# MODULE DESCRIPTION
# وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Organic Chemistry II** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>☒**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | **Che-314** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 3 | | **Semester of Delivery** | 5 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Che-224 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** | |

| | |
|---|---|
| أهداف المادة الدراسية | 1. To know the chemical structures of carboxylic acids, esters, amines and phenols.<br>2. To know the nomenclature of carboxylic acids, esters and amines.<br>3. The physical and chemical properties of carboxylic acids, esters, amines and phenols.<br>4. To understand the preparation and reactions of carboxylic acids, esters, amines and phenols.<br>5. To compare between carbanion and carbocation and know their stability.<br>6. To understand the reaction of carbanion (e.g. Aldol reaction and Claisen condensation). |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Recognize the structure and nomenclature of carboxylic acid and esters.<br>2. Recognize the physical and chemical properties of carboxylic acids and esters.<br>3. Explain how to prepare carboxylic acids derivatives.<br>4. Know the reaction of carboxylic acids and its derivatives.<br>5. Recognize the structure and nomenclature of amines.<br>6. Recognize the physical and chemical properties and amines.<br>7. Explain how to prepare amine derivatives.<br>8. Know the reaction of amines.<br>9. Understand the stability of carbanion and carbocation.<br>10. Explain the mechanism of reaction of carbanion.<br>11. Understand how to prepare new compound using reaction of carbanion. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>The structure and nomenclature of carboxylic acid, Properties and Acidity of carboxylic acids, Methods of Preparation and Reactions of carboxylic acids [10hrs]<br>The structure and nomenclature and Properties of esters, Methods of Preparation and Reactions of esters. [7 hrs]<br>The structure and classification and nomenclature of amines, Properties and basicity of amines, Methods of Preparation and Reaction of amines [10 hrs]<br>The stability of of carbanion and carbocation, Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation ), Addition reaction ( chalcone formation, Henry reaction), Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction). [10 hrs] |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | |

| | |
|---|---|
| | The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)** 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 | All |
| | Report | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| Summative assessment | Midterm Exam | 1 hr | 10% (10) | 7 | LO # 1-7 |
| | Final Exam | 3hr | 50% (50) | 16 | All |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|

| | |
|---|---|
| **Week 1** | The structure and nomenclature of carboxylic acid |
| **Week 2** | Properties of carboxylic acids and Acidity of carboxylic acids |
| **Week 3** | Methods of Preparation of carboxylic acids |
| **Week 4** | Reactions of carboxylic acids |
| **Week 5** | The structure and nomenclature and Properties of esters |
| **Week 6** | Methods of Preparation of esters |
| **Week 7** | Reactions of esters |
| **Week 8** | The structure and classification and nomenclature of amines |
| **Week 9** | Properties and basicity of amines |
| **Week 10** | Methods of Preparation of amines |
| **Week 11** | Reaction of amines |
| **Week 12** | The stability of of carbanion and carbocation. |
| **Week 13** | Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation ) |
| **Week 14** | Addition reaction ( chalcone formation, Henry reaction) |
| **Week 15** | Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction) |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Preparation of chlorobenzene |
| **Week 2** | Lab 2: Sulfonation of aromatic amine |
| **Week 3** | Lab 3: Preparation of sulfanilic acid |
| **Week 4** | Lab 4: Esterification of benzoic acid |
| **Week 5** | Lab 5: Preparation of ethylbenzene |
| **Week 6** | Lab 6: Oxidation of Toluene |
| **Week 7** | Lab 7: Preparation of benzoic acid |
| **Week 8** | Lab 8: Cannizzaro reaction |
| **Week 9** | Lab 9: preparation carboxylic acid from aldehyde |
| **Week 10** | Lab 10: Aldol condensation |
| **Week 11** | Lab 11: Preparation of Dibenzalacetone |
| **Week 12** | Lab 12: Claisen condensation |

| | |
|---|---|
| **Week 13** | Lab 13: Preparation of ethylacetoacetate |
| **Week 14** | Lab 14: Perkin condensation |
| **Week 15** | Lab 15: Preparation of cinnamic acid |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Organic Chemistry by Morison and Boyd | Yes |
| **Recommended Texts** | Textbook of practical organic chemistry by Brian S. Furniss | No |
| **Websites** | | |

## Grading Scheme
مخطط الدرجات

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Inorganic chemistry II** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **6.00** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 2 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. Marwan Mohammed F. | | **e-mail** | mw_mw_888@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | | **Version Number** | | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | This module provides the student with an introduction to inorganic chemistry, providing a knowledge and understanding of atomic and molecular structure, periodicity and reactivity of the inorganic elements. The basic concepts of inorganic chemistry will be introduced, such as reduction-oxidation, acid-base chemistry, and complexation chemistry. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Representation and understanding of the study of salts, the major part of inorganic compounds, in which cations and anions are linked together by ionic bonds.<br>Know the classification of inorganic compounds into oxides, carbonates, halides and sulfates, as they are distinguished by understanding many of them with a high melting point and poor conductivity of electricity in the solid state. Inorganic compounds are also characterized by their solubility in water and the ease of crystallization.<br>Knowing the simplest types of inorganic reactions, the double displacement reaction, when two salts are mixed and the ions exchange without any change in the oxidation state. |
| **Indicative Contents**<br>المحتويات الإرشادية | The origin of the quantum atom<br>photoelectric effect [6 h]<br>atomic spectra , Rutherford-and Bohr theory Schrödinger equation<br>Quantum preparation, monthly exam [12 h]<br><br>Periodic Table . The periodic table groups. Periodic table cycles<br>transitional elements . Periodic properties of the periodic table<br>Ionic compounds [15 h]<br><br>Covalent Bonds - Molecular Orbital Theory<br>monthly exam<br>[6 h] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning.<br>Guided Independent Study: Assessment preparation and completion<br>Scheduled Learning And Teaching Activities: Lecture<br>Scheduled Learning And Teaching Activities: Small group teaching |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Blocking with exercises |
| **Week 2** | Periodic properties of the periodic table |
| **Week 3** | The physical properties of group and period |
| **Week 4** | Ion energy. Electronegativity |
| **Week 5** | Atom radius (ionic and covalent) |
| **Week 6** | Types of chemical bonds with examples |
| **Week 7** | Ionic bond theory |
| **Week 8** | Covalent bond theory |
| **Week 9** | Hybridization . And spatial shapes |

| | |
|---|---|
| **Week 10** | Interactions of orbitals and space shapes |
| **Week 11** | Equivalence theory |
| **Week 12** | With examples of types of molecules |
| **Week 13** | Particle orbital theory |
| **Week 14** | Molecular geometry and molecular shape |
| **Week 15** | Mid. Exam |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | - Inorganic chemistry for the first stage - Dr. Manar Al-Hassani<br>- Inorganic Chemistry - Dr. Noman Al Nuaimi - Dr. Monther Youssef Al-Janabi.(2008) | No |
| **Recommended Texts** | - Inorganic Chemistry - Comparative and Synthetic - Dr. Mahdi Naji Zakum.<br>- Inorganic chemistry and life - d. Monther Youssef Al-Janabi2006. | No |
| **Websites** | - Mobile data show<br>PowerPoint programs<br>- Internet | |

| **Grading Scheme**<br>مخطط الدرجات |
|---|

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Analytical chemistry** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>☒**Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | MPH-112 | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | 1 |
| **Administering Department** | | MPH | **College** | Applied sciences-Heet | |
| **Module Leader** | Rasim Farraj Muslim | | **e-mail** | dr.rasim92hmts@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | | Assistant professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | / /2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | **1. The analytical chemistry course is determined according to the study plan prepared in the Medical Physics Department.**<br>**2. The course aims to introduce the student to the general concepts of the organic compounds and their importance and uses in various fields.**<br>3. **It also aims at a detailed study of the different structural compositions and naming principles for the compounds of organic chemistry, by focusing on the compounds. And help the student to know the composition of these substances, including drugs, and to know how interactions occur and the mechanism of interaction.** |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | **- The student should know the general concepts of the compounds of the analytical chemistry curriculum.**<br>**- That the student is acquainted with the basics and rules of naming, different structural structures and physical properties, and focuses on the same different rings for their vital activity, and recognizes their physical and chemical properties, and that the student distinguishes between the different structural structures.**<br>**- That the student knows the basic principles of preparation methods**<br>**- To familiarize the student with the different bases of their interactions.**<br>**- That the student is aware of the importance of these compounds and their applications.** |
| **Indicative Contents**<br>المحتويات الإرشادية | **a- Methods of teaching and learning**<br>**1- Giving lectures.**<br>**2- Using the method of recitation, discussion and solving questions.**<br>**3- Giving assignments to students to strengthen them and prepare them for the final and final exams.**<br>**b- Evaluation methods**<br>**1- Daily and monthly exams**<br>**2- Duties**<br>**3- In-class exercises** |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | **Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.** |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.1 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | **Introduction to qualitative analytical chemistry** |
| **Week 2** | **Methods for the detection of elements and ions** |
| **Week 3** | **Sedimentation methods** |
| **Week 4** | **Methods of separation** |
| **Week 5** | **Macro and micro Qualitative analysis** |
| **Week 6** | **Chromatographic separation column** |
| **Week 7** | **Detection and estimation of items** |
| **Week 8** | **First month exam** |
| **Week 9** | **Introduction to Volumetric Analysis Chemistry** |

| | |
|---|---|
| Week 10 | Methods for expressing concentrations |
| Week 11 | Solutions, ionic balance and chemical balance |
| Week 12 | Equilibrium constants, inverse reactions and common ion |
| Week 13 | Second month exam |
| Week 14 | Titration |
| Week 15 | Solubility product constant and slightly soluble salts |
| Week 16 | Comprehensive review, applications and problem solving |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | Material Covered |
| Week 1 | Test Reducing Flame |
| Week 2 | Flame test |
| Week 3 | Detection of halogens, nitrogen and sulfur |
| Week 4 | Extraction |
| Week 5 | Solubility |
| Week 6 | Titration methods |
| Week 7 | Chromatography methods |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | Text | Available in the Library? |
| Required Texts | Fundamentals of analytical chemistry. 9th Edition by Douglas A. Skoog (Author), Donald M. West (Author), F. James Holler (Author), Stanley R. Crouch (Author). 10 EDITION. July 16, 2021 | Yes |
| Recommended Texts | ANALYTICAL CHEMISTRY: A Fundamental Approach To Modern Separation Techniques. by Stanley Chris (Ph.D) (Author) August 15, 2022 | No |
| Websites | https://www.amazon.com/Fundamentals-Analytical-Chemistry-Douglas-Skoog/dp/0357450396/ref=d_pd_sbs_vft_none_sccl_3_1/145-7711462-5419924?pd_rd_w=CSlfi&content-id=amzn1.sym.3676f086-9496-4fd7-8490-77cf7f43f846&pf_rd_p=3676f086-9496-4fd7-8490-77cf7f43f846&pf_rd_r=7EZR6MGHA0J9A87C0JF0&pd_rd_wg=KzlqI&pd_rd_r=6cd67e00-88f2-4c85-8c5e-a2822ac1d629&pd_rd_i=0357450396&psc=1 | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 |
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| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

**Assist. Prof. Dr. Rasim Farraj Muslim**

**3 / 6 / 2023**

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Computer 2 | | | **Module Delivery** | |
| **Module Type** | Support | | | ☐ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | SCI-102 | | | | |
| **ECTS Credits** | 4 | | | | |
| **SWL (hr/sem)** | 100 | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | 2 |
| **Administering Department** | | | **College** | | |
| **Module Leader** | Ibrahim Saud Khaleel | | **e-mail** | ibrahem.abomusab@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | | Assist. Lect. | **Module Leader's Qualification** | | M.Sc. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| Name (if available) | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | / /2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | SCI-101 | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. To develop problem solving skills and understanding of circuit theory through the application of techniques.<br>2. To understand voltage, current and power from a given circuit.<br>3. This course deals with the basic concept of electrical circuits.<br>4. This is the basic subject for all electrical and electronic circuits.<br>5. To understand Kirchhoff's current and voltage Laws problems.<br>6. To perform mesh and Nodal analysis. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.<br>1. Recognize how electricity works in electrical circuits.<br>2. List the various terms associated with electrical circuits.<br>3. Summarize what is meant by a basic electric circuit.<br>4. Discuss the reaction and involvement of atoms in electric circuits.<br>5. Describe electrical power, charge, and current.<br>6. Define Ohm's law.<br>7. Identify the basic circuit elements and their applications.<br>8. Discuss the operations of sinusoid and phasors in an electric circuit.<br>9. Discuss the various properties of resistors, capacitors, and inductors.<br>10. Explain the two Kirchoff's laws used in circuit analysis.<br>11. Identify the capacitor and inductor phasor relationship with respect to voltage and current. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br><br><u>Part A - Circuit Theory</u><br>DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs]<br><br>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]<br><br>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]<br><br>RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] |

