Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2025-2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are

followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .**Diyala**.....

Faculty/Institute: .**Science** .....

Scientific Department: .....**Chemistry**.....

Academic or Professional Program Name: **Academic Program of the Department of Chemistry**

Final Certificate Name: ..... **Bachelor's**.....

Academic System :**yearly for the fourth stage**, **semester system for the third stage**, **and Bologna path for the first and second stages**:

Description Preparation Date: **1-9-2024**

File Completion Date: **1-10- 2024**

Signature:

Head of Department Name:

Assist. Prof.Wassan Baqir Ali

Date:2-2-2025

Signature

Scientific Associate Name

prof .Dr,Munther Hamza Radhi

The file is checked by: **Assist Prof Ghasan Sabeeh Mahmood**

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 2-2-2025

Signature:

Approval of the Dean

Prof. Dr. Taha Mohammad Hasan

Approval of the Dean

1. Program Vision

The program aspires to prepare a special quality of high-level graduates with an academic background that combines the required basic knowledge and skills that qualifies them to meet the needs of society and graduate a generation of researchers capable of solving its problems in a scientific manner. The department also looks forward to progressing and upgrading a distinguished faculty and striving to have its research included in the lists of internationally prestigious scientific journals. . The department's academic programs must be distinguished and high-quality in both its teaching and research aspects.

2. Program Mission

The program's mission is an Complementary part of the mission of the College of Science, which works hard to benefit from all types of knowledge of science and knowledge to provide society with qualified and efficient scientific cadres in solving the many dilemmas in the fields of industry, agriculture, health, environment, and others, in addition to opening horizons of cooperation with the various service and academic institutions and departments of the state to determine the country's need. Actual research keeping pace with scientific, technical and industrial development at the international level.

3. Program Objectives

- Preparing specialists familiar with the basics of chemistry in theory and practice who are able to fill the need of the labor market, in addition to teaching chemistry to students of other departments in the College of Science and some other colleges at the university.
- Conducting scientific research and trying to keep pace with the scientific development of chemistry.

- Cooperating with state institutions and the private sector by providing advice and scientific advice and conducting chemical analyses.

4. **Program Accreditation**
No

5. **Other external influences**
Is there a sponsor for the program? No

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**6**	**12**	**%8**	
College Requirements	**4**	**24**	**%15**	
Department Requirements	**24**	**120**	**%76**	
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
First/ 1st semester	Che-1112	Inorganic chemistry 1	4	-
	Che-1111	Qualitative Analytical Chemistry	3	3
	Che-1103	Physics	3	3
	Che-1104	Safety and chemical security	3	-
	UOD-12012	Arabic Language	3	-
	UOD-1106	Mathematics I	3	-
First/ 2nd semester	Che-1217	Volumetric Analytical Chemistry	3	3
	Che-1218	Inorganic Chemistry 2	4	-
	UOD- 1105	Human and democracy	3	-
	Che-12010	Cytology	3	2
	COS-12011	Computers program	1	2
	UOD-12012	English Language 2	2	
Second/ 1st semester	Che-23113	Gravimetric analytical chemistry	2	2
	Che-23114	Inorganic Chemistry III	2	2
	Che-23115	Thermodynamic Chemistry I	2	2
	Che-23116	Organic Chemistry I	2	2
	Che-23017	Nanotechnology	2	
	UD23	Computer II	1	2
	UD22	Arabic Language 2	2	2
Second/ 2nd semester	Che-24119	Separation methods	2	2
	Che-24120	Inorganic Chemistry IV	2	2
	Che-24121	Thermodynamic Chemistry II	2	2
	Che-24122	Organic Chemistry II	2	2
	UD24	Baath Party Crimes in Iraq	2	
	Che-24024	Statistics	2	
	UD21	English Language 2	2	
Third/ 1st semester	301CHKC	Kinetic chemistry	3	2
	302CHOC3	Organic Chemistry 3	2	2
	303CHIC1	Principles of Industrial chemistry	2	-
	304CHBC1	Biochemistry1	2	2

