Course specification
2020- 2021
Faculty of Pharmacy
Mansoura University

Second Level | **Pharmaceutical Organic Chemistry 3**

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutical Organic Chemistry
Course title: **Pharmaceutical Organic Chemistry 3**
Course code: PO 213

Program on which the course is given	Pharmaceutical Science, Pharm D
Academic Level	Second Level, first semester, 2020-2021
Date of course specification approval	9/1/2021

1. Basic Information: Course data:

Course title:	**Pharmaceutical Organic Chemistry 3**	**Code: PO 213**
Specialization:	**Pharmaceutical sciences**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

2.1. Gain an understanding of the basic principles of organic chemistry.
2.2. Have a good idea about heterocyclic -chemistry and organic reactions and carbohydrates to help in understanding of the next applied sciences.
2.3. 3. Be capable to synthesize and prepare many heterocyclic organic compounds

3. Course Learning Outcomes:

Upon completing the course, the students will be able to dominate the following key elements

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

1.1	Recognize in-depth and breadth knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.
1.2	Use appropriate pharmaceutical and medical terminology, abbreviations and symbols in pharmacy practice and recall scientific names of drugs.

1.3	Combine the principles of fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical raw materials and finished products
1.4	Explain drugs' mode of action, therapeutic effects and evaluate their appropriateness, effectiveness, and safety in individuals and populations, using knowledge from fundamental sciences.
1.7	Gather and critically analyze new information, including evidence-based information, that may be applicable to pharmaceutical industry and patient care.

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE

2.2.1	Identify, design, prepare, purify, and quantify, of pharmaceutical materials and from different origins.
2.2.2	Apply GMP guidelines for inventory and legal responsibility related to pharmaceutical industry of materials/ products of various origins.
2.2.3	Show the ability to use lab equipment and different kinds of simulation software with in depth knowledge to design synthetic and analytical processes for raw materials and finished pharmaceutical products.
2.4.2	Demonstrate ability to use principles of first aid in the practice of pharmacy.
2.5.3	Apply scientific principles of research and scholarly investigation and use systematic approaches in the search for best available evidence.

DOMAIN 3: PHARMACEUTICAL CARE

3.2.1	Integrate principles of medicinal chemistry and pharmacological aspects of drugs, as mode of action, therapeutic uses, proper dosage, unwanted effects and drug interactions.

DOMAIN 4: PERSONAL PRACTICE

4.1.1	Share decision-making activities with other with other pharmacy team members and non-pharmacy team members and apply effective time management skills.
4.2.2	Apply artificial technology whenever possible to present relevant information.
4.3.1	Use effective strategies to manage and improve self-practice of pharmacy.
4.3.2	Apply principles of continuing professional development including assessing own learning needs and developing a plan to meet these needs.

4. Contents:

Week No	Topics	No. of hours
1.	HETEROCYCLIC COMPOUNDS : Nomenclature and classification	2
2-3	FIVE-MEMBEED HETEROCYCLES : Pyrrole, furan, thiophen and indole and its derivatives	4
4.	FUSED HETEROCYCLES OF PYRROLE AND ITS DERIVATIVES	2
5.	COMPOUNDS WITH TWO OR MORE HETEROATOMS	2
6.	SIX MEMBERED HETEROCYCLES	2
7.	**Mid term exam**	
8-9.	QUINOLINES AND ISOQUINOLINES SIX-MEMBERED RINGS WITH ONE OXYGEN ATOM	4
10.	SIX-MEMBERED RINGS WITH TWO NITROGEN ATOMS	2
11-12.	SIX-MEMBERED RINGS WITH TWO DIFFERENT HETEROATOMS	4
13.	Carbohydrates	2
Week No	**Practical topics**	**No. of hours**
1-4	Separation of solid binary mixtures of organic compounds	8
5.	**Mixture separation Exam**	
6.	Organic synthesis (synthetic strategies)	2
7.	**Midterm exam**	
8.	Synthesis of ethyl acetate ester	2
9.	Synthesis of glucosazone	2
10.	Synthesis of nitrotoluene and nitronaphthalene	2
11.	Synthesis of iodoform and azodye	2
12.	**Synthesis Exam**	

