

Principles of Biochemistry and Molecular Biology
PHAR 7401
Fall Semester 2023

Course Description

Qualitative and quantitative understanding and application of biochemistry focusing on the cellular pathways as it would pertain to pharmacy.

Additional Course Information

This course provides the theoretical building blocks necessary to understand the biochemistry pathways of the cell. The interrelationship between biochemical pathways and physicochemical drug properties influencing drug metabolism and pharmacologic response.

Course Credit

4 credit hours

Pre-Requisites

N/A

Co-Requisites

N/A

Fundamental Knowledge

1. Biology.
2. Chemistry / organic chemistry fundamentals, including pH and pKa
3. Human anatomy and physiology

Class Meeting Days, Time & Location

Monday, 2:00-3:50 PM and Wednesday, 2:00 PM – 3:50 PM; W.T. Brookshire Hall (P1 classroom)

Course Coordinator

Santosh Aryal, Ph.D.

W.T. Brookshire Hall Room 370

Phone number: 903.566.6473

Email: santosharyal@uttyler.edu

Office hours: 9-10 AM Tuesday/ 4-5 pm Thursday/ and Lunch time (please contact instructor if you have time conflict. Also, instructor will explain office hours during regular class time)

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 as a PDF <https://www.uttyler.edu/pharmacy/academic-affairs/>. 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.

Disability/Accessibility Services:

The University of Texas at Tyler has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Like so many things this Fall, the need for accommodations and the process for arranging them may be altered by the COVID-19 changes we are experiencing and the safety protocols currently in place. Students with disabilities who may need accommodation(s) in order to fully participate in this

class are urged to contact the Student Accessibility and Resources Office (SAR) as soon as possible, to explore what arrangements need to be made to ensure access. During the **Fall 2023** semester, SAR will be conducting all appointments via ZOOM. If you have a disability, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student Application. For more information, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices> or call 903.566.7079.

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 through Access Pharmacy (<http://accesspharmacy.mhmedical.com/>) or on reserve.

1. Integrative Medical Biochemistry Examination and Board Review; Michael W. King, Ed by LANGE
2. Harper's Illustrated Biochemistry, 30e, Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil, Ed by LANGE
3. **Other required materials will be posted on the classes' Canvas site. The site address is: uttyler.edu/canvas.**

Additional Resources

1. Other texts will be available on Access Pharmacy (<http://accesspharmacy.mhmedical.com/>)

Course Format

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

1. Independent study of selected readings
2. Individual readiness assessment tests (iRATs)
3. Team-based learning, active learning strategies:
 - a. Team readiness assessment tests (tRATs)
 - b. Team application of content and concepts

Course Learning Outcomes (CLOs)

CLOs	PLO(s) Assessed for this CLO (1-15)	EPAs (1.1-6.1)	Assessment Methods	Grading Method	PPCP Skill(s) Assessed (1-5)	ACPE Std. 11 & 12 (1-4)
1. Understand and predict what would be the outcome of manipulating specific biochemical pathway.	1,7	N/A	MCQ, Fill in, open ended	ES	N/A	1
2. Describe how changes in normal physiology or disease affect a specific biochemical pathway.	1,7	N/A	MCQ, Fill in, open ended	ES	N/A	1
3. Summarize the role of biochemistry in drug metabolism.	1,7	N/A	MCQ, Fill in, open ended	ES	N/A	1
4.						
5.						
6.						

Course Assessment Methods

	Assessment Method	Description
1	Final Exam Multiple Choice or Multiple Selection Question(s)	<i>Standard MCQ and Select All that apply questions.</i>

2	Comprehensive Final Exam	<i>Standard MCQ and Select All that apply questions and Open Ended Question(s)</i>
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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, skills assessments, graded application assignments, participation in team-based projects, peer evaluations and other assessment methods that may include, but not limited to, Objective Structured Clinical Examinations (OSCE). 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 the 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.

