



T-104
2022

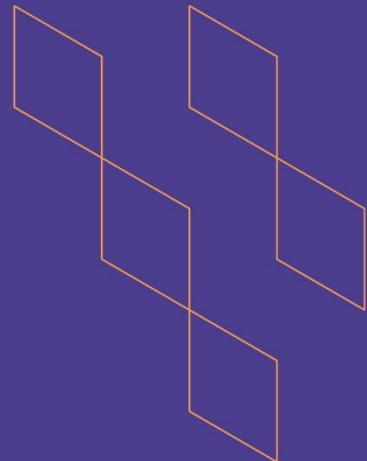
Course Specification





T-104
2022

Course Specification



Course Title: Drug Discovery and Development

Course Code: PHC-512

Program: Pharmaceutical Sciences

Department: Pharmaceutical Chemistry

College: Pharmacy

Institution: Najran University

Version: **CS-V1**

Last Revision Date: 20.12.2023



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A. General information about the course:

Course Identification

1. Credit hours:

2. Course type

a. University ☐ College ☒ Department ☐ Track ☐ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered:

9th Level/ 4th year

4. Course general Description

This course deals with the basis and processes involved in drug discovery and drug design that playing important role starting from folkloric and serendipitous discoveries in addition to traditional medical practices which represent very rich source for modern drug discovery through studying the efficacy of such practices and search for suitable scientific methods to utilize these products in addition to systematic scientific methods to synthesize new organic medicinal agents with more efficacy and of lower side effects through the studies of their stereochemical orientation in the space and the effects of such configuration on interactions with different cellular receptors and its relation to the different biological and biochemical reaction which results inside the body to exert the desired therapeutic effect or undesirable side effects. The course also deals with studying the pharmacokinetics of these agents in the manner of their absorption, distribution, metabolism and excretion beside the improvements to be made to such agents to improve their efficacy and reduce their side effects through improving their physicochemical properties. The course finally teaches the students the life time span and the processes to produce a newly discovered drug.

5. Pre-requirements for this course (if any): (PHC -411

6. Co- requirements for this course (if any): None

7. Course Main Objective(s)

- 1- Knowing the history of drug discovery.
- 2- Understanding of modern drug discovery methodology.
- 3- Highlight the current understanding of the factors affecting modern drug discovery.
- 4- Focus on general principles rather than specific diseases.
- 5- Highlight some Computational techniques used in drug designing.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	15	100
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		

No	Mode of Instruction	Contact Hours	Percentage
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	15
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	15



B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Outline the processes involved in drug lead discovery and Define theories involved in drug action	K3	lectures	Theoretical exam and assignment
1.2				
...				
2.0	Skills			
2.1	Apply bioisosteres approaches in drug designing	S1	lectures	Theoretical exam
2.2	Predict the physicochemical properties of drugs	S1	Case study	Theoretical exam
2.3	explain the metabolic pathways of a drug based on the chemical structure	S5	Case study	Theoretical exam
3.0	Values, autonomy, and responsibility			
3.1	Work independently and professionally with independent thinking	V4	Case study	assignment
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	History of Drug Discovery	1
2.	Target identification and validation	1
3.	Assay development and screening technologies	1
5	Lead identification and optimization	1
6	Screening of New Compounds	1



7	Drug design new techniques	1
8	Candidate Selection	1
9	Molecular modifications and correlation of chemical structure with biological activity.	2
10	Physicochemical Properties and Quantitative Structure-Activity Relationships	2
11	Prodrug, bioisosteres and different approaches used in drug discovery.	2
12	Pre-clinical	1
13	Clinical trials for newly discovered drugs and patents	1
Total		15

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz Exam 1	4	10
2.	Mid-Term Exam	7-9	25
3.	Assignments	15	10
4.	Observation card	15	5
5.	Final exam	16-18	50
	Total		100

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ol style="list-style-type: none"> 1. Textbook of drug design and discovery (3rd edition) by Povl Krogsgaard-Larsen, Tommy Liljefors, Ulf Madsen. 2. An Introduction to Medicinal Chemistry (6th edition) by Graham L. Patrick
Supportive References	<ul style="list-style-type: none"> • Textbook of drug design and discovery (3rd edition) by Povl Krogsgaard-Larsen, Tommy Liljefors, Ulf Madsen. <p>PowerPoints slides</p>
Electronic Materials	http://www.dlaf.nu.edu.sa/ http://www.drugdesign.com
Other Learning Materials	<ol style="list-style-type: none"> i. Chem. Draw software

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Suitable lecture room equipped with data show and internet and sufficient number of seats.
Technology equipment (projector, smart board, software)	Computers, data show, sound systems and internet
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Head of department Students	Indirect Questioners (indirect
Effectiveness of student's assessment	Faculty members Students	Indirect Questioners (indirect
Quality of learning resources	Students	Questioners(indirect)
The extent to which CLOs have been achieved	Students peer reviewer	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	PHARMACEUTICAL CHEMISTRY DEPARTMENT COUNCIL
REFERENCE NO.	COUNCIL NO.
DATE	20-12-2023

