



Department of Chemistry

College of Science

University of Salahaddin

Subject: Organic Chemistry

Course Book – First Stage Students (2023-2024)

Lecturer's name:

Theoretical part:

Dr Dotsha Jaleel Raheem

Practical part:

Dr Dotsha Jaleel Raheem

Pshtiwan Adel Masum

Hero Sabah Rahman

Course Book

1. Course name	Organic Chemistry
2. Lecturer in charge	Dr Dotsha Jaleel Raheem
3. Department/ College	Chemistry/Science
4. Contact	e-mail: peshawa.osw@su.edu.krd
5. Time (in hours) per week	Theory: 3 hr Practical: 3 hr
6. Office hours	Tuesday 09:00 – 10:00
7. Course code	
8. Teacher's academic profile	<p>Background</p> <p>BSc in Chemistry from College of Science - Salahaddin University MSc in Organic Chemistry –College of Science – Baghdad University PhD in Chemistry-School of Chemistry – Bangor University-UK</p> <p>Research interests</p> <ul style="list-style-type: none"> • Synthesis of heterocyclic organic compounds with possible biological activities • Plant chemistry (natural product isolation and structural elucidation) and their quantitative analysis. • Design and optimisation of methods for the separation and analysis • Ecological aspects of plant chemicals. Interactions resulting from these chemicals with other

	organisms (plants, insects and microorganisms) in a specific ecological niche.
9. Keywords	Organic compounds, alkanes, alkenes, alkynes, nomenclature, physical properties, chemical reactions
10. Course overview:	<p>Organic chemistry is the chemistry of carbon containing compounds. These compounds comprise the majority of the natural system. Knowledge of the chemistry of these compounds is a basic requirement for further studies in chemistry, biology and pharmacological sciences. In this course the main principles of organic chemistry are highlighted. Further in depth study of some of the organic compounds such as alkanes, alkene and alkynes are also included with focus on their physical and chemical properties and the effect of changes in structure on said parameters. The students are also introduced to some of the fundamental terminologies such as atomic and molecular orbitals, bonding, hybridisation and intermolecular forces.</p>
11. Course objective:	<ul style="list-style-type: none"> • The main objective of this course is to build foundation knowledge of organic chemistry required in later advanced levels. • To familiarise the students with different groups of organic compounds and the physical and chemical properties of each. • Build necessary skills required for students to tackle research problems based on the knowledge acquired throughout the course.
12. Student's obligation	<ul style="list-style-type: none"> ▪ The student must attend all lectures and practical lab sessions ▪ Should submit weekly reports on practical experiments ▪ Students must sit two exams throughout the academic year in addition to a final exam on the given topics
13. Forms of teaching	<p>Learning resources in this course include white board, lecture notes, PowerPoint presentations and examples from real life phenomena and situations.</p>
14. Assessment scheme	<p>Breakdown of overall assessment and examination</p> <p>A total of 100 marks are distributed as follows:</p> <ul style="list-style-type: none"> ▪ A total of 50 marks is calculated based on students' efforts throughout the course including: exams, quizzes and class attendance and activity. This is distributed over both theoretical and practical parts ▪ A final examination in topics given throughout the course (accounts for 50 marks)

<p>15. Student learning outcome:</p> <p>By the end of this course the students should be:</p> <ul style="list-style-type: none"> ▪ Familiar with the basic principles of organic chemistry ▪ Able to identify some of the main organic compounds ▪ Understand the driving physical and chemical characteristics behind different properties exhibited by organic compounds ▪ Identify the areas where organic chemistry is applied and their significance in science 	
<p>16. Course Reading List and References:</p> <ul style="list-style-type: none"> ▪ Efficiently Studying Organic Chemistry: for students of chemistry, biochemistry, biology, pharmacy, and medicine By Eberhard Breitmaier, Second revised edition, 2016 ▪ Organic Chemistry By Joseph M. Hornback, second edition, 2005 ▪ Organic Chemistry, Robert Thornton Morrison, Robert Neilson Boyd, Sixth edition, Prentice Hall, 1998 	
<p>17. The Topics:</p> <p>Week 1: Definition of organic chemistry, Atomic orbitals, Electronic configuration, Molecular Orbitals</p> <p>Week 2: Chemical bonds, Hybridization, Intermolecular forces, Bond dissociation energy</p> <p>Week 3 - 6: Electronegativity, Polarity of bonds, Polarity of molecules, Valance electrons, Formal Charge, Physical properties of organic compounds, Acids and bases, Electronic effects</p> <p>Week 7 - 11: Alkanes Definition, Energy of Activation, Transition State, physical properties, Nomenclature, preparations of Alkanes, reactions of Alkanes, Problems</p> <p>Week 12 - 17: Alkenes Structure and Preparation, Elimination, Propylene, The butylenes, Nomenclature, Physical properties, Preparation of Alkenes. Reactions of the Carbon-Carbon Double Bond, Electrophilic Addition, Electrophilic and Free-Rodical Addition, Reactions of alkenes, Problems</p>	<p>Lecturer's name</p>

<p>Week 18 - 23 : (Alkynes)</p> <p>Introduction, Structure of acetylene, Nomenclature, Physical properties of alkynes, Preparation of alkynes, Reactions of alkynes, Acidity of alkynes, Problems.</p> <p>Week 24 - 28: (Cyclic aliphatic compounds)</p> <p>Cyclic Aliphatic Compounds, Nomenclature, Preparation, Reactions, Orbital picture of angle strain Structure and Properties</p>	
<p>18. Practical Topics (If there is any)</p>	
<p>Experiment (1): Physical Properties of Organic Compounds: Determination of Melting Point (m.p.)</p> <p>Experiment (2): Physical Properties of Organic Compounds: Determination of Boiling Point (b.p.)</p> <p>Experiment (3): Purification of Organic Compounds by Recrystallisation</p> <p>Experiment (4): Purification of Organic Compounds by Sublimation</p> <p>Experiment (5): Simple Distillation</p> <p>Experiment (6): Separation of Organic Compounds Based on Acidity and Basicity Differences</p>	
<p>19. Examinations:</p> <p>A typical exam question may include a combination of the following:</p> <ul style="list-style-type: none"> • Definitions • Identifying the products of chemical reactions • Giving explanations for facts and phenomena • Outlining reaction mechanisms • Gap filling • Drawing glassware and identifying lab equipment 	
<p>20. Extra notes:</p>	
<p>21. Peer review</p>	