Course Description Form TDM Theory **second-course fifth year / practical course**

Reviewing the performance of the higher education institution ((academic program review))

Course Description

This course description provides a summary of the most important course characteristics and the learning outcomes expected of the student to achieve, demonstrating whether the student has made the most of the learning opportunities available, and is linked and consistent with the academic program description.

1. Educational Institution	**Al Zahrawi University Ministry of Higher Education and Scientific Research**
2. University Department / Center	**Collage of Pharmacy**
3. Course Name / Code	**Therapeutic drug monitoring - Fifth Stage/ practical course**
4. Programs in which it is included	**Bachelor of Pharmacy**
5. Available Forms of Attendance	**Daily attendance**
6. Semester / Year	**2025-2026**
7. Total Number of Study Hours	**30 hours**
8. Date of preparing this description	**2025-2026**

9. Course Objectives:

The course aims to enable students to:

1. Perform and interpret therapeutic drug monitoring calculations.
2. Calculate individualized drug doses based on patient characteristics.
3. Determine appropriate sampling times for therapeutic drug concentration measurement.
4. Interpret measured drug concentrations in relation to therapeutic and toxic ranges.
5. Adjust drug doses according to renal and hepatic function.
6. Apply pharmacokinetic principles to patient-specific dosing.
7. Solve practical TDM problems involving commonly monitored drugs.
8. Recognize potential drug interactions and their effects on drug concentrations.
9. Develop practical skills in evaluating TDM results and recommending appropriate dose adjustments.

10. Communicate TDM-related recommendations effectively with healthcare professionals.

10-Learning Outcomes, Teaching and Learning Methods, and Evaluation

A. Knowledge and Understanding

At the end of this practical course, the student will be able to:

1. Explain the practical principles of therapeutic drug monitoring.
2. Calculate pharmacokinetic parameters used in TDM.
3. Calculate loading and maintenance doses.
4. Determine appropriate dose intervals.
5. Interpret plasma drug concentration results.
6. Identify appropriate sampling times for therapeutic drug monitoring.
7. Adjust drug doses in patients with renal impairment.
8. Adjust drug doses in patients with hepatic impairment.
9. Apply TDM principles to special populations.
10. Interpret therapeutic drug concentrations of commonly monitored drugs.

B. Subject-Specific Skills

At the end of this practical course, the student will be able to:

1. Perform drug dose calculations accurately.
2. Calculate individualized doses using patient-specific data.
3. Calculate and interpret drug clearance, volume of distribution, and half-life.
4. Determine appropriate blood sampling times for TDM.
5. Interpret peak and trough drug concentrations.

Teaching and Learning Methods

- Practical demonstrations.
- Problem-solving and case-based calculations.
- Laboratory exercises and practical worksheets.
- Group discussions.
- Student presentations and practical assignments.

C. Evaluation Methods

1. **Midterm and final exams / exam grades.**
2. **Oral and written exams**
3. **Laboratory reports**

D. Thinking Skills

- Applying pharmacokinetic principles to solve practical TDM problems.
- Analyzing patient-specific laboratory and drug concentration data.
- Interpreting drug concentration results and identifying inappropriate levels.
- Selecting appropriate dose adjustments based on clinical and pharmacokinetic parameters.
- Developing problem-solving and clinical decision-making skills.

11. Course Structure

Weeks	Hours	Required Learning Outcomes	Unit Name / Course or Topic	Learning Methods	Evaluation Method
1	2	Practical skills	pharmacokinetic introduction	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
2	2	Practical skills	Basic pharmacokinetic calculations	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
3	2	Practical skills	Loading dose, maintenance dose, and dosing interval calculations	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
4	2	Practical skills	TDM equations and pharmacokinetic calculations	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
5	2	Practical skills	Interpretation of drug concentrations and sampling time	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
6	2	Practical skills	TDM in renal disease and dialysis	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
7	2	Practical skills	TDM in hepatic disease, heart failure	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
8	2	Practical skills	TDM in obesity, and drug interactions	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework

9	2	Practical skills	TDM for Aminoglycosides Part 1	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
10	2	Practical skills	TDM for Aminoglycosides Part 2 Calculation	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
11	2	Practical skills	TDM for Vancomycin Part I	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
12	2	Practical skills	TDM for Vancomycin Part 2 Calculation	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
13	2	Practical skills	TDM for Cyclosporine Introduction	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
14	2	Practical skills	TDM for Cyclosporine Calculation	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework
15	2	Practical skills	Integrated TDM practical exercises and comprehensive review	Practical calculations, group discussion	Daily exam, oral questions, discussion and homework

12. Infrastructure	
Required Readings:	1) **References:** Bauer LA (Ed.), Applied Clinical Pharmacokinetics. McGraw Hill, New York, 2014 2) Winter's Basic Clinical Pharmacokinetics, 7th Edition. Paul Beringer, 2024
Special Requirements (Workshops, Journals, Software, Websites):	**Electronic Websites:**
Social Services (Guest Lectures, Professional Training, Field Studies, Others)	Practical workshops and training activities related to therapeutic drug monitoring and pharmacokinetic calculations.

11. Admission:	
Prerequisites	Admission according to the central plan
Minimum Number of Students	Admission according to the approved capacity plan.
Maximum Number of Students	Admission according to the approved capacity plan.

Name of the Instructor: Ali Hassan Zaki