**Course Syllabus**

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| **1** | **Course title** | Pharmacokinetics |
| **2** | **Course number** | 1203475 |
| **3** | **Credit hours** | 2 (theory) |  |
| **Contact hours (theory, practical)** | 2 (theory) |
| **4** | **Prerequisites/corequisites** | 1203741 (Biopharmaceutics) |
| **5** | **Program title** | Pharmacy and PharmD |
| **6** | **Program code** |  |
| **7** | **Awarding institution**  | The University of Jordan |
| **8** | **School** | Pharmacy |
| **9** | **Department** | Biopharmaceutics & Clinical Pharmacy |
| **10** | **Course level**  | Undergraduate  |
| **11** | **Year of study and semester (s)** | 4th , 1st semester |
| **12** | **Other department (s) involved in teaching the course** |  |
| **13** | **Main teaching language** | English |
| **14** | **Delivery method** | X Face to face learning ☐Blended ☐Fully online |
| **15** | **Online platforms(s)** | ☐Moodle X Microsoft Teams ☐Skype ☐Zoom  |
| **16** | **Issuing/Revision Date** | Oct, 10, 2021 |

**17 Course Coordinator:**

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| Name: Dr. Mutasim Al-Ghazawi, Prof. Contact hours: Sun, Tue ((9:30-10:30) Mon, Wed (12:30-13:30)Office number: 138 Phone number: 23352Email :alghazam@ju.edu.jo |

**18 Other instructors:**

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| Name: Office number:Phone number:Email:Contact hours: |

**19 Course Description:**

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| 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. |

**20 Course aims and outcomes:**

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| 1. Aims:
2. Understanding and estimating pharmacokinetic parameters.
3. Prediction of concentrations at different times.
4. Designing dosing regimens by relating plasma concentration of drugs to their

pharmacological and toxicological action,1. Understanding the concept of therapeutic drug monitoring.

B- Students Learning Outcomes (SLOs): Upon successful completion of this course, students will be able to:1. **Describe** the physiological determinants of the primary pharmacokinetic parameters of clearance and volume of distribution.
2. **Determine** primary and secondary pharmacokinetic parameters from concentration-time data.
3. **Design** a pharmacokinetically-based dosage regimen for an individual patient.
4. **Modify** a dosage regimen for a patient based on the physiological changes brought about by disease or concomitant drug therapy.
5. **Apply** pharmacokinetic concepts to a particular drug therapy to solve relevant problems in pharmaceutical care.
6. **Differentiate** between linear and non-linear Pharmacokinetics.
7. **Understand** the concept of bioequivalence and the different guidelines for its evaluation.
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**21. Topic Outline and Schedule:**

