

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Qualitative Analytical chemistry		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	CHEM 1101			
ECTS Credits	10			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		1
Administering Department	CHEM	College	Type College Code	
Module Leader	Dr. Muataz Adnan		e-mail	muataz.ali@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Muataz Ali		e-mail	E-mail
Scientific Committee Approval Date	14/05/2023	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 Aims

أهداف المادة الدراسية

1. Introduction to Analytical Chemistry with a goal of understanding the reason for doing analytical chemistry and the basic steps of dealing with analytical issues present for a professional chemist
2. full introduction to the weights and volumes concept in chemistry reaching a full understanding of the mole concept
3. The curriculum develops to learn the main units regarding concentration in analytical chemistry and the relations between them and the ability to switch them.
4. Studying Stoichiometry, in relation to the mole concept
5. A basic understanding of gravimetric methods and solubility

1. مدخل عام في أساسيات الكيمياء التحليلية هدفه تعليم الطالب الغرض الأساسي من الكيمياء التحليلية والخطوات العامة الأساسية للتحليل الكيميائي والطرق المنهجية لأجراء أي قياس أو دراسة تحليلية
2. ثم يتطور المنهج للتعرف على الوحدات الأساسية المستخدمة في الكيمياء التحليلية بدا من المول وانتهاء بالنسب الوزنية والحجمية
3. التعرف على موازنة المعادلات الكيميائية
4. وأخيرا مدخل عام في الذوبانية وحاصل الذوبان

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Learning the correct methods to understand analytical issues
2. introduction to main definitions for volumetric and gravimetric analysis
3. understanding the Mole unit and studying Stoichiometry
4. Understanding main units in analytical chemistry
5. general introduction to solubility and common ion effect
6. Develop student abilities to adapt units and numbers and exchange them
7. Learn the ability to choose an analytical method for any analytical issue
8. Develop the ability to interact and balance chemical equations and do a stoichiometry
9. Develop basic abilities to interact with chemicals at an analytical lab and methods of detecting some elements

1. التعرف على المنهج الصحيح في التعامل مع المشاكل التحليلية
2. تعلم التعاريف الأساسية الكمية والحجمية وأثرها في اختيار طرق التحليل
3. التعرف على وحدة المول وموازنة المعادلات الكيميائية
4. تعلم الوحدات الأساسية
5. مدخل عام على حاصل الذوبانية وتداخلات الأيون المشترك
6. تطوير قابلية الطلبة على التعامل مع الأرقام والوحدات وطرق التحويل بين الوحدات
7. تعلم اختيار طرق التحليل المناسبة لكل مسألة تحليلية

	<p>8. تطوير مهارة التعامل مع المعادلات الكيميائية وموازنتها وتعلم حساب العناصر المتفاعلة</p> <p>9. تطوير مهارة التعامل مع المواد الكيميائية في المختبر وطرق الكشف عن العناصر البسيطة</p>
<p>Indicative Contents المحتويات الارشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Areas of chemical analysis 2. The current role of analytical chemist 3. Main branches of analytical chemistry 4. Classification of quantitative methods 5. Analytical Methodology 6. The concept of mole (mol) 7. The molar mass (molecular weight) 8. The mole calculations 9. Concentration units

	<ul style="list-style-type: none"> a. Molarity and Normality b. Molality c. dilution d. volume per volume e. weight per weight f. weight per volume g. ppm and ppb <p>10. Concentration units interchange</p> <p>11. Stoichiometry</p> <p>12. limiting and excess concept</p> <p>13. Solubility and Ksp</p> <p>14. Common ion effect</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<ul style="list-style-type: none"> • In class interactive lectures involving educational videos • Practical in lab lectures • Adapting interactivity with student's interaction by raising a question and asking the group to find the relevant answers to them as a main way of teaching. • 2hrs per week tutorial focused mainly on expanding solving numerical questions <ul style="list-style-type: none"> • محاضرات حضورية تفاعلية في القاعات الدراسية مع استخدام محاضرات الكترونية معروضة على الشاشة تحوي على فيديوهات تعليمية • محاضرات عملية في المختبر • اعتماد التفاعلية ومشاركة الطلاب وطرح الأسئلة والاجابة عليها وحل المشاكل الافتراضية كعامل أساسي في إيصال المادة الى الطلبة

