosage regimens, evaluate pharmacologic response, select a particular route of drug administration, determine the frequency of administration, identify patient factors which require a modification of normal drug dosing regimen

D. Transferable Skills:

Not applicable

Teaching and Learning Methods:

Development of ILOs is promoted through the following teaching and learning methods:

ILOs	Learning Methods	Evaluation Methods
Eg. A1 & A2	Eg. Lectures (to explain the theoretical knowledge for each topic)	Exams
Eg. B1 & B2	Eg. Solving mathematical problem with the student	Exams and in-class discussion
Eg. C1	Eg. Case discussion (to apply the knowledge to solve patient cases) And home works	Exams and in-class discussion

Fax:5232899 _ Amman – Jordan _ Tel :5609999

Form code: UF 130/1

Resolution number24/233

Accreditation date: 31/01/2018



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy of Applied Science Private University is Certified by the Accreditation Council for Pharmacy Education



المستوى الذهبي

جامعة كل العرب

Course Content:

Week	Date	Lecture number	Topic's Details	Exams/ /quizes/ holidays	Main Reference (chapter)	ILOs achieved
1,2	18-27/10/2020	1-4	Introduction and overview Important definitions and descriptions, Sites of drug administration, Review of ADME processes, Pharmacokinetic models, Rate processes		1	A1, A2
3,4	29/10-10/11-2020	5-8	One-Compartment Open Model: Intravenous Bolus Administration The apparent volume of distribution, The elimination half-life ($t_{1/2}$), The elimination rate constant (K or K_{el}), Plotting drug concentration versus time, Intravenous bolus administration: monitoring drug in urine, Use of urinary excretion data		3	A1, B1, B2, C1
5	12-17/11/2020	9-10	One-Compartment Open Model: Continuous intravenous infusion Monitoring drug in the body or blood, Sampling drug in body or blood during infusion, Sampling blood following cessation of infusion, Use of post-infusion plasma concentration data to obtain half-life, elimination rate constant and the apparent volume of distribution		10	A1, B1, B2, C1
First Exam						
6,7	19/11-1/12/2020	11-14	Extravascular routes of drug administration Drug remaining to be absorbed, Determination of elimination half-life ($t_{1/2}$) and elimination rate constant (K or K_{el}), Absorption rate constant (K_a), Lag time (t_0), Some		6	A1, B1, B2, C1

Fax:5232899 _ Amman – Jordan _ Tel :5609999

Form code: UF 130/1

Resolution number24/233

Accreditation date: 31/01/2018



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy of Applied Science Private University is Certified by the Accreditation Council for Pharmacy Education



المستوى الذهبي

جامعة كل العرب

			important comments on the absorption rate constant, The apparent volume of distribution (V), Time of maximum drug concentration, peak time (t_{max}), Maximum (peak) plasma concentration (C_p) _{max} , Example for the extravascular route of drug administration, Flip-flop kinetics			
8,9	3-15/12/2020	15-18	Multiple dosing: intravenous bolus administration Useful pharmacokinetic parameters in multiple dosing, Designing or establishing the dosage regimen for a drug, Concept of drug accumulation in the body (R), Determination of fluctuation (F): intravenous bolus administration, Number of doses required to reach a fraction of the steady-state condition, Calculation of loading and maintenance doses, Maximum and minimum drug concentration at steady state	11	A1, B1, B2, C1	
Second exam						
10&11	17-29/12/2020	19-22	Multiple dosing: extravascular routes of drug administration The peak time in multiple dosing to steady-state (t_{max}), Maximum, minimum, and average plasma concentration at steady state, Determination of drug accumulation, Calculation of fluctuation factor (F), Number of doses required reaching a fraction of steady-state, Determination of loading and maintenance dose, Interconversion between loading, maintenance, oral and intravenous bolus doses	12	A1, B1, B2 & C1	



