 MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | Analytical chemistry | | | | | **Module Delivery** | |
| **Module Type** | core | | | | | * **☒ Theory** * **☒ Lecture** * **☒ Lab** * **☒ Tutorial** * **☐ Practical** * **☐ Seminar** | |
| **Module Code** | ENH-1101 | | | | |
| **ECTS Credits** | 7 | | | | |
| **SWL (hr/sem)** | 175 | | | | |
| **Module Level** | | UGx11 1 | **Semester of Delivery** | | | | 1 |
| **Administering Department** | | Type Dept. Code | **College** | Type College Code | | | |
| **Module Leader** | **Haider Shanshool Mohammed** | | **e-mail** | Haider.shanshool@mu.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Lecturer | **Module Leader’s Qualification** | | | | Ph.D. |
| **Module Tutor** | **Haider Shanshool Mohammed** | | **e-mail** | Haider.shanshool@mu.edu.iq | | | |
| **Peer Reviewer Name** | | Name | **e-mail** | E-mail | | | |
| **Scientific Committee Approval Date** | | 020/10/2024 | **Version Number** | | 1.0 | | |

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| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | The module is designed to teach some of the fundamental laboratory skills required for a practicing chemist. | **Semester** |  |
| **Co-requisites module** | None | **Semester** |  |

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| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| **Module Aims**  **أهداف المادة الدراسية** | 1- Providing students with general information about analytical chemistry.  2- Introducing students to solutions, their types, and their formula.  3- Introduce students to ways of expressing concentrations and their types.  4- Introducing students to strong and weak acids and bases.  5- Explain to students what buffer solutions are and their types, with examples.  6- Introduce students to the definition of salts and their types, with |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | A - Cognitive objectives –   1. Introducing students to techniques in chemistry 2. Introducing students to methods of laboratory chemicals 3. Introduce the student to methods for calculating the pH of salts and Buffer solutions 4. Introducing the student to laboratory hazards.   b- The soft skills objectives of the course.   1. Training in solving special mathematical subordination, preparing solutions 2. Training students to apply for registration, please contact us regarding salts, their types, and types of buffer solutions 3. Training the student on different types of corrections |
| **Indicative Contents**  **المحتويات الإرشادية** | Indicative content includes the following:  1- Learn about analytical chemistry, its divisions, types and applications.  2- A brief summary of the quantitative analysis and its types, which serve as an introduction to the preparation of solutions.  3- Explanation of solutions and types of solutions  3- Explanation of solutions and types of solutions  4- Learn about the methods of preparing solutions.  5- Solve problems on ways of expressing concentrations.  6 - Solve problems on ways of expressing concentrations.  7- Identify the preparation of solids and liquids and solve  8- Calibration analysis and mathematical problem solving.  problems.  9- Calibration analysis and mathematical problem solving.  10- Clarification of strong and weak acids and bases.  11- Clarification of salts, types of salts and their equations  12- Identifying buffer solutions.  13- Derivation of the equations for the buffer solution  14-Identify solubility, solubility product constant, and solve mathematical problems. |

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| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| **Strategies** | **A- Methods of teaching and learning**  1- Using a Bower point to clarify the theoretical aspect.  2- Use of visual aids.  3- Use of practical tools.  4- Adopting daily exams and posts inside the hall.  **B- Evaluation methods**  1- Practical tests  2- Theoretical tests  3-Reports and studies  4- Quizzes with self-solving questions  5- Grades determined by homework |

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| **Student Workload (SWL)**  **الحمل الدراسي للطالب** | | | |
| **Structured SWL (h/sem)**  **الحمل الدراسي المنتظم للطالب خلال الفصل** | 76 | **Structured SWL (h/w)**  **الحمل الدراسي المنتظم للطالب أسبوعيا** | 5 |
| **Unstructured SWL (h/sem)**  **الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 99 | **Unstructured SWL (h/w)**  **الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 6.5 |
| **Total SWL (h/sem)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | 175 | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 5 | 7% (10) | 3,5,8,10,13 | LO #1, 2, 4 ,5 and 6 |
| **Assignments** | 5 | 6% (10) | 15 | LO # 3, 4, 5, 6,7,and 9 |
| **Projects / Lab.** | 6 | 6% (10) | 15 |  |
| **Report** | 1 | 6% (10) | 12 | LO # 5, 8 and 9 |
| **Summative assessment** | **Midterm Exam** | 8 | 15% (10) | 8 | LO # 1-8 |
| **Final Exam** | 14 | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **Material Covered** |
| **Week 1** | Introduction |
| **Week 2** | Quantitative analysis |
| **Week 3** | Solutions and Classification of solutions |
| **Week 4** | Express concentrations of solutions |
| **Week 5** | Express concentrations of solutions |
| **Week 6** | Preparation of solutions |
| **Week 7** | Stoichiometric Calculations |
| **Week 8** | **Exam** |
| **Week 9** | Titration analysis |
| **Week 10** | Chemical equilibrium |
| **Week 11** | Chemical equilibrium |
| **Week 12** | Acid-Base Equilibria |
| **Week 13** | Salts and salts hydrolysis |
| **Week 14** | Solubility of precipitates |
| **Week 15** | Buffer solution |
| **Week 16** | Preparatory week before the final Exam |

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| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **Material Covered** |
| **Week 1** | Introduction |
| **Week 2** | Laboratory devices and tools |
| **Week 3** | Preparing stock solutions |
| **Week 4** | Preparing solutions by dilution |
| **Week 5** | Preparing solutions by dilution |
| **Week 6** | Preparation and Standardization of HCl solution |
| **Week 7** | Determination of NaOH concentration by titration with HCl |
| **Week 8** | **Exam Week 9** |
| **Week 10** | Determination of acetic acid percentage in vinegar |
| **Week 11** | Determination of acetic acid percentage in vinegar |
| **Week 12** | Evaluating Commercial Antacid By Titration |
| **Week 13** | Evaluating Commercial Antacid By Titration |
| **Week14** | Determination of a mixture of sodium carbonate and sodium hydroxide by using double indicator method |
| **Week 15** | Determination of a mixture of sodium carbonate and sodium hydroxide by using double indicator method |

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| **Learning and Teaching Resources**  **مصادر التعلم والتدريس** | | |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | (1) “Fundamental of Analytical Chemistry” by Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Edition, 2013. thCrouch, 9  (2) “Quantitative Chemical Analysis” - Daniel C. Harris, 8th Ed, 2010 | Yes |
| **Recommended Texts** | Gary D.Chritian,Analytical Chemistry,fifth editionjohn Willy & sons,inc, 1986.  2) Modern of Analytical Chemistry, Daived 2000 | No |
| **Websites** |  | |

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| **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 |
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| **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. | | | | |