



Model (No 12)

Course Specification : Medicinal Chemistry (3)

Faculty of Pharmacy

Farabi Quality Management of Education and Learning - 15/1/2021

University : Mansoura University

Faculty : Faculty of Pharmacy

Department :

1- Course data :-

Code:	PD513 PD513				
Course title:	Medicinal Chemistry (3)				
Level:	Five				
Program Title:	• pharmaceutical sciences				
Specialization:					
Teaching Hours:	Theoretical:	2	Tutorial:		Practical: 1

2- Course aims :-

1. Recognizing the relationships between the chemical structures of different chemotherapeutic drugs and biological activities.
2. Understand the different mode of action of different classes of chemotherapeutic agents.

3- Intended learning outcomes of course (ILO'S) :-

a- Knowledge and understanding

1. [a4] Enumerate the theories of isolation, synthesis, purification, identification and standardization methods of chemicals, natural and pharmaceutical compounds; as well as the fundamentals of drug design and development.
 - a4.1-Outline the general synthetic pathways of different drug classes.
2. [a5] Identify the structure-activity relationship of group of pharmaceutical compounds.
 - a5.1-Realize how drug-receptor interactions occur based on the pharmacophoric group in each pharmacological class
3. [a14] Classify the pharmacological properties of drugs including mechanism of action, therapeutic uses, dosage, contraindications, adverse drug reactions and drug interactions.

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- a14.1-List the various structural subclasses of chemotherapeutic drugs and identify the representative pharmacophore in each pharmacological class
 - a14.2-Explain the molecular mechanisms of drug action.

b- Intellectual skills

1. [b5] Design appropriate methods for isolation, synthesis, purification, identification and standardization of various chemicals and pharmaceutical compounds.
 - b5.1-Predict pathways of metabolic degradation based on vulnerability of drug functional groups to metabolizing enzymes.
2. [b6] Apply the principles of bioinformatics and computer-aided tools and molecular modeling programs in the design of new molecular entities.
 - b6.1-Interpret the structural feature of a given drug in relation to affinity to a specific receptor.
3. [b16] Predict the physical and chemical properties and biological activity of natural and synthetic compounds based on molecular structure.
 - b16.1-Predict the major pharmacological action and therapeutic activity of a given drug based on the molecular structure.

c- Professional and practical skills

1. [c4] Apply appropriate methods for extraction, isolation, synthesis, purification, identification and standardization of active substances from different origins.
 - c4.1-Apply the given information to evaluate the activity of related compounds within a pharmaceutical class based on structural similarities and dissimilarities.
 - c4.2-Detect the possible side effects and toxicity to a given drug molecule based on its structural features.
 - c4.3-Analyze quantitatively drug concentration in pharmaceutical preparations.
2. [c17] Apply the concepts of pharmaceutical care in different pharmacy practice settings.
 - c17.1-Counsel the patients about proper use of antibiotics and prescribe therapeutic recommendations based on an understanding of drug chemistry'

d- General and transferable skills

1. [d3] Interact effectively in team working.
 - d3.1-Work effectively in a team.
2. [d4] Exploit calculations and statistical methods as well as information technology (IT) tools.
 - d4.1-Practice independent learning needed for continuous professional development.
3. [d8] Present information clearly in written, electronic and oral forms.
 - d8.1-Implement writing and presentation skills.
4. [d9] Promote critical thinking, problem-solving, decision-making, and time managing capabilities.
 - d9.1-Demonstrate creativity and time management abilities.

4- Course contents :-

No	Topics	Week
1	Introduction to chemotherapy	1
2	Penicillins and Cephalosporins	2-3
3	Non-classical antibiotics	4
4	antineoplastic agents	5
5	Quinolones, , chloramphenicol, UTIs	6
6	Midterm exam	7
7	Sulfonamides, antiprotozoal drugs, anthelmintics	8-9
8	Macrolides, aminoglycosides, lincomycins, tetracyclins	10-13
9	Practical course and case study	2-12

5- Teaching and learning methods :-

S	Method	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Lectures using Data show, PowerPoint presentations	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c4.3	d3.1
2	Research assignments	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c4.3	d4.1
3	Use of computer software for drawing of chemical structures	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c17.1	
4	Case study	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c4.3	d3.1

6- Teaching and learning methods of disables :-

1. None

7- Student assessment :-

a- Student assessment methods

No	Assessment Method	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Written exam	a4.1,a5.1,a14.1,a14.2			
2	2. Practical exam			c4.1,c4.2,c4.3,c17.1	
3	Oral exam				d8.1,d9.1
4	4. Case study	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1		

b- Assessment schedule

No	Method	Week
1	Mid-Term	7
2	Final written Exam	15
3	Oral	15
4	Practical exam	13

c- Weighting of assessments

No	Method	Weight
1	Mid_term examination	10
2	Final_term examination	50
3	Oral examination	15
4	Practical examination	20
5	Semester work	5
6	Other types of assessment	0
Total		100%

8- List of references

S	Item	Type
1	Practical course notes prepared by the department staff members	Course notes
2	"Foye's Principles of Medicinal Chemistry", 8th edition, (David A. Williams, Thomas L. Lemke & William O. Foye, Editors), Lippincott Williams & Wilkins, 2017	Books
3	"Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, (J. H. Block and J. M. Beale Jr, Editors), Lippincott Williams & Wilkins, Philadelphia, PA, 2011	Books
4	Graham L. Patrick; "An Introduction to Medicinal Chemistry" Oxford University Press, USA; 6th edition, 2017	Books

5	Thomas, Gareth, "Fundamentals of Medicinal Chemistry" Wiley-Blackwell; Kindle Edition (2013).	Books
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9- Matrix of knowledge and skills of the course

S	Course contents	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Introduction to chemotherapy	a5.1,a14.1	b6.1	c4.2	d4.1,d8.1,d9.1
2	Penicillins and Cephalosporins	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2	d4.1,d8.1
3	Non-classical antibiotics	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c17.1	d4.1,d9.1
4	antineoplastic agents	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2	d4.1
5	Quinolones, , chloramphenicol, UTIs	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c17.1	d4.1
6	Midterm exam	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2	
7	Sulfonamides, antiprotozoal drugs, anthelmintics	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2	d4.1
8	Macrolides, aminoglycosides, lincomycins, tetracyclins	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c17.1	d4.1
9	Practical course and case study	a4.1,a5.1,a14.1,a14.2	b5.1,b6.1,b16.1	c4.1,c4.2,c4.3	d3.1,d4.1,d8.1,d9.1

Course Coordinator(s): -

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