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعا	7.3
Unstructured SWL (h/sem) الحمل الدراسي الغير المنتظم للطالب خلال الفصل	141	Unstructured SWL (h/w) الحمل الدراسي الغير المنتظم للطالب أسبوعا	9.4
Total SWL (h/sem) الحمل الدراسي للطالب خلال الفصل	250		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	25% (50)	2, 5, 10, 12	LO #1, 2, 10 and 11
	Assignments				
	Projects / Lab.	1	5% (5)	Continuous	All
	Report/ Lab.	1	10% (10)	Continuous	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1-2	Learning basics of analytical chemistry and scientific steps of analysis
Week 3-5	Solution preparation and concentration (molecular mass, Moles, Molarity, Molality, Normality, and other concentration units)
Week 6-8	units interchange (mol, ppm, ppb, w/w, w/v, v/v)

Week 9-12	Stoichiometric Relationships (balancing chemical equation and stoichiometry)
Week 13-15	Gravimetric methods of analysis (solubility and common ion effects)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab introduction and basic glassware
Week 2	Analysis and identification of Group I Cations (Ag^+ , Hg_2^{2+} and Pb^{2+} – insoluble chlorides)
Week 3	Analysis and identification of Group I Cations in an unknown sample.
Week 4	Analysis and identification of Group II Cations (Hg_2^{2+} , Pb^{2+} , Cu^{2+} , Bi^{3+} , Cd^{2+} , As_3^+ , Sb^{3+} and Sn^{4+} – insoluble sulphides in acidic
Week 5	lab review
Week 6	Analysis and identification of Group II Cations in an unknown sample.
Week 7	Analysis and identification of Group III Cations (Al^{3+} , Fe^{3+} , Co^{2+} , Ni^{2+} , Cr^{3+} , Zn^{2+} and Mn^{2+} – insoluble sulphides or
Week 8	lab review
Week 9	Analysis and identification of Group III Cations in an unknown sample.
Week 10	Analysis and identification group IV Cations (Ca^{2+} , Sr^{2+} and Ba^{2+} – carbonate precipitates
Week 11	Analysis and identification of group IV Cations in an unknown sample.
Week 12	lab review
Week 13	Analysis and identification of Group V Cations (Mg^{2+} , Na^+ , K^+ and NH_4^+).
Week 14	end lab exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental of analytical chemistry, D.A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, 8th ed., 2004, Brooks/Cole.	Yes
Recommended Texts	Analytical chemistry, "Theoretical and Metrological Fundamentals", K. Danzer, 1st ed., 2006, Springer.	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتناز	90 - 100	Outstanding Performance
	B - Very Good	جند جدا	80 - 89	Above average with some errors
	C - Good	جند	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 (قند 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	URCOM		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	CS	College	College of Sciences
Module Leader	Dr. Safaa H. Shwail	e-mail	safaa.husseinshwail@nahrainunive.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Dr. Safaa H. Shwail	e-mail	safaa.husseinshwail@nahrainunive.edu.iq
Scientific Committee Approval Date	30/11/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. The History of the Personal Computer2. Understanding Digital Components3. Processing, Storage, and Connectivity4. Accessing, Using, and Managing Software5. Application Software6. Understanding System Software7. Understanding Programming8. How Networks Function9. Threats to Your Digital Assets
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. You will be able to describe the history of personal computer hardware and software development.2. You will be able to describe the devices that make up a computer system.3. You will be able to describe how computers process and store data and how devices connect to a computer system4. You will be able to explain the ways to access and use software and describe how to best manage your software.5. Describe the different types of application software used for productivity and multimedia.6. You will be able to explain the types and functions of operating systems and explain the steps in the boot process7. You will be able to describe the life cycle of a software project and identify the stages in the program development life cycle8. You will be able to explain the basics of networking, including the components needed to create a network, and describe the different ways a network can connect to the Internet.9. You will be able to describe hackers, viruses, and other online annoyances and the threats they pose to your digital security
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Understanding Digital Components, Understanding Your Computer, Input Devices, Output Devices.</p> <p>Processing, Storage, and Connectivity, Processing and Memory on the Motherboard, Storing Data and Information, Connecting Peripherals to the Computer, Power Management and Ergonomics.</p> <p>Accessing, Using, and Managing Software, Software Basics, Managing Your Software,</p> <p>Application Software, Productivity and Business Software, Multimedia and Educational Software.</p>

	<p>Understanding System Software, Operating System Fundamentals, What the Operating System Does, Starting Your Computer.</p> <p>Understanding Programming, Life Cycle of an Information System, Life Cycle of a Program.</p> <p>How Networks Function, Networking Fundamentals, Network Architectures, Network Components, Connecting to the Internet.</p> <p>Threats to Your Digital Assets, Identity Theft and Hackers, Computer Viruses, Online Annoyances and Social Engineering.</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is by explaining lectures in an interactive way by letting the students to participate in the presenting through questions and answers while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and labs.
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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	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	10% (10)	8	All
	Assignments	1	5% (5)	10	All

