



Course specification  
2020- 2021  
Faculty of Pharmacy  
Mansoura University



## First Level

## Course Specification Pharmaceutical Organic Chemistry 1

**University:** Mansoura University (MU)  
**Faculty:** Pharmacy  
**Department:** Pharmaceutical Organic Chemistry  
**Course title:** Pharmaceutical Organic Chemistry 1  
**Course code:** PO111

<b>Program on which the course is given</b>	Pharmaceutical Science, Pharm D
<b>Academic Level</b>	First Level, First semester, 2020-2021
<b>Date of course specification</b>	9/1/2021

### 1. Basic Information: Course data:

<b>Course title:</b>	<b>Pharmaceutical organic Chemistry 1</b>	<b>Code: PO111</b>
<b>Specialization:</b>	<b>Pharmaceutical organic Chemistry</b>	
<b>Prerequisite:</b>	-----	
<b>Teaching Hours:</b>	<b>Lecture: 2</b>	<b>Practical: 1</b>
<b>Number of units: (credit hours)</b>	<b>3</b>	

### 2. Course Aims:

- 2.1. Gain an understanding of the basic principles of atomic structures.
- 2.2. Have a good idea about the stereochemistry of the chiral organic compounds
- 2.3. Enable the student to understand the basics of the chemical reactions and their mechanisms.
- 2.4. Recognize the chemical properties of organic compounds.
- 2.5. Have a good idea about functional group transformation.

### 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.
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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.
1.6	Access, retrieve, critically analyze and apply relevant scientific resources to make evidence-informed professional decisions.
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.
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**DOMAIN 4: PERSONAL PRACTICE**

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



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learning needs and developing a plan to meet these needs.

#### 4. Contents:

Week No	Topics	No. of hours
1.	Atoms and bonding.	2
2.	Intermolecular forces and Electronic displacements factors.	2
3.	Stability of carbon intermediate, acidity and basicity concepts.	2
4.	Alkanes and cycloalkanes, nomenclatures; properties and reaction	2
5.	Alkenes and cycloalkenes, nomenclatures; properties and reactions	2
6.	<b>Mid-term Exam</b>	
7.	Alkynes and polyenes, nomenclatures; properties and reactions	2
8.	Alkyl halides, nomenclatures; properties and reactions	2
9.	Stereochemistry: Constitutional and conformational Isomers.	2
10.	Stereochemistry: optical and fischer projection	2
11.	Stereochemistry: relative and absolute configuration.	2
12.	Stereochemistry: Diastereoisomers and optical resolution of racemic mixture	2
13.	<b>Final written &amp; oral</b>	

Week No	Practical topics	No. of hours
1.	Laboratory safety rules and Practices	1
2.	Identification of organic compounds	1
3.	Physical characters	1
4.	Solubility	1
5.	Chemical Properties (soda lime)	1
6.	<b>Mid-term Exam</b>	
7.	30% NaOH	1
8.	Sodium carbonate	1
9.	Ferric chloride	1
10.	Element test	1
11.	Revision	1
12.	<b>Practical exam</b>	

## 5. Teaching and learning Methods:

5.1	Lectures using whiteboard
5.2	Lectures using Data show, PowerPoint presentations
5.3	Research assignments
5.4	Use of computer software for drawing of chemical structures
5.5	Chemical models and Chembio-office Chemdraw
5.6	Animation files

## 6. Student Assessment:

### a- Assessment methods

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

### b- Assessment schedule

Assessment 1	Practical	12 <sup>th</sup> week
Assessment 2	Mid-term	6 <sup>th</sup> week
Assessment 3	Oral	15 <sup>th</sup> week
Assessment 4	Written	15 <sup>th</sup> 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.	Atoms and bonding Electronic displacements factors	1 <sup>st</sup>	1.1, 1.2, 1.4, 1.7	2.2.1, 2.2.2, 2.4.2, 2.5.3	3.2.1	-
2.	Intermolecular forces	2 <sup>nd</sup>	1.1, 1.2, 1.3, 1.6, 1.7	2.2.1, 2.2.2, 2.2.3	3.2.1	-
3.	Stability of carbon intermediate, acidity and basicity concepts	3 <sup>rd</sup>	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.	Alkanes and cycloalkanes	4 <sup>th</sup>	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.	Alkenes and cycloalkenes	5 <sup>th</sup>	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.	Alkynes and polyenes	6 <sup>th</sup>	1.1, 1.2, 1.3, 1.4,	2.2.1, 2.2.3, 2.5.3	3.2.1	4.2.2, 4.3.1, 4.3.2



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7.	Alkyl halides	7 <sup>th</sup>	1.1, 1.2, 1.3, 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
8.	Stereochemistry	8 <sup>th</sup> -11 <sup>th</sup>	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

### 9. List of References

No	Reference	Type
1.	Fundamentals of Organic Chemistry, T. Solomon.	Book
2.	Notes in organic Chemistry, by Staff members of Pharm. Org. Chem. Dept	Course notes

Course Coordinator:	Mohammed Adel Massoud
Head of Department:	Shahenda Metwally EL-Messery