



## Syllabus: Pharmacokinetics (#1917021343) First/Second Semester 202./202.

COURSE INFORMATION	
<b>Course Name:</b> Pharmacokinetics <b>Learning method:</b> Face-to-face education <b>Semester:</b> First/Second <b>Department:</b> Clinical Pharmacy & Pharmacy Practice <b>Faculty:</b> Pharmaceutical Sciences	<b>Course Code:</b> 1917021343 <b>Section:</b> As per semester <b>Core Curriculum:</b> 2013 <b>Study Plan</b> <b>JNQF Level:</b> 7
<b>Day(s) and Time(s):</b> According to the HU courses timetable/semester <b>Classroom:</b> As per semester <b>Date prepared:</b> January 2020 <b>Date updated:</b> February 2023	<b>Credit Hours:</b> 3 <b>Prerequisites:</b> 1317011342 <b>(Biopharmaceutics)</b>
COURSE DESCRIPTION	
<p>This course focuses on basic pharmacokinetic principles, discusses the time concentration curve, and aims to teach students how to calculate drug levels in the blood and the urine after various administrations (IV bolus, IV infusions, single dosing, and multiple dosing) by solving various practice problems.</p>	
DELIVERY METHODS	
<p>The course will be delivered through a combination of active learning strategies. These include:</p> <ul style="list-style-type: none"> <li>• PowerPoint lectures and active classroom-based discussion</li> </ul> <p>Students will be encouraged to participate and be actively involved in the learning process. Lectures will start with questions to inquire about the students' prior knowledge of the topic. These questions will also be repeated at the end of the lecture to gain insight into the students' competences (to verify whether students have understood the topic). During delivering the lecture presentation, time will be given to allow students to reflect about what they have learnt and think in and discuss some examples of short case studies.</p>	

## FACULTY INFORMATION

<b>Names</b>	1- Dr. Khaled Jamal Alrosan. 2- Dr. Amjad Zuhier Alrosan
<b>Academic Title:</b>	Assistant Professors
<b>Office Location:</b>	Third Floor
<b>Telephone Number:</b>	Extensions:
<b>Email Address:</b>	1- <a href="mailto:kalrosan@hu.edu.jo">kalrosan@hu.edu.jo</a> 2- <a href="mailto:amjadz@hu.edu.jo">amjadz@hu.edu.jo</a>
<b>Office Hours:</b>	As announced per semester  <i>Please send an e-mail (as mentioned above) to meet at any other time.</i>

## REFERENCES AND LEARNING RESOURCES

### **Required Textbook(s):**

1. **Applied Biopharmaceutics & Pharmacokinetics**, 6th edition, 2012, Leon Shargel, Susanna Wu-Pong, Andrew Yu.
2. **Basic Pharmacokinetics**, 2<sup>nd</sup> edition, 2012, Sunil S. Jambhekar and Philip J. Breen P. ISBN 978 0 85369 980 4. Great Britain by TJ International, Padstow, Cornwall.

### **Suggested Additional Resources:**

3. **Range and Dale's Pharmacology E-book**, 2020.

### **Useful Web Resources:**

<https://www.boomer.org/c/p4>

## COURSE OBJECTIVES

After course completion, students will be able to:

1. To provide the student with the required information about the role of pharmacists in drug monitoring and designing dosing regimens by relating plasma concentration of drugs to their pharmacological and toxicological action.
2. To introduce the student to the basic mathematical skills related to pharmacokinetics.

## COURSE INTENDED LEARNING OUTCOMES (CILOs)

### A. Foundational Knowledge

When students have completed the program, they will have knowledge and understanding of the following:

**A.1.1** The student should gain several competencies in understanding the time course of Absorption, Distribution, Metabolism, and Excretion (ADME) of drugs in the body.

**A.1.2** The student should understand the concept of individualization of therapy and therapeutic drug monitoring

**A.1.3** Identify the difference between different compartmental models that demonstrated the human body's drug movement after administration.

**B. Essential for Practice and Care (Intellectual Skills):** When students have completed the course, they will be able to:

**B.1** Become a health care provider who's able to provide patient-centered care as the medication expert and as a dosage regimen designer, includes: collecting and interpreting evidence about dosage forms and drug's concentration-time profile, in addition to prioritizing, formulating assessments and recommending, implementing, and monitoring medications).

**B.2** Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness related to medications. Describe how population-based care influences patient-centered care and the development of practice guidelines and evidence-based best practices.

**C. Approach to Practice Pharmacy:** When students have completed the program, they will be able to:

**C.1** Identify problems; explore and prioritize potential strategies; design, implement, and evaluate viable solutions-related drug regimens. **(Problem solver)**

**C.1 Patient Advocacy (Advocate)** - Assure that patients' best interests regarding drug administration from different dosage forms.

**C.3 Educator (Educator)** – Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding regarding various medication dosage forms.

**C.4 Communication (Communicator)** – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization regarding various medication dosage forms

**C.5 (Collaborator)** – Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs

**D. Personal and Professional Development:** When students have completed the course they will be able to:

**D.1** The student should be able to calculate and develop dosing regimens for specified drug administration drug cases

**D.2** Self-awareness (Self-aware) – Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth regarding his role as a pharmacist, the medication expert and health care provider concerning the effective dose regimens

**D.3** Professionalism (Professional) - Exhibit behaviors and values that are consistent with the trust given to the profession of pharmacy by patients, other healthcare providers, and society.

## ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate, and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

**Special Needs Section:**

**Tel:** 00962-5-3903333 **Extension:** 4209

**Location:** Students Affairs Deanship/ Department of Student Welfare Services

**Email:** [amalomoush@hu.edu.jo](mailto:amalomoush@hu.edu.jo)  
[amalomoush@staff.hu.edu.jo](mailto:amalomoush@staff.hu.edu.jo)

### ***Participation***

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance.* It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

Sharing of course materials is forbidden. No course material including, but not limited to, course outline, lecture hand-outs, videos, exams, and assignments may be shared online or with anyone outside the class. Any suspected unauthorized sharing of materials will be reported to the university's Legal Affairs Office. If a student violates this restriction, it could lead to student misconduct procedures.

### ***Plagiarism***

Plagiarism is considered a serious academic offense and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of the Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

**The instructor has the right to fail the coursework or deduct marks where plagiarism is detected**

### ***Student Complaints Policy***

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

## ***Others***

- At the beginning of the lectures, be on time and don't leave before the end of the lecture without an acceptable excuse.
- If you missed a class, it is your responsibility to find out about any announcements or assignments you have missed.
- For any clarification, please communicate with your instructor at his posted office hours or by appointment.
- Switch off your mobile or keep it silent throughout the lecture.
- Listen well to the lecture and avoid side discussions, if you have a question, ask your instructor and not your colleague.
- Exams are scheduled to be given three times throughout the semester; you are expected to attend all. If not, make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.
- Cheating, academic misconduct, fabrication, and plagiarism will not be tolerated, and the university policy will be applied.

## **COURSE ASSESSMENT**

### ***Course Calendar and Assessment***

Students will be graded through the following means of assessment:

<b>Assessment</b>	<b>Grade Weighting</b>	<b>Deadline Assessment</b>
First Exam	30%	~ 6 <sup>th</sup> week
Second Exam	30%	~ 10 <sup>th</sup> week
Final Exam	40%	~ 15 <sup>th</sup> /16 <sup>th</sup> week

### ***Description of Exams***

Test questions will predominately come from the material presented in the lectures. Semester exams will be conducted during the regularly scheduled lecture period. The exam will consist of a combination of multiple-choice, true and false, and/or short answers.

No make-up exams will be given. Only documented absences will be considered as per HU guidelines. Make-up exams may be different from regular exams in content and format.

Grades are not negotiable and are awarded according to the following criteria\*:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

## WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

*“Lecture hours and weeks are approximate and may change as needed”*

*Note: For the 2 lecture periods per week (S/T, M/W), one lecture period covers 2 hours (120 minutes). The course content specifies chapters of the textbook that will be included in exams.*

*70-80% of the lectures are delivered by face-to-face learning.*

Course Content					
Week Number	No. of Hours	CILOs	Subject	Delivery Methods	Assessment Methods
1	3	A B C	<u>Introduction, PK model and PK calculations</u>	Active Classroom- Based Discussions  PowerPoint Lectures	Exams  Oral questions by choosing students to answer

				Relevant Videos	randomly (with no mark).
2-3	5.5	A B C D	<u>One compartment open model (IV bolus)</u>	PowerPoint Lectures  Active Classroom-Based Discussions  Relevant Videos	Exams  Oral questions by choosing students to answer randomly (with no mark).
3	1.5	A B C D	<u>IV bolus: Calculation of k from urinary excretion data</u>	PowerPoint Lectures  Active Classroom-Based Discussions  Relevant Videos	Exams  Oral questions by choosing students to answer randomly (with no mark).
4	3	A B C D	<u>Intravenous Infusion</u>	PowerPoint Lectures  Active Classroom-Based Discussions  Relevant Videos	Exams  Oral questions by choosing students to answer randomly (with no mark).
5-6	6	A B C D	<u>Pharmacokinetics of oral absorption</u>	PowerPoint Lectures  Active Classroom-	Exams  Oral questions by choosing



				Based Discussions Relevant Videos	students to answer randomly (with no mark).
7	1.5	A B C D	<b><u>Oral route: Calculation of k from urinary excretion data</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
7	1.5	A B C D	<b><u>Bioavailability and bioequivalence</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
8	3	A B C D	<b><u>Multiple dosage regimen</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
9	1.5	A B C D	<b><u>Dosage regimen design</u></b>	PowerPoint Lectures Active Classroom-	Exams Oral questions by choosing

				Based Discussions Relevant Videos	students to answer randomly (with no mark).
<b>9</b>	<b>1.5</b>	<b>A B C D</b>	<b><u>Dosing adjustment</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
<b>10</b>	<b>3</b>	<b>A B C D</b>	<b><u>Two compartment open model (IV bolus)</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
<b>11</b>	<b>1.5</b>	<b>A B C D</b>	<b><u>Multi-compartmental IV bolus</u></b>	PowerPoint Lectures Active Classroom-Based Discussions Relevant Videos	Exams Oral questions by choosing students to answer randomly (with no mark).
<b>11</b>	<b>1.5</b>	<b>A B C D</b>	<b><u>Non-linear PK</u></b>	PowerPoint Lectures Active Classroom-Based Discussions	Exams Oral questions by choosing students to answer

				Relevant Videos	randomly (with no mark).
12,13	6	B C D	<u>Several practice on calculations for oral and IV administration</u>	PowerPoint Lectures  Active Classroom-Based Discussions  Relevant Videos	Exams  Oral questions by choosing students to answer randomly (with no mark).
14			<u>University Final Exams</u>		