



**The University of Jordan**

**Accreditation & Quality Assurance Center**

# **COURSE Syllabus**

1	Course title	<b>Pharmacokinetics</b>
2	Course number	<b>1203475</b>
3	<b>Credit hours (theory, practical)</b>	<b>2 (theory)</b>
	<b>Contact hours (theory, practical)</b>	<b>2 (theory)</b>
4	Prerequisites/corequisites	<b>1203741 (Biopharmaceutics)</b>
5	Program title	<b>Pharmacy and PharmD</b>
6	Program code	
7	Awarding institution	<b>The University of Jordan</b>
8	Faculty	<b>Pharmacy</b>
9	Department	<b>Biopharmaceutics &amp; Clinical Pharmacy</b>
10	Level of course	<b>undergraduate</b>
11	Year of study and semester (s)	<b>Second semester of the 4<sup>th</sup> year</b>
12	Final Qualification	<b>Pharmacy, PharmD</b>
13	Other department (s) involved in teaching the course	<b>Pharmaceutical Sciences &amp; Pharmaceutics</b>
14	Language of Instruction	<b>English</b>
15	Date of production/revision	<b>1 September 2015</b>

#### 16. Course Coordinator:

**Office numbers, office hours, phone numbers, and email addresses should be listed.**

**Prof. Mutasim Al-Ghazawi, PhD.**

<http://eacademic.ju.edu.jo/alghazam/default.aspx>

Office 138

Phone 5355 000, Ext. 23352.

E-mail: alghazam@ju.edu.jo

Office hours: Sunday 1:00-2:00, Monday and Wednesday 3-4

#### 17. Other instructors:

*Office numbers, office hours, phone numbers, and email addresses should be listed.*

1) Prof. Rana Abu Dahab

Office 133

Phone 5355 000, Ext. 23353.

E-mail: abudahab@ju.edu.jo

Office hours to be announced

2) Dr. Mohammad Saleh

Office 130

Phone 5355 000, Ext. 23347.

E-mail: moh.saleh@ju.edu.jo

Office hours: Sunday: 1:00-2:00 PM and Monday: 12:00-1:00 PM

**18. Course Description:**

*As stated in the approved study plan.*

Study of the pharmacokinetic concepts, terminology, models, factors affecting drug absorption, distribution, metabolism, excretion and its importance in drug activities and side effects. Emphasis will be placed upon the prediction of plasma levels of drugs under varying conditions applying different pharmacokinetic parameters.

**19. Course aims and outcomes:**

**A- Aims:**

- 1) Understanding and estimating pharmacokinetic parameters.
- 2) Prediction of concentrations at different times.
- 3) Designing dosing regimens by relating plasma concentration of drugs to their pharmacological and toxicological action,
- 4) Understanding the concept of therapeutic drug monitoring.

**B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...****A) Knowledge and understanding**

- A1) Understanding mathematics of the time course of Absorption, Distribution, Metabolism, and Excretion (ADME) of drugs in the body.
- A2) Individualization of therapy and therapeutic drug monitoring.

**B) Intellectual skills (cognitive and analytical)**

- B1) Utilization of mathematics of the time course of Absorption, Distribution, Metabolism, and Excretion (ADME) of drugs in the body for dosage optimization.
- B2) Developing dosing regimens for the individualization of therapy for the patient

**C) Subject specific skills**

- C1) Fitting concentration time profiles and estimating pharmacokinetic parameters.
- C2) Adjusting dosing regimens in case of renal and hepatic dysfunction.

**D) Transferable Skills**

- D1) Communicating dosage adjustment with physicians and patients.
- D2) Suggesting therapeutic monitoring plans for clinicians.

**Program Competencies Achieved:**

- 1.2 Identify available originator brands of medicines and their alternative generic products
- 1.4 Identify different routes of administration of medicines
- 1.13 Advise patients on proper storage, usage and adherence of dispensed medicines
- 2.4 Identify drug-drug and drug-food interactions of medicines
- 2.5 Identify basic principles of drug pharmacokinetics and recognize disease conditions and other factors that interfere with safety and efficacy of medicines
- 2.9 Advise patients and other health professionals on proper usage of medicines including their strength, frequency, dosage form and route of administration
- 3.6 Demonstrate the ability to perform pharmaceutical calculations
- 5.1 Communicate effectively with patients and other healthcare professionals
- 5.7 Build positive relationships with patients and other healthcare professionals
- 6.1 Identify valid and up-to-date drug laws and regulations
- 6.2 Identify the principles of drug registration process
- 7.1 Engage in continuing professional development
- 7.2 Identify self-limitations and act upon them
- 7.4 Follow new advances in science related to the profession
- 7.5 Utilize information technology tools to enhance working experience

