The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus
1 Course title | Clinical Pharmacokinetics  
2 Course number | 1203577  
3 Credit hours (theory, practical) | 2 hrs / theoretical  
Contact hours (theory, practical) | 2 hrs / theoretical  
4 Prerequisites/corequisites | Pharmacokinetics (1203475)  
5 Program title | PharmD  
6 Program code | PharmD  
7 Awarding institution | The University of Jordan  
8 Faculty | Pharmacy  
9 Department | Biopharmaceutics & Clinical Pharmacy  
10 Level of course | Undergraduate  
11 Year of study and semester(s) | First semester of the 5th year  
12 Final Qualification | PharmD  
13 Other department(s) involved in teaching the course | Pharmaceutical Sciences & Pharmaceutics  
14 Language of Instruction | English  
15 Date of production/revision | 1 September 2015  

16. Course Coordinator:  
Dr. Maysa Suyagh  
Faculty of Pharmacy / Dept of Biopharmaceutics and Clinical Pharmacy  
Office No.: 106  
Phone No.: 5355000 ext. 23337  
Email: m.suyagh@ju.edu.jo  
Office hours: to be arranged  

17. Other instructors:  
N/A  

18. Course Description:  
This course aims to involve the clinically-oriented PharmD student in the process of clinical pharmacokinetic and pharmacodynamic monitoring of drug therapy. It is mainly concerned with the application of concepts and techniques of pharmacokinetics and pharmacodynamics to the rational design of individualized drug dosage regimens in the total clinical context, taking into account such special problems as hepatic and renal functional impairment, and the effects of disease, immaturity of drug metabolizing enzymes, and drug interactions.
19. Course aims and outcomes:

**A- Aims:**
This course aims to involve the clinically-oriented PharmD student in the process of clinical pharmacokinetic and pharmacodynamic monitoring of drug therapy. It is mainly concerned with the application of concepts and techniques of pharmacokinetics and pharmacodynamics to the rational design of individualized drug dosage regimens in the total clinical context, taking into account such special problems as hepatic and renal functional impairment, and the effects of disease, immaturity of drug metabolizing enzymes, and drug interactions.

The overall objectives of this course are to:
1. Discuss Disease states and factors that are responsible for altering the pharmacokinetics of specific drugs.
2. Initiate therapy by designing a dosing regimen based on 1) population-specific information or 2) estimated patient-specific information for drugs discussed in this course.
3. Modify/adjust a dosing regimen based on monitored blood concentrations, patient-specific information, physiologic changes associated with special populations, drug interactions, and switching of dosage forms for drugs discussed in this course.
4. Value the importance of pharmacokinetic and pharmacodynamic principles in different pharmacy setting.
5. Locate and evaluate the literature related to the pharmacokinetics of specific drugs.

**B- Intended Learning Outcomes (ILOs):**

A- Knowledge and Understanding:
Student is expected to
A1. Discuss and understand the basic pharmacokinetic principles and key pharmacokinetic parameters.
A2. Discuss and understand various aspects of a drug’s pharmacokinetic properties and factors affecting them.
A3. Discuss the effect of different disease states on the pharmacokinetics and pharmacodynamics of drugs.
A4. Understand the theoretical basis of therapeutic drug monitoring.

B- Intellectual, Analytical and Cognitive Skills:
Student is expected to
B1. Perform calculations to predict drug concentration after drug administration.
B2. Given a pharmacokinetic data set, determine the value of pharmacokinetic parameters after different modes of drug administration.
B3. Be able to develop a strategy for therapeutic drug monitoring for a range of narrow therapeutic window drugs.
B4. Identify the problems associated with dosage regimens through analyzing patient data.
B5. Gain therapeutic problem-solving skills.

C- Subject-Specific Skills:
Student should be able to
C1. Recommend initial dosage regimen, or adjust dosage and recommend monitoring strategy to ensure safe and effective drug therapy.
C2. Identify clinical manifestations of potential toxicities associated with patient’s medication and recommend the appropriate course of action.
C3. Apply the pharmacokinetic principles to specific problems commonly encountered in practice setting.
C4. Identify patients who are likely to get maximal benefit from clinical pharmacokinetic monitoring.

D- Transferable Key Skills:
Students is expected to
D1. Use different information sources to solve pharmacokinetics problems.
D2. Develop the theoretical ability to communicate scientific principles to other healthcare professionals.