| | |
|---|---|
| | Revision problem classes [6 hrs]<br><br><u>Part B - Analogue Electronics</u><br><br>Fundamentals<br>Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]<br><br>Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs]<br><br>Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs] |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3.2 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 52 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **100** | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 1 | 10% (10) | 5 and 10 | LO #1, #2 and #10, #11 |
| | Assignments | - | 10% (10) | 2 and 12 | LO #3, #4 and #6, #7 |
| | Projects / Lab. | 2 | 10% (10) | Continuous | All |
| | Report | - | 10% (10) | 13 | LO #5, #8 and #10 |
| Summative assessment | Midterm Exam | 1hr | 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 | What is the Excel program? Then ways to open Excel |
| Week 2 | Recognize tab commands? Then explain the home page |
| Week 3 | Explanation of commands for the main page |
| Week 4 | Explanation of the Insert tab |
| Week 5 | Explanation of the Page Layout tab |
| Week 6 | Explanation of the View tab |
| Week 7 | What is the power point program? Then ways to open power point program |
| Week 8 | Recognize tab commands? Then explain the home page |
| Week 9 | Explanation of commands for the main page |
| Week 10 | Explanation of the Insert tab |
| Week 11 | Explanation of the Insert Pictures and Videos tab |
| Week 12 | Explanation of the Page Layout tab |
| Week 13 | Explanation of the View tab |
| Week 14 | review |
| Week 15 | Monthly test |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Apply ways to open Excel. |
| **Week 2** | Lab 2: Application of scheduling orders? Apply the Home commands for Font Size, Insert Row, Column, and Worksheet . |
| **Week 3** | Lab 3: Insert tab application such as insert picture, clip, table, and text box. |
| **Week 4** | Lab 4: Explanation and application of writing equations such as (sum, max, min, if). |
| **Week 5** | Lab 5: Explain and apply page layout commands such as margins, orientation, and paper orientation from right to left and vice versa. |
| **Week 6** | Lab 6: Insert table, enter data, delete and insert columns and rows. |
| **Week 7** | Lab 7: Explain and apply display commands, such as showing and hiding rulers, gridlines, and size. |
| **Week 8** | Lab 8: Application ways to open PowerPoint. |
| **Week 9** | Lab 9: application for home page such as color-darkness, font-size and underline . |
| **Week 10** | Lab 10 : Insert the Video, Audio, and Equalization app tab. |
| **Week 11** | Lab11: The application inserts a set of new slides. |
| **Week 12** | Lab12: Application to delete a group of slides. |
| **Week 13** | Lab13: PowerPoint save application. |
| **Week 14** | Lab14: review. |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Computer basics represented by the difference between a computer and a human being, number, programs, memory size, and everything related to computer basics. | No |
| **Recommended Texts** | Apply to create the folder, change its name, show it, hide it, copy it, paste it, cut it, change the screen scroll, apply the right mouse commands, and everything related to basic computer basics in practice. | No |
| **Websites** | | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Computers 1 | | | **Module Delivery** | |
| **Module Type** | Support | | | ☐**Theory**<br>☐ **Lecture**<br>☒**Lab**<br>☒**Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | SCI-101 | | | | |
| **ECTS Credits** | 3 | | | | |
| **SWL (hr/sem)** | 75 | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | | | **College** | | |
| **Module Leader** | Ibrahim Saud Khaleel | | **e-mail** | ibrahem.abomusab@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | Assist. Lect. | | **Module Leader's Qualification** | M.Sc. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| Name (if available) | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | / /2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. To develop problem solving skills and understanding of circuit theory through the application of techniques.<br>2. To understand voltage, current and power from a given circuit.<br>3. This course deals with the basic concept of electrical circuits.<br>4. This is the basic subject for all electrical and electronic circuits.<br>5. To understand Kirchhoff's current and voltage Laws problems.<br>6. To perform mesh and Nodal analysis. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.<br>1. Recognize how electricity works in electrical circuits.<br>2. List the various terms associated with electrical circuits.<br>3. Summarize what is meant by a basic electric circuit.<br>4. Discuss the reaction and involvement of atoms in electric circuits.<br>5. Describe electrical power, charge, and current.<br>6. Define Ohm's law.<br>7. Identify the basic circuit elements and their applications.<br>8. Discuss the operations of sinusoid and phasors in an electric circuit.<br>9. Discuss the various properties of resistors, capacitors, and inductors.<br>10. Explain the two Kirchoff's laws used in circuit analysis.<br>11. Identify the capacitor and inductor phasor relationship with respect to voltage and current. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br><br><u>Part A - Circuit Theory</u><br>DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs]<br><br>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]<br><br>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]<br><br>RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] |

| | |
|---|---|
| | Revision problem classes [6 hrs]<br><br><u>Part B - Analogue Electronics</u><br><br>Fundamentals<br>Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]<br><br>Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs]<br><br>Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs] |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3.2 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 27 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.8 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **75** | | |

## Module Evaluation

تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 1 | 10% (10) | 5 and 10 | LO #1, #2 and #10, #11 |
| | Assignments | - | 10% (10) | 2 and 12 | LO #3, #4 and #6, #7 |
| | Projects / Lab. | 2 | 10% (10) | Continuous | All |
| | Report | - | 10% (10) | 13 | LO #5, #8 and #10 |
| Summative assessment | Midterm Exam | 1hr | 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 | What is a computer? Then find out the types of icons on the desktop. |
| Week 2 | Execute by applying the right mouse command related to system icons, programs, and folders. |
| Week 3 | Execute right mouse commands (copy, paste, cut, delete, and change folder name). |
| Week 4 | Execute the right mouse button (the properties of the system icon, program icon, and folder icon) |
| Week 5 | Create a new folder, then save it, change its name, shape, hide it, and show it) |
| Week 6 | Show and hide the system icon (Control panel) |
| Week 7 | Learn the Word program, then ways to open the program |
| Week 8 | Home tab and execute its commands |
| Week 9 | Insert and Execute tab Insert a table, clip art, picture, shapes, text box, and symbols |
| Week 10 | Page layout tabs such as paper margins, orientation, and size |
| Week 11 | The Page Layout tab performs watermark, page borders, and color commands |
| Week 12 | Executing and opening a file command such as saving the document and options for choosing the language of numbers and printing |
| Week 13 | Completing a file command for the rest of it, such as opening a new one, sending it, and previewing it before printing |
| Week 14 | review |
| Week 15 | Monthly test |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: An application to create a folder, change its name, format and save it. |
| **Week 2** | Lab 2: Change wallpaper. Learn about system icons, hide them, and show them. |
| **Week 3** | Lab 3: Application of commands difference between delete and removal and the location of the use of each of them. |
| **Week 4** | Lab 4: Application right-click (system icon, program icon, folder icon properties) |
| **Week 5** | Lab 5: Use the (Control Panel) application to open and modify some programs such as time, date, deletion, and others |
| **Week 6** | Lab 6: The application opens the Home tab and performs its commands |
| **Week 7** | Lab 7: Insert and Execute tab application Insert a table, clip art, picture, shapes, text box, and symbols |
| **Week 8** | Lab 8: Apply page layout tabs such as paper margins, orientation, and size |
| **Week 9** | Lab 9: The Page Layout tab applies watermark, page border, and color commands |
| **Week 10** | Lab 10 : Executing and opening a file command such as saving the document and options for choosing the language of numbers and printing |
| **Week 11** | Lab: A file command completion application for the rest of the command, such as opening a new command, submitting it, and previewing it before printing |
| **Week 12** | Lab: The application of inserting a table and adding data inside it. |
| **Week 13** | Lab: Complete the insert table application and add new rows and columns |
| **Week 14** | Lab: Complete the insert table application and the method for deleting rows and columns from within the table |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Computer basics represented by the difference between a computer and a human being, number, programs, memory size, and everything related to computer basics. | No |
| **Recommended Texts** | Apply to create the folder, change its name, show it, hide it, copy it, paste it, cut it, change the screen scroll, apply the right mouse commands, and everything related to basic computer basics in practice. | No |
| **Websites** | | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| | Module Information<br>معلومات المادة الدراسية | | | |
|---|---|---|---|---|
| **Module Title** | | **Academic English 1** | **Module Delivery** | |
| **Module Type** | | **S** | ☒**Theory**<br>☐**Lecture**<br>☐**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | UNI-101 | | |
| **ECTS Credits** | | 2 | | |
| **SWL (hr/sem)** | | **50** | | |

| | | | | | |
|---|---|---|---|---|---|
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | MPH | | **College** | College of Applied Sciences-Hit | |
| **Module Leader** | Yassir Sh. Hameed | | **e-mail** | yassiralheety@gmail.com | |
| **Module Leader's Acad. Title** | Asst. Instructor | | **Module Leader's Qualification** | MA. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | / /2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. To learn the four English skills (reading, writing, listening and speaking).<br>2. To understand and distinguish between vocabulary that are similar in use.<br>3. To help students know the phonic symbols of English letters.<br>4. To help students read, understand and comprehend certain English texts.<br>5. To enable students to write in English language as well as to learn the basic rules of building up English sentences.<br>6. To have the ability to practice the language in real situations. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.<br>1. Engage the students in real communication to practice speaking skill.<br>2. Divide the students into groups to practice writing skill.<br>3. Ask the students to learn and grasp the words that describe family members.<br>4. Distinguish among the different rules used in texts.<br>5. Analyze the sentences depending on their grammatical structures.<br>6. Differentiate between the word-system in students' mother tongue and the target language.<br>7. Draw certain conclusions after understanding the given texts. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>In this course, students are directed to practice what they are taught throughout the semester. They are encouraged to work on collecting important notes during the session to be able to utilize the learned materials later on. It's important to use certain aids to help understand the lesson. Moreover, students should be directed to write certain meaningful and grammatical paragraphs. They should understand the texts to be able to answer questions given in the quizzes, mid-term and final examination. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their global thinking skills. This will be achieved through classes interactive communication, by performing and involving the four English skills, the receptive and productive ones, reading, listening, writing and speaking. some practical |

| | |
|---|---|
| | activities will be beneficial and interested to the students like engaging them in a communicative situation, asking them to practice a role-changing activity and so on. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 32 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 2.1 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 18 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.2 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **50** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Hello! How are you? What's this in English? Good morning! |
| **Week 2** | Your world, What's his name? Contractions, Countries, Where are they from? Numbers |
| **Week 3** | All about you! What's his address? Personal information, Social expressions |
| **Week 4** | Family and friends! Possessive adjectives, Describing a friend, The alphabet |

| | |
|---|---|
| **Week 5** | The way I live! Present simple I/they/we/you, Sports/Food/Drinks, Language and nationalities, How much is it? Numbers |
| **Week 6** | Every day! Present simple he/she, Saying the time, Words go together, Days of the week, Prepositions of time on/at/in |
| **Week 7** | **Mid-term exam for the materials given above** |
| **Week 8** | My favorites! Make questions who, where, how, why… ect. Opposite adjectives, A holiday postcard |
| **Week 9** | Where I live? There's/'re, Directions, Go straight on, Turn right… ect. |
| **Week 10** | Time past! Was/were born, Saying years, When's your birthday? |
| **Week 11** | We had a great time! Regular v.s Irregular verbs, Time expressions, Making conversation |
| **Week 12** | I can do that! Show ability can/can't, Verb+noun, Adjective+noun |
| **Week 13** | Please and thank you! I'd like, Some v.s any, Making offers |
| **Week 14** | Here and now! Present continous v.s Present simple, Colours and clothes, What's the matter? |
| **Week 15** | It's time to go! Future plans, Means of transport, Social expressions |
| **Week 16** | **Preparation for the final examination** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | None |
| **Week 2** | None |
| **Week 3** | None |
| **Week 4** | None |
| **Week 5** | None |
| **Week 6** | None |
| **Week 7** | None |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |

| | | |
|---|---|---|
| **Required Texts** | Soars, L. (2009). New headway Plus: Beginner Student's Book. | No |
| **Recommended Texts** | Soars, L. (2009). New headway Plus: Beginner Working Book. | No |
| **Websites** | | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title**<br>اسم المادة او الوحدة | **Mathematics 1** | | | **Module Delivery** | |
| **Module Type**<br>نوع الوحدة | **Base** | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code**<br>كود الوحدة | **MPH-113** | | | | |
| **ECTS Credits** | **7** | | | | |
| **SWL (hr/sem)** | **175** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | MPH | | **College** | College of Applied Sciences - Heat | |
| **Module Leader** | م.م. ميثاق عبدالكريم عبدالواحد | | **e-mail** | Methaq90alheety@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | Assist. Lect. | | **Module Leader's Qualification**<br>مؤهلات مسؤول الوحدة | M.Sc. | |
| **Module Tutor** | None | | **e-mai** | None | |
| **Peer Reviewer Name** | | | **e-mai** | | |
| **Scientific Committee Approval Date** | / / 2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module**<br>مادة اساسية تدرس قبلها | None | **Semester**<br>الفصل الدراسي | |
| **Co-requisites module**<br>مادة دراسية تدرس معها مشتركة | None | **Semester**<br>الفصل الدراسي | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. A student's acquisition of the concept of words and mathematical logic and ways of dealing with them algebraically.<br>2. Clarify the concept of sets, relationships, functions and links between them and theories related to them. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Upon completing this course, students will:<br>1. An ability to apply knowledge of mathematics, science and engineering.<br>2. Evaluate the indefinite and improper integrals by using different integration techniques.<br>3. Identify the definition and properties associated with definite integrals.<br>4. Evaluate integrals using the method of substitution.<br>5. Solve problems involving applications of integrals including finding volume of solids of revolution and area between curves.<br>6. Discover determinants and matrices and their properties. Learn Crammer rule for solving a set of matrix system. |
| **Indicative Contents**<br>المحتويات الإرشادية | 1. Familiarity with basic mathematical concepts and principles required for all branches of mathematics.<br>2. Recognize the importance of integration and its applications.<br>3. Knowledge of the concept of specific values and related issues.<br>4. Studying methods of finding integration and identifying the most appropriate method. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 1. Thinking creatively and critically.<br>2. Talk with a partner or in a small group.<br>3. Express ideas with linear activities.<br>4. Explore personal positions and values through debate, argument, and discussion.<br>5. Meditation in the educational process |

