



## Course Book

### Course overview:

Principles of organic chemistry will be studied, including the structure, properties, and reactivity of aliphatic and aromatic organic molecules; and properties and behaviour of organic compounds and their derivatives. Emphasis is placed on organic synthesis and mechanisms. Includes study of covalent and ionic bonding, nomenclature, stereochemistry, structure and reactivity, reaction mechanisms, functional groups, and synthesis of simple molecules. Laboratory activities support the principles of organic chemistry.

### Course objective:

1. Understand and be able to explain the general principles, laws, and theories of chemistry that are discussed and presented throughout the semester
2. Use critical thinking and logic in the solution of problems
3. Apply learned chemistry skills to new situations
4. Demonstrate an understanding of chemistry through technological advancement
5. Apply chemical principles in the laboratory setting
6. Develop independent and cooperative learning skills
7. 8. Develop an awareness of the value of chemistry in our daily living

**Student's obligation:** The student must to attend all lectures during the academic year and is permitted to absence only for three weeks, which amounts to 10% and when the percentage exceeded in any lecture he is considered as failed in that lecture. The student not allowed delaying the theoretical and practical examinations only after getting medical report. The student must do short examinations weekly in the form of (quiz) with writing reports after conducting the practical experiments.

### - Forms of teaching

lecture halls with data show equipment for lecture presentations, white board, overhead projector, posters

### - Assessment scheme

10% Mid. Theory exam

15% Mid. practical exam

8% Quiz

27% Activity

20% final practical

20% final theory

**Specific learning outcome:**

- Ability to develop general knowledge
- Knowledge and understanding of the subject area and understanding of the profession
- Ability to identify, differentiate, pose and resolve problem
- Demonstrate the ability to think critically and solve problems in a laboratory setting
- Ability to apply knowledge in practice
- Ability to search for process and analyze information from a variety of sources
- Analysis of Specimens and Validation of Results
- Ability to act as ethical and responsible members of the health care team.
- Demonstrates research skills to investigate, evaluate or problem solve.
- Ability to make reasoned decision.
- Ability to design and manage projects.
- Capacity to generate new ideas (creative).

**- Course Reading List and References:**

1. Chemistry, the central science, 2006 10 editions by brown.
2. Chemistry for today: general, organic, and biochemistry, 2008, sixth edition by Spender L. Seager and Michael R. Slabaugh.
- 3- Introduction to General, Organic, and Biochemistry, 2013 - 11th Edition  
By Morris Hein, Scott Pattison, Susan Arena, Leo R. Best

- Course topics (Theory)	Week	Learning Outcome
Organic chemistry: Introduction, Carbon compounds, classification of hydrocarbons, sources and uses of hydrocarbons.	1	1,2
Alkanes ,alkyl groups, cycloalkanes, haloalkanes, physical and chemical properties	2	1,2
Alkenes, physical and chemical properties	3	1,2
Alkynes, physical and chemical properties	4	1,2,3,5,6,8 11,12
Alcohols, uses, physical and chemical properties	5	1,2,3,5,6,8 11,12

Aldehydes and ketones , uses, physical and chemical properties	6	1,2,3,5,6,8 11,12
Midterm examination, theoretical and practical examination	7,8	
Thioles, Ethers , uses, physical and chemical properties	9	1,2,3,5,6,8 11,12
Organic acids, uses, physical and chemical properties	10	1,2,3,5,6,8 11,12
Esters, thioesters , uses, physical and chemical properties	11	1,2,3,5,6,8 11,12
Amines and amides , uses, physical and chemical properties	12	1,2,3,5,6,8 11,12
Aromatic compounds , benzene and phenols ,properties, derivatives	13	1,2,3,5,6,8 11,12
Final examination theoretical and practical examination	14,15	
<b>Practical part</b>		
Course topics	Week	Learning Outcome
safety in lab- Glassware Safety – Determine Solubility Percentage	1	1,2
Determining Solubility of Organic Compounds in water , acid-base	2	1,2
Tests for Carboxylic Acids	3	
Determination melting point	4	1,2
Caffeine Extraction from Tea	5	3,4,5,6,8,9,11
Separation and purification	6	3,4,5,6,8,9,11
Distillation	7	3,4,5,6,8,9,11
Midterm examination, theoretical and practical examination	8-9	

Qualitative Identification of phenols	10	3,4,5,6,8,9,11
Qualitative Identification of Alcohols	11	3,4,5,6,8,9,11
Qualitative Identification of Aldehydes and Ketones- Functional Group Tests	12-13	3,4,5,6,8,9,11
Final examination theoretical and practical examination	14-15	
<p>- Examinations:</p> <p>Theoretical part:</p> <p>Q1- Fill in blanks with a suitable words: (25 marks)</p> <p>a- The most important use of hydrocarbons is .....</p> <p>b- Functional groups are usually classified as ..... or .....</p> <p>Q2- Explain why? (20 marks)</p> <p>1- The O-H and O-C bonds in the hydroxyl group are polar covalent bonds?</p> <p>2- The boiling point increased with increasing the molecular weight?</p> <p>Q3- Define the following: (15 marks)</p> <p>a. Organic chemistry</p> <p>b. Functional group</p> <p>Q4- a- Are Haloalkanes polar or nonpolar (40 marks)</p> <p>b- What are the chemical properties of aldehydes</p> <p>Practical part:</p> <p>Q1- Fill the following blanks with a suitable words: (25 marks)</p> <p>a- Solubility indicated by the formation of a ..... , ....., ..... , .....</p> <p>b- .....are the most common organic base</p> <p>Q2- Explain the principle of method for the following tests: (50 marks)</p>		

a- Sodium Bicarbonate Test for Carboxylic Acids

b- Formation of esters

Q3- Explain why?

(25 marks)

1- Replace caps or stoppers on reagent bottles and cover open vessels?

2- Millon's Test must not be done in alkaline solution?

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- External Evaluator

