MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Gravity Analytic Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23113**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Chem		**College**	CoS	
Module Leader	Marwah hashim Abdulateef		**e-mail**	marwahhashim@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2024		**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	Learning students analytical chemistry fundamentals in specific knowledge of gravimetric analysis chemistry, classification of gravimetric analysis, precipitation analysis, types of precipitating reagents, inorganic precipitants and organic precipitants, properties of precipitant used for gravimetric analysis, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates and Solubility product (Ksp), calculation the solubility from Ksp, solubility problems, The affected factors on the solubility of the precipitates, Contamination of the precipitates and its types , avoiding impurities, digestion of precipitates, washing solutions, drying and ignition of the precipitates, Statistic in analytical chemistry with examples. - Learning students, the fundamentals of analytical separation methods: classification of separation methods, masking agents, liquid-liquid extraction, solvent extraction fundamentals, separation and classification of chromatography, separation by ion exchanges. - Teaching and learning students all the subjects, that related to the analytical chemistry course, which allow them to be qualified working in different aspects of analytical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of analytical chemistry. Enable students to acquire knowledge and understanding of international chemical standards. Enable students to acquire knowledge and understanding of the laws of chemistry. Enable students to acquire knowledge and understanding of chemical analysis standards in gravimetric chemistry and separation methods. Enabling students to obtain knowledge and understanding of the law of the wrong use of chemicals.
Indicative Contents المحتويات الإرشادية	analytical chemistry fundamentals, gravimetric analysis chemistry, precipitation analysis, precipitating reagents, inorganic precipitants , organic precipitants, properties of precipitant, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates ,Solubility product (Ksp), solubility problems, affected factors on the solubility of the precipitates, Contamination of the precipitates, impurities, digestion of precipitates, washing solutions, , Statistic in analytical chemistry.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for analytical chemistry. -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some practical problems..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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)	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	Introduction of analytical chemistry, fundamentals of gravimetric analysis, sampling and sampling treatment
Week 2	The steps of the gravimetric analysis, weight of a sample, solvent of a sample, precipitate of a sample, precipitant digestion, washing of a precipitant, precipitant burning, weight of a precipitant
Week 3	Classification of gravimetric analysis, precipitation analysis, pyrolysis analysis, isolation analysis, the qualities of good precipitants
Week 4	Types of precipitating reagents, inorganic precipitants, and organic precipitants properties of precipitant used for gravimetric analysis
Week 5	precipitating of homogenous solutions, types of homogenous solutions and its applications in gravimetric analysis, organic & inorganic precipitants, and their types & advantages with examples
Week 6	The chemical composition of the precipitates, calculation of gravimetric analysis, gravimetric factor, and examples
Week 7	Solubility of precipitates and Solubility product (Ksp), calculation the solubility from Ksp, solubility problems
Week 8	**Midterm Exam**

Week 9	The affected factors of the solubility: temperature, the physical and chemical nature of the solute, the nature of solvent, common ion effect, oxidation-reduction reactions effect
Week 10	ionic strength of the solution, the effect of pH, the complex formation, the hydrolysis effect, particle size effect of solute, examples, and problems
Week 11	Crystalline composition of the precipitates, their types & advantages with examples, and problems,
Week 12	Colloid composition of the precipitate and their types & advantages with examples, von-weimern for colloidal state
Week 13	Contamination of the precipitates, type of contamination, co-precipitation, post precipitation
Week 14	Treatment of the precipitates, avoiding impurities, digestion of precipitates,
Week 15	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction and general idea of gravimetric analysis and the basic principles steps of gravimetric analysis ,gravimetric analysis methods ,Weight analysis steps ,Organic and inorganic precipitators and sediment solubility ,Precipitate contamination and its impact on the accuracy of results and treatment methods
Week 2	An experiment to determine the percentage of water of crystallization in aqueous salt
Week 3	An experiment to determine the percentage of water of crystallization in barium dichloride crystals
Week 4	Experimental estimation of elements by volatilization and dissolution method
Week 5	Calcium estimation experiment in the form of calcium oxalate
Week 6	Experimental determination of iron in the form of ferric oxide
Week 7	Experiment for the determination of nickel in the form of dimethylglyoxime
Week 8	Gravimetric Determination of Sulfate in Tap Water
Week 9	Cation Exchange Column Preparation and Determination of Total Capacity By Used NaCl
Week 10	Determination of Percentage From Sulfate Ion By Used Cation Exchange Chromatography
Week 11	Determination of Chloride By Anion Exchange Chromatography

Week 12	Separation of a Mixture of Halides By Paper Chromatography
Week 13	Separation of a Mixture of Colored Dyes By TLC
Week 14	Separation of Black Ink Components By Paper Chromatography
Week 15	Anion Exchange Column Preparation and Determination of Total Capacity By Used NaCl

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	1: Analytical Chemistry, Gary, Christian Sixth Edition 2: Chemical Analysis, Modern Instrumentation Methods and Techniques, Francis Rouessac and Annick Rouessac Second Edition	No
Websites	www.chemicalprocessing.com 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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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.