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

12, 13	31/12/2020- 7/1/2021	23-25	Two-Compartment Open Model: Intravenous Bolus Administration Determination of the post-distribution rate constant (β) and the coefficient (B), Determination of the distribution rate constant (α) and the coefficient (A), Determination of micro rate constants, Determination of volumes of distribution	13	A1, A2, B1, B2 & C1
13,14	12-19/1/2021	26-28	Clearance concepts Clearance definitions, Clearance: rate and concentration, Organ clearance, Physiological approach to clearance, Estimation of systemic clearance, Calculating renal clearance (Cl _r) and metabolic clearance (Cl _m), Determination of the area under the plasma concentration versus time curve: application of the trapezoidal rule, Elimination mechanism, Use of creatinine clearance to determine renal function	4	A1, B1, B2 & C1
Final exam					

Grade Distribution:

Your course grade will be determined by the following:

Assessment Method	% of Final Grade	Due Date
Quizzes	15	To be announced
Second exam	35	To be announced
Final exam	50	To be announced

* Provisional dates are scheduled in the course schedule.

Distribution of examination material (may vary depending on material included):

Example:

Fax:5232899 _ Amman – Jordan _ Tel :5609999

Form code: UF 130/1

Resolution number24/233

Accreditation date: 31/01/2018



Amman- Jordan

ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

Course Policies:

A- Attendance policies:

Attendance: Mandatory.

First warning – with 3 absences

Last warning – with 4 absences

Failing in the subject – with 5 absences

B- Absences from exams and handing in assignments on time:

Will result in zero achievements unless a health report or other significant excuse is documented.

C- Health and safety procedures: NA

D- Honesty policy regarding cheating, plagiarism, misbehavior:

The participation, the commitment of cheating will lead to applying all following penalties together

1. Failing the subject, he/she cheated at
2. Failing the other subjects taken in the same course
3. Not allowed to register for the next semester. The summer semester is not considered as a semester

E- Grading policy:

Exams and Quizzes.

Quizzes	15 points
Midterm exam:	35 points
Final Exam:	50 points
Total:	<u>100 points</u>

F- Available university services that support achievement in the course:

Classrooms, internet classes, ASU online web site (messages, assignment, and notes), **Microsoft teams**

24. Required equipment:

Data show, calculator

Make-up Exam Policy:

Make-up exams will be offered for valid reasons. They may be different from regular exams, both in content and format.

Textbooks information:

Main Reference:

Basic Pharmacokinetics. Sunil S. Jambhekar and Philip J. Breen. Second edition, 2012.

Other References:



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

Applied Biopharmaceutics and Pharmacokinetics. By Leon Shargel, Susanna Wu-Pong, and Andrew Yu, 7th edition, 2012

Additional information:

No side talks during a lecture

No mobile phones during lecture

Entering the lecture theatre after the instructor is not permitted.

Homework should be done by students independently and will be asked at the exams

Course Material and Announcements


Students need to use the e-learning page at the ASU website in order to get all lecture handouts and guidelines which will be uploaded there.

In addition, course-related announcements and exam results will be posted on the ASU online AND/OR course website and are the responsibility of each student to check the sites regularly.

Name of Course Coordinator: Dr. Muna Barakat Signature: 

Date: 4-10-2020

Head of curriculum committee: Reem Abutayeh Signature: 

Head of Department: Dr. May Abu Taha Signature: 



Dean: _____ Signature: _____

Copy to:

Head of Department
Head of the curriculum committee
Course File

Fax: 5232899 _ Amman - Jordan _ Tel : 5609999

Form code: UF 130/1

Resolution number 24/233

Accreditation date: 31/01/2018



ASU
APPLIED SCIENCE PRIVATE UNIVERSITY



Amman- Jordan

عمان - الأردن



كلية الصيدلة
Faculty Of Pharmacy



The Bachelor Degree in Pharmacy
of Applied Science Private
University is Certified by the
Accreditation Council for Pharmacy
Education



المستوى الذهبي

جامعة كل العرب

C 26 / version 3

Date:

رقم اجراء الخطة الدراسية 19 (29 UF) QP