| Student Workload (SWL)<br>الفصل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 96 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **175** | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 10% (10) | 5 and 10 | |
| | **Assignments** | 2 | 10% (10) | 2 and 12 | |
| | **Projects / Lab.** | 1 | 10% (10) | Continuous | |
| | **Report** | 1 | 10% (10) | 13 | |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | |
| | **Final Exam** | 3hr | 50% (50) | 16 | |
| **Total assessment** | | | 100% (100 Marks | | |

| Delivery Plan (Weekly+Lab Syllabus)<br>المنهاج الاسبوعي النظري والعملي | |
|---|---|
| | **Material Covered** |
| **Week 1** | The Real numbers, Slope, Equation of straight line, function |
| **Week 2** | Even and odd, Inequalities |
| **Week 3** | Domain , range and Sketch |
| **Week 4** | Limits |
| **Week 5** | Continuity |
| **Week 6** | The Derivative |
| **Week 7** | Second and higher derivatives , Derivative of natural logarithm |
| **Week 8** | Derivative of $a^x$ , Chain Rule |
| **Week 9** | Exam |
| **Week 10** | Integration, Definite integration |
| **Week 11** | Integration by parts |
| **Week 12** | Integration by partial fractions |
| **Week 13** | Partial Fraction |
| **Week 14** | Area |
| **Week 15** | Area between two curves |
| **Week 16** | **Preparatory week before the final Exam** |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | 1. Calculus with analytic Geometry, Swokowski, Olinickand Pence, 1994.<br>2. Calculus, 8th edition (2007) by Howard Anton, (John Wiley & Sons, Inc, New York). | ـ الكتب المقررة المطلوبة<br>Required textbooks |
| **Recommended Texts**<br>مصادر للاطلاع | 1. Professors lectures.<br>2. The internet. | الكتب والمراجع التي يوصى بها ( المجلات العلمية ، التقارير<br>Recommended books and references (scientific journals, reports |
| **Websites**<br>مواقع الويب | المراجع الالكترونية، مواقع الانترنيت<br>المكتبة الافتراضية<br>مواقع المكتبات في بعض الجامعات العالمية<br>Electronic references, websites<br>Virtual library<br>Library locations in some international universities | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**مدرس المادة / م.م. ميثاق عبدالكريم عبدالواحد**

**البريد الالكتروني / methaq90alheety@uoanbar.edu.iq**

# Module Description Form of bioelectronics

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Bioelectronics | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **L Seminar** | |
| **Module Code** | MPH-223 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | 150 | | | | |
| **Module Level** | 2 | | **Semester of Delivery** | 4 | |
| **Administering Department** | Medical Physics, MPH | | **College** | Applied sciences-Heet | |
| **Module Leader** | Manaf A Guma | | **e-mail** | manafguma@uoanabr.edu.iq | |
| **Module Leader's Acad. Title** | Ass. Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | / /2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | MPH-213 | **Semester** | 3 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | The main **Objectives of this modules are:**<br>The main objectives of a module on bioelectronics typically focus on providing students with knowledge and skills related to the integration of electronics and biology. Here are some common objectives of bioelectronics modules:<br><br>1. Understanding the principles of bioelectronics: Students should gain a solid understanding of the fundamental concepts and principles of bioelectronics. This includes studying the interface between electronics and biological systems, as well as the underlying physics, chemistry, and biology involved.<br><br>2. Exploring bioelectronic devices and sensors: Students should learn about various bioelectronic devices and sensors, such as biosensors, biochips, implantable electronics, and wearable sensors. They should understand their working principles, fabrication techniques, and applications in healthcare, diagnostics, and biomedical research.<br><br>3. Investigating bioelectronic interfaces: Students should explore the interfaces between electronic devices and biological systems, including bioelectrodes, neural interfaces, and bioMEMS (BioMicroElectroMechanical Systems). They should understand the challenges and techniques involved in achieving biocompatibility, signal transduction, and data acquisition.<br><br>4. Understanding signal processing and data analysis: Students should develop skills in processing and analyzing biological signals acquired by bioelectronic devices. This includes understanding signal amplification, filtering, digitization, and computational methods for data analysis.<br><br>5. Exploring bioelectronic applications: Students should learn about the diverse applications of bioelectronics in healthcare, biomedical research, and therapeutics. This may include areas such as medical diagnostics, bioimaging, neuroprosthetics, bioelectrochemical systems, and bioelectronic medicine.<br><br>6. Integrating electronics and biology: Students should develop an interdisciplinary perspective by integrating knowledge from electronics, biology, and other relevant fields. They should understand the challenges, opportunities, and potential solutions that arise when combining electronic technologies with biological systems.<br><br>7. Practical skills in bioelectronics: Students should gain hands-on experience in designing, fabricating, and characterizing bioelectronic devices and systems. This may involve laboratory work, experiments, and projects that involve building and testing bioelectronic prototypes.<br><br>8. Ethical considerations and societal impact: Students should be aware of the ethical considerations and societal implications of bioelectronics. This includes understanding issues related to privacy, data security, informed consent, and responsible use of bioelectronic technologies. |

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|---|---|
| | 9. Communication and collaboration: Students should develop effective communication skills to convey bioelectronics concepts and findings to both technical and non-technical audiences. They should also develop skills in interdisciplinary collaboration, working in teams, and presenting their work professionally.<br><br>By achieving these objectives, students will be well-prepared to contribute to the development and application of bioelectronic technologies, advancing fields such as healthcare, diagnostics, and biomedical research. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | The module learning outcomes for a bioelectronics module typically focus on developing knowledge and skills related to the integration of electronics and biology. Here are some common learning outcomes for a bioelectronics module:<br><br>1. Understanding of bioelectronics principles: Students should develop a comprehensive understanding of the fundamental principles and concepts of bioelectronics. This includes knowledge of the interface between electronics and biological systems, bioelectrodes, and the electrical properties of biological materials.<br><br>2. Knowledge of biological signal acquisition and processing: Students should learn about techniques for acquiring and processing biological signals, such as electrocardiography (ECG), electroencephalography (EEG), and electromyography (EMG). They should understand signal amplification, noise reduction, filtering, and digitization.<br><br>3. Familiarity with bioelectronic devices and sensors: Students should gain knowledge about different bioelectronic devices and sensors used for biological signal acquisition and stimulation. This includes understanding the working principles and applications of devices such as biosensors, implantable electronics, neurostimulation devices, and wearable sensors.<br><br>4. Integration of electronics with biological systems: Students should understand how to integrate electronic devices with biological systems for monitoring, diagnosis, and therapeutic purposes. They should learn about techniques for interfacing electronics with cells, tissues, and organs.<br><br>5. Design and development of bioelectronic systems: Students should be able to design and develop bioelectronic systems, including hardware and software components. They should understand the selection and integration of electronic components, design of circuits, firmware or software development, and system integration.<br><br>6. Analysis and interpretation of biological data: Students should develop skills in analyzing and interpreting biological data obtained from bioelectronic systems. This includes understanding data visualization techniques, statistical analysis, and pattern recognition methods for extracting meaningful information from biological signals.<br><br>7. Bioelectronic applications in healthcare and research: Students should explore and understand the applications of bioelectronics in healthcare and biomedical research. This may include areas such as medical diagnostics, neural engineering, neuroprosthetics, bioelectrochemical systems, and bioelectronic interfaces. |

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|---|---|
| | 8. Ethical considerations and regulatory aspects: Students should be aware of the ethical considerations and regulatory frameworks associated with the use of bioelectronic devices and systems. They should understand the importance of patient safety, informed consent, and compliance with relevant regulations and standards.<br><br>9. Practical skills in bioelectronics: Students should gain hands-on experience in designing, fabricating, and testing bioelectronic devices and systems. This may involve laboratory work, experiments, and projects that involve building and characterizing bioelectronic prototypes.<br><br>10. Communication and collaboration: Students should develop effective communication skills to convey bioelectronics concepts and findings to both technical and non-technical audiences. They should also develop skills in interdisciplinary collaboration, working in teams, and presenting their work professionally.<br><br>By achieving these learning outcomes, students will be equipped with the knowledge and skills necessary to contribute to the field of bioelectronics, advancing healthcare, diagnostics, and biomedical research. |
| **Indicative Contents**<br>مضمون المحتويات | Indicative content includes the following.<br><br>The indicative contents of a bioelectronics course may vary depending on the specific curriculum and level of the course. However, here are some common topics and areas that can be covered in a bioelectronics course:<br><br>1. Introduction to bioelectronics:<br>- Definition and scope of bioelectronics.<br>- Overview of the interface between electronics and biology.<br>- Applications of bioelectronics in healthcare and biomedical research.<br><br>2. Electrical properties of biological systems:<br>- Introduction to the electrical properties of cells, tissues, and organs.<br>- Membrane potential and ion channels.<br>- Excitable cells and action potentials.<br><br>3. Bioelectrodes and sensors:<br>- Principles of bioelectrodes and their fabrication.<br>- Electrode-skin interface and signal acquisition.<br>- Sensors for biomedical measurements (e.g., ECG, EEG, EMG).<br><br>4. Bioamplifiers and signal conditioning:<br>- Amplification and filtering of biological signals.<br>- Noise reduction techniques.<br>- Signal conditioning for reliable data acquisition.<br><br>5. Bioelectronic interfaces and implants:<br>- Design and integration of bioelectronic interfaces with biological systems.<br>- Implantable devices and neuroprosthetics.<br>- Wireless communication and power delivery.<br><br>6. Biosensors and biochips: |

| | |
|---|---|
| | - Principles of biosensors for biological detection.<br>- Transduction methods for biochemical measurements.<br>- Lab-on-a-chip technologies and microfluidics.<br><br>7. Neural engineering and neurostimulation:<br>- Neural interfaces for recording and stimulation.<br>- Brain-machine interfaces and neuroprosthetics.<br>- Deep brain stimulation and neuromodulation techniques.<br><br>8. Bioelectrochemical systems:<br>- Biofuel cells and enzymatic reactions.<br>- Bioelectrochemical sensors and biosensors.<br>- Energy harvesting from biological systems.<br><br>9. Bioelectronics in diagnostics and therapy:<br>- Medical diagnostics using bioelectronic devices.<br>- Wearable sensors and point-of-care testing.<br>- Bioelectronic therapeutic interventions.<br><br>10. Ethical considerations and societal impact:<br>- Ethical implications of bioelectronics.<br>- Privacy and security considerations.<br>- Regulatory frameworks and standards for bioelectronic devices.<br><br>11. Emerging trends and future directions:<br>- Advancements in bioelectronics research.<br>- Nanotechnology and bioelectronic integration.<br>- Bioelectronic medicine and personalized healthcare.<br><br>These indicative contents provide a framework for structuring a bioelectronics course. The actual content and emphasis may vary depending on the specific requirements of the course and the expertise of the instructor.. |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Learning and teaching strategies in Biochemistry aim to engage students in active learning, facilitate understanding of complex concepts, and develop critical thinking skills. Here are some common learning and teaching strategies employed in Basic Biochemistry courses:<br><br>1. Lectures: Lectures are often used to deliver foundational knowledge and concepts in biochemistry. They provide an overview of the topics, explain key principles, and highlight important details. Lectures may be supplemented with visual aids, such as slides or multimedia presentations, to enhance understanding.<br><br>2. Laboratory Work: Laboratory sessions allow students to apply theoretical knowledge to practical situations. They provide hands-on experience with biochemical techniques, |

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|---|---|
| | data collection, analysis, and interpretation. Lab work may involve experiments related to biomolecule analysis, enzyme kinetics, or metabolic pathways.<br><br>3. Problem-solving Exercises: Problem-solving exercises and case studies help students apply their knowledge to real-life scenarios. They encourage critical thinking and problem-solving skills by presenting biochemical problems or experimental data for analysis and interpretation. Students may work individually or in groups to find solutions and explain their reasoning.<br><br>4. Interactive Discussions: Interactive discussions, such as small group discussions or classroom debates, promote active learning and peer-to-peer interaction. They allow students to ask questions, clarify doubts, and engage in meaningful discussions about biochemical concepts, experiments, or applications.<br><br>5. Concept Mapping: Concept mapping is a visual learning tool that helps students organize and connect different biochemical concepts. It involves creating diagrams or mind maps that illustrate the relationships between different biomolecules, metabolic pathways, or cellular processes. Concept maps can aid in understanding the "big picture" and identifying the interconnections within biochemistry.<br><br>6. Multimedia Resources: Incorporating multimedia resources, such as videos, animations, and interactive simulations, can enhance students' engagement and understanding of complex biochemical processes. These resources can visually illustrate molecular structures, enzyme kinetics, or cellular processes, making them more accessible and memorable.<br><br>7. Collaborative Learning: Collaborative learning activities, such as group projects or problem-solving tasks, encourage students to work together to solve biochemical problems or complete assignments. This fosters teamwork, communication, and the exchange of ideas, allowing students to learn from each other's perspectives and experiences.<br><br>8. Assessments: Assessments, such as quizzes, exams, and assignments, evaluate students' understanding and knowledge retention. They provide feedback on individual progress and help identify areas that require further review or clarification. Assessments may include multiple-choice questions, problem-solving tasks, or short essay questions.<br><br>9. Online Resources: Utilizing online resources, such as virtual labs, interactive tutorials, or online discussion forums, can provide additional learning opportunities outside of the classroom. These resources offer flexibility and accessibility, allowing students to review content at their own pace and seek additional support when needed.<br><br>10. Real-world Applications: Relating biochemistry concepts to real-world applications, such as medical advancements, biotechnology, or environmental issues, can enhance students' motivation and understanding. Exploring the practical relevance of |