	Projects / Lab.	1	15% (15)	Continuous	All
	Report	1	10% (10)	10	All
Summative assessment	Midterm Exam	2 hr	10% (10)	7,14	All
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The History of the Personal Computer
Week 2	Understanding Digital Components
Week 3	Understanding Digital Components (cont.)
Week 4	Processing, Storage, and Connectivity
Week 5	Accessing, Using, and Managing Software
Week 6	Application Software
Week 7	Application Software (cont.)
Week 8	Mid-term Exam 1
Week 9	Understanding System Software
Week 10	Understanding System Software (cont.)
Week 11	Understanding Programming
Week 12	Understanding Programming (cont.)
Week 13	How Networks Function
Week 14	Threats to Your Digital Assets
Week 15	Mid-term Exam 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Computer Hardware 1
Week 2	Lab 2: Exploring windows desktop and its icons
Week 3	Lab 3: Directors and file types
Week 4	Lab 4: Exploring windows elements
Week 5	Lab 5: Control panel hardware
Week 6	Lab 6: Control panel programs
Week 7	Lab 7: Other elements in control panel
Week 8	Mid-Term Exam 1
Week 9	Lab 8: Introduction to Word interfaces
Week 10	Lab 9: Formatting writing, creating tables, and correcting spelling errors
Week 11	Lab 10: Add and edit images, shapes, page numbering, and frames
Week 12	Lab 11: Introduction to Excel interfaces
Week 13	Lab 12: Equations of Excel
Week 14	Lab 13: Charts of Excel
Week 15	Mid-Term Exam 2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Technology in action complete, 16 th edition, 2020.	No
Recommended Texts	Computer System Architecture 3rd edition by M.Morris Mano 1992	No
Recommended Texts	Fundamentals of Logic Design, 6th edition 2010	No

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language		Module Delivery
Module Type	Core		<ul style="list-style-type: none"><input checked="" type="checkbox"/> Theory<input checked="" type="checkbox"/> Lecture<input type="checkbox"/> Tutorial<input type="checkbox"/> Practical<input type="checkbox"/> Seminar
Module Code	UREQ1101		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Science
Module Leader	Khalid Waleed	e-mail	Khalid.waleed21@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Nil	e-mail	E-mail
Peer Reviewer Name	me	e-mail	E-mail
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 Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1. Explain the principle of the English language and how to use it2. Explain how to use English grammar in a correct way in talking and writing3. Explain how to write in an academic way to use it to prepare to write the research at the end of year four
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Students will be able to communicate effectively in English in a variety of academic and professional settings, using appropriate vocabulary, grammar, and discourse strategies.2. Students will be able to read and comprehend texts of different genres and levels of complexity in English, and apply critical thinking and analytical skills to interpret and evaluate the texts.3. Students will be able to write clear and coherent texts in English for different purposes and audiences, using appropriate conventions of style, format, and citation.4. Students will be able to listen and understand spoken English in different contexts and situations, and respond appropriately to the speakers' intentions and expectations.5. Students will be able to demonstrate awareness and appreciation of the cultural and linguistic diversity of the English-speaking world, and reflect on their own cultural and linguistic identities and experiences.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>A1. Knowing the principle of the English language</u> <u>A2. Use English in the correct way in talking and in writing in an academic way</u> <u>A3. English language skills such as speaking, listening, reading and writing</u> <u>A4. Communicative English and professional communication</u> <u>A5. Cultural education and diversity.</u></p> <p><u>These topics are designed to help students develop their critical thinking, analytical, creative and communicative abilities in English. They also expose students to a wide range of literary and cultural texts and contexts.</u></p>

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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

10. Course Structure Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	2	English	Chapter one	Class	Quizzes/oral and mid exams
2	2	English	Academic writing	Class	Quizzes/oral and mid exams
4	2	English	Tutorial	Class	Quizzes/oral and mid exams
5	2	English	Introduction to Presentations	Class	Presentation
6	2	English	Chapter two	Class	Quizzes/oral and mid exams
7	2	English	Essential tips for academic presentations	Class	Presentation
8	2	English	Chapter three	Class	Quizzes/oral and mid exams
9	2	English	Ppresentation assessments	Class	Presentation
10	2	English	Mid exam 1	Class	Quizzes/oral and mid exams
12	2	English	Academic writing	Class	Quizzes/oral and mid exams
13	2	English	Reading	Class	Quizzes/oral and mid exams
14	2	English	Grammar	Class	Quizzes/oral and mid exams
15	2	English	Mid exam 2	Class	Quizzes/oral and mid exams

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	1. Books Required reading:	New Headway Plus/Upper-Intermediate/ Student's Book
		New headway plus / Upper Intermediate/ Workbook
Websites	https://www.scribbr.com/category/academic-essay/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Inorganic Chem.		Module Delivery
Module Type			<ul style="list-style-type: none"><input checked="" type="checkbox"/> Theory<input checked="" type="checkbox"/> Lecture<input type="checkbox"/> Lab<input type="checkbox"/> Tutorial<input type="checkbox"/> Practical<input type="checkbox"/> Seminar
Module Code	CHEM 101		
ECTS Credits			
SWL (hr/sem)	36		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Ahmed Al-Ani	e-mail	E-mail
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	PhD
Module Tutor	Name (if available)	e-mail	ahmed.sabeeh@nahrainuniv.edu.iq
Peer Reviewer Name	me	e-mail	ahmed.sabeeh@nahrainuniv.edu.iq
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 Aims أهداف المادة الدراسية	To understand and give general view to the following subjects: 1- Covalent Bond, Valence bond theory and VSEPR Model 2- Lewis Structure and Octet Rule, Lewis Acids and Bases, Molecular Orbital Theory (MOT) and bond order calculations 3- Heteronuclear Diatomic Molecule, Paramagnetism vs. Diamagnetism, Fajans Rules 4- Lattice Energy 5- Born Haber Cycle 6- Saline hydrides, applications 7- Types of hydrides and Diborane
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Teach students the principle of chemistry 2- Explain the atomic structures and its compounds 3- Explain some of chemical phenomena 4- Study the properties of some chemical elements
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. To give general view Covalent Bond, Valence bond theory and VSEPR Model [6hrs] Explain Lewis Structure and Octet Rule, Lewis Acids and Bases, Molecular Orbital Theory (MOT) and bond order calculations [8hrs] Give details of Heteronuclear Diatomic Molecule, Paramagnetism vs. Diamagnetism, Fajans Rules [4hrs] Definition of Lattice Energy [2hrs] Definition and applications of Born Haber Cycle [8hrs] Saline hydrides, applications [4hrs] Types of hydrides and Diborane [4hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be provided to the students, is to encourage them to participate in solving exercises, and at the same time improve their skills through classes, interactive tutorials and by considering type of simple experiments involving some activities that are more important to them.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	20	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	24	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	36		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	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	Covalent Bond
Week 2	Valence bond theory and VSEPR Model
Week 3	Lewis Structure and Octet Rule
Week 4	Lewis Acids and Bases
Week 5	Molecular Orbital Theory (MOT) and bond order calculations
Week 6	Molecular Orbital Theory (MOT) and bond order calculations
Week 7	Heteronuclear Diatomic Molecule
Week 8	Paramagnetism vs. Diamagnetism, Fajans Rules
Week 9	Lattice Energy
Week 10	Born Haber Cycle
Week 11	Born Haber Cycle
Week 12	Saline hydrides,
Week 13	applications
Week 14	Types of hydrides
Week 15	Diborane
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Basic Inorganic Chemistry F. Albert Cotton, Geoffrey Wilkinson, Paul L. Gaus, , 3rd Edition, 1995	Yes
Recommended Texts	Inorganic chemistry, Sharpe, A. G. (Alan George), Harlow: Longman Scientific and Technical, 3rd Edition 1992	Yes
Websites	-https://courses.lumenlearning.com/boundless-chemistry/chapter/the-structure-of-the-atom/ https://www.acs.org/content/acs/en/careers/chemical-sciences/areas/inorganic-chemistry.html https://courses.lumenlearning.com/boundless-chemistry/chapter/periodic-trends/	

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
<p>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.</p>				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus (I)		Module Delivery
Module Type	B		<ul style="list-style-type: none">• <input type="checkbox"/> Theory• <input checked="" type="checkbox"/> Lecture• <input type="checkbox"/> Lab• <input type="checkbox"/> Tutorial• <input type="checkbox"/> Practical• <input type="checkbox"/> Seminar
Module Code	CREQ		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	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	me	e-mail	E-mail
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 Aims أهداف المادة الدراسية	The aim of this course is for student to gain proficiency in computations. In calculus, we use two main tools for analyzing and describing the behavior of functions: limits and derivatives. Students will use these tools to solve application problems in a variety of setting ranging from physics and chemistry to business and economics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. To determine the solution set of inequalities involving absolute value, 2. To determine domain, range and operation of some one variable functions and the graphs. 3. To determine limit and continuity of one variable functions. 4. To determine derivate of one variable functions. 5. To determine the solution of problems involving the derivate of one variable function. 6. To determine inverse function and its derivative. 7. To learn about application of derivatives.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none"> 1. Real number, inequalities, absolute value, Cartesian coordinate system, function and its graph, operation on function, trigonometry function. 2. Definition, theorems of limit, trigonometry function limit, limit on infinity, infinite limit, continuity function, 3. Definition and rule of derivate, derivate of trigonometry function, chain rule, higher order derivate, implicit derivate, related rate, basic concept of differential, 4. Maximum and minimum, monotonicity and concavity, graphing one variable function, mean value theorem for derivate. 7. Natural logarithm function, inverse function and its derivate, natural exponential function, general exponential function, general logarithm function, hyperbolic function and its inverse.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be presented to the students through a specified series of lectures, supported by problem solving practice carried out in interactive tutorials. These tutorials will be supported by practice and directed study outside the classroom. Formative assessment takes place throughout the module during tutorials and feedback is given during these tutorials.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5333
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, 10	LO #1, 2, and 3
	Assignments	2	10% (10)	7, 12	LO # 4 and 6
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	14	LO # 5 and 7
Summative assessment	Midterm Exam	2	10% (10)	6,11	LO # 1-5
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The Rate of Change of Function: Coordinates, Increments and Distance, Slope of the straight line, Equations of straight lines.
Week 2	Inequalities, Intervals, Absolute value.
Week 3	Functions and graphs: Domain, Range, Axes intercept points, Symmetry, Asymptotes.
Week 4	Limits and continuity :Calculation Techniques of limits, One sided and two-sided limits.
Week 5	Limit at infinity, Oblique asymptote.
Week 6	Mid Term Exam + Continuous functions.
Week 7	The slope of the curve and derivatives: Formal differentiation, Rules of derivatives
Week 8	Implicit differentiation, Second and higher order derivatives, Chain rule.

Week 9	Parametric equations, L'Hopital rule.
Week 10	Transcendental Functions: Properties and derivatives for Trigonometric functions and Inverse of trigonometric functions.
Week 11	Mid Term Exam + Properties and derivatives for Inverse of trigonometric functions.
Week 12	Properties and derivatives for Logarithmic, exponential functions and The exponent function a^x
Week 13	Properties and derivatives for Hyperbolic functions and Inverse of Hyperbolic Functions
Week 14	Applications of Derivatives: Curve sketching, Maxima and minima problems
Week 15	Related rate, Velocity and acceleration.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Calculus and Analytic Geometry by Thomas	Yes
Recommended Texts	Calculus with application brief version	No
Websites	www.mathhandbook.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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Physics (electricity)		Module Delivery
Module Type	Core		<ul style="list-style-type: none"><input checked="" type="checkbox"/> Theory<input checked="" type="checkbox"/> Lecture<input checked="" type="checkbox"/> Lab<input type="checkbox"/> Tutorial<input type="checkbox"/> Practical<input type="checkbox"/> Seminar
Module Code	UoB12345		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Sadeem Abbas Fadhil	e-mail	sadeemfadhil@yahoo.com
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Hussein Ali	e-mail	
Peer Reviewer Name	me	e-mail	E-mail
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 Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1. To develop problem solving skills and understanding of electricity physics through the application of techniques.2. To understand voltage, current and power from a given circuit.3. Understanding the main rules in static electricity and the laws that govern it.4. Learning how to deal with the electrical devices safely.5. Learning how to use the electrical measuring devices in determining the electrical parameters for materials.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Definition of electricity, the laws related to it, as well as the electric fields accompanying charged particles, methods of derivation for calculating electric field strength, electric potential and current identification2. Resistors and their types and areas of use and applications.3. Definition of electric current and how to connect electrical circuits and calculate unknowns in them.4. Describe electrical power, charge, and current.5. Define Ohm's law.6. Identify the basic circuit elements and their applications.7. Discuss the various properties of resistors, capacitors, and inductors.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Electricity Physics:</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. [30 hrs]</p> <p>Revision problem classes. [6 hrs] Experimental hours. [30hrs] Electronic classes [6 hrs] Assignments [10 hrs]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	105	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	165		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered	
Week 1	Unit one/ Coulomb's Law and electric fields