Standard Grade Calculation*

Individual Component	<u>95%</u>
iRAT	10%
2 Midterm Assessments	45%
Compressive Final	40%
Team Component	<u>5%</u>
tRAT	3%
Team Application(s)	2%

** Expect an iRAT/tRAT for every class unless otherwise told.*

Standard Grade Calculation*	100%
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****The final course letter grade will be determined according to the following grading scheme:***

A	90 - 100 %
B	80 - 89.999 %
C	70 - 79.999 %
D	65.0 - 69.999 %
F	< 65.0 %

Top 200 Rx & Top 100 OTC Medications (LINK): The medications discussed in this course are indicated in the course schedule, first column (i.e. Week). Check here if this section does not apply:

Principles of Biochemistry and Molecular Biology (PHAR 7401)						
W E E K	DAY	DATE	TOPIC	Instructor	CLO¹	Disease States
1	M	8/21	1. Biochemistry: Course Introduction/Introduction to cell structure and function 2. Biological Molecules	Pearson	1, 2, 3	S20.99
	W	8/23	Biochemistry: Cellular membranes and membrane transport	Pearson	1, 2, 3	S20.99
2	M	8/28	Biochemistry: Intracellular transport, cell movement, extracellular	Pearson	1, 2, 3	S20.99
	W	8/30	Protein Structure and Function	Pearson	1, 2, 3	S20.99
3	M	9/4	Biochemistry: Signal transduction and regulation	Pearson	1, 2, 3	S20.99
	W	9/6	Biochemistry: Regulation of Cell Cycle	Pearson	1, 2, 3	S20.99, S7.05
4	M	9/11	Biochemistry: Regulation of apoptosis	Pearson	1, 2, 3	S20.99
	W	9/13	Biochemistry: Biochemistry of Nitric Oxide (NO)	Pearson	1, 2, 3	S20.99
5	M	9/18	Biochemistry: Introduction to metabolism	Aryal	1, 2, 3	S20.99
	W	9/20	EXAM 1	Aryal		
6	M	9/25	Biochemistry: Biochemistry of enzymes (Kinetics)	Aryal	1, 2, 3	S20.99 S01.08,
	W	9/27	Biochemistry: Carbohydrate metabolism	Aryal	1, 2, 3	S20.99
7	M	10/2	Biochemistry: Energy Production	Aryal	1, 2, 3	S20.99
	W	10/4	Biochemistry: Lipid metabolism and dyslipidemia	Aryal		S01.08 Dyslipidemia
8	M	10/9	Biochemistry: Protein metabolism	Aryal	1, 2, 3	S20.99
	W	10/11	Biochemistry: Nucleotide metabolism	Aryal	1, 2, 3	S20.99

9	M	10/16	Biochemistry: Arachidonic acid metabolism/ Fever	Aryal	1, 2, 3	S18.22 Pediatric fever
	W	10/18	Metabolism and Energy Production Review/Energy Calculation	Aryal		S20.99
10	M	10/23	Biochemistry: Thrombosis:	Aryal	1, 2, 3	S01.06 Venous Thrombosis
	W	10/25	Biochemistry: Biochemistry of RBC and oxygen carrying	Aryal	1,2,3	S14.01 Anemia
11	M	10/30	EXAM2	Aryal		
	W	11/1	Biochemistry: Chromosomal abnormalities	Glavy	1, 2, 3	S20.99
12	M	11/6	Biochemistry: DNA damage and repair	Glavy	1, 2, 3	S20.99,
	W	11/8	Biochemistry: Gene expression and regulation	Glavy	1, 2, 3	S20.99
13	M	11/13	Biochemistry: Molecular biology of a virus/Flu	Glavy	1, 2, 3	S15.05A Influenza
	W	11/15	Biochemistry: Biotechnology/molecular biology/genetics	Glavy	1, 2, 3	S20.99
		11/20-26	Thanksgiving Break	RELAX		
14	M	11/27	Translation	Glavy	1, 2, 3	S20.99
	W	11/29	Make up day/Open - Review	Aryal		
		TBD	Comprehensive Final Exam	Aryal		

ACKNOWLEDGING AND ACCEPTING THIS SYLLABUS: By taking any quizzes or exams or class and turning in it for grading, you are agreeing to the policies of this course outlined in this syllabus and any modifications hereafter (will be amended on-line).

NOTE: *The Course Coordinator reserves the right to correct or amend/alter this syllabus as deemed necessary. The changes, if any, will be notified to all participants in advance and will be updated online accordingly.*