| | |
|---|---|
| | biochemistry concepts helps students appreciate the significance of their learning and its impact in various fields.<br><br>These strategies aim to create an active and engaging learning environment that promotes understanding, critical thinking, and application of biochemistry principles. The specific strategies employed may vary based on the teaching style, course format, and resources available to the instructor. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.3 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **150** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | 1. Introduction to bioelectronics: |
| **Week 2** | 2. Electrical properties of biological systems: |
| **Week 3** | 3. Bioelectrodes and sensors: |
| **Week 4** | 4. Bioamplifiers and signal conditioning: |
| **Week 5** | 5. Bioelectronic interfaces and implants: |
| **Week 6** | 6. Biosensors and biochips: |
| **Week 7** | Mid Exam |
| **Week 8** | 7. Neural engineering and neurostimulation: |
| **Week 9** | 8. Bioelectrochemical systems: |
| **Week 10** | 9. Bioelectronics in diagnostics and therapy: |
| **Week 11** | 10. Ethical considerations and societal impact: |
| **Week 12** | 11. Emerging trends and future directions: |
| **Week 13** | Bio applications of bioelectronics |
| **Week 14** | Bio applications of bioelectronics |
| **Week 15** | Bio applications of bioelectronics |
| **Week 16** | **Final Exam** |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Here are some references and research papers related to bioelectronics:<br><br>1. "Bioelectronics: From Theory to Applications" by Giovanna De Luca, Fiorenzo Omenetto, and Mohamad Sawan.<br><br>2. "Bioelectronic Medicine: An Emerging Field in Biomedical Engineering" by Poonam Sharma, Pankaj Yadav, and Nitin Sharma. | **Available** Online |

| | | |
|---|---|---|
| | 3. "Bioelectronics: A Study of the Electronics of Living Systems" by Avinash Kumar Agarwal and Dilip Sharma.<br><br>4. "Bioelectronic Devices: Principles and Applications" edited by Paolo Facci.<br><br>5. "Bioelectronics Handbook: MOSFETs, Biosensors, and Neurons" edited by Wouter Serdijn, Rudy van der Toorn, and Leif Sörnmo.<br><br>6. "Bioelectronics: From Theory to Applications" edited by Krzysztof Iniewski.<br><br>7. "Bioelectronic Interfaces: Present Challenges and Future Prospects" by George G. Malliaras and Magnus Berggren.<br><br>8. "Bioelectronic Devices: Self-Assembled Systems and Semi-Living Technologies" by Tom F. Otero, Daniel J. Thomas, and Aleksandr Noy.<br><br>9. "Bioelectronic Medicine: An Overview of the Field and Its Potential" by Valentin A. Pavlov, Kevin J. Tracey, and Paul-Peter Tak.<br><br>10. "Bioelectronic Interfaces: Progress, Challenges, and Future Directions" by Sandeep K. Vashist. | |
| **Recommended Texts** | "Bioelectronics: From Theory to Applications" by Giovanna De Luca, Fiorenzo Omenetto, and Mohamad Sawan. | Yes |
| **Websites** | Any website | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Biology II** | | | **Module Delivery** | |
| **Module Type** | **Basic** | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | MPH-123 | | | | |
| **ECTS Credits** | 6 | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 2 | |
| **Administering Department** | MPH | | **College** | Applied Sciences-Heet | |
| **Module Leader** | Ahmed Saadoun Jaloot Al-heety | | **e-mail** | asjaloot@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | Assistant Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Ammar Abdul Razzaq Tawfiq | | **e-mail** | ammarabta@uoanbar.edu.iq | |
| **Peer Reviewer Name** | Marwan Mahmoud Saleh | | **e-mail** | ah.marwan_bio@uoanbar.edu.iq | |
| **Scientific Committee Approval Date** | / / 2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | MPH-114 | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

## Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

| | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. Introducing the student to how to examine organisms and tissues using a microscope, in addition to<br>2. introducing him to the microorganisms that are pathogenic to humans (how to write their scientific names), and<br>3. the diseases resulting from them. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | **1.** Recognize how does the cell form tissues and organs.<br>**2.** List the various terms associated with cell.<br>**3.** Define the Cell Theory.<br>**4.** Define the basic parts of a cell.<br>**5.** How do the parts of a cell work together?<br>**6.** Describe each part of the cell separately.<br>**7.** How does The Cytoskeleton Supports Eukaryotic Cells?<br>**8.** Structures found in animal Cells but not in plant Cells.<br>**9.** Structures found in plant Cells but not in animal Cells.<br>**10.** Recognize how does Cell division & MITOSIS.<br>**11.** Recognize how does a cell cycle and MEIOSISI.<br>**12.** How can the student distinguish between MITOSIS and MEIOSISI?<br>**13.** Define the basic parts of a Bacterial cell.<br>**14.** Define the basic parts of a virus molecule.<br>**15.** How can the student distinguish between bacteria and viruses. |
| **Indicative Contents**<br>المحتويات الإرشادية | **Part A - General introduction to Biology**<br>Branches of Biology<br>General characteristics of prokaryotes, fungi ,Protista, Anamilia and Plantae<br>CLASSIFICATION OF ORGANISMS. [**15 hrs**]<br><br>Introduction to Cytology or Cell Biology. Cell membrane, Functions of the cell membrane [**15 hrs**]<br><br>Nucleus, Nuclear envelope and Chromosomes.<br>Nucleic acid as a Genetic Material, Gene, Genetic code. and Gene expression. [10 hrs]<br><br>Proteins, essential functions of proteins and Proteins Has Four Levels of Organization. The Cytoskeleton Supports Eukaryotic Cells.. [**15 hrs**]<br><br>Revision problem classes [**6 hrs**]<br><br>**Part B - Cell division**<br><br>Cell division & MITOSIS [**15 hrs**]<br>A Cell cycle and MEIOSISI. [**7 hrs**]<br>Bacteria, Shape & Size, Arrangement, Gram-staining characteristics, and Structure Of Bacterial Cell. Viruses, characteristics of Viruses and Viruses are said to have five specific properties that distinguish them from living cells. [**15 hrs**] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | **79** | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | **5.3** |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | **71** | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | **4.7** |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **150** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to Histology |
| **Week 2** | Introduction to Epithelial Tissue |
| **Week 3** | Main characteristics of the four basic types of tissues. |
| **Week 4** | Basement Membranes |
| **Week 5** | Specializations of the apical cell surface |
| **Week 6** | Types of epithelia. Covering or Lining Epithelia and Common types of covering epithelia |
| **Week 7** | Secretory Epithelia & Glands. Exocrine glands, Endocrine glands. |
| **Week 8** | Connective Tissue. |
| **Week 9** | Cells of Connective tissue. |
| **Week 10** | Functions of cells in Connective tissue proper.. |
| **Week 11** | Fibers in Connective tissue. |
| **Week 12** | Types of Connective Tissue, Connective Tissue Proper, Classification of connective or supporting tissues |
| **Week 13** | Specialized connective tissue, Adipose Tissue, Cartilage and Bone. |
| **Week 14** | Muscle Tissue |
| **Week 15** | Nervous System |
| **Week 16** | **Preparatory week before the final Exam** |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Introduction to CELL |
| **Week 2** | Lab 2: Introduction to Histology |
| **Week 3** | Lab 3: Epithelia and adjacent connective |
| **Week 4** | Lab 4: Histology |
| **Week 5** | Lab 5: Histology |
| **Week 6** | Lab 6: Histology |
| **Week 7** | Lab 7: Histology |
| **Week 8** | Lab 8: Histology |
| **Week 9** | Lab 9: Histology |
| **Week 10** | Lab 10: Histology |

| | |
|---|---|
| **Week 11** | Lab 11: Histology |
| **Week 12** | Lab 12: Histology |
| **Week 13** | Lab 13: Histology |
| **Week 14** | Lab 14: Histology |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | **Campbell**, N.A., Urry, L.A., Cain, M.L. and et al., (2021). **Biology**.12 ed.Pearson BenjaminCummings. SanFrancisco, USA. | Yes |
| **Recommended Texts** | **Mescher**, A.L. (2021). unqueira's Basic Histology.6th ed. McGraw-Hill Education, USA. | Yes |
| **Websites** | https://vetbooks.ir/?s=lippincott&fbclid=IwAR12okqcqBcCQorPjWFvbaOoLvqG5GjelDFlxNcB8jQyUnLk-ExQ0QgCr6I | |

## Grading Scheme
مخطط الدرجات

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Mathematics 2 | | | **Module Delivery** | |
| **Module Type** | Basic | | | ☒**Theory**<br>☐ **Lecture**<br>☐**Lab**<br>☒**Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | MPH-122 | | | | |
| **ECTS Credits** | 8 | | | | |
| **SWL (hr/sem)** | 200 | | | | |
| **Module Level** | | 1 | **Semester of Delivery** | | 2 |
| **Administering Department** | | MPH | **College** | Applied sciences- Heet | |
| **Module Leader** | Ahmed T | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | | Lect. | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | / /2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | MPH-113 | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. To develop problem solving skills and understanding of Ordinary differential Equations.<br>2. To understand Initial Conditions and Boundary Conditions, Homogeneous Equation and Exact Differential Equations.<br>3. This course deals with the basic concept of differential Equations with the methods for solving in different types.<br>4. This is the basic subject for all differential Equations.<br>5. To understand Initial Conditions and Boundary Conditions, Homogeneous Equation and Exact Differential Equations problems.<br>6. To perform and Solve the differential equation (D.E) by using the separating variables method and First-Order Differential Equations. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.<br>1. understand differential Equations and how to connect with other application.<br>2. To be educated differential Equations.<br>3. General Solution: A general solution represents a family of functions that satisfy the differential equation. It contains one or more arbitrary constants, which can be determined by applying appropriate initial or boundary conditions.<br>4. Particular Solution: A particular solution is a specific function that satisfies the differential equation along with given initial or boundary conditions. It can be obtained by applying specific values to the arbitrary constants in the general solution.<br>5. For certain types of differential equations, it is important to determine if a solution exists and whether it is unique. The theory of differential equations provides conditions under which solutions exist and are unique within a given domain. Define Ohm's law.<br>6. Differential equations can be visualized using phase portraits, which plot the behavior of solutions in a multidimensional space. Phase portraits provide insights into the long-term behavior of a system and can help identify stable and unstable equilibria, limit cycles, and other dynamic phenomena. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following. When studying differential equations (D.E.), the indicative contents typically include the following topics:<br><u>Part A</u><br>1-Introduction to Differential Equations: Definition of a differential equation, order and degree of a differential equation, classification of differential equations (ordinary vs. partial), and examples illustrating the need for differential equations in various fields.<br>First-Order Differential Equations: Solution techniques for first-order differential equations, including separable variables, exact equations, integrating factors, and |

| | |
|---|---|
| | linear equations. Applications of first-order differential equations in growth and decay problems, population dynamics, and mixing problems. [15 hrs]<br><br>Second-Order Linear Differential Equations: Homogeneous and non-homogeneous linear differential equations of second order. Solution techniques, such as finding the complementary solution and particular solution, using the method of undetermined coefficients and variation of parameters. [15 hrs]<br><br>Higher-Order Linear Differential Equations: Extension of solution techniques to higher-order linear differential equations. Characteristic equation, roots, and general solutions. Applications in physics and engineering. [15 hrs]<br><br>Systems of Differential Equations: Introduction to systems of first-order differential equations. Solution techniques such as matrix methods, eigenvalues, and eigenvectors.<br><br>Revision problem classes [6 hrs] |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The primary tactic that will be used in the instruction of this module is going to be to emphasize the need of active engagement from the students in the exercises, while simultaneously honing and extending their capacity for critical thinking. This will be accomplished via the use of lectures, interactive tutorials, and discussion of various sorts of straightforward experiments that include certain sampling tasks that the students find fascinating. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 121 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 8.1 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | |
| Week 2 | |
| Week 3 | |
| Week 4 | |
| Week 5 | |
| Week 6 | |
| Week 7 | Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit |
| Week 8 | |
| Week 9 | |
| Week 10 | |
| Week 11 | |
| Week 12 | |
| Week 13 | |
| Week 14 | |
| Week 15 | |
| Week 16 | **Preparatory week before the final Exam** |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | | Yes |
| **Recommended Texts** | | No |
| **Websites** | | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Organic chemistry** | | | **Module Delivery** | |
| **Module Type** | **Basic** | | | ☒**Theory**<br>☐ **Lecture**<br>☒**Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | MPH-126 | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | **125** | | | | |
| **Module Level** | | 2 | **Semester of Delivery** | | 3 |
| **Administering Department** | | MPH | **College** | Applied sciences -Heet | |
| **Module Leader** | Rasim Farraj Muslim | | **e-mail** | Dr.rasim92hmts@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | | Assistant professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | / /2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | MPH-112 | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | **1. The chemistry of organic compounds course is determined according to the study plan prepared in the Medical Physics Department.**<br>**2. The course aims to introduce the student to the general concepts of the organic compounds and their importance and uses in various fields.**<br>3. **It also aims at a detailed study of the different structural compositions and naming principles for the compounds of organic chemistry, by focusing on the compounds. And help the student to know the composition of these substances, including drugs, and to know how interactions occur and the mechanism of interaction.** |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | **- The student should know the general concepts of the compounds of the organic chemistry curriculum.**<br>**- That the student is acquainted with the basics and rules of naming, different structural structures and physical properties, and focuses on the same different rings for their vital activity, and recognizes their physical and chemical properties, and that the student distinguishes between the different structural structures.**<br>**- That the student knows the basic principles of preparation methods**<br>**- To familiarize the student with the different bases of their interactions.**<br>**- That the student is aware of the importance of these compounds and their applications.** |
| **Indicative Contents**<br>المحتويات الإرشادية | **a- Methods of teaching and learning**<br>**1- Giving lectures.**<br>**2- Using the method of recitation, discussion and solving questions.**<br>**3- Giving assignments to students to strengthen them and prepare them for the final and final exams.**<br>**b- Evaluation methods**<br>**1- Daily and monthly exams**<br>**2- Duties**<br>**3- In-class exercises** |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | **Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.** |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 46 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | **Introduction and principles in organic techniques** |
| **Week 2** | **Chemistry of carbon and hydrogen compounds** |
| **Week 3** | **Concept of energy** |
| **Week 4** | **Organic formulations** |
| **Week 5** | **Reaction relationship and physical properties of organic compounds** |
| **Week 6** | **Alkanes** |
| **Week 7** | **Alkenes** |
| **Week 8** | **First month exam** |
| **Week 9** | **Alkynes** |

