Module Information
معلومات المادة الدراسية

Module Title	**Chemistry**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ER102**		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	Petroleum and Gas engineering	**College**	Collage of Engineering
Module Leader	Zahraa Abdul hussein	**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	13/06/2023	**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	1. To acquire a reasonable level of knowledge in chemical in accordance with what is given among the different universities around the world, especially the high ranked ones. 2. To understanding of the basic topics in chemistry and its applications in the field of laboratories with knowledge Appropriate on different chemistry axes. 3. To gain good knowledge of the fields of using chemical methods in different fields of knowledge and the ability to diagnosis of the problems he faces and how to address them in order to be qualified to work in the industries of society. 4. Outstanding students are eligible to complete their higher studies inside and outside the country and to be high qualified Engineer. The objective of the course is to strengthen the level scientific for students on the principles of chemistry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how use chemical concentrations to work with chemicals. 2. List the various methods of measuring chemical concentrations. 3. Summarize what is meaning of mole, molar mass, calculations in garms and mole. 4. Define solution preparation, molarity, normality, formality, PH, POH, solubility. 5. Chemical equilibrium and chemical equations.

	6. Explain the introduction about acids and based, and buffers solution. 7. Acid-base reactions equilibrium 8. Analytical methods: qualitative analysis. 9. Analytical methods: Titration. 10. Forward titration. 11. backward titration. 12. Complex titration using ETDA.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction to chemistry and measuring methods</u> This chapter a details deception and introduction will be provided about the different kinds of available breached of chemistry sciences and the field that Petroleum and Gas Engineering are focused on and why? The available measuring methods of concertation used in the chemistry will be given and discussed in details including some relevant information about the importance of these measurements in oil and gas engineering. [10hrs] Mole and Molar mass –mass mole causations for elements and substances; Mole measurement calculation, using different methods for liquid and solid [10hrs] Molarity – Define the other methods of measuring the concentration, including molarity and normality and identify the relation between them, knowing how to measure PH and POH. [10 hrs]

	Chemical Equations – types of chemical equation; chemical stoichiometric, chemical equation equilibrium. [10hrs] Revision problem classes [6 hrs] <u>Part B Acid base</u> Acid –Base – equilibrium and buffers solution, specification of buffer solution, the calculations of acid based solutions; equivalent point [10 hrs] Titration: An introduction to titration; tools; phenomena; applciations . [7 hrs] Types of titrations: Backwards; forward; and complex [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

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	5.6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

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)	7	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 – Definitions and fundamental concepts
Week 2	Concretions of solutions
Week 3	Dilution Law, normality and molarity calculation
Week 4	Acid-Base Equilibrium
Week 5	Buffers Solutions
Week 6	Volumetric analysis
Week 7	Mid-term Exam + Quiz day
Week 8	Titration
Week 9	End Points and Equivalent Point
Week 10	Forward Titration
Week 11	Backward Titration
Week 12	Complex Titration using EDTA
Week 13	Presentation Students Day
Week 14	Seminar Day
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to chemical concertation calculation: Solubility.
Week 2	Lab 2: Acid – Based equilibrium

Week 3	Lab 3: volumetric analysis and Titration
Week 4	Lab 4: Buffer solutions
Week 5	Lab 5: Forward Titration
Week 6	Lab 6: Backward Titration
Week 7	Lab 7: Complex Titration

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	[1] Analytical_Chemistry_7e_by_Gary_D._Chris	Yes
Recommended Texts	[2] Fundamentals_of_Analytical_Chemistry_Ed Copyright Year: 2020, dissidents.	No
Websites	[3] Harris_-_Quantitative_Chemical_Analysis_-_8th_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.