	305CHCC1	Coordination chemistry 1	2	2
	306CHEC	Environmental chemistry	2	-
Third/ 2nd semester	307CHEC	Electro chemistry	3	2
	308 CHOC4	Organic Chemistry 4	2	2
	309CHIC2	Industrial chemistry Applications	2	
	310BC2	Biochemistry 2	2	2
	311CC2	Coordination chemistry 2	2	2
	312SC	Surface Chemistry	2	-
	313EI	English languish	2	
Fourth	401CHGP	Graduate Project	2	6
Fourth	402CHQS	Quantum and Spectra	3	-
Fourth	403CHIC2	Industrial Chemistry2	2	2
Fourth	404CHBC2	Biochemistry2	2	2
Fourth	405CHIA	Instrumental Analysis	3	2
Fourth	406CHSI	Spectral Identification	1	2
Fourth	407CHH	Hormones	2	-
Fourth	408CHCOA	Chemistry of the Atmosphere	2	-

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	– Enabling students to obtain knowledge and understanding of the intellectual framework of chemistry. – Enabling students to obtain knowledge and understanding of international chemical standards. – Enabling students to obtain knowledge and understanding of the laws of chemistry. – Enabling students to obtain knowledge and understanding of chemical analysis standards. – Enabling students to obtain knowledge and understanding of the law of misuse of chemicals.
Skills	
Learning Outcomes 2	The solutions to many of the problems that computer scientists solve are not always obvious and instead require these individuals to think outside the box.
Learning Outcomes 3	Collaboration is often necessary in professional settings. Students must learn to work effectively in teams, communicate clearly, resolve conflicts, and assume leadership roles when necessary.
Ethics	
Learning Outcomes 4	Graduates will learn about ethical dilemmas in the field of handling chemical compounds, adhere to professional codes of conduct, and respect the principles of privacy and security.
Learning Outcomes 5	Understand the ethical, social and legal issues related to work in all areas of chemistry and demonstrate ethical behavior and professional responsibility in all aspects of their work

9. Teaching and Learning Strategies

Providing students with the basics and topics related to knowledge and systems described in:

A – Clarification and explanation of study materials by the academic staff through the blackboard, smart board, and computer.

B– Providing students with knowledge through homework assignments for academic vocabulary

C- Asking students to visit the library to obtain additional knowledge of academic subjects

D- Improving students' skills by visiting websites to obtain additional knowledge of academic subjects

10. Evaluation methods

Daily and monthly tests with multiple-choice questions for academic subjects

- Grades for sharing difficult competitive questions for students
- Assigning grades to assigned homework
- Student activities

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
professor	chemistry	Physical chemistry			2	
Assistant Professor	chemistry	Physical chemistry			2	
Assistant Professor	chemistry	Biochemistry			4	
Assistant Professor	chemistry	organic chemistry			3	
Assistant Professor	chemistry	inorganic chemistry			3	
Assistant Professor	chemistry	Industrial chemistry			2	
Assistant Professor	chemistry	analytical chemistry			2	
Lecturer	chemistry	organic chemistry			3	

Lecturer	**chemistry**	**Biochemistry**			**6**	
Lecturer	**chemistry**	**inorganic chemistry**			**1**	
Lecturer	**chemistry**	**Physical chemistry**			**2**	
Lecturer	**chemistry**	**Industrial chemistry**			**2**	
Lecturer	**Mathematics**	**Pure mathematics**			**1**	
assistant Lecturer	**chemistry**	**Lecturer**			**4**	
assistant Lecturer	**chemistry**	**inorganic chemistry**			**4**	
assistant Lecturer	**chemistry**	**Physical chemistry**			**5**	
assistant Lecturer	**chemistry**	**analytical chemistry**			**5**	
assistant Lecturer	**chemistry**	**Biochemistry**			**2**	

Professional Development
Mentoring new faculty members
By participating in training courses, seminars and workshops on modern teaching methods
Professional development of faculty members
- Follow up on scientific development by contacting international universities via the Internet - Participation in scientific conferences inside and outside the country - Participation in scientific workshops and seminars inside and outside the country - Field visits in industrial projects.

