MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Organic Chemistry II**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	**Che-314**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	5	
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	Name		**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	Che-224	**Semester**	4
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. To know the chemical structures of carboxylic acids, esters, amines and phenols. 2. To know the nomenclature of carboxylic acids, esters and amines. 3. The physical and chemical properties of carboxylic acids, esters, amines and phenols. 4. To understand the preparation and reactions of carboxylic acids, esters, amines and phenols. 5. To compare between carbanion and carbocation and know their stability. 6. To understand the reaction of carbanion (e.g. Aldol reaction and Claisen condensation).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the structure and nomenclature of carboxylic acid and esters. 2. Recognize the physical and chemical properties of carboxylic acids and esters. 3. Explain how to prepare carboxylic acids derivatives. 4. Know the reaction of carboxylic acids and its derivatives. 5. Recognize the structure and nomenclature of amines. 6. Recognize the physical and chemical properties and amines. 7. Explain how to prepare amine derivatives. 8. Know the reaction of amines. 9. Understand the stability of carbanion and carbocation. 10. Explain the mechanism of reaction of carbanion. 11. Understand how to prepare new compound using reaction of carbanion.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. The structure and nomenclature of carboxylic acid, Properties and Acidity of carboxylic acids, Methods of Preparation and Reactions of carboxylic acids [10hrs] The structure and nomenclature and Properties of esters, Methods of Preparation and Reactions of esters. [7 hrs] The structure and classification and nomenclature of amines, Properties and basicity of amines, Methods of Preparation and Reaction of amines [10 hrs] The stability of of carbanion and carbocation, Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation), Addition reaction (chalcone formation, Henry reaction), Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction). [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	The teaching approach employed involves delivering lectures to students using presentations supplemented by the blackboard for further clarification. The use of illustrative examples is incorporated to facilitate a better understanding of the concepts being taught. Additionally, active student participation is encouraged to enhance their involvement in the lecture through explanations and discussions.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 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	The structure and nomenclature of carboxylic acid
Week 2	Properties of carboxylic acids and Acidity of carboxylic acids
Week 3	Methods of Preparation of carboxylic acids
Week 4	Reactions of carboxylic acids
Week 5	The structure and nomenclature and Properties of esters
Week 6	Methods of Preparation of esters
Week 7	Reactions of esters
Week 8	The structure and classification and nomenclature of amines
Week 9	Properties and basicity of amines
Week 10	Methods of Preparation of amines
Week 11	Reaction of amines
Week 12	The stability of of carbanion and carbocation.
Week 13	Reaction of carbanion (addition reaction : Aldol reaction, Claisen condensation)
Week 14	Addition reaction (chalcone formation, Henry reaction)
Week 15	Substitution reaction (Halogenation , kolbe-schmitt reaction and Reimer-Tiemann raction)
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Preparation of chlorobenzene
Week 2	Lab 2: Sulfonation of aromatic amine
Week 3	Lab 3: Preparation of sulfanilic acid
Week 4	Lab 4: Esterification of benzoic acid
Week 5	Lab 5: Preparation of ethylbenzene
Week 6	Lab 6: Oxidation of Toluene
Week 7	Lab 7: Preparation of benzoic acid
Week 8	Lab 8: Cannizzaro reaction
Week 9	Lab 9: preparation carboxylic acid from aldehyde
Week 10	Lab 10: Aldol condensation
Week 11	Lab 11: Preparation of Dibenzalacetone
Week 12	Lab 12: Claisen condensation

Week 13	Lab 13: Preparation of ethylacetoacetate
Week 14	Lab 14: Perkin condensation
Week 15	Lab 15: Preparation of cinnamic acid

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Organic Chemistry by Morison and Boyd	Yes
Recommended Texts	Textbook of practical organic chemistry by Brian S. Furniss	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

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	**Analytical chemistry**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐**Lecture** ☒**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	MPH-112				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
Administering Department		MPH	**College**	Applied sciences-Heet	
Module Leader	Rasim Farraj Muslim		**e-mail**	dr.rasim92hmts@uoanbar.edu.iq	
Module Leader's Acad. Title		Assistant 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		/ /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. The analytical chemistry course is determined according to the study plan prepared in the Medical Physics Department.** **2. The course aims to introduce the student to the general concepts of the organic compounds and their importance and uses in various fields.** 3. **It also aims at a detailed study of the different structural compositions and naming principles for the compounds of organic chemistry, by focusing on the compounds. And help the student to know the composition of these substances, including drugs, and to know how interactions occur and the mechanism of interaction.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**- The student should know the general concepts of the compounds of the analytical chemistry curriculum.** **- That the student is acquainted with the basics and rules of naming, different structural structures and physical properties, and focuses on the same different rings for their vital activity, and recognizes their physical and chemical properties, and that the student distinguishes between the different structural structures.** **- That the student knows the basic principles of preparation methods** **- To familiarize the student with the different bases of their interactions.** **- That the student is aware of the importance of these compounds and their applications.**
Indicative Contents المحتويات الإرشادية	**a- Methods of teaching and learning** **1- Giving lectures.** **2- Using the method of recitation, discussion and solving questions.** **3- Giving assignments to students to strengthen them and prepare them for the final and final exams.** **b- Evaluation methods** **1- Daily and monthly exams** **2- Duties** **3- In-class exercises**

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	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

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**	1hr	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 to qualitative analytical chemistry**
Week 2	**Methods for the detection of elements and ions**
Week 3	**Sedimentation methods**
Week 4	**Methods of separation**
Week 5	**Macro and micro Qualitative analysis**
Week 6	**Chromatographic separation column**
Week 7	**Detection and estimation of items**
Week 8	**First month exam**
Week 9	**Introduction to Volumetric Analysis Chemistry**

Week 10	Methods for expressing concentrations
Week 11	Solutions, ionic balance and chemical balance
Week 12	Equilibrium constants, inverse reactions and common ion
Week 13	Second month exam
Week 14	Titration
Week 15	Solubility product constant and slightly soluble salts
Week 16	Comprehensive review, applications and problem solving

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Test Reducing Flame
Week 2	Flame test
Week 3	Detection of halogens, nitrogen and sulfur
Week 4	Extraction
Week 5	Solubility
Week 6	Titration methods
Week 7	Chromatography methods

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of analytical chemistry. 9th Edition by Douglas A. Skoog (Author), Donald M. West (Author), F. James Holler (Author), Stanley R. Crouch (Author). 10 EDITION. July 16, 2021	Yes
Recommended Texts	ANALYTICAL CHEMISTRY: A Fundamental Approach To Modern Separation Techniques. by Stanley Chris (Ph.D) (Author) August 15, 2022	No
Websites	https://www.amazon.com/Fundamentals-Analytical-Chemistry-Douglas-Skoog/dp/0357450396/ref=d_pd_sbs_vft_none_sccl_3_1/145-7711462-5419924?pd_rd_w=CSlfi&content-id=amzn1.sym.3676f086-9496-4fd7-8490-77cf7f43f846&pf_rd_p=3676f086-9496-4fd7-8490-77cf7f43f846&pf_rd_r=7EZR6MGHA0J9A87C0JF0&pd_rd_wg=KzlqI&pd_rd_r=6cd67e00-88f2-4c85-8c5e-a2822ac1d629&pd_rd_i=0357450396&psc=1	

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.

Assist. Prof. Dr. Rasim Farraj Muslim

3 / 6 / 2023

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer 2			**Module Delivery**	
Module Type	Support			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	SCI-102				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		1	**Semester of Delivery**		2
Administering Department			**College**		
Module Leader	Ibrahim Saud Khaleel		**e-mail**	ibrahem.abomusab@uoanbar.edu.iq	
Module Leader's Acad. Title		Assist. Lect.	**Module Leader's Qualification**		M.Sc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Name (if available)		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		/ /2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	SCI-101	**Semester**	1
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 develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</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. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]

	Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 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	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
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	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	-	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	-	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	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	What is the Excel program? Then ways to open Excel
Week 2	Recognize tab commands? Then explain the home page
Week 3	Explanation of commands for the main page
Week 4	Explanation of the Insert tab
Week 5	Explanation of the Page Layout tab
Week 6	Explanation of the View tab
Week 7	What is the power point program? Then ways to open power point program
Week 8	Recognize tab commands? Then explain the home page
Week 9	Explanation of commands for the main page
Week 10	Explanation of the Insert tab
Week 11	Explanation of the Insert Pictures and Videos tab
Week 12	Explanation of the Page Layout tab
Week 13	Explanation of the View tab
Week 14	review
Week 15	Monthly test

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Apply ways to open Excel.
Week 2	Lab 2: Application of scheduling orders? Apply the Home commands for Font Size, Insert Row, Column, and Worksheet .
Week 3	Lab 3: Insert tab application such as insert picture, clip, table, and text box.
Week 4	Lab 4: Explanation and application of writing equations such as (sum, max, min, if).
Week 5	Lab 5: Explain and apply page layout commands such as margins, orientation, and paper orientation from right to left and vice versa.
Week 6	Lab 6: Insert table, enter data, delete and insert columns and rows.
Week 7	Lab 7: Explain and apply display commands, such as showing and hiding rulers, gridlines, and size.
Week 8	Lab 8: Application ways to open PowerPoint.
Week 9	Lab 9: application for home page such as color-darkness, font-size and underline .
Week 10	Lab 10 : Insert the Video, Audio, and Equalization app tab.
Week 11	Lab11: The application inserts a set of new slides.
Week 12	Lab12: Application to delete a group of slides.
Week 13	Lab13: PowerPoint save application.
Week 14	Lab14: review.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Computer basics represented by the difference between a computer and a human being, number, programs, memory size, and everything related to computer basics.	No
Recommended Texts	Apply to create the folder, change its name, show it, hide it, copy it, paste it, cut it, change the screen scroll, apply the right mouse commands, and everything related to basic computer basics in practice.	No
Websites		

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	Computers 1			**Module Delivery**	
Module Type	Support			☐**Theory** ☐ **Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	SCI-101				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Ibrahim Saud Khaleel		**e-mail**	ibrahem.abomusab@uoanbar.edu.iq	
Module Leader's Acad. Title	Assist. Lect.		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Name (if available)	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	/ /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 develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</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. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]

	Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 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	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
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)	5 and 10	LO #1, #2 and #10, #11
	Assignments	-	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	-	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	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	What is a computer? Then find out the types of icons on the desktop.
Week 2	Execute by applying the right mouse command related to system icons, programs, and folders.
Week 3	Execute right mouse commands (copy, paste, cut, delete, and change folder name).
Week 4	Execute the right mouse button (the properties of the system icon, program icon, and folder icon)
Week 5	Create a new folder, then save it, change its name, shape, hide it, and show it)
Week 6	Show and hide the system icon (Control panel)
Week 7	Learn the Word program, then ways to open the program
Week 8	Home tab and execute its commands
Week 9	Insert and Execute tab Insert a table, clip art, picture, shapes, text box, and symbols
Week 10	Page layout tabs such as paper margins, orientation, and size
Week 11	The Page Layout tab performs watermark, page borders, and color commands
Week 12	Executing and opening a file command such as saving the document and options for choosing the language of numbers and printing
Week 13	Completing a file command for the rest of it, such as opening a new one, sending it, and previewing it before printing
Week 14	review
Week 15	Monthly test

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: An application to create a folder, change its name, format and save it.
Week 2	Lab 2: Change wallpaper. Learn about system icons, hide them, and show them.
Week 3	Lab 3: Application of commands difference between delete and removal and the location of the use of each of them.
Week 4	Lab 4: Application right-click (system icon, program icon, folder icon properties)
Week 5	Lab 5: Use the (Control Panel) application to open and modify some programs such as time, date, deletion, and others
Week 6	Lab 6: The application opens the Home tab and performs its commands
Week 7	Lab 7: Insert and Execute tab application Insert a table, clip art, picture, shapes, text box, and symbols
Week 8	Lab 8: Apply page layout tabs such as paper margins, orientation, and size
Week 9	Lab 9: The Page Layout tab applies watermark, page border, and color commands
Week 10	Lab 10 : Executing and opening a file command such as saving the document and options for choosing the language of numbers and printing
Week 11	Lab: A file command completion application for the rest of the command, such as opening a new command, submitting it, and previewing it before printing
Week 12	Lab: The application of inserting a table and adding data inside it.
Week 13	Lab: Complete the insert table application and add new rows and columns
Week 14	Lab: Complete the insert table application and the method for deleting rows and columns from within the table

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Computer basics represented by the difference between a computer and a human being, number, programs, memory size, and everything related to computer basics.	No
Recommended Texts	Apply to create the folder, change its name, show it, hide it, copy it, paste it, cut it, change the screen scroll, apply the right mouse commands, and everything related to basic computer basics in practice.	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

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		**Academic English 1**	**Module Delivery**	
Module Type		**S**	☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code		UNI-101		
ECTS Credits		2		
SWL (hr/sem)		**50**		

Module Level	1		**Semester of Delivery**	1	
Administering Department	MPH		**College**	College of Applied Sciences-Hit	
Module Leader	Yassir Sh. Hameed		**e-mail**	yassiralheety@gmail.com	
Module Leader's Acad. Title	Asst. Instructor		**Module Leader's Qualification**	MA.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	/ /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 learn the four English skills (reading, writing, listening and speaking). 2. To understand and distinguish between vocabulary that are similar in use. 3. To help students know the phonic symbols of English letters. 4. To help students read, understand and comprehend certain English texts. 5. To enable students to write in English language as well as to learn the basic rules of building up English sentences. 6. To have the ability to practice the language in real situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Engage the students in real communication to practice speaking skill. 2. Divide the students into groups to practice writing skill. 3. Ask the students to learn and grasp the words that describe family members. 4. Distinguish among the different rules used in texts. 5. Analyze the sentences depending on their grammatical structures. 6. Differentiate between the word-system in students' mother tongue and the target language. 7. Draw certain conclusions after understanding the given texts.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. In this course, students are directed to practice what they are taught throughout the semester. They are encouraged to work on collecting important notes during the session to be able to utilize the learned materials later on. It's important to use certain aids to help understand the lesson. Moreover, students should be directed to write certain meaningful and grammatical paragraphs. They should understand the texts to be able to answer questions given in the quizzes, mid-term and final examination.

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 global thinking skills. This will be achieved through classes interactive communication, by performing and involving the four English skills, the receptive and productive ones, reading, listening, writing and speaking. some practical

	activities will be beneficial and interested to the students like engaging them in a communicative situation, asking them to practice a role-changing activity and so on.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 and 10	LO #1, #2 and #10, #11
	Assignments	-	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	LO #1 - #7
	Final Exam	1hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Hello! How are you? What's this in English? Good morning!
Week 2	Your world, What's his name? Contractions, Countries, Where are they from? Numbers
Week 3	All about you! What's his address? Personal information, Social expressions
Week 4	Family and friends! Possessive adjectives, Describing a friend, The alphabet

Week 5	The way I live! Present simple I/they/we/you, Sports/Food/Drinks, Language and nationalities, How much is it? Numbers
Week 6	Every day! Present simple he/she, Saying the time, Words go together, Days of the week, Prepositions of time on/at/in
Week 7	**Mid-term exam for the materials given above**
Week 8	My favorites! Make questions who, where, how, why… ect. Opposite adjectives, A holiday postcard
Week 9	Where I live? There's/'re, Directions, Go straight on, Turn right… ect.
Week 10	Time past! Was/were born, Saying years, When's your birthday?
Week 11	We had a great time! Regular v.s Irregular verbs, Time expressions, Making conversation
Week 12	I can do that! Show ability can/can't, Verb+noun, Adjective+noun
Week 13	Please and thank you! I'd like, Some v.s any, Making offers
Week 14	Here and now! Present continous v.s Present simple, Colours and clothes, What's the matter?
Week 15	It's time to go! Future plans, Means of transport, Social expressions
Week 16	**Preparation for the final examination**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	None
Week 2	None
Week 3	None
Week 4	None
Week 5	None
Week 6	None
Week 7	None

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	Soars, L. (2009). New headway Plus: Beginner Student's Book.	No
Recommended Texts	Soars, L. (2009). New headway Plus: Beginner Working Book.	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

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 اسم المادة او الوحدة	**Mathematics 1**			**Module Delivery**	
Module Type نوع الوحدة	**Base**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code كود الوحدة	**MPH-113**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MPH		**College**	College of Applied Sciences - Heat	
Module Leader	م.م. ميثاق عبدالكريم عبدالواحد		**e-mail**	Methaq90alheety@uoanbar.edu.iq	
Module Leader's Acad. Title	Assist. Lect.		**Module Leader's Qualification** مؤهلات مسؤول الوحدة	M.Sc.	
Module Tutor	None		**e-mai**	None	
Peer Reviewer Name			**e-mai**		
Scientific Committee Approval Date	/ / 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module مادة اساسية تدرس قبلها	None	**Semester** الفصل الدراسي	
Co-requisites module مادة دراسية تدرس معها مشتركة	None	**Semester** الفصل الدراسي	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. A student's acquisition of the concept of words and mathematical logic and ways of dealing with them algebraically. 2. Clarify the concept of sets, relationships, functions and links between them and theories related to them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completing this course, students will: 1. An ability to apply knowledge of mathematics, science and engineering. 2. Evaluate the indefinite and improper integrals by using different integration techniques. 3. Identify the definition and properties associated with definite integrals. 4. Evaluate integrals using the method of substitution. 5. Solve problems involving applications of integrals including finding volume of solids of revolution and area between curves. 6. Discover determinants and matrices and their properties. Learn Crammer rule for solving a set of matrix system.
Indicative Contents المحتويات الإرشادية	1. Familiarity with basic mathematical concepts and principles required for all branches of mathematics. 2. Recognize the importance of integration and its applications. 3. Knowledge of the concept of specific values and related issues. 4. Studying methods of finding integration and identifying the most appropriate method.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Thinking creatively and critically. 2. Talk with a partner or in a small group. 3. Express ideas with linear activities. 4. Explore personal positions and values through debate, argument, and discussion. 5. Meditation in the educational process

Student Workload (SWL) الفصل 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	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.4
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**	2	10% (10)	5 and 10	
	Assignments	2	10% (10)	2 and 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks		

Delivery Plan (Weekly+Lab Syllabus) المنهاج الاسبوعي النظري والعملي	
	Material Covered
Week 1	The Real numbers, Slope, Equation of straight line, function
Week 2	Even and odd, Inequalities
Week 3	Domain , range and Sketch
Week 4	Limits
Week 5	Continuity
Week 6	The Derivative
Week 7	Second and higher derivatives , Derivative of natural logarithm
Week 8	Derivative of a^x , Chain Rule
Week 9	Exam
Week 10	Integration, Definite integration
Week 11	Integration by parts
Week 12	Integration by partial fractions
Week 13	Partial Fraction
Week 14	Area
Week 15	Area between two curves
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Calculus with analytic Geometry, Swokowski, Olinickand Pence, 1994. 2. Calculus, 8th edition (2007) by Howard Anton, (John Wiley & Sons, Inc, New York).	ـ الكتب المقررة المطلوبة Required textbooks
Recommended Texts مصادر للاطلاع	1. Professors lectures. 2. The internet.	الكتب والمراجع التي يوصى بها (المجلات العلمية ، التقارير Recommended books and references (scientific journals, reports
Websites مواقع الويب	المراجع الالكترونية، مواقع الانترنيت المكتبة الافتراضية مواقع المكتبات في بعض الجامعات العالمية Electronic references, websites Virtual library Library locations in some international universities	

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

مدرس المادة / م.م. ميثاق عبدالكريم عبدالواحد

البريد الالكتروني / methaq90alheety@uoanbar.edu.iq

Module Description Form of bioelectronics

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Bioelectronics			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **L Seminar**	
Module Code	MPH-223				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Medical Physics, MPH		**College**	Applied sciences-Heet	
Module Leader	Manaf A Guma		**e-mail**	manafguma@uoanabr.edu.iq	
Module Leader's Acad. Title	Ass. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	/ /2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPH-213	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The main **Objectives of this modules are:** The main objectives of a module on bioelectronics typically focus on providing students with knowledge and skills related to the integration of electronics and biology. Here are some common objectives of bioelectronics modules: 1. Understanding the principles of bioelectronics: Students should gain a solid understanding of the fundamental concepts and principles of bioelectronics. This includes studying the interface between electronics and biological systems, as well as the underlying physics, chemistry, and biology involved. 2. Exploring bioelectronic devices and sensors: Students should learn about various bioelectronic devices and sensors, such as biosensors, biochips, implantable electronics, and wearable sensors. They should understand their working principles, fabrication techniques, and applications in healthcare, diagnostics, and biomedical research. 3. Investigating bioelectronic interfaces: Students should explore the interfaces between electronic devices and biological systems, including bioelectrodes, neural interfaces, and bioMEMS (BioMicroElectroMechanical Systems). They should understand the challenges and techniques involved in achieving biocompatibility, signal transduction, and data acquisition. 4. Understanding signal processing and data analysis: Students should develop skills in processing and analyzing biological signals acquired by bioelectronic devices. This includes understanding signal amplification, filtering, digitization, and computational methods for data analysis. 5. Exploring bioelectronic applications: Students should learn about the diverse applications of bioelectronics in healthcare, biomedical research, and therapeutics. This may include areas such as medical diagnostics, bioimaging, neuroprosthetics, bioelectrochemical systems, and bioelectronic medicine. 6. Integrating electronics and biology: Students should develop an interdisciplinary perspective by integrating knowledge from electronics, biology, and other relevant fields. They should understand the challenges, opportunities, and potential solutions that arise when combining electronic technologies with biological systems. 7. Practical skills in bioelectronics: Students should gain hands-on experience in designing, fabricating, and characterizing bioelectronic devices and systems. This may involve laboratory work, experiments, and projects that involve building and testing bioelectronic prototypes. 8. Ethical considerations and societal impact: Students should be aware of the ethical considerations and societal implications of bioelectronics. This includes understanding issues related to privacy, data security, informed consent, and responsible use of bioelectronic technologies.

	9. Communication and collaboration: Students should develop effective communication skills to convey bioelectronics concepts and findings to both technical and non-technical audiences. They should also develop skills in interdisciplinary collaboration, working in teams, and presenting their work professionally. By achieving these objectives, students will be well-prepared to contribute to the development and application of bioelectronic technologies, advancing fields such as healthcare, diagnostics, and biomedical research.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes for a bioelectronics module typically focus on developing knowledge and skills related to the integration of electronics and biology. Here are some common learning outcomes for a bioelectronics module: 1. Understanding of bioelectronics principles: Students should develop a comprehensive understanding of the fundamental principles and concepts of bioelectronics. This includes knowledge of the interface between electronics and biological systems, bioelectrodes, and the electrical properties of biological materials. 2. Knowledge of biological signal acquisition and processing: Students should learn about techniques for acquiring and processing biological signals, such as electrocardiography (ECG), electroencephalography (EEG), and electromyography (EMG). They should understand signal amplification, noise reduction, filtering, and digitization. 3. Familiarity with bioelectronic devices and sensors: Students should gain knowledge about different bioelectronic devices and sensors used for biological signal acquisition and stimulation. This includes understanding the working principles and applications of devices such as biosensors, implantable electronics, neurostimulation devices, and wearable sensors. 4. Integration of electronics with biological systems: Students should understand how to integrate electronic devices with biological systems for monitoring, diagnosis, and therapeutic purposes. They should learn about techniques for interfacing electronics with cells, tissues, and organs. 5. Design and development of bioelectronic systems: Students should be able to design and develop bioelectronic systems, including hardware and software components. They should understand the selection and integration of electronic components, design of circuits, firmware or software development, and system integration. 6. Analysis and interpretation of biological data: Students should develop skills in analyzing and interpreting biological data obtained from bioelectronic systems. This includes understanding data visualization techniques, statistical analysis, and pattern recognition methods for extracting meaningful information from biological signals. 7. Bioelectronic applications in healthcare and research: Students should explore and understand the applications of bioelectronics in healthcare and biomedical research. This may include areas such as medical diagnostics, neural engineering, neuroprosthetics, bioelectrochemical systems, and bioelectronic interfaces.

	8. Ethical considerations and regulatory aspects: Students should be aware of the ethical considerations and regulatory frameworks associated with the use of bioelectronic devices and systems. They should understand the importance of patient safety, informed consent, and compliance with relevant regulations and standards. 9. Practical skills in bioelectronics: Students should gain hands-on experience in designing, fabricating, and testing bioelectronic devices and systems. This may involve laboratory work, experiments, and projects that involve building and characterizing bioelectronic prototypes. 10. Communication and collaboration: Students should develop effective communication skills to convey bioelectronics concepts and findings to both technical and non-technical audiences. They should also develop skills in interdisciplinary collaboration, working in teams, and presenting their work professionally. By achieving these learning outcomes, students will be equipped with the knowledge and skills necessary to contribute to the field of bioelectronics, advancing healthcare, diagnostics, and biomedical research.
Indicative Contents مضمون المحتويات	Indicative content includes the following. The indicative contents of a bioelectronics course may vary depending on the specific curriculum and level of the course. However, here are some common topics and areas that can be covered in a bioelectronics course: 1. Introduction to bioelectronics: - Definition and scope of bioelectronics. - Overview of the interface between electronics and biology. - Applications of bioelectronics in healthcare and biomedical research. 2. Electrical properties of biological systems: - Introduction to the electrical properties of cells, tissues, and organs. - Membrane potential and ion channels. - Excitable cells and action potentials. 3. Bioelectrodes and sensors: - Principles of bioelectrodes and their fabrication. - Electrode-skin interface and signal acquisition. - Sensors for biomedical measurements (e.g., ECG, EEG, EMG). 4. Bioamplifiers and signal conditioning: - Amplification and filtering of biological signals. - Noise reduction techniques. - Signal conditioning for reliable data acquisition. 5. Bioelectronic interfaces and implants: - Design and integration of bioelectronic interfaces with biological systems. - Implantable devices and neuroprosthetics. - Wireless communication and power delivery. 6. Biosensors and biochips:

	- Principles of biosensors for biological detection. - Transduction methods for biochemical measurements. - Lab-on-a-chip technologies and microfluidics. 7. Neural engineering and neurostimulation: - Neural interfaces for recording and stimulation. - Brain-machine interfaces and neuroprosthetics. - Deep brain stimulation and neuromodulation techniques. 8. Bioelectrochemical systems: - Biofuel cells and enzymatic reactions. - Bioelectrochemical sensors and biosensors. - Energy harvesting from biological systems. 9. Bioelectronics in diagnostics and therapy: - Medical diagnostics using bioelectronic devices. - Wearable sensors and point-of-care testing. - Bioelectronic therapeutic interventions. 10. Ethical considerations and societal impact: - Ethical implications of bioelectronics. - Privacy and security considerations. - Regulatory frameworks and standards for bioelectronic devices. 11. Emerging trends and future directions: - Advancements in bioelectronics research. - Nanotechnology and bioelectronic integration. - Bioelectronic medicine and personalized healthcare. These indicative contents provide a framework for structuring a bioelectronics course. The actual content and emphasis may vary depending on the specific requirements of the course and the expertise of the instructor..

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and teaching strategies in Biochemistry aim to engage students in active learning, facilitate understanding of complex concepts, and develop critical thinking skills. Here are some common learning and teaching strategies employed in Basic Biochemistry courses: 1. Lectures: Lectures are often used to deliver foundational knowledge and concepts in biochemistry. They provide an overview of the topics, explain key principles, and highlight important details. Lectures may be supplemented with visual aids, such as slides or multimedia presentations, to enhance understanding. 2. Laboratory Work: Laboratory sessions allow students to apply theoretical knowledge to practical situations. They provide hands-on experience with biochemical techniques,

	data collection, analysis, and interpretation. Lab work may involve experiments related to biomolecule analysis, enzyme kinetics, or metabolic pathways. 3. Problem-solving Exercises: Problem-solving exercises and case studies help students apply their knowledge to real-life scenarios. They encourage critical thinking and problem-solving skills by presenting biochemical problems or experimental data for analysis and interpretation. Students may work individually or in groups to find solutions and explain their reasoning. 4. Interactive Discussions: Interactive discussions, such as small group discussions or classroom debates, promote active learning and peer-to-peer interaction. They allow students to ask questions, clarify doubts, and engage in meaningful discussions about biochemical concepts, experiments, or applications. 5. Concept Mapping: Concept mapping is a visual learning tool that helps students organize and connect different biochemical concepts. It involves creating diagrams or mind maps that illustrate the relationships between different biomolecules, metabolic pathways, or cellular processes. Concept maps can aid in understanding the "big picture" and identifying the interconnections within biochemistry. 6. Multimedia Resources: Incorporating multimedia resources, such as videos, animations, and interactive simulations, can enhance students' engagement and understanding of complex biochemical processes. These resources can visually illustrate molecular structures, enzyme kinetics, or cellular processes, making them more accessible and memorable. 7. Collaborative Learning: Collaborative learning activities, such as group projects or problem-solving tasks, encourage students to work together to solve biochemical problems or complete assignments. This fosters teamwork, communication, and the exchange of ideas, allowing students to learn from each other's perspectives and experiences. 8. Assessments: Assessments, such as quizzes, exams, and assignments, evaluate students' understanding and knowledge retention. They provide feedback on individual progress and help identify areas that require further review or clarification. Assessments may include multiple-choice questions, problem-solving tasks, or short essay questions. 9. Online Resources: Utilizing online resources, such as virtual labs, interactive tutorials, or online discussion forums, can provide additional learning opportunities outside of the classroom. These resources offer flexibility and accessibility, allowing students to review content at their own pace and seek additional support when needed. 10. Real-world Applications: Relating biochemistry concepts to real-world applications, such as medical advancements, biotechnology, or environmental issues, can enhance students' motivation and understanding. Exploring the practical relevance of

	biochemistry concepts helps students appreciate the significance of their learning and its impact in various fields. These strategies aim to create an active and engaging learning environment that promotes understanding, critical thinking, and application of biochemistry principles. The specific strategies employed may vary based on the teaching style, course format, and resources available to the instructor.

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	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

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.		10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	1hr	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	1. Introduction to bioelectronics:
Week 2	2. Electrical properties of biological systems:
Week 3	3. Bioelectrodes and sensors:
Week 4	4. Bioamplifiers and signal conditioning:
Week 5	5. Bioelectronic interfaces and implants:
Week 6	6. Biosensors and biochips:
Week 7	Mid Exam
Week 8	7. Neural engineering and neurostimulation:
Week 9	8. Bioelectrochemical systems:
Week 10	9. Bioelectronics in diagnostics and therapy:
Week 11	10. Ethical considerations and societal impact:
Week 12	11. Emerging trends and future directions:
Week 13	Bio applications of bioelectronics
Week 14	Bio applications of bioelectronics
Week 15	Bio applications of bioelectronics
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Here are some references and research papers related to bioelectronics: 1. "Bioelectronics: From Theory to Applications" by Giovanna De Luca, Fiorenzo Omenetto, and Mohamad Sawan. 2. "Bioelectronic Medicine: An Emerging Field in Biomedical Engineering" by Poonam Sharma, Pankaj Yadav, and Nitin Sharma.	**Available** Online

	3. "Bioelectronics: A Study of the Electronics of Living Systems" by Avinash Kumar Agarwal and Dilip Sharma. 4. "Bioelectronic Devices: Principles and Applications" edited by Paolo Facci. 5. "Bioelectronics Handbook: MOSFETs, Biosensors, and Neurons" edited by Wouter Serdijn, Rudy van der Toorn, and Leif Sörnmo. 6. "Bioelectronics: From Theory to Applications" edited by Krzysztof Iniewski. 7. "Bioelectronic Interfaces: Present Challenges and Future Prospects" by George G. Malliaras and Magnus Berggren. 8. "Bioelectronic Devices: Self-Assembled Systems and Semi-Living Technologies" by Tom F. Otero, Daniel J. Thomas, and Aleksandr Noy. 9. "Bioelectronic Medicine: An Overview of the Field and Its Potential" by Valentin A. Pavlov, Kevin J. Tracey, and Paul-Peter Tak. 10. "Bioelectronic Interfaces: Progress, Challenges, and Future Directions" by Sandeep K. Vashist.	
Recommended Texts	"Bioelectronics: From Theory to Applications" by Giovanna De Luca, Fiorenzo Omenetto, and Mohamad Sawan.	Yes
Websites	Any website	

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	**Biology II**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPH-123				
ECTS Credits	6				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MPH		**College**	Applied Sciences-Heet	
Module Leader	Ahmed Saadoun Jaloot Al-heety		**e-mail**	asjaloot@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Ammar Abdul Razzaq Tawfiq		**e-mail**	ammarabta@uoanbar.edu.iq	
Peer Reviewer Name	Marwan Mahmoud Saleh		**e-mail**	ah.marwan_bio@uoanbar.edu.iq	
Scientific Committee Approval Date	/ / 2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPH-114	**Semester**	1
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. Introducing the student to how to examine organisms and tissues using a microscope, in addition to 2. introducing him to the microorganisms that are pathogenic to humans (how to write their scientific names), and 3. the diseases resulting from them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1.** Recognize how does the cell form tissues and organs. **2.** List the various terms associated with cell. **3.** Define the Cell Theory. **4.** Define the basic parts of a cell. **5.** How do the parts of a cell work together? **6.** Describe each part of the cell separately. **7.** How does The Cytoskeleton Supports Eukaryotic Cells? **8.** Structures found in animal Cells but not in plant Cells. **9.** Structures found in plant Cells but not in animal Cells. **10.** Recognize how does Cell division & MITOSIS. **11.** Recognize how does a cell cycle and MEIOSISI. **12.** How can the student distinguish between MITOSIS and MEIOSISI? **13.** Define the basic parts of a Bacterial cell. **14.** Define the basic parts of a virus molecule. **15.** How can the student distinguish between bacteria and viruses.
Indicative Contents المحتويات الإرشادية	**Part A - General introduction to Biology** Branches of Biology General characteristics of prokaryotes, fungi ,Protista, Anamilia and Plantae CLASSIFICATION OF ORGANISMS. [**15 hrs**] Introduction to Cytology or Cell Biology. Cell membrane, Functions of the cell membrane [**15 hrs**] Nucleus, Nuclear envelope and Chromosomes. Nucleic acid as a Genetic Material, Gene, Genetic code. and Gene expression. [10 hrs] Proteins, essential functions of proteins and Proteins Has Four Levels of Organization. The Cytoskeleton Supports Eukaryotic Cells.. [**15 hrs**] Revision problem classes [**6 hrs**] **Part B - Cell division** Cell division & MITOSIS [**15 hrs**] A Cell cycle and MEIOSISI. [**7 hrs**] Bacteria, Shape & Size, Arrangement, Gram-staining characteristics, and Structure Of Bacterial Cell. Viruses, characteristics of Viruses and Viruses are said to have five specific properties that distinguish them from living cells. [**15 hrs**]

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 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	**5.3**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**71**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4.7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

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**	1hr	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 to Histology
Week 2	Introduction to Epithelial Tissue
Week 3	Main characteristics of the four basic types of tissues.
Week 4	Basement Membranes
Week 5	Specializations of the apical cell surface
Week 6	Types of epithelia. Covering or Lining Epithelia and Common types of covering epithelia
Week 7	Secretory Epithelia & Glands. Exocrine glands, Endocrine glands.
Week 8	Connective Tissue.
Week 9	Cells of Connective tissue.
Week 10	Functions of cells in Connective tissue proper..
Week 11	Fibers in Connective tissue.
Week 12	Types of Connective Tissue, Connective Tissue Proper, Classification of connective or supporting tissues
Week 13	Specialized connective tissue, Adipose Tissue, Cartilage and Bone.
Week 14	Muscle Tissue
Week 15	Nervous System
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to CELL
Week 2	Lab 2: Introduction to Histology
Week 3	Lab 3: Epithelia and adjacent connective
Week 4	Lab 4: Histology
Week 5	Lab 5: Histology
Week 6	Lab 6: Histology
Week 7	Lab 7: Histology
Week 8	Lab 8: Histology
Week 9	Lab 9: Histology
Week 10	Lab 10: Histology

Week 11	Lab 11: Histology
Week 12	Lab 12: Histology
Week 13	Lab 13: Histology
Week 14	Lab 14: Histology

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Campbell**, N.A., Urry, L.A., Cain, M.L. and et al., (2021). **Biology**.12 ed.Pearson BenjaminCummings. SanFrancisco, USA.	Yes
Recommended Texts	**Mescher**, A.L. (2021). unqueira's Basic Histology.6th ed. McGraw-Hill Education, USA.	Yes
Websites	https://vetbooks.ir/?s=lippincott&fbclid=IwAR12okqcqBcCQorPjWFvbaOoLvqG5GjelDFlxNcB8jQyUnLk-ExQ0QgCr6I	

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	Biostatics			**Module Delivery**	
Module Type	Basic			☒**Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	MPH-321				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		3	**Semester of Delivery**		6
Administering Department		Medical Physics	**College**	Applied Sciences-Heet	
Module Leader	Rabah Salim Shareef		**e-mail**	eq.rabah.s.shareef@uoanbar.edu.iq	
Module Leader's Acad. Title		Asset. Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	None		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date		/ /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	Upon completion of the course the learner is expected to do the following: 1. design research questions; 2. distinguish qualitative and quantitative data; 3. Evaluate strength of different biological experimental designs; and 4. Evaluate different data analysis methods;
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the course the learner will be able to: 1. Knowledge of the basics of biological tests 2. Know the importance of health and vital data 3. Know how to collect data and samples 4. analyze different experimental designs for generation of qualitative and quantitative data; 5. design research hypotheses and generate appropriate data; and 6. generated data to appropriate statistical analysis and give relevant interpretation to the output
Indicative Contents المحتويات الإرشادية	This course explores the meaning of statistics. It introduces students to some basic terms like variable, continuous variable, discrete or discontinuous variables population, sample, histogram, frequency, classes, class interval and frequency distribution; a distribution in statistical terms: mode, median, mean; measuring the spread of a distribution: range, semi interquartile range, mean deviation, variance, standard deviation; samples and populations: probability and the normal distribution curve, distribution of t, calculating the limits of a mean; and comparing the means of two samples: null hypothesis, alternate hypothesis, differences between standard deviations, limits for standard deviation and variance. The course also examines a comparison of three or more samples: simple analysis of variance; correlation of two variables: scatter diagram, correlation coefficient, regression lines, mean center; and chi-square test: the 2x2 contingency table. Learners are taken through planning experiments: layout of experiments, controls, precision of measurements, number of replicates, randomization, Latin squares, and interaction.

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	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.4
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**	1hr	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	INTRODUCTON TO BIOSTATISTICS: Meaning of biostatistics - Types of variables - Population and samples (Populations, Samples from populations, Random sampling, Parameters and statistics)
Week 2	Data Collection: (Sources of statistical data, The sources of medical data , Methods of data collection , Sampling Method , Methods of ensuring sample representation of the original population)
Week 3	PRESENTATION OF BIOLOGICAL DATA: (Frequency distribution)
Week 4	Graphical presentation: (Bar Charts, Histogram, Frequency polygon, Cumulative Frequency Polygon, The Pie Chart)
Week 5	PROBABILITY AND STATISTICS: 1- Probability (Laws of probability: Counting possible outcomes, Probability of an event, adding probabilities, Multiplying probabilities) – 2- Permutation and combinations: (Permutations, Combinations)

Week 6	NORMAL DISTRIBUTION: (Symmetry and Kurtosis • Proportions of normal distribution • The distribution of means • Statistical hypothesis testing • Assessing departures from normality)
Week 7	BIONOMIAL AND POISSON DISTRIBUTION: (• Binomial distribution • Poisson distribution)
Week 8	STANDRAD ERROR AND CONFIDENCE INTERVAL: (• Standard error • Confidence interval)
Week 9	HYPOTHESIS TESTING: (• Null hypothesis and alternative hypotheses • The standard format for hypothesis testing)
Week 10	THE t- DISTRIBUTION: One group of observations (or one sample test) • Two independent group of observation (Variances not known; Variances known)
Week 11	THE CHI-SQUARE DISTRIBUTION: Ch-Square X^2
Week 12	Correlation Analysis: (Types of correlation , Measuring Correlation , Simple correlation coefficient , Multiple correlation coefficient , Partial Correlation)
Week 13	Regression Analysis: (The importance of regression analysis , The importance of , regression analysis , Simple linear Regression Analysis , Simple Regression Model , Multiple liner regression)
Week 14	ANALYSIS OF VARIANCE: One-way (Single factor) ANOVA
Week 15	ANALYSIS OF VARIANCE: Two-way (factor) ANOVA
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introductory Biostatistics for the Health Sciences	No
Recommended Texts	Techniques of Medical and Biological Statistics, 2021	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

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	Statistics			**Module Delivery**	
Module Type	Assistant			☒Theory ☐Lecture ☐Lab ☒Tutorial ☐Practical ☒Seminar	
Module Code	UoA12345				
ECTS Credits	4				
SWL (hr/sem)	200				
Module Level		2	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Professor Bilal JM Aldahham		**e-mail**	bilalaldahham@uoanbar.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Professor Bilal JM Aldahham		**e-mail**	bilalaldahham@uoanbar.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/09/2023	**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. Explain the notion of Sampling as an integral part of Analytical Methods of Analysis. 2. Identify and describe the sources of sampling error. 3. Have a knowledge of some important basic principles of error analysis. 4. Identify and discuss the various types and sources of experimental errors. 5. Explain and use the concept of significant figures. 6. Define and distinguish between absolute vs. relative error; random vs. systematic error; 7. Describe the relationship between error and probability. 8. Apply simple statistics and error analysis to determine the reliability of analytical chemical procedures. 9. Clearly and correctly report measurements and the uncertainties in them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solve applied problems in differential and integral calculus, and probability theory. 2. Use a variety of statistical software packages to enter and manage data, and to calculate and combine descriptive statistical parameters. 3. Differentiate between various sampling techniques. 4. Utilize inferential statistics. 5. Calculate test statistics. 6. Use various test statistics to assess the significance of a model. 7. Utilize regression analysis to construct a predictive model. 8. Design and analyze experiments using a variety of techniques. 9. Gain entrance into careers as well as in graduate or professional school
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. This course aims to discuss data analysis techniques using descriptive and inferential statistics and their interpretations. Topics covered include: basic statistical concepts, error theory, descriptive statistics, probability distribution, sampling technique, statistical hypothesis testing, normality test, homogeneity test, average similarity test, regression and correlation analysis, analysis of variance, analysis of covariance, path analysis, and a structural equation model (SEM). Students will also learn to process and analyze data using special software so that it will help them in practical research activities. Lectures will be held with a case-based learning approach. Mastery of lecture material will assist students in conducting quality research.

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 أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

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
Week 2	Types of errors ,statistical symbols and mathematical process
Week 3	Central tendency in statistics
Week 4	Central tendency in statistics
Week 5	Dispersion tendency in Statistics
Week 6	Dispersion tendency in Statistics

Week 7	Central tendency in statistics
Week 8	Dispersion tendency in Statistics
Week 9	Dispersion tendency in Statistics
Week 10	Normal distribution
Week 11	Correlations
Week 12	Regression
Week 13	Sample distribution
Week 14	T test
Week 15	ANOVA
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Statistics and Chemometrics for Analytical Chemistry, James N Miller and Jane C Miller, Pearson Education Limited, Sixth edition 2010	Yes
Recommended Texts		
Websites	https://www.my-mooc.com/en/mooc/intro-to-descriptive-statistics--ud827/	

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	**Chemical safety and security**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**8**				
SWL (hr/sem)	**30**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name: Dr. may fahmi		**e-mail**	Mayfahmi2015@uoanbar.edu.iq	
Module Leader's Acad. Title	teacher		**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	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 Objectives أهداف المادة الدراسية	Helping the student know the most important basics of laboratory safety and security and knowing how to take safety precautions when conducting chemical reactions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and understanding 1- That the student understands the basic concepts in qualitative analysis 2- Understanding all detection methods and preparation methods. 3- Memorizing and understanding the equations for finding the concentration of a substance. B- Subject-specific skills 1- Classification of the chemical problem 2- Develop a plan to solve the problem 4- Use separation rates and methods to address the problem
Indicative Contents المحتويات الإرشادية	A- Teaching and learning methods 1- Giving lectures. 2- Using the method of presentation, discussion, and solving questions. 3- Giving students assignments to strengthen them and prepare them for the final and final exams. B- Evaluation methods 1- Daily and monthly exams 2- Duties 3- In-class exercises

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Developing the thinking skill by formulating questions and assignments that develops the student's abilities and increases his self-confidence and full readiness to understand and solve questions related to the subject.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

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.				
	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	Chemical health and safety, chemical risks, and safety methods
Week 2	safety tools
Week 3	Safety records for chemicals (MSDS)
Week 4	Risks and injuries in chemical laboratories / Types of risks in chemical laboratories
Week 5	A guide to fire prevention and how to act in the event of a fire
Week 6	Warning sign for the dangers of chemicals
Week 7	Explosive chemicals
Week 8	Eating toxins
Week 9	Toxic effects
Week 10	Safety precautions for experiments that require heating
Week 11	Methods of heating organic liquids
Week 12	Ventilation in laboratories
Week 13	Occupational safety and security conditions
Week 14	Chemical burns and methods of prevention
Week 15	Chemical health and safety, chemical risks, and safety methods
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	**Baseline survey on the implementation of laboratory chemical safety, health and security within health faculties laboratories at Universitas Indonesia,** ***J. Chem. Health Saf.*** **2016, 23, 4, 38–43** Publication Date:July 1, 2016. https://doi.org/10.1016/j.jchas.2015.11.002 **© 2015 American Chemical Society**	No
Recommended Texts	**Machine Learning and Deep Learning in Chemical Health and Safety: A Systematic Review of Techniques and Applications** **Cite this:** *ACS Chem. Health Saf.* 2020, 27, 6, 316–334 Publication Date:October 18, 2020 https://doi.org/10.1021/acs.chas.0c00075	No
Websites	- Mobile data show PowerPoint programs - Internet	

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 chemistryII**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐ **Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name: Dr. may fahmi		**e-mail**	Mayfahmi2015@uoanbar.edu.iq	
Module Leader's Acad. Title	teacher		**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	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 Objectives أهداف المادة الدراسية	59
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Representation and understanding of the study of salts, the major part of inorganic compounds, in which cations and anions are linked together by ionic bonds. Know the classification of inorganic compounds into oxides, carbonates, halides and sulfates, as they are distinguished by understanding many of them with a high melting point and poor conductivity of electricity in the solid state. Inorganic compounds are also characterized by their solubility in water and the ease of crystallization. Knowing the simplest types of inorganic reactions, the double displacement reaction, when two salts are mixed and the ions exchange without any change in the oxidation state.
Indicative Contents المحتويات الإرشادية	The origin of the quantum atom photoelectric effect [6 h] atomic spectra , Rutherford-and Bohr theory Schrödinger equation Quantum preparation, monthly exam [12 h] Periodic Table . The periodic table groups. Periodic table cycles transitional elements . Periodic properties of the periodic table Ionic compounds [15 h] Covalent Bonds - Molecular Orbital Theory monthly exam [6 h]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning. Guided Independent Study: Assessment preparation and completion Scheduled Learning And Teaching Activities: Lecture Scheduled Learning And Teaching Activities: Small group teaching

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

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.				
	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	Ionic compounds
Week 2	Conditions for the formation of ionic compounds
Week 3	As fair Bourne = Landy
Week 4	Born-Haber cycle
Week 5	Polarization of ionic compounds
Week 6	first month exam
Week 7	solubility of ionic compounds
Week 8	The structure of ionic crystals
Week 9	covalent bonds
Week 10	Basic rules and formative theories for the formation of the covalent bond

Week 11	Energy sequence of orbitals and rules for determining the electronic arrangement of an atom
Week 12	Molecular orbital theory
Week 13	The shapes of the molecules of covalent compounds
Week 14	Hybridization in compounds containing only SCMA
Week 15	Hybridization in compounds containing only Pi GLA
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	- Inorganic chemistry for the first stage - Dr. Manar Al-Hassani - Inorganic Chemistry - Dr. Noman Al Nuaimi - Dr. Monther Youssef Al-Janabi.(2008)	No
Recommended Texts	- Inorganic Chemistry - Comparative and Synthetic - Dr. Mahdi Naji Zakum. - Inorganic chemistry and life - d. Monther Youssef Al-Janabi2006.	No
Websites	- Mobile data show PowerPoint programs - Internet	

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	**Analytical chemistry**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☒ **Tutorial** ☐**Practical** ☒ **Seminar**	
Module Code					
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name: Dr. Marwan Abdula-Aziz		**e-mail**	Marwan.abdulaziz@uoanbar.edu.iq	
Module Leader's Acad. Title		teacher	**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		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 Objectives أهداف المادة الدراسية	Analytical Chemistry course - volumetric analysis according to the study plan prepared in the Department of Applied Chemistry. The course aims to introduce the student to the general concepts of quantitative volumetric analysis, volumetric preparation methods, and their uses in various chemical fields. It also aims to study in detail the volumetric analyses, which include direct and indirect titration analyses, such as acid and base tests, oxidation and reduction tests, precipitation tests, and complex formation tests.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- The student should know the general concepts of volumetric analyzes in analytical chemistry - The student should be familiar with the foundations and rules of selecting primary compounds and know the general classifications of acids and bases - The student should know the basic principles of methods for preparing solutions - The student will be familiar with the various foundations of neutralization reactions, oxidation-reduction reactions, precipitation reactions, and complex formation reactions.
Indicative Contents المحتويات الإرشادية	The origin of the quantum atom photoelectric effect [6 h] atomic spectra , Rutherford-and Bohr theory Schrödinger equation Quantum preparation, monthly exam [12 h] Periodic Table . The periodic table groups. Periodic table cycles transitional elements . Periodic properties of the periodic table Ionic compounds [15 h] Covalent Bonds - Molecular Orbital Theory monthly exam [6 h]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Scheduled Learning (SL): includes lectures, practical classes and workshops, peer group learning. Guided Independent Study: Assessment preparation and completion Scheduled Learning And Teaching Activities: Lecture Scheduled Learning And Teaching Activities: Small group teaching

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

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.	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	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	Volumetric methods of analysis
Week 2	Calculating of pH weak acid and base
Week 3	Calculating of pH of salts
Week 4	Buffer solution
Week 5	Calculating the pH of Buffer solution
Week 6	Buffer capacity
Week 7	Acid base titration
Week 8	Mid exam
Week 9	Acid base indicator theory

Week 10	Differential titration (mixture two acid)
Week 11	Precipitation titration
Week 12	Complexometric titration
Week 13	Solution Exercises
Week 14	monthly exam
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction
Week 2	Preparation of approximately (0.1N) HCl and (0.1 N) $CaCO_3$
Week 3	standardization of HCl with standard Solution of sodium carbonate
Week 4	Analysis of sodium carbonate
Week 5	Analysis of H_2SO_4 with sodium carbonate
Week 6	Analysis of mixture (NaOH + Na_2CO_3)
Week 7	Analysis of mixture ($NaHCO_3$ + Na_2CO_3)
Week 8	Introduction of precipitation reaction
Week 9	Analysis of chloride ion by Mohr method
Week 10	Introduction of oxidation-redaction reaction
Week 11	Preparation (0.1N) of $Na_2C_2O_4$ and standardization of $KMnO_4$ with $Na_2C_2O_4$
Week 12	Introduction of hardness of water
Week 13	Determination of total hardness of water
Week 14	**Preparatory week before the final Exam**
Week 15	Final EXAM

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- - Douglas A. Skoog; Donald M. West; F. James Holler, Fundamentals of Analytical Chemistry 9th Edition Cengage Learning (2014) NEW, YORK 1090 p	No

	Daniel C. Harris Quantitative Chemical Analysis 7 Edition 2007 .	
Websites	- Mobile data show PowerPoint programs - Internet	

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.