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| bas | **Ministry of Higher Education and Scientific Research**  **Republic of Iraq** |  |
| **University: University Of Basrah** |
| **College: college of science** |
| **Department : department of biology** |
|  **Year : 2023-2024** |  | **Semester : First** |

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| **Module Information****معلومات المادة الدراسية** |
| **Module Title** | Volumetric Ananlysis | **Module Delivery** |
| **Module Type** | Core | * **☒ Theory**
* **☒ Lecture**
* **☒ Lab**
* **☐ Tutorial**
* **☐ Practical**
* **☐ Seminar**
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| **Module Code** | Analytical Chemistry |
| **ECTS Credits**  | 6.60 |
| **SWL (hr/sem)** | 256 |
| **Module Level** | UGx11 1 | **Semester of Delivery** | 1 |
| **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 |

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| **Relation with other Modules****العلاقة مع المواد الدراسية الأخرى** |
| **Prerequisite module** | None | **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 Objectives****أهداف المادة الدراسية** | 1. To calculating concentrations of liquid and solid materials.
2. To calculating pH – value of Acid, Base, Salts, and others.
3. Study the hydrolysis of Salts.
4. To determination the percentage of Mixture.
5. Study the Argentometric titrations.
6. Study the Redox-Titrations.
7. Study the complex titrations.
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| **Module Learning Outcomes****مخرجات التعلم للمادة الدراسية** | 1. Learning of concentration unit : Molarity, Normality, ppm, %.
2. Learning how determine pH of Strong Acid, Strong Base, weak Acid, weak base, buffer solutions, salts and others.
3. Define the Kh of deferent types of salts.
4. Learning of precipitation titration (determination of %Chloride) and Mohr and Volhard methods.
5. Writing of redox equations.
6. Learning of EDTA titration and determination of Mg by comples titration.
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| **Indicative Contents****المحتويات الإرشادية** | Indicative content includes the following.Part A – Concertation.Part B – pH-value , MixturePart C – Titration Curve.Part – D Titration of Silver , EDTA and Redox |

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| **Learning and Teaching Strategies****استراتيجيات التعلم والتعليم** |
| **Strategies** | Give the principal of analytical chemistry, and imagining the subjects in laboratories in real work, and give many examples of calculations |

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| **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** | 2 |
| **Unstructured SWL (h/sem)****الحمل الدراسي غير المنتظم للطالب خلال الفصل** | 165 | **Unstructured SWL (h/w)****الحمل الدراسي غير المنتظم للطالب أسبوعيا** | 1 |
| **Total SWL (h/sem)****الحمل الدراسي الكلي للطالب خلال الفصل** | **256** |

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| **Module Evaluation****تقييم المادة الدراسية** |
| **As** | **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** | 2hr | 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 : Concentration Unit |
| **Week 2** | Concentration Unit |
| **Week 3** | Calculating of pH |
| **Week 4** | Calculating of pH |
| **Week 5** | Salts |
| **Week 6** | Buffer Solutions |
| **Week 7** | Mixture |
| **Week 8** | Mixture |
| **Week 9** | Titration Curve (SS+SB) |
| **Week 10** | Titration Curve (SS+WB) |
| **Week 11** | Titration Curve (WS+SB) |
| **Week 12** | Argentometric titration |
| **Week 13** | Mohr and Volhard Methods |
| **Week 14** | Redox Titration |
| **Week 15** | Extra Examples |
| **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** | Lab 1: prepration of liquid and solid |
| **Week 2** | Lab 2: Titration of carbonate |
| **Week 3** | Lab 3: Titration of Mixture 1 |
| **Week 4** | Lab 4: Titration of Mixture 2 |
| **Week 5** | Lab 5: Argentometric Titration |
| **Week 6** | Lab 6: Redox Titration |
| **Week 7** | Lab 7: Oral Exam |

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| **Learning and Teaching Resources****مصادر التعلم والتدريس** |
|  | **Text** | **Available in the Library?** |
| **Required Texts** | Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education | Yes |
| **Recommended Texts** | DC Electrical Circuit Analysis: A Practical ApproachCopyright Year: 2020, dissidents. | No |
| **Websites** | https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering |

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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. |