12. Acceptance Criterion

((**Central - Scientific**)

According to the requirements of the Ministry of Higher Education and Scientific Research, so that it matches the latest admission requirements in Iraqi universities

13. **The most important sources of information about the program**
- Methodological books approved by the sectoral committee for colleges of science. - The website of the college and university - Helping books - Local scientific trends - Global scientific requirements

14. Program Development Plan
Curriculum development: By adding modern topics that keep pace with the continuous development in chemistry. Developing and training faculty members: through their participation in seminars, courses, and attendance at scientific conferences for the purpose of being informed of the latest developments. Laboratory development: In cooperation with the Deanship of the College, work is being done to develop the laboratories of the Chemistry Department

- **Please tick the boxes corresponding to the individual program learning**

Program Skills Outline

Course Code	Course Name	Basic or optional	Required program Learning outcomes									
			Knowledge				Skills				Ethics	
			A1	A2	A3	A4	B1	B2	B3	B4	C1	C2
301 CHKC	Kinetic chemistry	Basic	√	√	√	√	√	√	√	√	√	√
302 CHOC3	Organic Chemistry 3	Basic	√	√	√	√	√	√	√	√	√	√
303 CHIC1	Principles of Industrial chemistry	Basic	√	√	√	√	√	√	√	√	√	√
304 CHBC1	Biochemistry1	Basic	√	√	√	√	√	√	√	√	√	√
305 CHCC1	Coordination chemistry 1	Basic	√	√	√	√	√	√	√	√	√	√
306 CHEC	Environmental chemistry	Basic	√	√	√	√	√	√	√	√	√	√
307 CHEC	Electro chemistry	Basic	√	√	√	√	√	√	√	√	√	√
308 CHOC4	Organic Chemistry 4	Basic	√	√	√	√	√	√	√	√	√	√
309 CHIC2	Industrial chemistry Applications	Basic	√	√	√	√	√	√	√	√	√	√
310 BC2	Biochemistry 2	Basic	√	√	√	√	√	√	√	√	√	√
311 CC2	Coordination chemistry 2	Basic	√	√	√	√	√	√	√	√	√	√
312 SC	Surface Chemistry	Basic	√	√	√	√	√	√	√	√	√	√
313 EI	English languish	Basic	√	√	√	√	√	√	√	√	√	√
401 CHGP	Graduate Project	Basic	√	√	√	√	√	√	√	√	√	√
402 CHQS	Quantum and Spectra	Basic	√	√	√	√	√	√	√	√	√	√
403 CHIC2	Industrial Chemistry2	Basic	√	√	√	√	√	√	√	√	√	√
404 CHBC2	Biochemistry2	Basic	√	√	√	√	√	√	√	√	√	√
405 CHIA	Instrumental Analysis	Basic	√	√	√	√	√	√	√	√	√	√
406 CHSI	Spectral Identification	Basic	√	√	√	√	√	√	√	√	√	√
407 CHHCC	Heterocyclic Compounds	Basic	√	√	√	√	√	√	√	√	√	√

outcomes under evaluation.

Level One

Semester One

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Qualitative Analytical Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1111**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Chemistry		**College**	College of Science	
Module Leader	Ekhlas Ahmed Abdulkareem		**e-mail**	ekhlasahmed@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant teacher		**Module Leader's Qualification**	Msc	
Module Tutor	Name (if available)		**e-mail**	Khloosa123aa@gmail.com	
Peer Reviewer Name	Ekhlas Ahmed Abdulkareem		**e-mail**	ekhlasahmed@uodiyala.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Throughout this course, we will focus on the following learning objectives: 1. Understand the fundamental concepts of chemical equilibrium 2. Parameterize solution behavior and calculate solution concentrations given the appropriate equilibrium constants 3. Apply knowledge of equilibrium constraints to a range of systems of interest including solubility, acid/base chemistry, complex formation, oxidation/reduction, hydrolysis, and phase partitioning. 4. Investigate solution behavior using electrochemical methods, including potentiometry, voltammetry, and ion selective electrodes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the principles of qualitative analysis: * Describe the theoretical basis of classical and modern qualitative analysis techniques. * Explain the chemical reactions involved in group and specific ion analysis. 2. Identify and classify cations and anions in mixtures: * Systematically detect and confirm the presence of inorganic ions using classical group separation schemes. * Apply solubility rules, complexation, precipitation, and redox reactions in qualitative analysis. 3. Demonstrate proficiency in laboratory techniques: * Perform wet chemistry techniques such as precipitation, filtration, centrifugation, and spot tests with proper safety and accuracy. * Handle reagents, glassware, and samples responsibly and in accordance with laboratory safety procedures. 4. Interpret qualitative data and draw conclusions: * Analyze observed chemical reactions (e.g. color change, precipitate formation) and deduce the identity of unknown compounds. * Record and report qualitative results in a clear, logical, and scientifically valid manner.

	5. Apply analytical reasoning to solve problems: * Design a flowchart or procedural plan for the identification of unknown mixtures. * Troubleshoot common issues encountered during qualitative analysis procedures. 6. Evaluate the limitations and reliability of qualitative methods: * Critically assess sources of error and interferences in qualitative tests. * Compare qualitative analysis with quantitative and instrumental techniques in terms of sensitivity and specificity.
Indicative Contents المحتويات الإرشادية	This course offers a comprehensive introduction to Analytical Chemistry, laying a strong foundation in its core concepts and methodologies. It is structured to equip students with essential theoretical knowledge and practical skills necessary for accurate chemical analysis and experimentation. Throughout the program, students will gain in-depth insight into various analytical techniques, mastering the principles that govern them. Emphasis is placed on precise calculations, critical interpretation of data, and systematic evaluation of chemical samples. Engaging laboratory sessions provide hands-on experience, reinforcing theoretical understanding and enhancing technical competence. By the end of the course, students will be capable of executing analytical procedures, addressing complex chemical problems, and contributing effectively to advancements within the field of analytical chemistry.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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**	5	10% (10)	2,4,6,8 and 10	LO #1, #2, #4, #6 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)	8	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 analytical chemistry, its types and applications
Week 2	Volumetric analysis and its requirements And the types of solutions and their specifications

Week 3	Methods of expressing the concentration of solutions The most important laws used
Week 4	Solve mathematical examples for calculations concentration of different solutions
Week 5	Chemical balances and constants balance and how to use it in the chemical balance calculations
Week 6	Acids, bases and their types And the presumption and its salts and accounts hydrogen concentration
Week 7	Types of corrections and how Perform correction calculations How to choose the guides
Week 8	**Midterm Exam**
Week 9	Acid and base bleaching And their types
Week 10	Acids and bases corrections power and adjustment accounts and the types of evidence used
Week 11	Acids and bases corrections and its types, and how it is performed accounts
Week 12	Buffering solutions and their specifications How to prepare and make an account acidity function
Week 13	Acidity of solutions and agents affecting them, such as forces ionic and effective coefficient and strong acids and bases
Week 14	multiple acids and how Calculating the acidity and how to make corrections
Week 15	The most important applications of neutralizers in the field of environment, industry and biological analyzes And change it
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction in qualitative analysis
Week 2	Lab 2: Analysis of catione
Week 3	Lab 3: The theoretical basis for the analysis of the first group of group cations (group silver)
Week 4	Lab 4: The practical basis for the analysis of the first group of group cations (group silver)
Week 5	Lab 5: First exam - first semester