| | |
|---|---|
| **Week 10** | **Alcohols and phenols** |
| **Week 11** | **Ethers** |
| **Week 12** | **Carbonyl compounds** |
| **Week 13** | **Second month exam** |
| **Week 14** | **Amine derivatives** |
| **Week 15** | **Basic principles in the techniques of organic preparations** |
| **Week 16** | **Comprehensive review, applications and problem solving** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | **Melting point** |
| **Week 2** | **Boiling point** |
| **Week 3** | **Distillation** |
| **Week 4** | **Extraction** |
| **Week 5** | **Detection of organic compounds** |
| **Week 6** | **Detection of alcoholic compounds** |
| **Week 7** | **Chromatography methods** |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | **Organic Chemistry**, 6th Edition. Robert T. **Morrison**. 4.3 out of 5 stars 70 ; **Organic Chemistry**, 7th Edition ; **Organic Chemistry** Fundamentals (Quick Study Academic). | Yes |
| **Recommended Texts** | **Introductory Organic Chemistry and Hydrocarbons A Physical Chemistry Approach.** 1st Edition. By Caio Lima Firme. Copyright 2020. | No |
| **Websites** | https://www.amazon.com/Organic-Chemistry-Morrison-Boyd/dp/8131704815 | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

**Assist. Prof. Dr. Rasim Farraj Muslim**

**3 / 6 / 2023**

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Biostatics | | | **Module Delivery** | |
| **Module Type** | Basic | | | ☒**Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | MPH-321 | | | | |
| **ECTS Credits** | 4 | | | | |
| **SWL (hr/sem)** | 100 | | | | |
| **Module Level** | | 3 | **Semester of Delivery** | | 6 |
| **Administering Department** | | Medical Physics | **College** | Applied Sciences-Heet | |
| **Module Leader** | Rabah Salim Shareef | | **e-mail** | eq.rabah.s.shareef@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | | Asset. Professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | None | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | / /2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | Upon completion of the course the learner is expected to do the following:<br>1. design research questions;<br>2. distinguish qualitative and quantitative data;<br>3. Evaluate strength of different biological experimental designs; and<br>4. Evaluate different data analysis methods; |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Upon successful completion of the course the learner will be able to:<br>1. Knowledge of the basics of biological tests<br>2. Know the importance of health and vital data<br>3. Know how to collect data and samples<br>4. analyze different experimental designs for generation of qualitative and quantitative data;<br>5. design research hypotheses and generate appropriate data; and<br>6. generated data to appropriate statistical analysis and give relevant interpretation to the output |
| **Indicative Contents**<br>المحتويات الإرشادية | This course explores the meaning of statistics. It introduces students to some basic terms like variable, continuous variable, discrete or discontinuous variables population, sample, histogram, frequency, classes, class interval and frequency distribution; a distribution in statistical terms: mode, median, mean; measuring the spread of a distribution: range, semi interquartile range, mean deviation, variance, standard deviation; samples and populations: probability and the normal distribution curve, distribution of t, calculating the limits of a mean; and comparing the means of two samples: null hypothesis, alternate hypothesis, differences between standard deviations, limits for standard deviation and variance. The course also examines a comparison of three or more samples: simple analysis of variance; correlation of two variables: scatter diagram, correlation coefficient, regression lines, mean center; and chi-square test: the 2x2 contingency table. Learners are taken through planning experiments: layout of experiments, controls, precision of measurements, number of replicates, randomization, Latin squares, and interaction. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5.3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 21 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1.4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **100** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | INTRODUCTON TO BIOSTATISTICS: Meaning of biostatistics - Types of variables - Population and samples (Populations, Samples from populations, Random sampling, Parameters and statistics) |
| **Week 2** | Data Collection: (Sources of statistical data, The sources of medical data , Methods of data collection , Sampling Method , Methods of ensuring sample representation of the original population) |
| **Week 3** | PRESENTATION OF BIOLOGICAL DATA: (Frequency distribution) |
| **Week 4** | Graphical presentation: (Bar Charts, Histogram, Frequency polygon, Cumulative Frequency Polygon, The Pie Chart) |
| **Week 5** | PROBABILITY AND STATISTICS: 1- Probability (Laws of probability: Counting possible outcomes, Probability of an event, adding probabilities, Multiplying probabilities) – 2- Permutation and combinations: (Permutations, Combinations) |

| | |
|---|---|
| **Week 6** | NORMAL DISTRIBUTION: (Symmetry and Kurtosis • Proportions of normal distribution • The distribution of means • Statistical hypothesis testing • Assessing departures from normality) |
| **Week 7** | BIONOMIAL AND POISSON DISTRIBUTION: (• Binomial distribution • Poisson distribution) |
| **Week 8** | STANDRAD ERROR AND CONFIDENCE INTERVAL: (• Standard error • Confidence interval) |
| **Week 9** | HYPOTHESIS TESTING: (• Null hypothesis and alternative hypotheses • The standard format for hypothesis testing) |
| **Week 10** | THE t- DISTRIBUTION: One group of observations (or one sample test) • Two independent group of observation (Variances not known; Variances known) |
| **Week 11** | THE CHI-SQUARE DISTRIBUTION: Ch-Square $X^2$ |
| **Week 12** | Correlation Analysis: (Types of correlation , Measuring Correlation , Simple correlation coefficient , Multiple correlation coefficient , Partial Correlation) |
| **Week 13** | Regression Analysis: (The importance of regression analysis , The importance of , regression analysis , Simple linear Regression Analysis , Simple Regression Model , Multiple liner regression) |
| **Week 14** | ANALYSIS OF VARIANCE: One-way (Single factor) ANOVA |
| **Week 15** | ANALYSIS OF VARIANCE: Two-way (factor) ANOVA |
| **Week 16** | **Preparatory week before the final Exam** |

## Learning and Teaching Resources

مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Introductory Biostatistics for the Health Sciences | No |
| **Recommended Texts** | Techniques of Medical and Biological Statistics, 2021 | No |
| **Websites** | | |

| Grading Scheme<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION
# وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Mechanics of Organic Chemistry** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | **Che-314** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 3 | | **Semester of Delivery** | 5 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Che-224 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** | a. Course Objectives: This course aims to provide the student with the |

| | |
|---|---|
| أهداف المادة الدراسية | necessary knowledge of the basics of organic chemistry mechanics from a theoretical point of view. Through this specialization, the student is pushed to search in specific research directions that enable him to gain complete experience and graduate qualified students to deal with chemical reactions and predict in determining the intermediates of organic chemistry reactions of organic compounds. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | a. Knowledge and understanding<br><br>A1- The student should be familiar with the basics of organic chemistry mechanics.<br><br>A 2 - The program aims to raise the student's ability to the level of understanding in the field of mediations of interactions as far as it relates to his specialization.<br><br>A3- Developing the student's cognitive abilities and raising them to the level of predicting the mechanics of organic chemistry. |
| **Indicative Contents**<br>المحتويات الإرشادية | General and transferable skills (other skills related to employability and personal development).<br>1- Basic skills for communication and communication through (sports activities, educational guidance, conferences for the college, seminars for the department, seminars to discuss student research)<br>D2 - Teaching the student how to develop creative and innovative thinking skills in the field of specialization |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions. |

| **Student Workload (SWL)** |
|---|

| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 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 | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 1 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|
| **Week 1** | Acids and bases (theories and basic rule) |
| **Week 2** | The carbonium ion and the nitrogen and oxygen atoms lack an electron |
| **Week 3** | Methods of formation of the carbonium ion and factors affecting its stability |
| **Week 4** | Carbonium ion rearrangement |
| **Week 5** | Unconventional carbonium ion and carbonium ion interactions |
| **Week 6** | first month exam |
| **Week 7** | |
| **Week 8** | carbonion ion |
| **Week 9** | Carbonion ion methods |

| | |
|---|---|
| **Week 10** | carbon ion stability |
| **Week 11** | Carbonion ion rearrangement |
| **Week 12** | Carbonion ion rearrangement |
| **Week 13** | Totality, mesomerism, and carbonion ion interactions |
| **Week 14** | Free radicals and their formation |
| **Week 15** | Free radical stability |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |
| **Week 8** | |
| **Week 9** | |
| **Week 10** | |
| **Week 11** | |
| **Week 12** | |
| **Week 13** | |
| **Week 14** | |
| **Week 15** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Organic Chemistry by Morison and Boyd | Yes |

| | | |
|---|---|---|
| | Organic Chemistry I: Reactions and Overview | |
| **Recommended Texts** | Writing Reaction Mechanisms In Organic Chemistry | No |
| **Websites** | | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Chemical safety and security** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **30** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. may fahmi | | **e-mail** | Mayfahmi2015@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | Helping the student know the most important basics of laboratory safety and security and knowing how to take safety precautions when conducting chemical reactions. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | A- Knowledge and understanding<br>1- That the student understands the basic concepts in qualitative analysis<br>2- Understanding all detection methods and preparation methods.<br>3- Memorizing and understanding the equations for finding the concentration of a substance.<br>B- Subject-specific skills<br>1- Classification of the chemical problem<br>2- Develop a plan to solve the problem<br>4- Use separation rates and methods to address the problem |
| **Indicative Contents**<br>المحتويات الإرشادية | A- Teaching and learning methods<br>1- Giving lectures.<br>2- Using the method of presentation, discussion, and solving questions.<br>3- Giving students assignments to strengthen them and prepare them for the final and final exams.<br>B- Evaluation methods<br>1- Daily and monthly exams<br>2- Duties<br>3- In-class exercises |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Developing the thinking skill by formulating questions and assignments that develops the student's abilities and increases his self-confidence and full readiness to understand and solve questions related to the subject. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation
تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Chemical health and safety, chemical risks, and safety methods |
| Week 2 | safety tools |
| Week 3 | Safety records for chemicals (MSDS) |
| Week 4 | Risks and injuries in chemical laboratories / Types of risks in chemical laboratories |
| Week 5 | A guide to fire prevention and how to act in the event of a fire |
| Week 6 | Warning sign for the dangers of chemicals |
| Week 7 | Explosive chemicals |
| Week 8 | Eating toxins |
| Week 9 | Toxic effects |
| Week 10 | Safety precautions for experiments that require heating |
| Week 11 | Methods of heating organic liquids |
| Week 12 | Ventilation in laboratories |
| Week 13 | Occupational safety and security conditions |
| Week 14 | Chemical burns and methods of prevention |
| Week 15 | Chemical health and safety, chemical risks, and safety methods |
| Week 16 | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

| المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | - Inorganic chemistry for the first stage - Dr. Manar Al-Hassani<br>- Inorganic Chemistry - Dr. Noman Al Nuaimi - Dr. Monther Youssef Al-Janabi.(2008) | No |
| **Recommended Texts** | - Inorganic Chemistry - Comparative and Synthetic - Dr. Mahdi Naji Zakum.<br>- Inorganic chemistry and life - d. Monther Youssef Al-Janabi2006. | No |
| **Websites** | - Mobile data show<br>PowerPoint programs<br>- Internet | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **thermodynamics of gases** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☒**Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **200** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. may fahmi | | **e-mail** | Mayfahmi2015@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. Knowles Students by The Thermal Properties of Material in The Nature<br>2. Study Of the Deferent Thermal System of Material in The Nature<br>3. Applied The Chemical Operation to Link between The Theoretical& Workable Material |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.<br>1. Define and explain fundamental concepts such as system, state function, quasistatic reversible process, thermodynamic equilibrium and equation of state.<br>2. State the Zeroth Law of Thermodynamics; explain how this leads to the definition of empirical temperature, describe how the International Temperature Scale is realised and perform calculations related to empirical temperature scales.<br>3. State the First Law of Thermodynamics and show how this leads to a definition of the internal energy, U, as a state function and to the conservation law dU = dW + dQ.<br>4. Define bulk parameters, such as the principal heat capacities, and perform calculations requiring application of the First Law.<br>5. Students will be able to problem solve and critically think about thermodynamic problems and extrapolate solutions based on learned theory.<br>6. Use laboratory instrumentation to measure characteristics of basic thermal systems.<br>7. Students will understand that thermodynamics gives relationship between macroscopic observables<br>8. Students will be able to clearly define the conditions of the kinetic¬ molecular theory and be able to calculate the pressure of an ideal gas from its premises.<br>9. Apply thermodynamic concepts, properties and laws to the modelling of thermal systems. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br><br><u>Part A - Introduction to Thermodynamic</u><br>Concepts and definitions, open and closed systems, state, process, properties, phases, units, 1st law of thermodynamic, energy conservation, enthalpy, 2nd law of thermodynamics, pure substance with /without phase change, ideal gases, specific heats, internal energy, enthalpy, entropy, process of ideal gases, gas laws [15 hrs]<br><u>Heat Transfer</u><br>Heat transfer and heat exchangers [15 h]<br>Revision problem classes [6 hrs]<br>Derive Clausius' theorem from the Second Law and show how this theorem leads to the definition of entropy, S. Prove that S is a state function. Derive the entropy form of the First Law. Calculate entropy changes for simple irreversible processes. [15 h] |