**20. Topic Outline and Schedule:**

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction	<b>1</b>	All	A1-2,C1	Exams, Quizes	<b>Shargel</b>
The one-compartment open model with an intravenous bolus dose; plasma data	<b>2</b>	<b>All</b>	A1-2, B1, C1	Exams, Quizes	Shargel
The one-compartment open model with an intravenous bolus dose; urinary data	<b>3</b>	<b>All</b>	A1-2, B1, C1	Exams, Quizes	Shargel
The one-compartment open model with an intravenous infusion	<b>4</b>	<b>All</b>	A1-2, B1, C1	Exams, Quizes	Shargel
The one-compartment open model with First-order absorption	<b>5</b>	<b>All</b>	A1-2, B1, C1	Exams, Quizes	Shargel
The one-compartment open model with multiple dosing kinetics	<b>6-7</b>	<b>All</b>	A1-2, B1-2, C1	Exams, Quizes	Shargel
Designing dosing regimens	<b>8-9</b>	<b>All</b>	B1, C1	Exams, Quizes	Shargel
Dosage adjustment in renal failure and hepatic dysfunction	<b>10</b>	<b>All</b>	A1, B1, C1, C2, D1	Exams, Quizes	Shargel
The two-compartment open model with intravenous administration	<b>11</b>	<b>All</b>	A1, B1,C1	Exams, Quizes	Shargel
Non-linear pharmacokintics	<b>12</b>	<b>All</b>	C1-2, D1-2	Exams, Quizes	Shargel

Pharmacodynamics	13	All	A2, B2	Exams, Quizes	Shargel
Therapeutic Drug Monitoring	14	All	A2, B2, D1-2	Exams, Quizes	Shargel
Bioequivalence	15	All	B1, C1	Exams, Quizes	Shargel
Final Exam	16				

## 21. Teaching Methods and Assignments:

<b>Development of ILOs is promoted through the following teaching and learning methods:</b>		
<b>ILO/s</b>	<b>Learning Methods</b>	<b>Evaluation Methods</b>
<b>A1-2, B1-2, C1-2, D1-2</b>	Lectures Case studies Computer-aided learning (PK-Sim)	Exams, Quizzes

Learning skills:

1. Critical thinking
2. Digital literacy
3. Problem-solving skills
4. Computer-aided curve fitting
5. Computer-aided calculations

## 22. Evaluation Methods and Course Requirements:

<b>Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:</b>
<ol style="list-style-type: none"> <li>1. Exams</li> <li>2. Quizzes</li> <li>3. Students reports on assignments</li> </ol>

## 23. Course Policies:

<p>A- Attendance policies:</p> <p>Attendance: Mandatory.</p> <p><b>First warning</b> – with 3 absences</p> <p><b>Last warning</b> – with 4 absences</p> <p>Failing in the subject – with 5 absences</p> <p>B- Absences from exams and handing in assignments on time:</p> <p>Will result in zero achievement unless health report or other significant excuse is documented.</p>
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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.

Mid Exam:	40 points
Quizz	10 points
Final Exam:	50 points
Total	100 points

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

Classrooms, internet classes:

## 24. Required equipment:

Datashow and internet connection

## 25. References:

A- Required book (s), assigned reading and audio-visuals:

- 1) Applied biopharmaceutics and pharmacokinetics, Shargel and Yu, 7<sup>th</sup> edition, 2016

B- Recommended books, materials, and media:

- 1- Clinical pharmacokinetics: concepts and applications  
Rowland and Tozer, 4<sup>th</sup> edition, 2011.
- 2) A First Course in Pharmacokinetics and Biopharmaceutics  
<http://www.boomer.org/c/p1/>



**26. Additional information:**

The course can be successfully completed with your current skills and background. It is not difficult **IF** (and that is a big IF) taken slowly, in small bites. Its just like eating an elephant-you cannot do it all in one sitting.

Name of Course Coordinator: Mutasim Al-Ghazawi

Signature:

Date:

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Assurance

Copy to:

Head of Department

Assistant Dean for Quality

Course File