Week 6	Lab 6:The theoretical basis for the separation of the second group of positive ions (copper-arsenic)
Week 7	Lab 7: The practical basis for separating the second group of positive ions (copper-arsenic)
Week 8	Lab 8: A test on the analysis of anonymous samples of the second group
Week 9	Lab 9: Characteristic descriptive interactions of the third group ions
Week 10	Lab 10: A test on the analysis of the known samples of the third group
Week 11	Lab 11: A test on the analysis of anonymous samples of the third group
Week 12	Lab 12: Characteristic descriptive interactions of the four group ions
Week 13	Lab 13: A test on the analysis of the known samples of the four group
Week 14	Lab 14: A test on the analysis of anonymous samples of the four group
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M. West Eight Edition	Yes
Recommended Texts	Analytical Chemistry, Gary Christian Sixth Edition	No
Websites	www.bytoco.com	

Grading Scheme

مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group **(0 – 49)**	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1112**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Jinan Mohammed Mahmoud		**e-mail**	jinan.mohammed@uodiyala.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	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	This module aims to: 1. Introduce the fundamental principles of inorganic chemistry, including atomic structure, chemical bonding, periodicity, and redox chemistry. 2. Develop an understanding of the periodic table as a tool for predicting the physical and chemical behavior of elements, particularly main group (s- and p-block) elements. 3. Explain the structure and bonding of molecules and solids, using classical and modern bonding theories such as VSEPR and Molecular Orbital Theory. 4. Familiarize students with acid-base and redox concepts, relevant to inorganic systems, including the use of oxidation numbers and acid-base classifications. 5. Explore the structures of crystalline solids, including types of unit cells and how they relate to material properties.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A- Cognitive goals** 1- Enable students to obtain knowledge and understanding of inorganic chemistry. 2- Enable students to obtain knowledge and understanding of the chemical elements in the periodic table. 3- Enable students to obtain knowledge and understanding of the chemical structures of inorganic compounds. 4- Enable students to obtain knowledge and understanding of reactions in inorganic chemistry. 5- Enable students to obtain knowledge and understanding of practical experiments in inorganic chemistry. **B - The soft skills objectives of the course** 1 - knowledge skills - remembering. 2 - application and analysis skills. 3 - Use and development skills. 4- evaluation and creativity skills.
Indicative Contents المحتويات الإرشادية	This semester focuses on the study of atomic structure and the electronic configuration of elements, along with their arrangement in the periodic table according to groups and periods. The course covers the rules and regulations governing the allowed orbitals for electron placement in the main shells. It also explores the periodic

	properties of elements. Additionally, the course addresses the atomic states (term symbols) of elements to facilitate investigation into the properties and crystal structures of ionic compounds.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 11	LO #3, #4 and #6, #9
	Assignments	2	10% (10)	4 and 12	LO #5, #7 and #10, #11
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, #2 and #12
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction about inorganic chemistry , Atomic structure :Basic structure atom , Rutherford nuclear atom, The origins of radiation, Wave properties of radiation , intra nuclear processes radioactivity.
Week 2	Theory of Bohr's model of hydrogen atom : Fall through Bohr theory and hydrogen-like atoms, modification of Bohr's theory (Elliptical Orbit , Zeeman effect, Fine structure).
Week 3	De Broglie Waves in the hydrogen Atom , Heisenberg's uncertainty principle , The Schrödinger equation, Quantum numbers.
Week 4	Examples and solutions
Week 5	Atomic orbital's
Week 6	Periodic table , Reading the periodic table, Electron configuration :Aufbau principle , Pauli exclusion principle , Hund's rules of maximum multiplicity
Week 7	Classification of elements : Based on their general properties , the representative elements.
Week 8	**Midterm Exam**
Week 9	Atomic Term symbols: Assigning Term symbols , Microstates.

Week 10	Examples and solutions
Week 11	Periodic Trends :Shielding and effective nuclear charge.
Week 12	Ionization Energy (IE)or Ionization Potential (IP) , Atomic radius, Metallic radius .
Week 13	The electronegativity :Calculation of electronegativity .
Week 14	Electron affinity.
Week 15	Examples and solutions
Week 16	**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	الكيمياء اللاعضوية ، تأليف الدكتورة ثناء جعفر محمد الحسني ، 1989	Yes
Recommended Texts	Inorganic Chemistry principles of structure and reactivity 4th ed, by James E. Huhhey et al, Harper Collins college Puplishers (1993) Inorganic Chemistry, 5th Edition; Gary. L. Miessler and	No

	Donald . A. Tarr (2014).	
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Physics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1103**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
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	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 provide students with a strong foundation in the fundamental principles of physics. 2. To prepare qualified specialists in general physics and its practical applications, capable of addressing national development needs and meeting the demands of the job market across governmental institutions and industrial sectors. 3. To cultivate an educated generation equipped with scientific knowledge and methodologies, fostering critical thinking, analysis, and adaptability to technological advancements, in line with the expanding needs of society. 4. To strengthen the university's engagement with society by offering expert consultancy, training programs, and professional development opportunities for both academic and administrative staff. 5. To prepare graduates specialized in physics, who are ready to contribute meaningfully to national progress and development. 6. To fulfill the demands of various sectors by providing highly qualified personnel in the field of physics. 7. To encourage outstanding students in physics to join the department as teaching assistants, paving the way for their future roles as members of the academic teaching staff.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Describe the major concepts in physics. Demonstrate an appropriate level of competency in both computer and research laboratory skills. Formulate hypotheses and devise and perform experiments to test a hypothesis as individuals and in a team. Effectively apply current technology and scientific methodologies for problem solving in various scientific, professional and community settings. Effectively use and critically evaluate current technical/scientific research literature, online information, as well as information related to scientific issues in the mass media. Integrate and relate scientific knowledge learned from classroom with real life situations. Communicate in written and oral forms with interested citizens and professionals on key concepts in physics and general scientific issues.

	Work cooperatively as part of a research team. Maintain life-long learning in the sciences and incorporate new information into the existing body of knowledge. Outline the applications of physics in industry and the role of physicists as entrepreneurs.
Indicative Contents المحتويات الإرشادية	• Mechanics - kinematics, forces, work and energy, momentum, circular motion, rotational motion • Materials • Fields - static electricity • Waves/light - sound, optics, • Electricity/magnetism - d.c. electricity, a.c. electricity, motors, generators, transformers • Atomic/nuclear • Particle physics • Astronomy/cosmology • Medical physics • Thermodynamics - heat, temperature • Quantum physics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	56	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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**	5	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)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Measurement, Dimensions, Units of measurement, Measurement systems, Dimensional analysis
Week 2	Vectors and their compounds, Unit vectors
Week 3	Vector Addition and Multiplication of Vectors
Week 4	Linear motion in one dimension
Week 5	Force and its types and Newton's laws of motion
Week 6	Equilibrium and Work
Week 7	Energy and Power
Week 8	**Midterm Exam**
Week 9	Material properties, Density, Elasticity and Hooke's law
Week 10	Electrostatics, Coulomb's law and Electric field
Week 11	Capacitors and Electric current
Week 12	Resistors and Ohm's
Week 13	Electric potential
Week 14	Magnetism and Magnetic field
Week 15	Biot-Savart's law and Ampere's
Week 16	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Safety instructions in the laboratory
Week 2	Explain how to write a report and chart
Week 3	Ohm's law
Week 4	Calculate the resultant forces that meet at one point using the vector method, and verify the validity of the result by drawing squares on the forces board
Week 5	Find the ground Acceleration using a Pendulum
Week 6	Calculate the melting point of the wax from the cooling curve
Week 7	Calculating the focal length of a lens by displacement method

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamental of Physics (Halliady, Resnick, and Walker).	Yes
Recommended Texts	Electromagnetic theory (book). 2000.vol.1	Yes
Websites	https://www.coursera.org/browse/physical-science-and engineering/ electricalengineering	