5. Teaching and learning Methods:

5.1	Lectures using whiteboard
5.2	Laboratory equipments
5.3	Models
5.4	Animation files
5.5	Lectures using Data show, PowerPoint presentations

6. Student Assessment:

a- Assessment methods

1. Quizzes	To assess understanding, intellectual and professional skills
2. Oral exam	To assess knowledge, understanding, intellectual skills, general skills and confidence
3. Practical exam	To assess professional and practical skills
4. Lab. reports	To assess the skills of problem-solving and date presentation
5. Written exam	To assess understanding, intellectual and professional skills

b- Assessment schedule

Assessment 1	Mid-term	7th week
Assessment 2	Practical	5th and 11th week
Assessment 3	Written	15th week
Assessment 4	Oral	15th week

c- Weighting of assessments

1.	Mid-term examination	15 %
2.	Final-term examination	50 %
3.	Oral examination	10 %
4.	Practical examination and Semester work	25 %
Total		100 %

7. Facilities required for teaching and learning

Class room	Data show, computers, internet, molecular chemical models and animation files
Laboratory facilities	Equipment and tools.
Library	Books for self learning

8. Matrix of knowledge and skills of the course

No	Course contents	Study Week	ILOS			
			Domain 1	Domain 2	Domain 3	Domain 4
1.	HETEROCYCLIC COMPOUNDS : Nomenclature and classification	1st	1.1, 1.2, 1.4, 1.7	2.2.1, 2.2.2, 2.4.2, 2.5.3	3.2.1	-
2.	FIVE-MEMBEED HETEROCYCLES : Pyrrole, furan, thiophen and indole and its derivatives	2nd and 3rd	1.1, 1.2, 1.3, 1.6, 1.7	2.2.1, 2.2.2, 2.2.3	3.2.1	-
3.	FUSED HETEROCYCLES OF PYRROLE AND ITS DERIVATIVES	4th	1.1, 1.2, 1.3, 1.4, 1.6	2.2.1, 2.2.2, 2.2.3, 2.5.3	3.2.1	-
4.	COMPOUNDS WITH TWO OR MORE HETEROATOMS	5th	1.1, 1.3, 1.4, 1.6, 1.7	2.2.1, 2.2.2, 2.4.2,	3.2.1	4.2.2, 4.3.1, 4.3.2
5.	SIX MEMBERED HETEROCYCLES	6th	1.1, 1.2, 1.3, 1.4, 1.7	2.2.1, 2.2.3, 2.4.2, 2.5.3	3.2.1	4.2.2, 4.3.1, 4.3.2
6.	QUINOLINES AND ISOQUINOLINES SIX-MEMBERED RINGS WITH ONE OXYGEN ATOM	8th and 9th	1.1, 1.3, 1.4, 1.6, 1.7	2.2.1, 2.2.2, 2.4.2,	3.2.1	-
7.	SIX-MEMBERED RINGS WITH TWO NITROGEN ATOMS	10th	1.1, 1.2, 1.3, 1.6, 1.7	2.2.1, 2.2.2, 2.4.2,	3.2.1	-
8.	SIX-MEMBERED RINGS WITH TWO DIFFERENT HETEROATOMS	11th and 12th	1.1, 1.2, 1.3, 1.6, 1.7	2.2.1, 2.2.2, 2.4.2,	3.2.1	-
9.	Carbohydrates	13th	1.1, 1.2, 1.3, 1.6, 1.7	2.2.1, 2.2.2, 2.4.2,	3.2.1	-

9. List of References

No	Reference	Type
1.	Practical course notes and lectures notes prepared by the department staff members	Course notes
2.	Organic Chemistry: Structure and Reactivity by Seyhan N. Hardcover - Jul 2003)	Book
3.	Handbook of Heterocyclic Chemistry, Second Edition by Alan R. Katritzky and Pozharskii (Paperback - Oct 16, 2000	Book
4.	Pine, Hendrickson, Cram and Hammond, Organic Chemistry •	Book
5.	Joule, Mills and Smith, Heterocyclic Chemistry	Book

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