| | |
|---|---|
| | Define the Helmholtz and Gibbs functions and show how these are related to conditions of thermodynamic equilibrium. [6 h]<br>Part B - Analogue Electronics<br>Discuss and use (in quantitative calculations) the fundamental ideas of thermodynamics in a range of systems such as (i) showing that U is independent of T for an ideal gas; (ii) deriving the TdS equations and use them to describe the behavior of the principal specific heat capacities; (iii) applying a thermodynamic approach to the elastic deformation of a rod; (iv) deriving the equations for the Joule and Joule-Kelvin coefficients and explaining how the Joule-Kelvin effect is used in the liquefaction of gases; (v) the thermodynamic analysis of black body radiation etc [15 hrs]<br><br>State the Third Law of Thermodynamics and describe some of the consequences for the behaviour of systems at low temperatures. [6 h]<br>Clausius' theorem. Entropy S. dU = TdS – PdV. Changes in entropy for some simple irreversible processes. [6 h]<br>Helmholtz and Gibbs functions. Relationship to conditions of thermodynamic equilibrium. |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning.<br>Guided Independent Study: Assessment preparation and completion<br>Scheduled Learning And Teaching Activities: Lecture<br>Scheduled Learning And Teaching Activities: Small group teaching |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Introduction to systems, state functions, quasistatic reversible processes and equations of state. |
| Week 2 | The scope of thermodynamics. Energy forms |
| Week 3 | Properties of pure substances. PVT behavior of pure substances. Thermodynamic properties and state functions. Applied processes for the ideal gas. (Constant volume, constant pressure, isothermal, adiabatic, polytropic). |
| Week 4 | The Zeroth Law of Thermodynamics, empirical temperature scales and thermometers. The International Temperature Scale. Quiz |
| Week 5 | The First Law of Thermodynamics and internal energy U. dU = dQ + dW. Perfect and imperfect differentials. Discussion of whether U, Q and W are state functions. |
| Week 6 | Definition of heat capacity in general terms and expressions for CP and CV for a compressible fluid. Description of how U varies with P and V for ideal and real gases. Proof that CP - CV = nR for an ideal gas. Quasistatic adiabatic process for an ideal gas. The van der Waals and virial equations for gases and how they attempt to account for the behaviour of real gases. |
| Week 7 | Mid-term Exam |
| Week 8 | The second law of thermodynamics and entropy. The mathematical expression of the second law. Heat and Cooling Machines. |
| Week 9 | Various applications of the fundamental ideas of thermodynamics including at least some of the following: (i) showing that the internal energy of an ideal gas is independent of p and V; (ii) derivation of the two 'TdS Equations' and use of them to describe the behaviour of the principal |

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| | specific heat capacities |
| **Week 10** | The third law of thermodynamics and absolute entropy |
| **Week 11** | Thermodynamic property relations. Maxwell relations, Clapeyron equation, Joule-Thomson coefficient |
| **Week 12** | Gas Mixtures and Ideal-Gas |
| **Week 13** | Gas flow power conversion systems. Quiz |
| **Week 14** | Steam power conversion systems (Carnot, Rankine and reheated Rankine cycles) |
| **Week 15** | Cooling, liquidation and gas vapor mixtures |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Determination of Heat Capacity of a calorimeter |
| **Week 2** | Lab 2: Heat Change of Salt Solution |
| **Week 3** | Lab 3: Determine Molecular Weight by the Dumas Method |
| **Week 4** | Lab 4: Determination the Viscosity of Liquids using Capillary Type Viscometer |
| **Week 5** | Lab 5: Determine the Density of Liquids |
| **Week 6** | Lab 6: Specific Heat Capacities of Metals |
| **Week 7** | Lab 7: Heat of Neutralization |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Howard DeVoe, Thermodynamics and Chemistry 2nd Edition, Prentice-Hall, Inc. | No |
| **Recommended Texts** | P. Atkins and J. De Paula, Atkins' Physical Chemistry, eighth edition, W. H. Freeman Company, 2006. | No |
| **Websites** | https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks %** | **Definition** |
| **Success Group** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |

| | | | | |
|---|---|---|---|---|
| **(50 - 100)** | **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION
# وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Stereochemistry** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>☒**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | **Che-314** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 3 | | **Semester of Delivery** | 5 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Che-224 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims** | 1. Objective: To study the most basic issues of stereochemistry and |

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|---|---|
| أهداف المادة الدراسية | stereochemistry of simple and complex molecules, their biological activity, the possibility of preparing them in the laboratory, and knowing the sources of biological activity in some natural products |
| **Modul Outcor**<br>الدراسية | This course description provides a necessary summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve<br><br>Evidence of whether he made the most of the available learning opportunities. It must be linked to the description.<br><br>B- Learning outcomes of the course:<br><br>Upon completion of this course, students will:<br><br>.1Knowledge of the basics of stereochemistry.<br><br>-2The ability to apply knowledge in stereochemistry.<br><br>-3Knowledge of molecules and their biological effectiveness for simple and complex compounds.<br><br>-4Knowing the sources of biological activity and some natural products.<br><br>-5Knowing the geometry of vehicles in space...of biological importance. |
| **Indicative Contents**<br>المحتويات الإرشادية | Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction). [10 hrs] |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

| Module Evaluation<br>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 | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 1 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | isomers |
| **Week 2** | Molecular symmetry |
| **Week 3** | Optical similarity due to asymmetric federal carbons |
| **Week 4** | Molecules containing more than one asymmetric carbon atom |
| **Week 5** | The racemic mixture - composition - |
| **Week 6** | optical purity |
| **Week 7** | monthly exam |
| **Week 8** | Prepare the center of asymmetry in the molecule |

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|---|---|
| **Week 9** | Spatial-absolute-geometric structure |
| **Week 10** | Positions of non-cyclic compounds |
| **Week 11** | infrared absorption |
| **Week 12** | magnetic resonance spectrum absorption |
| **Week 13** | Addition and subtraction reactions |
| **Week 14** | positions and their effectiveness |
| **Week 15** | Utilization and comparison between compounds spatially |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |
| **Week 8** | |
| **Week 9** | |
| **Week 10** | |
| **Week 11** | |
| **Week 12** | |
| **Week 13** | |
| **Week 14** | |
| **Week 15** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |

| | | |
|---|---|---|
| **Required Texts** | Organic Chemistry by Morison and Boyd | Yes |
| **Recommended Texts** | **Organic Chemistry CHE 502 / STEREOCHEMISTRY-I Dr. SHALINI SINGH** | No |
| **Websites** | | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks (%)** | **Definition** |
| **Success Group (50 - 100)** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |
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| | **D -** Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
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| **Fail Group (0 – 49)** | **FX –** Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
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| | | | | |

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# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Statistics | | | **Module Delivery** | |
| **Module Type** | Assistant | | | ☒Theory<br>☐Lecture<br>☐Lab<br>☒Tutorial<br>☐Practical<br>☒Seminar | |
| **Module Code** | UoA12345 | | | | |
| **ECTS Credits** | 4 | | | | |
| **SWL (hr/sem)** | 200 | | | | |
| **Module Level** | | 2 | **Semester of Delivery** | | 2 |
| **Administering Department** | | Type Dept. Code | **College** | Type College Code | |
| **Module Leader** | Professor Bilal JM Aldahham | | **e-mail** | bilalaldahham@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | | Professor | **Module Leader's Qualification** | | Ph.D. |
| **Module Tutor** | Professor Bilal JM Aldahham | | **e-mail** | bilalaldahham@uoanbar.edu.iq | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | | 01/09/2023 | **Version Number** | | 1.0 |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. Explain the notion of Sampling as an integral part of Analytical Methods of Analysis.<br>2. Identify and describe the sources of sampling error.<br>3. Have a knowledge of some important basic principles of error analysis.<br>4. Identify and discuss the various types and sources of experimental errors.<br>5. Explain and use the concept of significant figures.<br>6. Define and distinguish between absolute vs. relative error; random vs. systematic error;<br>7. Describe the relationship between error and probability.<br>8. Apply simple statistics and error analysis to determine the reliability of analytical chemical procedures.<br>9. Clearly and correctly report measurements and the uncertainties in them. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Solve applied problems in differential and integral calculus, and probability theory.<br>2. Use a variety of statistical software packages to enter and manage data, and to calculate and combine descriptive statistical parameters.<br>3. Differentiate between various sampling techniques.<br>4. Utilize inferential statistics.<br>5. Calculate test statistics.<br>6. Use various test statistics to assess the significance of a model.<br>7. Utilize regression analysis to construct a predictive model.<br>8. Design and analyze experiments using a variety of techniques.<br>9. Gain entrance into careers as well as in graduate or professional school |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>This course aims to discuss data analysis techniques using descriptive and inferential statistics and their interpretations. Topics covered include: basic statistical concepts, error theory, descriptive statistics, probability distribution, sampling technique, statistical hypothesis testing, normality test, homogeneity test, average similarity test, regression and correlation analysis, analysis of variance, analysis of covariance, path analysis, and a structural equation model (SEM). Students will also learn to process and analyze data using special software so that it will help them in practical research activities. Lectures will be held with a case-based learning approach. Mastery of lecture material will assist students in conducting quality research. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, |

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|---|---|
| | interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 52 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3.5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

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

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction – definitions |
| **Week 2** | Types of errors ,statistical symbols and mathematical process |
| **Week 3** | Central tendency in statistics |
| **Week 4** | Central tendency in statistics |
| **Week 5** | Dispersion tendency in Statistics |
| **Week 6** | Dispersion tendency in Statistics |

| | |
|---|---|
| **Week 7** | Central tendency in statistics |
| **Week 8** | Dispersion tendency in Statistics |
| **Week 9** | Dispersion tendency in Statistics |
| **Week 10** | Normal distribution |
| **Week 11** | Correlations |
| **Week 12** | Regression |
| **Week 13** | Sample distribution |
| **Week 14** | T test |
| **Week 15** | ANOVA |
| **Week 16** | **Preparatory week before the final Exam** |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | **Text** | **Available in the Library?** |
|---|---|---|
| **Required Texts** | Statistics and Chemometrics for Analytical Chemistry, James N Miller and Jane C Miller, Pearson Education Limited, Sixth edition 2010 | Yes |
| **Recommended Texts** | | |
| **Websites** | https://www.my-mooc.com/en/mooc/intro-to-descriptive-statistics--ud827/ | |

## Grading Scheme
مخطط الدرجات

| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F** – Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

بسم الله الرحمن الرحيم


اسم الجامعة: جامعة الانبار
اسم الكلية: العلوم التطبيقية ـ هيت
اسم القسم: الكيمياء التطبيقية
المرحلة: الاولى
اسم المحاضر الثلاثي: د. مروان محمد فرحان
اللقب العلمي: أستاذ مساعد
المؤهل العلمي: دكتوراه

# استمارة الخطة التدريسية للمادة

| الفصل الدراسي / الثاني | | | | |
|---|---|---|---|---|
| الاسبوع | التاريخ | المادة النظرية | المادة العملية | الملاحظات |
| 1 | | نظائر | | |
| 2 | | التماثل الجزيئي | | |
| 3 | | التشابه البصري بسبب الكربونات الفيدرالية غير المتماثلة | | |
| 4 | | الجزيئات التي تحتوي على أكثر من ذرة كربون غير متماثلة | | |
| 5 | | الخليط الراسيمي - التركيب - | | |
| 6 | | النقاء البصري | | |
| 7 | | الامتحان الشهري | | |
| 8 | | تحضير مركز عدم التماثل في الجزيء | | |
| 9 | | البنية المكانية المطلقة والهندسية | | |
| 10 | | مواقع المركبات غير الحلقية | | |
| 11 | | امتصاص الأشعة تحت الحمراء | | |
| 12 | | امتصاص طيف الرنين المغناطيسي | | |
| 13 | | تفاعلات الجمع والطرح | | |
| 14 | | المواقف وفعاليتها | | |
| 15 | | الاستفادة والمقارنة بين المركبات مكانيا | | |
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توقيع الأستاذ: توقيع رئيس القسم توقيع العميد:

Republic of Iraq

The ministry of higher Education & scientific Research


University name: Anbar University
College name: Applied Sciences - HIT
Department name: Applied Chemistry
The first phase
Name of the lecturer: Dr. Marwan Muhammad Farhan
Scientific title: Assistant Professor
Academic qualification: Ph.D

**Course** / second

| week | Data | Topes covered | Lab. Experiment Assignment | notes |
|---|---|---|---|---|
| 1 | 25/02/2024 | isomers | | |
| 2 | 03/03/2024 | Molecular symmetry | | |
| 3 | 10/03/2024 | Optical similarity due to asymmetric federal carbons | | |
| 4 | 17/03/2024 | Molecules containing more than one asymmetric carbon atom | | |
| 5 | 19/03/2024 | The racemic mixture - composition - | | |
| 6 | 24/03/2024 | optical purity | | |
| 7 | 31/03/2024 | monthly exam | | |
| 8 | 07/04/2024 | Prepare the center of asymmetry in the molecule | | |
| 9 | 14/04/2024 | Spatial-absolute-geometric structure | | |
| 10 | 16/04./2024 | Positions of non-cyclic compounds | | |
| 11 | 21/04/2024 | infrared absorption | | |
| 12 | 23/04/2024 | magnetic resonance spectrum absorption | | |
| 13 | 28/04/2024 | Addition and subtraction reactions | | |
| 14 | 05/05/2024 | positions and their effectiveness | | |
| 15 | 12/05/2024 | Utilization and comparison between compounds spatially | | |
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Instructor signature: Head of Dep. Signature: Dean Signature:

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

بسم الله الرحمن الرحيم


اسم الجامعة: جامعة الانبار
اسم الكلية: العلوم التطبيقية ـ هيت
اسم القسم: الكيمياء التطبيقية
المرحلة: الثالثة
اسم المحاضر الثلاثي: د. مروان محمد فرحان
اللقب العلمي: أستاذ مساعد
المؤهل العلمي: دكتوراه

# استمارة الخطة التدريسية للمادة

| الفصل الدراسي / الثاني | | | | |
|---|---|---|---|---|
| الاسبوع | التاريخ | المادة النظرية | المادة العملية | الملاحظات |
| 1 | 30/01/2024 | لأحماض والقواعد (النظريات والقاعدة الأساسية) | | |
| 2 | 06/02/2024 | يفتقر أيون الكربونيوم وذرات النيتروجين والأكسجين إلى الإلكترون | | |
| 3 | 13/02/2024 | طرق تكوين أيون الكربونيوم والعوامل المؤثرة على ثباته | | |
| 4 | 20/02/2024 | إعادة ترتيب أيون الكربونيوم | | |
| 5 | 27/02/2024 | تفاعلات أيون الكربونيوم وأيونات الكربون غير التقليدية | | |
| 6 | 05/03/2024 | امتحان الشهر الأول | | |
| 7 | 12/03/2024 | أيون الكربون | | |
| 8 | 19/03/2024 | أيون الكربون | | |
| 9 | 26/03/2024 | طرق أيون الكربونيون | | |
| 10 | 02/04/2024 | استقرار أيون الكربون | | |
| 11 | 09/04/2024 | إعادة ترتيب أيون الكربون | | |
| 12 | 16/04/2024 | إعادة ترتيب أيون الكربون | | |
| 13 | 23/04/2024 | التفاعلات الكلية والميزومرية وأيونات الكربون | | |
| 14 | 30/04/2024 | الجذور الحرة وتكوينها | | |
| 15 | 07/05/2024 | استقرار الجذور الحرة | | |
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توقيع الأستاذ: توقيع رئيس القسم توقيع العميد:

Republic of Iraq

The ministry of higher Education & scientific Research


University name: Anbar University
College name: Applied Sciences - HIT
Department name: Applied Chemistry
The first phase
Name of the lecturer: Dr. Marwan Muhammad Farhan
Scientific title: Assistant Professor
Academic qualification: Ph.D

**Course** / second

| week | Data | Topes covered | Lab. Experiment Assignment | notes |
|---|---|---|---|---|
| 1 | 30/01/2024 | Acids and bases (theories and basic rule) | | |
| 2 | 06/02/2024 | The carbonium ion and the nitrogen and oxygen atoms lack an electron | | |
| 3 | 13/02/2024 | Methods of formation of the carbonium ion and factors affecting its stability | | |
| 4 | 20/02/2024 | Carbonium ion rearrangement | | |
| 5 | 27/02/2024 | Unconventional carbonium ion and carbonium ion interactions | | |
| 6 | 05/03/2024 | first month exam | | |
| 7 | 12/03/2024 | carbonion ion | | |
| 8 | 19/03/2024 | carbonion ion | | |
| 9 | 26/03/2024 | Carbonion ion methods | | |
| 10 | 02/04/2024 | carbon ion stability | | |
| 11 | 09/04/2024 | Carbonion ion rearrangement | | |
| 12 | 16/04/2024 | Carbonion ion rearrangement | | |
| 13 | 23/04/2024 | Totality, mesomerism, and carbonion ion interactions | | |
| 14 | 30/04/2024 | Free radicals and their formation | | |
| 15 | 07/05/2024 | Free radical stability | | |
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Instructor signature: Head of Dep. Signature: Dean Signature:

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Chemical safety and security** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **30** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. may fahmi | | **e-mail** | Mayfahmi2015@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | Helping the student know the most important basics of laboratory safety and security and knowing how to take safety precautions when conducting chemical reactions. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | A- Knowledge and understanding<br>1- That the student understands the basic concepts in qualitative analysis<br>2- Understanding all detection methods and preparation methods.<br>3- Memorizing and understanding the equations for finding the concentration of a substance.<br>B- Subject-specific skills<br>1- Classification of the chemical problem<br>2- Develop a plan to solve the problem<br>4- Use separation rates and methods to address the problem |
| **Indicative Contents**<br>المحتويات الإرشادية | A- Teaching and learning methods<br>1- Giving lectures.<br>2- Using the method of presentation, discussion, and solving questions.<br>3- Giving students assignments to strengthen them and prepare them for the final and final exams.<br>B- Evaluation methods<br>1- Daily and monthly exams<br>2- Duties<br>3- In-class exercises |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Developing the thinking skill by formulating questions and assignments that develops the student's abilities and increases his self-confidence and full readiness to understand and solve questions related to the subject. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation
تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | Chemical health and safety, chemical risks, and safety methods |
| Week 2 | safety tools |
| Week 3 | Safety records for chemicals (MSDS) |
| Week 4 | Risks and injuries in chemical laboratories / Types of risks in chemical laboratories |
| Week 5 | A guide to fire prevention and how to act in the event of a fire |
| Week 6 | Warning sign for the dangers of chemicals |
| Week 7 | Explosive chemicals |
| Week 8 | Eating toxins |
| Week 9 | Toxic effects |
| Week 10 | Safety precautions for experiments that require heating |
| Week 11 | Methods of heating organic liquids |
| Week 12 | Ventilation in laboratories |
| Week 13 | Occupational safety and security conditions |
| Week 14 | Chemical burns and methods of prevention |
| Week 15 | Chemical health and safety, chemical risks, and safety methods |
| Week 16 | **Preparatory week before the final Exam** |

## Delivery Plan (Weekly Lab. Syllabus)

| المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | **Baseline survey on the implementation of laboratory chemical safety, health and security within health faculties laboratories at Universitas Indonesia,** ***J. Chem. Health Saf.*** **2016, 23, 4, 38–43**<br>Publication Date:July 1, 2016.<br>https://doi.org/10.1016/j.jchas.2015.11.002<br>**© 2015 American Chemical Society** | No |
| **Recommended Texts** | **Machine Learning and Deep Learning in Chemical Health and Safety: A Systematic Review of Techniques and Applications**<br>**Cite this:** *ACS Chem. Health Saf.* 2020, 27, 6, 316–334<br>Publication Date:October 18, 2020<br>https://doi.org/10.1021/acs.chas.0c00075 | No |
| **Websites** | - Mobile data show<br>PowerPoint programs<br>- Internet | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Inorganic chemistry** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **200** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Ibrahim Saud Khaleel | | **e-mail** | ibrahem.abomusab@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 59 |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Representation and understanding of the study of salts, the major part of inorganic compounds, in which cations and anions are linked together by ionic bonds.<br>Know the classification of inorganic compounds into oxides, carbonates, halides and sulfates, as they are distinguished by understanding many of them with a high melting point and poor conductivity of electricity in the solid state. Inorganic compounds are also characterized by their solubility in water and the ease of crystallization.<br>Knowing the simplest types of inorganic reactions, the double displacement reaction, when two salts are mixed and the ions exchange without any change in the oxidation state. |
| **Indicative Contents**<br>المحتويات الإرشادية | The origin of the quantum atom<br>photoelectric effect [6 h]<br>atomic spectra , Rutherford-and Bohr theory Schrödinger equation<br>Quantum preparation, monthly exam [12 h]<br><br>Periodic Table . The periodic table groups. Periodic table cycles<br>transitional elements . Periodic properties of the periodic table<br>Ionic compounds [15 h]<br><br>Covalent Bonds - Molecular Orbital Theory<br>monthly exam<br>[6 h] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning.<br>Guided Independent Study: Assessment preparation and completion<br>Scheduled Learning And Teaching Activities: Lecture<br>Scheduled Learning And Teaching Activities: Small group teaching |

| Student Workload (SWL) |
|---|

| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation
تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |
| **Week 8** | |
| **Week 9** | |

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|---|---|
| **Week 10** | |
| **Week 11** | |
| **Week 12** | |
| **Week 13** | |
| **Week 14** | |
| **Week 15** | |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: What is a computer? and There are types of icons on the desktop. |
| **Week 2** | Lab 2: Use the right mouse key for system, program and folder icons. |
| **Week 3** | Lab 3: Use the right mouse key (copy, paste, cut, delete, change folder name). |
| **Week 4** | Lab 4: Apply the right mouse button ( of the system icon, program icon, and folder icon). |
| **Week 5** | Lab 5: What is Word Program ? Then there are many ways to open Word. |
| **Week 6** | Lab 6: in Word program ,Recognize tab commands? Then explain the home page. |
| **Week 7** | Lab 7: In Word program, use the following tools (B, U, I) and change the font size. |
| **Week 8** | Lab 8: in Word program , page layout and use of page borders. |
| **Week 9** | Lab 9: In Word program, implement margins and change the orientation of the sheet. |
| **Week 10** | Lab 10: In Word program, insert a picture and a mathematical equation. |
| **Week 11** | Lab 11: In Word program, From the View tab, activate the ruler and grid lines. |
| **Week 12** | Lab 12: In Word program, insert a table consisting of a set of columns and rows. |
| **Week 13** | Lab 13: In Word program, insert a watermark into the worksheet. |
| **Week 14** | monthly exam |
| **Week 15** | Preparatory week before the final Exam |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | - Inorganic chemistry for the first stage - Dr. Manar Al-Hassani - Inorganic Chemistry - Dr. Noman Al Nuaimi - Dr. Monther Youssef Al-Janabi.(2008) | No |

| | | |
|---|---|---|
| **Recommended Texts** | - Inorganic Chemistry - Comparative and Synthetic - Dr. Mahdi Naji Zakum.<br>- Inorganic chemistry and life - d. Monther Youssef Al-Janabi2006. | No |
| **Websites** | - Mobile data show<br>PowerPoint programs<br>- Internet | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Cell Biology** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **200** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. Omar Qahtan | | **e-mail** | Omerkahtan@gmail.com | |
| **Module Leader's Acad. Title** | Teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | The concept of the cell is defined in terms of structure and function, in addition to tracing the stages of cell discovery, as well as distinguishing between types of cells, on what basis they are classified, and what are the differences between them.<br>Learn about the components of the cell and the chemical nature of the cell membrane, and what are the most important activities that occur through the membrane, such as transfer, communication, and transmission of signals, and identify the chemical factors through which these activities occur.<br>Identifying the nucleus and its contents, as well as identifying the genetic material and its structure, how cell division occurs, what its life cycle is, and how replication of the genetic material occurs inside the cell. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | In addition to describing the steps of cell discovery, the notion of a cell is described in terms of its structure and function. Different cell types are also identified, along with the reasons for their classification and the characteristics that set them apart.<br>Get knowledge about the parts of a cell, the chemical makeup of the cell membrane, the key functions of the membrane—such as signal transmission, communication, and transfer—as well as the chemical processes that underlie these functions.<br>recognizing the existence of the nucleus and its contents, the genetic material and its composition, the process of cell division, the characteristics of its life cycle, and the process of genetic material replication inside the cell. |
| **Indicative Contents**<br>المحتويات الإرشادية | Introduction of Cell Biology, Cell membrane (Plasma membrane (structure and function, Cell membrane transport, Cell membrane Gap, Tight and Adhesion Junctions Cell membrane (General principles of cell signaling) [10 h]<br><br>The Cytoplasm and membrane bounded organelles, The Cytoplasm, Non membrane bounded organelles, The Cytoskeleton, Cell Movement, Cytoplasmic inclusions [6 h]<br><br>The nucleus structure, function, Cell metabolism, Cellular Respiration, Cell Cycle (cell life), Cell division and growth, Cell Death Pathways (Necrosis, Senescence, Apoptosis), Molecular base for genetic [12 h] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | |

| | |
|---|---|
| | Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning.<br>Guided Independent Study: Assessment preparation and completion<br>Scheduled Learning And Teaching Activities: Lecture<br>Scheduled Learning And Teaching Activities: Small group teaching |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Introduction of Cell Biology |
| **Week 2** | Cell membrane (Plasma membrane) structure and function |

| | |
|---|---|
| **Week 3** | Cell membrane transport |
| **Week 4** | Cell membrane Gap, Tight and Adhesion Junctions |
| **Week 5** | Cell membrane (General principles of cell signaling) |
| **Week 6** | The Cytoplasm, membrane bounded organelles |
| **Week 7** | The Cytoplasm, Non membrane bounded organelles |
| **Week 8** | The Cytoskeleton, Cell Movement, Cytoplasmic inclusions |
| **Week 9** | Mid exam |
| **Week 10** | The nucleus structure , function |
| **Week 11** | Cell metabolism, Cellular Respiration |
| **Week 12** | Cell Cycle (cell life) |
| **Week 13** | Cell division and growth |
| **Week 14** | Cell Death Pathways (Necrosis, Senescence, Apoptosis) |
| **Week 15** | Molecular base for genetic |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Microscope and microscope compound |
| **Week 2** | Laboratory instruments and devices |
| **Week 3** | Cells and cell shape |
| **Week 4** | Cheek cell and onion cell |
| **Week 5** | Structure of cell |
| **Week 6** | Cell and its types |
| **Week 7** | Mitosis &Cell life cycle |
| **Week 8** | Cells diffusion |
| **Week 9** | Preparing culture media and how to stain slides |
| **Week 10** | Photosynthesis and respiration |
| **Week 11** | White blood cells and their types |
| **Week 12** | Red blood cells |
| **Week 13** | Red blood cell membrane osmosis experiment |
| **Week 14** | Test the volume of packed blood cells |
| **Week 15** | Experiment with how to make strips of tissue |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | - alberts.-.molecular.biology.of.the.cell.5th.ed<br>- Medical Physiology by Walter F Boron Emile L Boulpaep (z-lib.org) | No |
| **Recommended Texts** | Harvey_Lodish_Molecular_Cell_Biology | No |
| **Websites** | - Mobile data show<br>- PowerPoint programs<br>- Internet | |

