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| | Ministry of Higher Education and Scientific Research - Iraq<br>Al-Nahrain University<br>College of Science<br>Applied Pathological Analysis Department | |

# MODULE DESCRIPTOR FORM

# نموذج وصف المادة الدراسية

| **Module Information**<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Organic Chemistry | | | **Module Delivery** | |
| **Module Type** | Core | | | ☒**Theory**<br>☒**Lecture**<br>☒**Lab**<br>☒**Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | APPA125 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | 2 |
| **Administering Department** | | Applied Pathological Analysis | **College** | | College of Science |
| **Module Leader** | Dr. Wisam Kadhum H- Al-Hashemi<br>Dr. Rasha Saad Jwad | | **e-mail** | | Wisam.kadhim@nahrainuniv.edu.iq<br>rasha.saad@nahrainuniv.edu.iq |
| **Module Leader's Acad. Title** | | Assistant Professor | **Module Leader's Qualification** | | PhD |
| **Module Tutor** | MSc. Ahmed Abd Temur | | **e-mail** | | ahmed.abed@nahrainuniv.edu.iq |
| **Peer Reviewer Name** | | Dr Rasha Saad Jwad | **e-mail** | | rasha.saad@nahrainuniv.edu.iq |
| **Review Committee Approval** | | 24/02/2024 | **Version Number** | | 1 |
| **Laboratory staff** | MSc. Ahmed Abd Temur, MSc. Dania Emad Ibrahim, Ibrahim Abdul Kareem, MSc. Zina Jabbar Ghaib Hassan, MSc. Huda Ghazi, Dr. Samar T. Hameed, MSc. Amer Adnan, MSc. Omar Khalid Suhail, MSc. Ahlam Abdulla Alwan, MSc. Sarah A. Mahdi, MSc. Athraa Falah. | | | | |

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

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| **Prerequisite module** | None | **Semester** | None |
| **Co-requisites module** | None | **Semester** | None |

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

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| **Module Aims**<br>أهداف المادة الدراسية | 1. Equip students with a foundational understanding of organic chemistry.<br>2. Cover essential topics such as chemical bonding, structure, nomenclature of organic compounds, reactivity of basic functional groups, and the chemistry of different functional groups.<br>3. Exploring molecules of biological significance.<br>4. Serve as a universal baseline of organic chemistry knowledge for incoming first-year students.<br>5. Construct the practical skills of organic chemistry for students. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. The student will be able to recognize and name different types of organic molecules based on their structure, functional groups, and systematic nomenclature rules.<br>2. Describe the bonding and shape of organic molecules: Understanding the types of bonds present in organic molecules (e.g., covalent bonds) and how these bonds influence the three-dimensional shape or geometry of the molecules.<br>3. Understanding the factors that influence the reactivity of organic molecules, such as the presence of functional groups, steric hindrance, and electronic effects.<br>4. Being able to describe the physical and chemical properties of different functional groups, as well as methods for preparing them and their typical reactions.<br>5. Being able to use the information about organic compound structure, bonding, reactivity, and functional groups to predict and explain the outcomes of organic reactions and to solve problems related to organic chemistry. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following. |

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| | 1. Structure and bonding in organic molecules: This covers the basics of molecular structure, including the shapes of organic molecules and the nature of chemical bonds within them.<br><br>2. Functional groups: Organic molecules are classified based on functional groups, which are specific arrangements of atoms within the molecule that confer characteristic chemical properties.<br><br>3. Nomenclature: Organic chemistry has a systematic way of naming compounds, which is essential for communication within the field. This includes the IUPAC (International Union of Pure and Applied Chemistry) naming system.<br><br>4. Isomerism: Organic molecules can exist as different isomers, compounds with the same molecular formula but different structural arrangements or spatial orientations, leading to distinct chemical properties.<br><br>5. Organic reactions: Understanding how organic reactions occur at the molecular level is fundamental to organic chemistry.<br><br>6. Stereochemistry: This branch of organic chemistry focuses on the spatial arrangement of atoms within molecules and how it influences the properties and reactivity of compounds.<br><br>7. Bioorganic chemistry: This interdisciplinary field explores the chemical processes occurring in living organisms, including the structures and functions of biological macromolecules like proteins, nucleic acids, and carbohydrates. |
| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
| **Strategies** | The primary approach for introducing this unit will involve fostering student engagement through active participation in homework exercises, aiming to enhance and broaden their critical thinking abilities. This will be facilitated through class sessions and interactive tutorials, supplemented by the exploration of simple experiments designed to incorporate sampling activities tailored to students' interests. |

## Student Workload (SWL)

الحمل الدراسي للطالب

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| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 87 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 63 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5, 10 | LO #1, 2, 10 and 11 |
| | **Assignments** | 2 | 10% (10) | 2, 12 | LO # 3, 4, 6 and 7 |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 2hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Introduction to organic chemistry |
| **Week 2** | Alkanes and alkenes |
| **Week 3** | Alkynes |
| **Week 4** | Alkyl halides |
| **Week 5** | Alcohols |
| **Week 6** | Amines |
| **Week 7** | Aldehydes |
| **Week 8** | Ketones |
| **Week 9** | Carboxylic acids and their derivatives |
| **Week 10** | Carboxylic acids and their derivatives |
| **Week 11** | Carboxylic acids and their derivatives |
| **Week 12** | Aromatic compounds |
| **Week 13** | Benzene |
| **Week 14** | Phenols |
| **Week 15** | **Preparatory Week** |
| **Week 16** | **Final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
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| | **Material Covered** |
| **Week 1** | Lab 1: Lab safety guide and laboratory glass wares |
| **Week 2** | Lab 2: Crystallization |
| **Week 3** | Lab 3: Liquid-liquid extraction |
| **Week 4** | Lab 4: Soxhlet extraction |
| **Week 5** | Lab 5: Extracting Caffeine from tea |
| **Week 6** | Lab 6:  Simple and fractional distillation |
| **Week 7** | Lab 7: Determination of melting point and boiling point |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس |
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| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Bruice, Paula Yurkanis. (2014). Organic Chemistry, 7th ed. New Jersey: Pearson Education International, pages 1392. | Yes |
| **Recommended Texts** | McMurry, John E., (2016). Organic Chemistry, 9th ed., Cengage Learning, pages 1518. | No |
| **Websites** | https://www.khanacademy.org/science/organic-chemistry<br>https://www.masterorganicchemistry.com/ | |

**APPENDIX:**

| **GRADING SCHEME**<br>مخطط الدرجات | | | | |
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| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C -** Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D -** Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E -** Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX –** Fail | مقبول بقرار | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
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Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي