MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Volumetric Analytical Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1217**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Chemistry	**College**	College of Science	
Module Leader	Ekhlas Ahmed Abdulkareem		**e-mail**	ekhlasahmed@uodiyala.edu.i	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Msc
Module Tutor	Name (if available)		**e-mail**	ekhlasahmed@uodiyala.edu.i	
Peer Reviewer Name		Ekhlas Ahmed Abdulkareem	**e-mail**	Khloosa123aa@gmail.com	
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Throughout this course, we will focus on the following learning objectives: 1. Understand the fundamental concepts of chemical equilibrium 2. Parameterize solution behavior and calculate solution concentrations given the appropriate equilibrium constants 3. Apply knowledge of equilibrium constraints to a range of systems of interest including solubility, acid/base chemistry, complex formation, oxidation/reduction, hydrolysis, and phase partitioning. 4. Investigate solution behavior using electrochemical methods, including potentiometry, voltammetry, and ion selective electrodes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this learning unit, the student is able to : This course aims to extend the fundamental formation of 'Analytical Chemistry I' to current instrumental analysis methods. The philosophy and strategy of this programme are identical to those described in . This course not only provides excellent practice in analytical techniques, but also allows the rigorous development of experimental schemes and analysis methods, relying on physical chemistry and analytical reasoning. The objectives of the practical exercises are the following : - To help the understanding of the course - To familiarize the students with the theory-experience relationship - To train the students in a professional practice in a chemistry laboratory - To instil a sense of initiative towards practical processes in the students
Indicative Contents المحتويات الإرشادية	**Class** Molecular absorption spectroscopy, atomic spectrometry and voltamperometric methods: equipment, performances and applications. Electrolysis-based analysis methods: analytical applications.

	Acid-base reactions in non-aqueous media: solvent types and pH calculations. Practical aspects of chromatography in liquid and gas phases. **Exercises** Analysis of samples where application of most of the techniques covered during the course is required. A complete analysis of a 'real' sample will be encouraged, for which the well-thought-out use of titrimetric and instrumental methods is necessary in order to determine the concentration of several ions of a solution. This process will allow the students: (i) to develop and discuss schemes and analysis methods with rigorous analytical reasoning. (ii) to obtain professional laboratory experience of current techniques.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem)	106	**Unstructured SWL (h/w)**	7

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	5	10% (10)	2,4,6,8 and 10	LO #1, #2, #3, #6, #8, # 10 and #12, #14
	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)	8	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	Volumetric Analysis, Classification and General Aspect for Volumetric Titrimetry
Week 2	Expressing the concentration of standard solutions
Week 3	Volumetric Calculations Using Molraity and calculations
Week 4	Volumetric Calculations Using Normality and calculations
Week 5	Titer (T) and calculations
Week 6	Back-titration and calculations

Week 7	Neutralization Titration and classifications
Week 8	**Midterm Exam**
Week 9	Theory of Neutralization Titrations of Simple Systems
Week 10	Type of Neutralization Titrations
Week 11	Titration curves
Week 12	Titration Curve for Strong Base vs. Strong Acid with calculations
Week 13	Oxidation and reduction and what oxidizing and reducing agents
Week 14	Evidence of oxidation and reduction And their types
Week 15	oxidizing and reducing agents types and applications
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to quantitative analysis
Week 2	Lab 2: Methods of expressing the concentrations of solutions in analysis and quantitative calculations related to volumeric analysis
Week 3	Lab 3:preparation of(0.1N) HCL solution and sandardization wih sodium carbonate
Week 4	Lab 4: preparation of(0.1N) NaOHL solution and sandardization it with(0.1N)HCL
Week 5	Lab 5: first exam
Week 6	Lab 6: Determintion of hardness of water
Week 7	Lab 7: preparation and sandardization of (0.1N)KMnO4
Week 8	Standardization of permanganate solution with oxalate ion
Week 9	Unknown solution: Practical exam.
Week 10	Determination the concentration of ferrous ion.
Week 11	Unknown solution: Practical exam.

Week 12	Complexometric titration, Determination of total hardness (permanent and temporary) of water
Week 13	Unknown solution: Practical exam.
Week 14	**Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M. West Eight Edition	Yes
Recommended Texts	Analytical Chemistry, Gary Christian Sixth Edition	No
Websites	www.bytoco.com	

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.