## Grading Scheme
مخطط الدرجات

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

**University of Kufa**
**Faculty of Science**
**Department of Chemistry**

# MODULE DESCRIPTION
# وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Organic Chemistry 3** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>☒**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | **Che-314** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 3 | | **Semester of Delivery** | 5 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Che-224 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. To know the chemical structures of carboxylic acids, esters, amines and phenols.<br>2. To know the nomenclature of carboxylic acids, esters and amines.<br>3. The physical and chemical properties of carboxylic acids, esters, amines and phenols.<br>4. To understand the preparation and reactions of carboxylic acids, esters, amines and phenols.<br>5. To compare between carbanion and carbocation and know their stability.<br>6. To understand the reaction of carbanion (e.g. Aldol reaction and Claisen condensation). |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Recognize the structure and nomenclature of carboxylic acid and esters.<br>2. Recognize the physical and chemical properties of carboxylic acids and esters.<br>3. Explain how to prepare carboxylic acids derivatives.<br>4. Know the reaction of carboxylic acids and its derivatives.<br>5. Recognize the structure and nomenclature of amines.<br>6. Recognize the physical and chemical properties and amines.<br>7. Explain how to prepare amine derivatives.<br>8. Know the reaction of amines.<br>9. Understand the stability of carbanion and carbocation.<br>10. Explain the mechanism of reaction of carbanion.<br>11. Understand how to prepare new compound using reaction of carbanion. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br>The structure and nomenclature of carboxylic acid, Properties and Acidity of carboxylic acids, Methods of Preparation and Reactions of carboxylic acids [10hrs]<br>The structure and nomenclature and Properties of esters, Methods of Preparation and Reactions of esters. [7 hrs]<br>The structure and classification and nomenclature of amines, Properties and basicity of amines, Methods of Preparation and Reaction of amines [10 hrs]<br>The stability of of carbanion and carbocation, Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation ), Addition reaction ( chalcone formation, Henry reaction), Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction). [10 hrs] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

| Module Evaluation<br>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 | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 1 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | The structure and nomenclature of carboxylic acid |
| **Week 2** | Properties of carboxylic acids and Acidity of carboxylic acids |
| **Week 3** | Methods of Preparation of carboxylic acids |
| **Week 4** | Reactions of carboxylic acids |
| **Week 5** | The structure and nomenclature and Properties of esters |
| **Week 6** | Methods of Preparation of esters |
| **Week 7** | Reactions of esters |
| **Week 8** | The structure and classification and nomenclature of amines |
| **Week 9** | Properties and basicity of amines |
| **Week 10** | Methods of Preparation of amines |
| **Week 11** | Reaction of amines |
| **Week 12** | The stability of of carbanion and carbocation. |
| **Week 13** | Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation ) |
| **Week 14** | Addition reaction ( chalcone formation, Henry reaction) |
| **Week 15** | Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction) |
| **Week 16** | **Preparatory week before the final Exam** |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Preparation of chlorobenzene |
| **Week 2** | Lab 2: Sulfonation of aromatic amine |
| **Week 3** | Lab 3: Preparation of sulfanilic acid |
| **Week 4** | Lab 4: Esterification of benzoic acid |
| **Week 5** | Lab 5: Preparation of ethylbenzene |
| **Week 6** | Lab 6: Oxidation of Toluene |
| **Week 7** | Lab 7: Preparation of benzoic acid |
| **Week 8** | Lab 8: Cannizzaro reaction |
| **Week 9** | Lab 9: preparation carboxylic acid from aldehyde |

| | |
|---|---|
| **Week 10** | Lab 10: Aldol condensation |
| **Week 11** | Lab 11: Preparation of Dibenzalacetone |
| **Week 12** | Lab 12: Claisen condensation |
| **Week 13** | Lab 13: Preparation of ethylacetoacetate |
| **Week 14** | Lab 14: Perkin condensation |
| **Week 15** | Lab 15: Preparation of cinnamic acid |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Organic Chemistry by Morison and Boyd | Yes |
| **Recommended Texts** | Textbook of practical organic chemistry by Brian S. Furniss | No |
| **Websites** | | |

## Grading Scheme
مخطط الدرجات

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

**University of Kufa**
**Faculty of Science**
**Department of Chemistry**

# MODULE DESCRIPTION
# وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Organic Chemistry 3** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☐**Lecture**<br>☒**Lab**<br>☐**Tutorial**<br>☐**Practical**<br>☒**Seminar** | |
| **Module Code** | **Che-314** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | 3 | | **Semester of Delivery** | 5 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name | | **e-mail** | E-mail | |
| **Module Leader's Acad. Title** | Professor | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Che-224 | **Semester** | 4 |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. Identify the chemical structures of hydrocarbons.<br>2. Know the names of hydrocarbons.<br>3. The physical and chemical properties of hydrocarbons<br>4. To understand the preparation and reactions of alkanes, alkenes and alkynes<br>5. To compare carbanion and carbocation and find out their stability.<br>6. To understand the reaction of alkanes, alkenes and alkynes.<br><br>1. Learn about the structure and nomenclature of alkanes, alkenes, and alkynes.<br>2. Identify the physical properties of alkanes, alkenes, and alkynes.<br>3. Explain how to prepare derivatives of alkanes, alkenes and alkynes.<br>4. Learn about the interaction of alkanes, alkenes, alkynes and their derivatives.<br>5. Identification of the structure and naming of alkyl halides.<br>6. Identify the physical and chemical properties of alkyl halides.<br>7. Explain how to prepare derivatives of alkanes, alkenes and alkynes.<br>8. Learn about the reaction of alkanes, alkenes and alkynes.<br>9. Understanding of carbanion and carbocation stability.<br>10. Explain the mechanism of the carbonization reaction.<br>11. Understand how to prepare a new compound using the carbonaceous reaction.<br><br>Indicative content includes the following.<br>Structure and nomenclature of carboxylic acid, properties and acidity of carboxylic acids, methods of preparation and reactions of carboxylic acids [10 hours]<br>Structure, nomenclature and properties of esters, methods of preparation and reactions of esters. [7 hours]<br>Structure, classification and nomenclature of amines, properties and basics of amines, methods of preparation and reaction of amines [10 hours]<br>Stability of carbanions and carbonites, carbanions reaction (addition reaction: aldol reaction, Claisen condensation), addition reaction (chalcone formation, Henry reaction), substitution reaction (halogenation, Kolb-Schmidt reaction, Reimer-Tiemann reaction). [10 hours]<br>1. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. |
| | |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم |
|---|

| | |
|---|---|
| **Strategies** | The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | **Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)** الحمل الدراسي غير المنتظم للطالب خلال الفصل | 71 | **Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)** 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 | All |
| | **Report** | 1 | 10% (10) | 13 | LO # 5, 8 and 10 |
| **Summative assessment** | **Midterm Exam** | 1 hr | 10% (10) | 7 | LO # 1-7 |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

| | **Material Covered** |
|---|---|

| | |
|---|---|
| **Week 1** | hydrocarbons in general |
| **Week 2** | Alkanes, nomenclature, physical properties |
| **Week 3** | Methods for preparing alkanes. Chemical properties of alkanes |
| **Week 4** | Stereochemistry of Alkanes (The Horse and Eclipse Positions) |
| **Week 5** | cyclic compounds of alkanes |
| **Week 6** | Alkenes, nomenclature, physical properties |
| **Week 7** | Methods for preparing alkenes. Chemical properties of alkenes |
| **Week 8** | Stereochemistry of alkenes, cyclic compounds of alkenes |
| **Week 9** | Alkynes, nomenclature, physical properties |
| **Week 10** | Methods for preparing alkynes. Chemical properties of alkynes |
| **Week 11** | Stereochemistry Alkynes, cyclic compounds of alkynes |
| **Week 12** | Alkyl halides, nomenclature and physical properties |
| **Week 13** | Benefits, harms and uses of alkyl halides |
| **Week 14** | The existence of alkyl halides and methods of obtaining them |
| **Week 15** | Chemical properties of alkyl halides |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Preparation of chlorobenzene |
| **Week 2** | Lab 2: Sulfonation of aromatic amine |
| **Week 3** | Lab 3: Preparation of sulfanilic acid |
| **Week 4** | Lab 4: Esterification of benzoic acid |
| **Week 5** | Lab 5: Preparation of ethylbenzene |
| **Week 6** | Lab 6: Oxidation of Toluene |
| **Week 7** | Lab 7: Preparation of benzoic acid |
| **Week 8** | Lab 8: Cannizzaro reaction |
| **Week 9** | Lab 9: preparation carboxylic acid from aldehyde |
| **Week 10** | Lab 10: Aldol condensation |
| **Week 11** | Lab 11: Preparation of Dibenzalacetone |
| **Week 12** | Lab 12: Claisen condensation |

| | |
|---|---|
| **Week 13** | Lab 13: Preparation of ethylacetoacetate |
| **Week 14** | Lab 14: Perkin condensation |
| **Week 15** | Lab 15: Preparation of cinnamic acid |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Organic Chemistry by Morison and Boyd | Yes |
| **Recommended Texts** | Textbook of practical organic chemistry by Brian S. Furniss | No |
| **Websites** | | |

## Grading Scheme
مخطط الدرجات

| 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 | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
| | | | | |

**Note:** Marks 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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Inorganic chemistryII** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒**Theory**<br>☒**Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐**Practical**<br>☐**Seminar** | |
| **Module Code** | | | | | |
| **ECTS Credits** | **8** | | | | |
| **SWL (hr/sem)** | **200** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Type Dept. Code | | **College** | Type College Code | |
| **Module Leader** | Name: Dr. may fahmi | | **e-mail** | Mayfahmi2015@uoanbar.edu.iq | |
| **Module Leader's Acad. Title** | teacher | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Name (if available) | | **e-mail** | E-mail | |
| **Peer Reviewer Name** | Name | | **e-mail** | E-mail | |
| **Scientific Committee Approval Date** | 01/06/2023 | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 59 |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Representation and understanding of the study of salts, the major part of inorganic compounds, in which cations and anions are linked together by ionic bonds.<br>Know the classification of inorganic compounds into oxides, carbonates, halides and sulfates, as they are distinguished by understanding many of them with a high melting point and poor conductivity of electricity in the solid state. Inorganic compounds are also characterized by their solubility in water and the ease of crystallization.<br>Knowing the simplest types of inorganic reactions, the double displacement reaction, when two salts are mixed and the ions exchange without any change in the oxidation state. |
| **Indicative Contents**<br>المحتويات الإرشادية | The origin of the quantum atom<br>photoelectric effect [6 h]<br>atomic spectra , Rutherford-and Bohr theory Schrödinger equation<br>Quantum preparation, monthly exam [12 h]<br><br>Periodic Table . The periodic table groups. Periodic table cycles<br>transitional elements . Periodic properties of the periodic table<br>Ionic compounds [15 h]<br><br>Covalent Bonds - Molecular Orbital Theory<br>monthly exam<br>[6 h] |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning.<br>Guided Independent Study: Assessment preparation and completion<br>Scheduled Learning And Teaching Activities: Lecture<br>Scheduled Learning And Teaching Activities: Small group teaching |

| Student Workload (SWL) |
|---|

| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 109 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 7 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 91 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **200** | | |

## Module Evaluation
تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Ionic compounds |
| **Week 2** | Conditions for the formation of ionic compounds |
| **Week 3** | As fair Bourne = Landy |
| **Week 4** | Born-Haber cycle |
| **Week 5** | Polarization of ionic compounds |
| **Week 6** | first month exam |
| **Week 7** | solubility of ionic compounds |
| **Week 8** | The structure of ionic crystals |
| **Week 9** | covalent bonds |
| **Week 10** | Basic rules and formative theories for the formation of the covalent bond |

| | |
|---|---|
| **Week 11** | Energy sequence of orbitals and rules for determining the electronic arrangement of an atom |
| **Week 12** | Molecular orbital theory |
| **Week 13** | The shapes of the molecules of covalent compounds |
| **Week 14** | Hybridization in compounds containing only SCMA |
| **Week 15** | Hybridization in compounds containing only Pi GLA |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | |
| **Week 2** | |
| **Week 3** | |
| **Week 4** | |
| **Week 5** | |
| **Week 6** | |
| **Week 7** | |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | - Inorganic chemistry for the first stage - Dr. Manar Al-Hassani<br>- Inorganic Chemistry - Dr. Noman Al Nuaimi - Dr. Monther Youssef Al-Janabi.(2008) | No |
| **Recommended Texts** | - Inorganic Chemistry - Comparative and Synthetic - Dr. Mahdi Naji Zakum.<br>- Inorganic chemistry and life - d. Monther Youssef Al-Janabi2006. | No |
| **Websites** | - Mobile data show<br>PowerPoint programs<br>- Internet | |

| **Grading Scheme**<br>مخطط الدرجات | | | | |
|---|---|---|---|---|
| **Group** | **Grade** | التقدير | **Marks %** | **Definition** |

| | | | | |
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| | **D -** Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
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