Jordan University of Science and Technology
Faculty of Pharmacy
Pharmacy Department

PHAR782 Advanced Drug Design

First Semester 2024-2025

Course Catalog
3 Credit Hours. The course discusses the concept of rational drug design and the conventional strategies applied in lead-to-drug optimization process. The course focuses on mastering the ability of students to critically analyze drug design literatures and solving problems encountered during lead-to-drug optimization process.
Teaching Method: Blended

Text Book	
Title	Textbook of Drug Design and Discovery
Author(s)	Kristian Stromgaard, Povl Krogsgaard-Larsen, Ulf Madsen
Edition	5th Edition
Short Name	1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Foye's Principles of Medicinal Chemistry	Victoria F. Roche, S. William Zito, Thomas L. Lemke, and David A. Williams	8th Edition	

Instructor	
Name	**Dr. Soraya Alnabulsi**
Office Location	-
Office Hours	
Email	smalnabulsi@just.edu.jo

Class Schedule & Room
Section 2: Lecture Time: Sun, Tue : 10:00 - 11:00 Room: U

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Introduction to drug design and terminology	From **1**, From **2**
Week 2	Lead Optimization concept	From **1**, From **2**
Week 3	Drug Likness	
Weeks 4, 5	Optimizing drug-target interactions	
Weeks 6, 7	Improving pharmacokinetic properties	
Weeks 12, 13	Bioisosterism: A useful strategy for molecular modification and drug design	
Weeks 8, 9	Thermodynamics of drug-target interaction	
Week 10	Binding kinetics (Residence time as a predictor of drug in vivo efficacy)	
Week 11	Quantitative structure-activity relationship QSAR	
Week 14	Enzyme kinetics	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Differentiate critically the key milestones in the rational drug design process and evaluate their roles in pharmaceuticals development [1PLO-MP1]	12%	
Extract structure-activity and structure-property relationships from experimental data, applying these insights to guide drug design and optimization. [1PLO-MP2]	19%	

Assess various strategies applied in lead-to-drug optimization process, considering their impact on drug efficacy, safety, and development timelines. [1PLO-MP2]	33%	
Examine early drug discovery studies across a variety of drug classes, analyzing the methodologies, challenges, and successes specific to each class [1PLO-MP2]	16%	
Evaluate medicinal chemistry literatures, assessing the quality, relevance, and contributions of key studies to current drug discovery and development practices [1PLO-MP4]	20%	

PLO1.1	PLO2.1	PLO3.2	PLO3.3	PLO2.2	PLO2.3	PLO2.4	PLO3.1	PLO3.4	PLO3.5	PLO3.6	PLO4.1	PLO4.2	PLO4.3	PLO4.4	PLO5.1	PLO-PT1.1	PLO-PT2.1	PLO-PT2.2	PLO-PT3.1

Evaluation	
Assessment Tool	**Weight**
First exam	25%
Second exam	15%
Assignments	10%
Final exam	50%

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