Week 2	Solving problems on unit1
Week 3	Unit Two/ Potential and capacitance
Week 4	Solving problems on unit2
Week 5	Unit Three /Current, resistance and Ohm's law
Week 6	Solving problems on unit3
Week 7	Mid-term exam
Week 8	Unit Four/ Electrical Power
Week 9	Solving problems on unit4
Week 10	Unit 5/ Equivalent resistance
Week 11	Solving problems on unit5
Week 12	Unit 6/ Kirchhoff's law
Week 13	Solving problems on unit6
Week 14	Unit 7/ Forces on magnetic fields
Week 15	Solving problems on unit7
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Ohm's law
Week 2	Lab 2: Parallel and series resistors
Week 3	Lab 3: Ohmic and non-Ohmic resistors
Week 4	Lab 4: Parallel and series capacitors
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Frequency filters

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	. Schaums Outline of College Physics by Frederick J. Bueche, Eugene Hecht, Frederick Bueche 1997.	Yes
Recommended Texts	Electricity and magnetism by Kyle, Kirkland 2007	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Inorganic chemistry		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	CHEM 101			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery		1
Administering Department	CHEM	College	Type College Code	
Module Leader	Dr. Ahmed Sabeeh		e-mail	ahmed.sabeeh@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Ahmed Al-Ani		e-mail	E-mail
Scientific Committee Approval Date	14/05/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<p>The aim is to explain the following subjects:</p> <ol style="list-style-type: none">1- Chemical Bonding and Covalent bond2- Theories of Covalent Bonding3- Valence Shell Electron Pair Repulsion (VSEPR) Theory4- Valence Bond Theory5- Molecular Orbital Theory (MOT)6- Lewis Structure and Octet Rule7- Fajans Rules8- Lattice Energy9- Born Haber Cycle10- Saline hydrides and Diborane
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Teach students the principle of chemistry2. Explain the atomic structures and its compounds3. Explain some of chemical phenomena4. Study the properties of some chemical elements5. Practical and laboratory skills6. Improvement skills, to improve student's mind and to let students think more about chemistry7. Productive skills
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none">1. Areas of inorganic chemistry2. The current role of inorganic chemistry3. Improve the student's mind by how he or she can deal with chemicals and its uses4. Teach students about hazardous chemicals in the lab and how can avoid any risk in the lab

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- In class interactive lectures involving educational videos
- Practical in lab lectures
- Adapting interactivity with student's interaction by raising a question and asking the group to find the relevant answers to them as a main way of teaching.
- Power point presentation, examples from books and internet

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعا	4.2
Unstructured SWL (h/sem) الحمل الدراسي الغير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي الغير المنتظم للطالب أسبوعا	4
Total SWL (h/sem) الحمل الدراسي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	25% (50)	2, 5, 10, 12	LO #1, 2, 10 and 11
	Assignments				
	Projects / Lab.	1	5% (5)	Continuous	All
	Report/ Lab.	1	10% (10)	Continuous	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1-2	Chemical Bonding and Covalent bond, Theories of Covalent Bonding, Valence Shell Electron Pair Repulsion (VSEPR) Theory and Valence Bond Theory
Week 3-5	Molecular Orbital Theory (MOT) and Bond order calculation
Week 6-8	Lewis Structure and Octet Rule and Fajans Rules

Week 9-12	Lattice Energy and Born Haber Cycle
Week 13-15	Saline hydrides and Diborane
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Inorganic chemistry, Sharpe, A. G. (Alan George), Harlow: Longman Scientific and Technical, 3 rd Edition 1992	Yes
Recommended Texts	Basic Inorganic Chemistry F. Albert Cotton, Geoffrey Wilkinson, Paul L. Gaus, , 3rd Edition, 1995	Yes
Websites	https://courses.lumenlearning.com/boundless-chemistry/chapter/the-structure-of-the-atom/ https://www.acs.org/content/acs/en/careers/chemical-sciences/areas/inorganic-chemistry.html https://courses.lumenlearning.com/boundless-chemistry/chapter/periodic-trends/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جند جدا	80 - 89	Above average with some errors
	C - Good	جند	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 (قند 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Volumetric Analytical chemistry		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CHEM 121		
ECTS Credits	10		
SWL (hr/sem)	200		
Module Level	1	Semester of Delivery	
Administering Department	CHEM	College	Type College Code
Module Leader	Dr. Muataz Adnan	e-mail	muataz.ali@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Muataz Adnan	e-mail	muataz.ali@nahrainuniv.edu.iq
Peer Reviewer Name	Muataz Ali	e-mail	muataz.ali@nahrainuniv.edu.iq
Scientific Committee Approval Date	14/05/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Application of wet Analytical Chemistry starting from understanding acids and bases2. Moving on to neutralization titration (strong acid, strong base, weak acid, weak base) through understanding its calculations and lab applications3. Understanding the role of indicators and its structure and their usage in neutralization titration4. titration of multiprotic acids5. Introduction to buffer systems and its applications in nature Application of buffer calculation in measuring its pH and buffer preparation6. Introduction to statistics in analytical chemistry
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. introduction to acids and basis, strong and weak and neutralization titration2. Methods of measuring acidity3. Undersetting buffer and its role in nature4. Develop the ability to interact acids and basis in lab and measuring acidity Learning buffer preparation, uses, reactions and properties5. general understanding of statistics in analytical chemistry
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none">1. what is titration2. how indicator works3. most common indicators4. titration using pH meter5. strong and weak acids and bases

