**Course Description**

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| **Faculty** | **Pharmacy** |
| **Department**  | **Pharmaceutics and Pharmaceutical Technologies** | **Level** |  |
| **Course**  | **Biopharmaceutics and pharmacokinetics** | **Code** | **1701400** | **Prerequisite** | 1701302 |
| **Credit hours** | 2 | **Theoretical**  |  | **Practical** | 1701401 |
| **Coordinator** | Rehan Al kasasbeh | **Email** |  |
| **Teachers** | Rawan al karaki | **Emails** |  |
| **Lecture Time** |  | **Place** |  | **Attendance mode** |  |
| **Semester**  |  | **Preparation date**  |  | **Modification Date** |  |

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|  **Abstracted Course Description**  |
| This course will introduce students to the basic concepts and principles pharmacokinetics. Pharmacokinetics describes the processes involved in the Absorption of a drug (from its site of administration into the blood circulation, Distribution of the drug to its sites of action, Metabolism of the drug, and its subsequent Excretion of the drug from the body (ADME). Processes that influence the pharmacokinetics of drugs, including formulation, physico-chemical, physiological, pharmacological and pathological factors will be discussed. The use of mathematical equations to describe the pharmacokinetic concepts and principles of drug action are introduced and applied to dosage regimen determinations. |
| **Course Goals** |
| * To provide students with a strong foundation in the principles of pharmacokinetics.
* To understand the processes involved in drug absorption, distribution, metabolism, and excretion (ADME).
* To analyze the factors influencing drug pharmacokinetics, including formulation and physiological aspects.
* To apply mathematical equations to determine dosage regimens for optimal drug therapy.
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| **CILOs** |
| **Knowledge** |
| a1. Comprehend the fundamental principles of pharmacokinetics.a2. Understand the processes of drug absorption, distribution, metabolism, and excretion (ADME).a3. Identify the factors affecting drug pharmacokinetics, including formulation, physiological aspects, and pathology. . |
| **Skills** |
| b1. Apply pharmacokinetic principles to predict drug behavior in the body.b2. Analyze the impact of different formulations on drug absorption.b3. Calculate dosage regimens based on pharmacokinetic parameters.. |
| **Competencies** |
| c1. Apply pharmacokinetic concepts to optimize drug therapy.c2. Assess the influence of various factors on drug pharmacokinetics.c3. Develop effective dosage regimens for specific drug treatments.. |
| **Learning Methods** |
| * Lectures and discussions on pharmacokinetic principles and processes
* Problem-solving exercises and case studies
* Application of mathematical equations for dosage regimen determinations
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| **Evaluation Tools** |
| Quizzes, Midterm exam, Final Exam |
| **Week** | **Topics** | **Learning methods** | **Evaluation tool** | **ILOs** | **Hours** |
| **1.** | Introduction | Lecture material and notes | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **2.** | The one-compartment open model with an intravenous bolus dose; plasma data | Homework and Projects, Presentation, … | Assignments, | **A2,a3,b1,b3,c2,c3** | **3** |
| **3.** | The one-compartment open model with an intravenous bolus dose; Case studies, and urinary data | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **4.** | The one-compartment open model with an intravenous infusion | Homework and Assignments, Projects, Presentation, … | Exams | **A1,a2,b1,b2,c1** | **3** |
| **5.** | The one-compartment open model with First-order absorption  | Lecture material and notes  | Exams | **A1,a2,b1,b2,c1** | **3** |
| **6.** | The one-compartment open model with First-order absorption-Urinary data | Lecture material and notes  | Exams | **A1,a2,b1,b2,c1** | **3** |
| **7.** | Multiple dosing- Principle of superposition | Homework and Assignments, Projects, Presentation, … | Exams | **A1,a2,b1,b2,c1** | **3** |
| **8.** | Midterm Exam | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **9.** | The one-compartment open model with multiple dosing kinetics-IV | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **10.** | The one-compartment open model with multiple dosing kinetics-Extravascular | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **11.** | Designing dosing regimens | Lecture material and notes | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **12.** | Dosage adjustment in renal failure and hepatic dysfunction | Lecture material and notes | Exams | **A1,a2,b1,b2,c1** | **3** |
| **13.** | The two-compartment open model with intravenous administration | Presentation | Presentation, project, assignments | **A1,a2,b1,b2,c1** | **3** |
| **14.** | Non-linear pharmacokinetics | Presentation | Presentation, project, assignments | **A1,a2,b1,b2,c1** | **3** |
| **15.** | Final Exam |  |
| **16.** |  |  |  |  |  |

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| **Plan of Course Evaluation** |
| **Evaluation Tools** | **Mark** | **ILOs** |
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| **First Exam (Mid-term)**  | **30%** | **A1,a2,b1,b2,c1** |  |  |  |  |  |
| **Second Exam (If available)** |  |  |  |  |  |  |  |
| **Final Exam** | **50%** | **A1,A2,a3,b1,b2,b3,,c1c2,c3** |  |  |  |  |  |
| **Activities** |  |  |
| **Activities Evaluation** | Homework/Tasks | 10% | B1.B2,B3C1 |  |  |  |  |  |
| Case Study  |  |  |  |  |  |  |  |
| Discussion and Interactions |  |  |  |  |  |  |  |
| Group Activities |  |  |  |  |  |  |  |
| Laboratory Exams |  |  |  |  |  |  |  |
| Presentations |  |  |  |  |  |  |  |
| Quizzes | 10% | B1.B2,B3C1 |  |  |  |  |  |
| Others |  |  |  |  |  |  |  |
| **Total** | 100% |  |  |  |  |  |  |

 **Components**  |
| **Book** |  |
| **References** |  |
| **Recommended Readings** |  |
| **Electronic materials** |  |
| **Other websites** |  |