

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	MEDICAL CHEMISTRY		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET1107			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	UOH	
Module Leader	Zahra Aamer Ismail		e-mail	zahraa_amer@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Ms.c
Module Tutor	Zahra Aamer Ismail		e-mail	zahraa_amer@hilla-unc.edu.iq
Peer Reviewer Name	Zahra Aamer Ismail		e-mail	
Scientific Committee Approval Date	10/3/2026		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Develop the ability to write and balance chemical equations, which serve as the foundation for various calculations. 2. Learn to determine the percent composition of elements in a compound and derive its empirical formula based on composition data. 3. Predict the feasibility of specific reactions by analyzing their economic pathways through stoichiometric calculations of balanced chemical equations. 4. Gain an understanding of how to prepare buffer solutions with different pH ranges using acids with appropriate dissociation constants. 5. Explore the impact of common ions on the equilibrium of reversible reactions. 6. Examine the theoretical principles underlying the operation of spectrophotometric instruments. 7. Discuss the significance of isotopes in the diagnosis and treatment of diseases..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Name chemical compounds systematically and write their formulas. 2. Calculate and convert chemical concentrations using various units. 3. Determine composition percent and empirical formulas of compounds. 4. Write and balance chemical equations, predict limiting reactants, and calculate product yields. 5. Assess reaction direction using equilibrium constants. 6. Prepare buffer solutions and understand their function. 7. Recognize the significance of slightly soluble salts. 8. Understand galvanic and electrolytic cells, including their applications. 9. Apply thermodynamic principles to evaluate reaction spontaneity. 10. Highlight the role of isotopes in medical diagnosis and treatment.
Indicative Contents المحتويات الإرشادية	This module covers chemical nomenclature, concentration calculations, stoichiometry, and equilibrium, including buffer preparation and the role of slightly soluble salts. It explores electrochemistry, focusing on galvanic and electrolytic cells, and applies thermodynamic principles to assess reaction spontaneity. The importance of isotopes in medical diagnosis and treatment is also highlighted.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Homework assignments, written exam, Quizzes, seminars, reports, practical tests and Online tests
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Student Workload (SWL) الحمل الدراسي للطالب			
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) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Units conversion, Isotopes, Chemical formula
Week 2	Methods of expressing analytical concentrations: Normality, Formality, Molarity, Molality, Mole fraction, Mill equivalent, ppm, ppb, wt. and vol. percent ratio.
Week 3	Stoichiometry
Week 4	Chemical equilibrium
Week 5	Acid-Base dissociation constant
Week 6	pH-scale, buffer solution+ Solubility of precipitations, common ion effect
Week 7	Mid-term Exam
Week 8	Errors & statistical treatment of analytical data sources of errors, types of errors, average mode, range, average derivation, standard deviation, relative standard deviation, variance, method of expressing accuracy, Absolute error, relative error.
Week 9	Redox reactions, balancing of redox equation
Week 10	Electrochemistry: electrochemical cells, types of electrodes, electrolytes, Nernst equation, cell potential
Week 11	Thermodynamic, Zero and first law of thermodynamic, Reversible and irreversible expansion, Heat capacities, adiabatic expansion, Isothermal processes.
Week 12	Second law of thermodynamic: spontaneous processes, entropy and Gibbs free energy.
Week 13	Photochemistry (spectrophotometer analysis), Regions of electromagnetic spectrum, Absorption and emission of electromagnetic spectrum, Beer Lambert law, instrumentations components of spectrophotometer.
Week 14	IR Spectrophotometer, mass spectroscopy, flame ionization spectrophotometry.
Week 15	Potentiometer, conductive meter, pH-meter and some other applications of chemical sensors+ Preparatory week before the final Exam

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Learning Relevant Outcome
Formative assessment	Quizzes	10min/ 3 times	20% (20)	2,4,5	LO #1, 2, 8 and 10
	Seminar	1.5 hr/ 1 time	10% (10)	6	LO # 3, 4, 6 and 7
	lab	/Each lab 5 times	5% (5)	3,4,5,6	
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1.5 hr/ 1 time	10% (10)	7	LO # 1-7
	Final Exam	3 hr/ 1 time	50% (50)	16	All
Total assessment			100% (100 Marks))		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Principals of qualitative analysis
Week 2	Qualitative analysis of cations of 1 st and 2nd groups.
Week 3	Qualitative analysis of cations of 3 rd and fifth groups.
Week 4	Introduction to Quantitative (volumetric) analysis and types of standard substance in titration, principles and calculations of titration.
Week 5	How to prepare solution of primary standard materials and to standardize secondary standard substance of HCl, (acid-base titration
Week 6	Standardization secondary standard substance of NaOH and its application by determination of vinegar acidity.
Week 7	Determination of residual chloride in tape water by titration against silver nitrate (precipitation titration).

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	1- ESSENTIALS OF GENERAL CHEMISTRY By EBBING GABBON RAGSDALE CHEMICAL PRINCIPLES By Steven S Zumdahl - 4th edition	

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.

د. د. هارون عبد الكاظم شهيد
الحسيد

عميد الكلية : أ.د. هارون عبد الكاظم شهيد
التاريخ : 2026 / 3 / 10

رئيس القسم : أ.د. محمود شاكر نصر

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اسم التدريسي: م.م. زهراء عامر اسماعيل

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