University : Mansoura University

Faculty : Faculty of Pharmacy

Department :

1- Course data :-

Code:	PD411|PD411					
Course title:	Medicinal Chemistry (1)					
Level:	Four					
Program Title:	• pharmaceutical sciences					
Specialization:						
Teaching Hours:	**Theoretical:**	3	**Tutorial:**		**Practical:**	1

2- Course aims :-

1. Introducing students to medicinal chemistry topics and domain.
2. Studying physicochemical properties of drugs.
3. Explaining the different phases of drug metabolism and the enzymes involved.
4. Understanding the mode of action of drugs affecting autonomic nervous system (ANS), cardiovascular drugs and diuretics.
5. Knowing the chemistry, synthesis, nomenclature and structure activity relationship (SAR) of drugs affecting ANS, cardiovascular drugs and diuretics.

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

a- Knowledge and understanding

1. [a1] Identify the principles of basic, pharmaceutical, medical, food components, herbal, social, behavioral, management, health and environmental sciences as well as pharmacy practice.
    - a1.1-Identify the physicochemical properties of drugs .

2. [a5] Identify the structure-activity relationship of group of pharmaceutical compounds.
    - a5.1-Recognize the possible metabolic pathways for different drug molecules
3. [a14] Classify the pharmacological properties of drugs including mechanism of action, therapeutic uses, dosage, contraindications, adverse drug reactions and drug interactions.
    - a14.1-List the pharmacological properties of drugs, including mechanism of action, clinical uses, drug interactions, contra-indications, adverse drug reactions (ADRs) and SAR.

b- Intellectual skills

1. [b5] Design appropriate methods for isolation, synthesis, purification, identification and standardization of various chemicals and pharmaceutical compounds.
    - b5.1-Assess drug interactions and ADRs.
2. [b16] Predict the physical and chemical properties and biological activity of natural and synthetic compounds based on molecular structure.
    - b16.1-Predict absorption and distribution behavior of drug molecules based on drug chemistry
    - b16.2-Predict pathways of metabolic degradation based on vulnerability of drug functional groups to metabolizing enzymes.

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.
2. [c5] Perform good pharmacy practice by proper understanding of etiology and pathophysiology of diseases, and drug chemistry.
    - c5.1-Model and simulate structure of drugs using laboratory software.

3. [c14] Apply different qualitative and quantitative analytical, chemical, microscopical, and biological methods for identification, quality control (QC) and assay of raw materials as well as pharmaceutical preparations.
    - c14.1-Infer physicochemical properties from examination of drug structure.

d- General and transferable skills

1. [d3] Interact effectively in team working.
    - d3.1-Work effectively in a team.
2. [d8] Present information clearly in written, electronic and oral forms.
    - d8.1-Implement writing and presentation skills.

4- Course contents :-

No	Topics	Week
1	Introduction to medicinal chemistry. Definitions, objectives, classification of drugs and nomenclature of drugs	1
2	The physicochemical properties and drug action. Drug-Receptor interactions and forces involved	2
3	Drug biotransformation	3-4
4	Drugs affecting the autonomic nervous system: Adrenergic agonists and antagonists; Cholinergic agonists and antagonists.	5-8
5	Antihypertensive drugs, anticoagulant drugs, antianginal drugs, antiarrhythmic drugs, antihyperlipidemic drugs, and diuretics	9-12
6	Practical: Molecular modeling of drug molecules (computer programs) and case study related to the studied topics	2-11

5- Teaching and learning methods :-

S	Method	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Lectures using whiteboard and data show	a1.1,a5.1,a14.1	b5.1,b16.1,b16.2	c4.1,c14.1	d8.1
2	Practical using computer software for drawing of chemical structures	a1.1,a5.1	b16.1,b16.2	c4.1,c5.1,c14.1	d3.1

3	Practical: Case study	a1.1,a5.1,a14.1	b5.1,b16.1,b16.2	c4.1,c14.1	d3.1,d8.1

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	a1.1,a5.1,a14.1	b5.1,b16.1,b16.2	c4.1,c14.1	
2	Practical exam	a1.1,a5.1	b16.1	c4.1,c5.1,c14.1	
3	Oral	a1.1,a5.1,a14.1	b5.1,b16.1,b16.2	c4.1	d3.1,d8.1

b- Assessment schedule

No	Method	Week
1	Mid-term	7
2	Practical	12
3	Oral	15

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 asessment	0
Total		100%

8- List of references

S	Item	Type
1	"Foye's Principles of Medicinal Chemistry", 8th edition, (David A. Williams, Thomas L. Lemke & William O. Foye, Editors), Lippincott Williams & Wilkins, 2017	Books
2	"Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, (J. H. Block and J. M. Beale Jr, Editors),	Books

	Lippincott Williams & Wilkins, Philadelphia, PA, 2011	
3	Graham L. Patrick; "An Introduction to Medicinal Chemistry" Oxford University Press, USA; 6 th Revised edition, 2017	Books
4	Practical course notes prepared by the department staff members	Course notes
5	http://pharmacy.creighton.edu/	Web sites

9- Matrix of knowledge and skills of the course

S	Course contents	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Introduction to medicinal chemistry. Definitions, objectives, classification of drugs and nomenclature of drugs	a1.1	b16.1,b16.2	c14.1	d3.1
2	The physicochemical properties and drug action. Drug-Receptor interactions and forces involved	a1.1	b16.1,b16.2	c14.1	d3.1
3	Drug biotransformation	a1.1	b16.1,b16.2		d3.1
4	Drugs affecting the autonomic nervous system: Adrenergic agonists and antagonists; Cholinergic agonists and antagonists.	a5.1,a14.1	b5.1	c4.1	d3.1
5	Antihypertensive drugs, anticoagulant drugs, antianginal drugs, antiarrhythmic drugs, antihyperlipidemic drugs, and diuretics	a5.1,a14.1	b5.1	c4.1	d3.1
6	Practical: Molecular modeling of drug molecules (computer programs) and case		b16.1,b16.2	c5.1	d3.1,d8.1

	study related to the studied topics				

Course Coordinator(s): -

Ghada Sameh Hafez Hassan

Head of department: -

Ghada Sameh Hafez Hassan