	<ol style="list-style-type: none"> 6. titration of strong (acid/base) with strong (base/acid) 7. titration of strong (acid/base) with weak (base/acid) 8. understand K_a and K_b 9. mixtures of strong and weak (acids/ bases) and titration against (acid/base) 10. polyfunctional acids and bases 11. buffer capacity 12. introduction to statistics in analytical chemistry
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<ul style="list-style-type: none"> ● In class interactive lectures involving educational videos ● Practical in lab lectures ● Adapting interactivity with student's interaction by raising a question and asking the group to find the relevant answers to them as a main way of teaching. ● 2hrs per week tutorial focused mainly on expanding solving numerical questions

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	126	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8.4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	124	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	8.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	250		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	25% (50)	2, 5, 10, 12	LO #1, 2, 10 and 11
	Assignments				
	Projects / Lab.	1	5% (5)	Continuous	All
	Report/ Lab.	1	10% (10)	Continuous	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1-2	Neutralization titration
Week 3-5	Indicator (theory, structure and usage)
Week 6-8	Titration of multiprotic acids and

Week 9-12	Buffer preparation and usage
Week 13-15	statistics
Week 16	final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Exp.1 - Preparation of standards solution of solid (NaOH,Na ₂ CO ₃) and liquid (HCl,H ₂ SO ₄).
Week 2	Exp.2 – Standardization of sodium hydroxide by titration with KHP (potassium hydrogen phthalate).
Week 3	Exp. 3 – Determination of HCl by titration with standard NaOH).
Week 4	Exp. 4 - Determination of H ₂ SO ₄ by titration with standard NaOH).
Week 5	Exp. 5 - Determination of the HAC (pure) by titration with standard NaOH).
Week 6	Exp. 6 - Determination of acidic acid in commercial samples.
Week 7	Exp. 7- Determination of NH ₃ by titration with HCl.
Week 8	Exp. 8- Determination of carbonate (CO ₃) by titration with HCl.
Week 9	Exp. 9 – Determination of mixture from sodium hydroxide (NaOH) and sodium carbonate (Na ₂ CO ₃).
Week 10	Exp. 10 - Determination of mixture from sodium carbonate (Na ₂ CO ₃) and sodium bicarbonate (NaHCO ₃).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental of analytical chemistry, D.A. Skoog, D. M.West, F. J. Holler and S. R. Crouch, 8th ed., 2004, Brooks/Cole.	Yes

