Ministry of Higher Education and Scientific Research - Iraq
University of Al-Muthanna
College of Applied Medical Sciences
Department of Environmental Health

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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	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	

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**	

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.

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

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		

Module Evaluation
تقييم المادة الدراسية

		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)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	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

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	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

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.	No

	2) Modern of Analytical Chemistry, Daived 2000	
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.