



Course Specification

(Bachelor)

Course Title: : Drug Discovery and Development

Course Code: PHCH 315

Program: Pharmaceutical Sciences

Department: Pharmaceutical Chemistry

College: Pharmacy

Institution: Najran University

Version: 3

Last Revision Date: 18/11/2024

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A. General information about the course:

1. Course Identification

1. Credit hours: 1 (1+0)

2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☒ Program
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (6th Level / 3rd 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):

PHCH 212

6. Co-requisites 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.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	15	100
2	E-learning		





No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	15
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
Total		15

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

Code	Course Learning Outcomes	Code of PLOs 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	Written exam
2.0	Skills			
2.1	Apply bioisosteres approaches in drug designing and physicochemical properties of drugs	S1	Lectures Group discussion	Written exam
2.2	Communicate clearly and effectively with the others	S5	Lectures Group discussion	Assignment
3.0	Values, autonomy, and responsibility			





Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Demonstrate effective and reasonable solutions for rising problems based on the available information as well as critical thinking	V4	Group discussion	Observation cards Assignment

C. Course Content

No	List of Topics	Contact Hours
1.	History of Drug Discovery	1
2.	Biological Mechanisms	1
3.	Pharmacokinetics and Drug Metabolism	2
4.	Pharmaceutical Considerations in Drug Development	1
5.	Exploiting a Chemical Lead 'Search for leads as a drug designer' - from natural products - application of hypothesis - serendipity or accidental - drug metabolites - side effects of existing drugs - mass screening for biological action	2
6.	Screening of New Compounds	1
7.	Computational Chemistry and Molecular Diversity	1
8.	Molecular modifications and correlation of chemical structure with biological activity.	1
9.	Physicochemical Properties and Quantitative Structure-Activity Relationships	1
10.	Structure-guided Drug Design Quantitative structure-activity relationship (QSAR) in the design of new drugs.	1
11.	Pro-drug and bioisosteres approaches in drug designing.	1
12.	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-1	6	5
2.	Midterm	9	25
3.	Quiz-2	11	5





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Assignment	14	10
5.	Observation card	14	5
6.	Final exam	17-19	50
7.	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	<ol style="list-style-type: none"> 1. Textbook of drug design and discovery (3rd edition) by Povl Krogsgaard-Larsen, Tommy Liljefors, Ulf Madsen. 2. PowerPoints slides
Electronic Materials	http://www.dlaf.nu.edu.sa/ http://www.drugdesign.com
Other Learning Materials	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 departments and students	Indirect Questionnaires (indirect)
Effectiveness of Students assessment	Faculty and students members	Indirect Questionnaires (indirect)
Quality of learning resources	Students	Questionnaires (Indirect)



Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Student peer reviewer	Direct Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Pharmaceutical Chemistry Department Council
REFERENCE NO.	4-2024
DATE	18/11/2024

