

Principles of Pharmacokinetics and Biopharmaceutics

PHAR 7302

Fall Semester 2022

Course Description

Qualitative and quantitative understanding and application of pharmacokinetics focusing on the processes of drug absorption, distribution, metabolism, and elimination.

Additional Course Information

This course provides the theoretical building blocks necessary to design patient- and population-specific drug dosing regimens. The interrelationship between physiologic and biochemical processes and physicochemical drug properties influences drug disposition and pharmacologic response. A major component of this course includes mathematical modeling.

Course Credit: 3 credit hours

Pre-Requisites: PHAR 7402 – Pharmaceutics

Foundational Knowledge

1. Mathematical calculations including solving algebraic and calculus-based problems.
2. Chemistry fundamentals, including pH and pKa
3. Human anatomy and physiology

Co-Requisites: None

Class Meeting Days, Time & Location

Tuesdays, 2:00 pm – 4:00 pm; WTB 136
Fridays, 9:00 am – 10:00 am; WTB 136

Course Coordinator

M. Delwar Hussain, Ph.D.
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Office hours: Tuesdays and Thursdays; 4:00 pm – 5:00 pm, or by appointment. Preferred method of contact: Email

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Fisch College of Pharmacy (FCOP) and UT Tyler Policies

This is part 1 of the syllabus. Part 2 contains UT Tyler and the FCOP course policies and procedures. These are available as a PDF at <https://www.uttyler.edu/pharmacy/academic-affairs/files/fcop-syllabus-policies.pdf>. For experiential courses (i.e., IPPE and/or APPE), the Experiential Manual contains additional policies and instructions that supplement the Syllabus Part 1 and 2. Please note, the experiential manual may contain policies with different deadlines and/or instructions. The manual should be followed in these cases.

Required Materials

Most course required materials are available through the Robert R. Muntz Library. These materials are available either online (<http://library.uttyler.edu/>) or on reserve.

1. Required materials will be posted on the classes' Canvas site at: uttyler.edu/canvas.
2. Scientific calculator for exponential computations and linear regressions (e.g., TI 30XS)

Course Format

The course may include, but is not limited to, the following activities:

1. Independent study of selected readings
2. Individual examinations
3. Individual application of content and concepts
4. Team activities

Course Learning Outcomes (CLOs)

CLOs	Related PLO(s)	EPA	Assessment Methods	Grading Method	PPCP Skill(s) Assessed
1. Demonstrates understanding of the qualitative and quantitative factors affecting the absorption, distribution, metabolism, and excretion of drugs.	1	1.1, 1.2	1, 2	ES RUB	1, 2
2. Demonstrates proficiency in numeric calculations and graphical interpretations related to drug concentrations and pharmacokinetic processes and their clinical implications.	1, 2, 6	1.1, 1.2, 1.5, 3.2, 4.1	1, 2	ES	NA
3. Selects specific drug products based on pharmaceutical, therapeutic, or bioequivalent parameters.	1, 2, 6	3.2, 4.1	1, 2	ES	NA

Course Assessment Methods

	Assessment Methods	Description
1	Multiple Choice or Multiple Selection Question(s)	<i>Standard MCQ and Select All that apply questions.</i>
2	Open Ended Question(s)	<i>Handwritten calculations using a rubric on paper and/or in ExamSoft.</i>

Grading Policy & Grade Calculation

Grades will be determined based on evaluation of individual and team readiness assessment tests (iRATs, tRATs), individual and team cumulative assessment tests (iCATs, tCATs), midterm examinations, final written examinations, participation in team-based projects, peer evaluations and other assessment methods. Examinations, RATs and CATs may consist of, but not limited to, multiple-choice, true/false, fill in the blank, short-answer, essay, and problem-based questions.

During the time the course is in progress, students whose cumulative course percentage falls below 70.0% may receive an academic alert and be subject to periodic course content review in special sessions with the course instructor(s). The student's faculty advisor may receive an academic alert to act upon on the student's behalf.

All examinations, tests, and assignments, including the final examination, may be **cumulative**. Students are responsible for material presented during prior courses. The grading scale for all graded material is below. The final course grade will be assigned according to the calculated percentage and the percentages will not be rounded upward or downward. For additional information, see examination/assessment policy below.

Grade Calculation*

Individual Grades (95%):

iRAT, iCAT, Assignments, etc.	5%
Exam 1 (Sep 24)	20%
Exam 2 (Oct 15)	20%
Exam 3 (Nov 5)	20%
Final Exam (Dec 7)	30%

Team Grades (5%):

Team activity, Assignments, etc.	5%
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Total	100%
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***The final course letter grade will be determined according to the following grading scheme:**

A	90 - 100 %
B	80 - < 90 %
C	70 - < 80 %
D	65.0 - < 70 %
F	< 65.0 %

If a student misses the exam or any graded activity with an **unexcused absence** for the class, their individual exam or graded activity score will be 0.

Remediation: Students who earn a course grade of 'D' or 'F' may be given the opportunity to remediate this course during the summer.

PHAR 7302 Course Schedule

WEEK	DAY	DATE	TOPIC	CLO	WSOP Category
1	T	8/23	Introduction	1, 2, 3	S18.04, S18.09, S20.01
	F	8/26	PK Models, Compartmental Models	1, 2	S01.11, S02.04, S15.16
2	T	8/30	IV Bolus: One Compartment Model*	1, 2	S01.11, S02.04, S15.16
	F	9/2	IV Bolus: One Compartment Model		
3	T	9/6	IV Bolus: Multi Compartment Model	1, 2	S01.11, S02.04, S15.16
	F	9/9	IV Bolus: Multi Compartment Model		
4	T	9/13	IV Infusion*	1, 2	S01.11, S02.04, S18.14
	F	9/16	IV Infusion		
5	T	9/20	Exam 1 Review (Intro, IV Bolus & Infusion)**		
	F	9/23	Exam 1 (Intro, IV Bolus & Infusion)		
6	T	9/27	Multiple IV Dosing*	1, 2	S01.11, S15.16, S18.14
	F	9/30	Multiple IV Dosing		
7	T	10/4	Distribution Kinetics	1, 2	S01.11, S02.04, S15.16
	F	10/7	Distribution Kinetics		
8	T	10/11	Exam 2 Review (Multiple Dosing, Distribution Kinetics)**		
	F	10/14	Exam 2 (Multiple Dosing, Distribution Kinetics)		
9	T	10/18	Extravascular Dosing, Absorption	1, 2, 3	S01.11, S10.03, S18.04
	F	10/21	PK of Oral Absorption		
10	T	10/25	Bioavailability and Bioequivalence*	1, 2	S01.11, S05.08, S18.14
	F	10/28	Bioavailability and Bioequivalence		
11	T	11/1	Exam 3 Review (Extravascular Dosing, Absorption, PK, BA/BE)**		
	F	11/4	Exam 3 (Extravascular Dosing, Absorption, PK, BA/BE)		
12	T	11/8	Elimination and Clearance Concepts	1, 2, 3	S01.11, S10.03, S18.14
	F	11/11	Elimination and Clearance Concepts		
13	T	11/15	Nonlinear PK*	1, 2, 3	S01.11, S10.03, S18.14
	F	11/18	Nonlinear PK		
14	T	11/22	Thanksgiving Break		
	F	11/25	Thanksgiving Break		
15	T	11/29	Model-Independent Kinetics		
	F	12/2	Final Exam Review**		
16	T	TBD	Final Exam		

Please note that dates, topics, and assignments are subject to change. In the event of a change, you will be given notification of the change.

**iRATs/tRATs (total 5)*

***iCATs/tCATs (total 4)*