

Principles of Pharmacokinetics and Biopharmaceutics (PHAR 7302)

Fall Semester 2024

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

Thursday, 11:00 am – 12:30 pm; WTB 235

Friday, 11:00 am – 12:30 pm; WTB 235

Course Coordinator

Rahmat Talukder, R.Ph., Ph.D.

WTB 342

rtalukder@uttyler.edu

Office hours: Thursday and Friday, 9:30 am – 11:00 am, or by appointment. Preferred method of contact: Email

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 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

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

1. Most 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., Texas Instruments 30Xpromp/Tbl/2E5 Scientific Calculator)
3. Ducharme, M.P. and Shargel, L. *Shargel and Yu's Applied Biopharmaceutics & Pharmacokinetics*, 8th Edition, McGraw Hill, 2022. (Electronic copy is available at the University library.)

Course Format

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

1. Independent study of selected readings
2. Individual readiness 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 of 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 the 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 are not limited to, multiple-choice, true/false, fill-in-the-blank, short-answer, essay, and problem-based questions.

When the course is in progress, students whose cumulative course percentage falls below 75.0% 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 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 materials 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 the examination/assessment policy below.

Grade Calculation*

Individual Grades (98%):

iRAT, Assignments, etc.,	3%
Exam 1	20%
Exam 2 (Cumulative)	20%
Exam 3 (Cumulative)	20%
Final Exam (Comprehensive)	35%

Team Grades (2%):

Team activity, Assignments, etc.,	2%
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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** from 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 (P2) Course Schedule – Fall 2024

The class meets Thursday and Friday from 11 am to 12:30 pm

WEEK	DAY	DATE	TOPIC	CL O	WSOP Category
1	Th	8/29	Introduction	1, 2, 3	S18.04, S18.09, S20.01
	F	8/30	PK Models, Compartmental Models	1, 2	S01.11, S02.04, S15.16
2	Th	9/05	IV Bolus: One Compartment Model*	1, 2	S01.11, S02.04, S15.16
	F	9/06	IV Bolus: One Compartment Model	1, 2	S01.11, S15.16, S18.14
3	Th	9/12	IV Bolus: Multi-Compartment Model*	1, 2	S01.11, S15.16, S18.14
	F	9/13	IV Infusion*	1, 2	S01.11, S02.04, S18.14
4	Th	9/19	IV Infusion	1, 2	S01.11, S15.16, S18.14
	F	9/20	Intro, IV Bolus & Infusion*	1, 2	S01.11, S15.16, S18.14
5	Th	9/26	Exam 1		
	F	9/27	Multiple IV Dosing*	1, 2	S01.11, S15.16, S18.14
6	Th	10/03	Multiple IV Dosing	1, 2	S01.11, S15.16, S18.14
	F	10/04	Distribution Kinetics*	1, 2	S01.11, S02.04, S15.16
7	Th	10/10	Distribution Kinetics	1, 2	S01.11, S10.03, S18.04
	F	10/11	Multiple Dosing, Distribution Kinetics*	1, 2	S01.11, S15.16, S18.14
8	Th	10/7	Exam 2 (Comprehensive)		
	F	10/18	Extravascular Dosing, Absorption	1, 2, 3	S01.11, S10.03, S18.04
9	Th	10/24	PK of Oral Absorption*	1, 2, 3	S01.11, S10.03, S18.04
	F	10/25	Bioavailability and Bioequivalence*	1, 2	S01.11, S05.08, S18.14
10	Th	10/31	Bioavailability and Bioequivalence (BA/BE)	1, 2	S01.11, S15.16, S18.14
	F	11/01	Extravascular Dosing & Absorption, BA/BE*	1, 2, 3	S01.11, S10.03, S18.14
11	Th	11/07	Exam 3 (Comprehensive)		
	F	11/08	Elimination and Clearance Concepts	1, 2, 3	S01.11, S10.03, S18.14
12	Th	11/14	Elimination and Clearance Concepts*	1, 2, 3	S01.11, S10.03, S18.14
	F	11/15	Nonlinear PK*	1, 2, 3	S01.11, S10.03, S18.14
13	Th	11/21	Nonlinear PK	1, 2, 3	S01.11, S10.03, S18.14
	F	11/22	Model-Independent Kinetics	1, 2, 3	S01.11, S10.03, S18.14
14	Th	11/28	Thanksgiving Break (11/25 to 11/29)		
	F	11/29	Thanksgiving Break (11/25 to 11/29)		
15	Th	12/05	Final Exam (Comprehensive) (9 am – 12 pm)		
Please note that dates, topics, and assignments are subject to change. In the event of a change, you will be notified.					