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| **Week** | **Lecture** | **Topic** | **Teaching Methods\*/platform** | **Evaluation Methods\*\*** | **References** |
| 1 | 1.1 | Introduction |  Face-to-Face | Exams, Quizzes | Shargel |
| 1.2 | Introduction | Face-to-Face | Exams, Quizzes | Shargel |
| 2 | 2.1 | The one-compartment open model with an intravenous bolus dose; plasma data | Face-to-Face | Exams, Quizzes | Shargel |
| 2.2 | The one-compartment open model with an intravenous bolus dose; plasma data | Face-to-Face | Exams, Quizzes | Shargel |
| 3 | 3.1 | The one-compartment open model with an intravenous bolus dose; Case studies | Face-to-Face | Exams, Quizzes | Shargel |
| 3.2 | The one-compartment open model with an intravenous bolus dose; urinary data | Face-to-Face | Exams, Quizzes | Shargel |
| 4 | 4.1 | The one-compartment open model with an intravenous infusion | Face-to-Face | Exams, Quizzes | Shargel |
| 4.2 | The one-compartment open model with an intravenous infusion | Face-to-Face | Exams, Quizzes | Shargel |
| 5 | 5.1 | The one-compartment open model with First-order absorption  | Face-to-Face | Exams, Quizzes | Shargel |
| 5.2 | The one-compartment open model with First-order absorption  | Face-to-Face | Exams, Quizzes | Shargel |
| 6 | 6.1 | The one-compartment open model with First-order absorption-Urinary data | Face-to-Face | Exams, Quizzes | Shargel |
| 6.2 | Multiple dosing- Principle of superposition | Face-to-Face | Exams, Quizzes | Shargel |
| 7 | 7.1 | The one-compartment open model with multiple dosing kinetics-IV | Face-to-Face | Exams, Quizzes | Shargel |
| 7.2 | The one-compartment open model with multiple dosing kinetics-IV | Face-to-Face | Exams, Quizzes | Shargel |
| 8 | 8.1 | The one-compartment open model with multiple dosing kinetics-Extravascular | Face-to-Face | Exams, Quizzes | Shargel |
| 8.2 | Designing dosing regimens | Face-to-Face | Exams, Quizzes | Shargel |
| 9 | 9.1 | Designing dosing regimens | Face-to-Face | Exams, Quizzes | Shargel |
| 9.2 | Dosage adjustment in renal failure and hepatic dysfunction | Face-to-Face | Exams, Quizzes | Shargel |
| 10 | 10.1 | Dosage adjustment in renal failure and hepatic dysfunction | Face-to-Face | Exams, Quizzes | Shargel |
| 10.2 | The two-compartment open model with intravenous administration | Face-to-Face | Exams, Quizzes | Shargel |
| 11 | 11.1 | The two-compartment open model with intravenous administration | Face-to-Face | Exams, Quizzes | Shargel |
| 11.2 | Non-linear pharmacokinetics | Face-to-Face | Exams, Quizzes | Shargel |
| 12 | 12.1 | Non-linear pharmacokinetics | Face-to-Face | Exams, Quizzes | Shargel |
| 12.2 | Non-linear pharmacokinetics | Face-to-Face | Exams, Quizzes | Shargel |
| 13 | 13.1 | Non-linear pharmacokinetics | Face-to-Face | Exams, Quizzes | Shargel |
| 13.2 | Pharmacodynamics | Face-to-Face | Exams, Quizzes | Shargel |
| 14 | 14.1 | Pharmacodynamics | Face-to-Face | Exams, Quizzes | Shargel |
| 14.2 | Bioequivalence | Face-to-Face | Exams, Quizzes | Shargel |
| 15 | 15.1 | Bioequivalence | Face-to-Face | Exams, Quizzes | Shargel |
| 15.2 | Therapeutic Drug Monitoring | Face-to-Face | Exams, Quizzes |   |

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**22 Evaluation Methods:**

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| Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

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| **Evaluation Activity** | **Mark** | **Topic(s)** | **Period (Week)** | **Platform** |
|  Quiz (1) |  10 |  Introduction & one comp. IV bolus |  4 |  |
|  Midterm  |  30 |  All material up to the end of 6th week |  7-8 |   |
|  Quiz (2) |  10 |  Two-Comp model |  12 |  |
| Final | 50 | All material | 16 |  |
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**23 Course Requirements**

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| **(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):** **internet connection, smart device or computer** |

**24 Course Policies:**

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| A- Attendance policies:Attendance: Mandatory.***First warning*** – with 3 absences***Last warning*** – with 4 absencesFailing in the subject – with 5 absencesB- Absences from exams and handing in assignments on time:Will result in zero achievement unless health report or other significant excuse is documented.C- Health and safety procedures:NAD- Honesty policy regarding cheating, plagiarism, misbehaviour:The participation, the commitment of cheating will lead to applying all following penalties together1) Failing the subject he/she cheated at2) Failing the other subjects taken in the same course3) Not allowed to register for the next semester. The summer semester is not considered as a semesterE- Grading policy:Exams and Quizzes. Mid Exam:30 pointsQuizzes 20 points Final Exam: 50 pointsTotal 100 pointsF- Available university services that support achievement in the course:1. Electronic library
2. Access Pharmacy
3. Internet
4. Pharmacokinetics Computer Lab.
5. Pharmacokinetic Simulation (software)
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**25 References:**

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| A- Required book(s), assigned reading and audio-visuals:1. Applied biopharmaceutics and pharmacokinetics, Shargel and Yu, 7th edition, 2016

B- Recommended books, materials and media: 1)Basic pharmacokinetics by Sunil S. Jambhekar and Philip J. Breen 2nd edition,20122)Basic Pharmacokinetics and Pharmacodynamics\_ An Integrated Textbook and Computer Simulations by Sara E. Rosenbaum, 2nd edition, 2016 3) A First Course in Pharmacokinetics and Biopharmaceutics <http://www.boomer.org/c/p1/> 4) Basic pharmacokinetics  https://www.boomer.org/c/p4/index.php?Loc=Visitor |

**26 Additional information:**

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Name of Course Coordinator: Mutasim A. Al-Ghazawi Signature: ----------------------- Date: Oct, 10, 2021

Head of Curriculum Committee/Department: ---------------------------- Signature: ------------------------------------

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

Head of Curriculum Committee/Faculty: ---------------------------------------- Signature: ---------------------------

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