**Competencies achieved upon completion of the course.**

1.3 Characterize different dosage forms of medicines and their proper usage
1.4 Identify different routes of administration of medicines
1.10 Accurately interpret prescriptions’ instructions including medicine’s type, strength, dosage form and route of administration
1.13 Advise patients on proper storage, usage and adherence of dispensed medicines
2.8 Identify indications, side effects and contraindications of medicines
2.9 Identify drug-drug and drug-food interactions of medicines
2.10 Identify basic principles of drug pharmacokinetics and recognize disease conditions and other factors that
interfere with safety and efficacy of medicines
2.17 Advise patients and other health professionals on proper usage of medicines including their strength, frequency, dosage form and route of administration
2.18 Identify any medicament-related problems and take appropriate actions to resolve them
2.19 Recommend necessary modifications to patient therapy to optimize its safety and efficacy
2.20 Able to interpret patient biochemical laboratory results
2.23 Recognize the principles of drug safety and efficacy evaluation

3.4 Demonstrate the ability to perform pharmaceutical calculations
5.1 Communicate effectively with patients and other healthcare professionals

### 20. Topic Outline and Schedule:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Week</th>
<th>Instructor</th>
<th>Achieved ILOs</th>
<th>Evaluation Methods</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Clinical Pharmacokinetics: Concepts, Equations and Calculations</td>
<td>1</td>
<td>Dr. Maysa Suyagh</td>
<td>A1, A2, A4</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Drug Therapy Individualization in Patients with Hepatic Disease</td>
<td>2</td>
<td>Dr. Maysa Suyagh</td>
<td>A3</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Drug Therapy Individualization for Patients with Chronic Kidney Disease</td>
<td>3</td>
<td>Dr. Maysa Suyagh</td>
<td>A3</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Aminoglycosides</td>
<td>4</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Drug Dosage Regimen Design in Dialytic Patients</td>
<td>5</td>
<td>Dr. Maysa Suyagh</td>
<td>A3</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Vancomycin</td>
<td>6</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Clinical Pharmacokinetics in Special Populations</td>
<td>7</td>
<td>Dr. Maysa Suyagh</td>
<td>A3</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Clinical Pharmacokinetics in Special Populations</td>
<td>8</td>
<td>Dr. Maysa Suyagh</td>
<td>A3</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Digoxin</td>
<td>9</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Phenytoin</td>
<td>10</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Other AEDs</td>
<td>11</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>TDM of Immunosuppressants</td>
<td>12</td>
<td>Dr. Maysa Suyagh</td>
<td>A3, B1-5, C1-4, D1-2</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Case Discussions</td>
<td>13</td>
<td>Dr. Maysa Suyagh</td>
<td>All ILOs</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
<tr>
<td>Case Discussions</td>
<td>14</td>
<td>Dr. Maysa Suyagh</td>
<td>All ILOs</td>
<td>Exams &amp; Quiz</td>
<td>General references provided below</td>
</tr>
</tbody>
</table>
21. Teaching Methods and Assignments:

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

<table>
<thead>
<tr>
<th>ILOs</th>
<th>Learning Methods</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1, A2, A3, A4</td>
<td>Lectures and Homeworks</td>
<td>Quizzes, Exams and Assignments</td>
</tr>
<tr>
<td>B1, B2, B3, B4, B5</td>
<td>Lectures and in-class case discussions</td>
<td>Quizzes, Exams and Assignments</td>
</tr>
<tr>
<td>C1, C2, C3, C4</td>
<td>in-class case discussions</td>
<td>Assignments</td>
</tr>
<tr>
<td>D1, D2</td>
<td>in-class case discussions</td>
<td></td>
</tr>
</tbody>
</table>

**Learning skills:**
- Critical thinking
- Digital literacy
- Problem-solving skills
- Self-directed learning

22. Evaluation Methods and Course Requirements:

*Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:*

1. Exams
2. Quizzes
3. Students participation in homeworks and class case discussion

23. Course Policies:

**A- Attendance policies:**
- Attendance: Mandatory.
- First warning – with 4 absences
- Last warning – with 5 absences
- Failing in the subject – with 6 absences

**B- 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:**
- NA

**D- Honesty policy regarding cheating, plagiarism, misbehavior:**
The participation, the commitment of cheating will lead to applying all following penalties together
- Failing the subject he/she cheated at
- Failing the other subjects taken in the same course
- 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
- Quiz: 10 points
- Final Exam: 50 points
- Total 100 points

**F- Available university services that support achievement in the course:**
- Teaching halls equipped with data show, computer and white board.
24. Required equipment:

Data show, Computer and White Board

25. References:

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


B- Recommended books, materials, and media:

6. Relevant original and review articles from scientific journals

26. Additional information:

N/A
Name of Course Coordinator: **Dr, Maysa Suyagh**  
Signature: ----------------------  
Date: Feb, 16, 2016

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

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

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

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

**Copy to:**  
Head of Department  
Assistant Dean for Quality Assurance  
Course File