Recommended Texts	Analytical chemistry, "Theoretical and Metrological Fundamentals", K. Danzer, 1st ed., 2006, Springer.	No
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
<p>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.</p>				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus (II)		Module Delivery
Module Type	B		<ul style="list-style-type: none">• <input type="checkbox"/> Theory• <input checked="" type="checkbox"/> Lecture• <input type="checkbox"/> Lab• <input type="checkbox"/> Tutorial• <input type="checkbox"/> Practical• <input type="checkbox"/> Seminar
Module Code	CREQ		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	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	me	e-mail	E-mail
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 Aims أهداف المادة الدراسية	The aim of this course is to introduce the concept of integration, study various techniques of integration, test improper integrals for convergence and illustrate some applications of integration. Student will gain proficiency to use integration to solve real world problems such as area and volumes problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing the course, students have the ability <ol style="list-style-type: none">1. To determine proper integral of one variable functions.2. To determine integral involving the fundamental theorem of Calculus and method of substitution.3. To determine the solution of problems involving the integral of one variable function.4. To compute integral involving transcendental functions.5. To compute integral with advanced integration techniques.6. To demonstrate ability to think critically by recognizing patterns and determining and using appropriate techniques for solving a variety of integration problems.7. To solve indeterminate forms and improper integral problems.8. To solve the parametric representation of curves in the plane, calculate the length of a plane curve and solving area and volume application problems.9. To sketch the graph of a polar equation and the area problems in the polar coordinate system.10. To demonstrate an intuitive and computational understanding for integral applications by solving a variety of problems from physics, engineering and mathematics.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none">1. Proper integral, Fundamental Theorem of Calculus, basic rules of integration.2. Methods of integrations, method of substitution, partial integration method, trigonometry integral and integral of rational function with partial fraction.3. Improper integrals, test for convergence and divergence of improper integrals.4. Application of Definite Integrals, Mean value theorem of integration, Area, solid revolution volume and Arc length.5. polar coordinates, Moments and center of mass and Average value of functions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be presented to the students through a specified series of lectures, supported by problem solving practice carried out in interactive tutorials. These tutorials will be supported by practice and directed study outside the classroom. Formative assessment takes place throughout the module during tutorials and feedback is given during these tutorials.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5333
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)	6, 10	LO #1, 2, and 6
	Assignments	2	10% (10)	7, 12	LO # 3 and 7
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	14	LO # 5, 7 and 8
Summative assessment	Midterm Exam	2	10% (10)	5,11	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Indefinite integrals, Definite integrals, The fundamental theorems of integrals, Basic Integration Formulas.
Week 2	Integration by substitution
Week 3	Integration of certain powers of trigonometric and hyperbolic functions
Week 4	Integrals involving trigonometric substitutions, Integrals involving hyperbolic substitution .
Week 5	Mid-Term Exam + Integrals involving quadratic Function
Week 6	Integration by parts
Week 7	Integration of Rational Functions
Week 8	Integration of Irrational Functions, Integration of Rational Functions of Trigonometric
Week 9	Improper integrals: Definition of improper integral and examples
Week 10	Application of Definite Integrals: Area under the curve
Week 11	Mid-Term Exam + Area between two curves
Week 12	Volume of solid of revolution
Week 13	Arc length, Area of surface of revolution
Week 14	Area in polar coordinates
Week 15	Average value of functions, Moments and center of mass
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Calculus and Analytic Geometry by Thomas	Yes
Recommended Texts	Calculus with application brief version	No
Websites	www.mathhandbook.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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Occupational safety		Module Delivery
Module Type	Basic(b)		<ul style="list-style-type: none">• <input type="checkbox"/> Theory• <input checked="" type="checkbox"/> Lecture• <input type="checkbox"/> Lab• <input checked="" type="checkbox"/> Tutorial• <input type="checkbox"/> Practical• <input type="checkbox"/> Seminar
Module Code	CREQ1207		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	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	me	e-mail	E-mail
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 Aims أهداف المادة الدراسية	1- Introducing students to all the basic concepts related to occupational safety 2- Increase awareness and education of students in all matters of occupational safety 3- Occupational safety in industrial units
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Teach the student to take all safety measures in laboratories 2- Develop the student's skills to conduct on-site assessment of laboratories and factories 3- Teaching the student how to identify the risks of working in factories and how to overcome them
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A Introduction Safety..... Meanings Safety...Glossary of Terms Safety...Glossary of Terms, Part 2 Part B Toxicological chemistry, Fire or Burning Hazard and Risk Chemical Information data Part C Laboratory Safety Managing Chemicals Working with Laboratory Equipment, Working with Chemicals Managing Chemical Waste Part D <u>Safety & Health in Chemical Industries</u>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	Lectures, discussion during the lecture, presentation of specialized films and pictures that enhance the student's understanding of his subject matter, and the student presents a project that is a case study of safety issues that he presents as a presentation in front of his colleagues.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	100	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
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, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	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 Safety..... Meanings
Week 2	Safety...Glossary of Terms
Week 3	Safety...Glossary of Terms, Toxicological chemistry
Week 4	Toxicological chemistry,

	Fire or Burning
Week 5	Fire or Burning
Week 6	Hazard and Risk
Week 7	Hazard and Risk, Chemical Information data
Week 8	Mid. course exam/1
Week 9	Chemical Information data, Laboratory Safety
Week 10	Laboratory Safety
Week 11	Managing Chemicals
Week 12	Working with Laboratory Equipment, Working with Chemicals
Week 13	Managing Chemical Waste
Week 14	Safety & Health in Chemical Industries
Week 15	Safety & Health in Chemical Industries Mid. course exam /2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lisa Moran and Tina Masciangioli....'Chemical Laboratory Safety and Security	Yes
Recommended Texts	Nicholas P. Cheremisinoff "Handbook of Hazardous Chemical Properties"	yes
Websites	<ul style="list-style-type: none"> • http://www.acs.org/content/acs/en.html 	

Grading Scheme مخطط الدرجات

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