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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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	**Safety and chemical security**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Cos-1104**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Noor Sabah Ahmed		**e-mail**	noorsabah@uodiyala.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	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	1. To teach students the fundamental principles of chemical safety and promote awareness of potential hazards in laboratory environments. 2. To provide students with essential knowledge of proper laboratory design and specifications, ensuring a safe and efficient working environment. 3. To develop students' understanding of the correct application of safety and security protocols in chemical laboratories. 4. To train students on the proper handling and usage of chemicals and laboratory glassware, fostering good laboratory practices. 5. To encourage critical thinking by assigning external questions as homework, giving students the opportunity to analyze, explore, and find solutions independently. 6. To motivate students to conduct reports and research related to their coursework, promoting the use of modern research tools and technologies—such as the internet—to enhance their scientific and research skills. 7. To prepare graduates specialized in chemistry who are equipped to contribute effectively to the country's scientific and industrial development. 8. To meet the demands of various sectors by providing highly qualified professionals** in the field of chemistry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the subject, students will be able to: (a) apply the basic and common techniques used in biological and chemical laboratories; (b) comply with the general laboratory safety, the biological safety and the chemical safety regulations; (c) use laboratory equipment, apparatus, and preparation of reagents and solutions correctly; (d) perform accurate observations in laboratory practices; (e) write the laboratory report in a properly written form with data
Indicative Contents المحتويات الإرشادية	Laboratory Safety General laboratory safety practices; Hazards and risk assessment; General principles of biosafety; Basic laboratories – Biosafety Levels 1 and 2; Equipment designed to reduce biological hazards;

	Safe laboratory techniques; disinfection and sterilisation; Hazards associated with chemicals and chemical waste; General knowledge on the handling, storage and disposal of chemicals and chemical wastes; Personal protection and protective clothing for handling of potentially hazardous chemicals, chemical wastes and spillages; Laws pertaining to the handling and storage of chemicals: dangerous goods, controlled chemicals, dangerous substances used in industry, disposal of chemical waste and others.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	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)	8	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 of Chemical Safety and Security,general Chemistry Safety and Laboratory Rules
Week 2	Common Laboratory Glassware and Equipment
Week 3	General information to laboratory staff ,Chemical storage and how to store chemical.
Week 4	Acids Bases and Salts
Week 5	Lab Safety Symbols and Hazard Signs
Week 6	Principles of Green Chemistry
Week 7	LABORATORY CHEMICAL WASTE MANAGEMENT
Week 8	**Midterm Exam**
Week 9	Lab building requirements
Week 10	Rules and precaution need to deal safely with chemicals.

Week 11	Personal protection equipment, chemicals handing and transfer to the department in the safe way
Week 12	Lab accidents and how to deal with, avoiding and protection from fires,
Week 13	chemical waste storage, burning and disposal
Week 14	Selling and purchasing of chemicals, receiving, recording chemical data, delivery to storage,
Week 15	safe storage of solvents, flammable and explosive chemicals
Week 16	**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	Estridge, B.H. & Reynolds, A.P. (2012). Basic Clinical Laboratory Techniques. (6th ed.), Thomson Delmar Learning Publishers.	
Recommended Texts	Bisen P.S. (2014). Laboratory Protocols in Applied Life Sciences. CRC Press.	

	Brown J.K. Biotechnology (2011). A Laboratory Skills Course. (1st ed.), Hercules BioRad Laboratories. Fleming & Hunt (Editors) (2017). Biological Safety Principles and Practices. (5th ed.), ASM Press.	
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	**Mathematics**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1106**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Suhad Kareem Hamid		**e-mail**	suhadkareem@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	MSc	
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	Teaching the student functions and the concept of continuity for functions and inequalities, as well as derivation, methods of integration and operations on them, and how to use them in various scientific subjects and harness them to solve mathematical problems that they face in various scientific subjects. Teaching and educating students on all the necessary and necessary information related to mathematics, which qualifies them to model scientific concepts into mathematical equations..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Enabling students to obtain knowledge and understanding of modern mathematics A2- Enable students to obtain knowledge and understanding of the structure of functions and equations, test their properties, and perform integrations and differentials on them. A3- Enabling students to obtain knowledge and understanding of mathematical integrations and differentials of functions. A4- Enabling students to obtain knowledge and understanding of numerical analysis methods and types of equations B - The soft skills objectives of the course B1 - the skill of knowing - remembering B2 - Memory and analysis skills B3 - Use and modeling skills
Indicative Contents المحتويات الإرشادية	Subtraction-minus, greater than, take away, fewer than, less than, subtract, decreased by. Multiplication-product, multiply, multiplied by, times. Division-quotient, dividend, divide, divided by, each, per, average, divided equally. Equal-the same, equals, the same as, equivalent, is equal to.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard.

	Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	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	Limits and continuity ,Estimating limits from graphs, Estimating limits from tables Formal definition of limits (epsilon-delta),Properties of limits,Limits by direct substitution, Limits using algebraic manipulation, Strategy in finding limit
Week 2	Continuity at a point, Continuity over an interval, Removing discontinuities, Infinite limits , Limits at infinity, Intermediate value theorem
Week 3	Derivatives: definition and basic rules, Estimating derivatives, definition and basic rules Differentiability, definition and basic rules, Power rule, chain rule and other More chain rule practice,chain rule and other advanced topic
Week 4	Implicit differentiation, Implicit differentiation (advanced examples), Differentiating inverse functions, Derivatives of inverse trigonometric function
Week 5	Second derivatives, Disguised derivatives, Logarithmic differentiation, exponentials differentiation
Week 6	Applications of derivatives,Approximation with local linearity, Applications of derivatives L'Hôpital's rule, L'Hôpital's rule, composite exponential functions
Week 7	Integrals ,Indefinite integrals of common functions, Integrals .Definite integrals of common Integrating with u-substitution,
Week 8	**Midterm Exam**
Week 9	Integrating using long division and completing the squares Integrating using trigonometric identities

Week 10	Integration of rational function, Integration by parts, Integration by fraction partition
Week 11	Sequences, Series and the integral test, Comparison tests
Week 12	Alternating Series, absolute convergence, ratio and root tests
Week 13	Strategy for testing series, Power series, representations of functions as power series
Week 14	Taylor and Maclaurin series
Week 15	Applications of Taylor polynomials
Week 16	**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	*Foundations of the Calculus*, DeBaggis, Henry F.; Miller, Kenneth S. (1966) Differential and Integral Calculus, Philip Franklin ·	Yes
Recommended	Limits and Continuity, Teddy C. J. Leavitt	No

Texts		
Websites	https://www.cuemath.com/calculus/	

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	**اللغة العربية 1**			**Module Delivery**	
Module Type	**Basic learning activities**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UD12**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGI	**Semester of Delivery**		
Administering Department		All	**College**	All	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Lecturer	**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		3/11/2024	**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	الهدف الأساس في تدريس اللغة العربية للأقسام العلمية : • اخذ الطالب الى روعة بيان القران الكريم ، وادراكه يقينا ان التعبير القراني تعبير فني مقصود ، كل لفظة ، وكل حرف وضع وضعا فنياً مقصوداً • تقويم اللسان العربي . واعتماد العربية الفصحى في الحديث والكتابة ، ولزيادة رصيد الطالب من ادب وتراث ، على تناول النصوص المختارة من العصور الأدبية المختلفة ، لزيادة رصيد ادب لتراث والادب المعاصر . • التأكيد على دور الطالب في المتابعة واثراء المعرفة باللغة العربية وفنونها بجهد خاص ، ذا ما وضعنا مفاتيح المنهاج الدراسي لتقع على الطالب بعد ذلك مهمة فتح الأبواب والنوافذ الى مصادر المعرفة الواسعة . في جعل العربية الفصيحة تحتل موضع الصدارة وتجاوز العامية ، خدمة الى لغتنا العربية المقدسة. وحفاظا على قوتها وجمالها . • ومن نافلة القول في اهداف تدريس اللغة العربية : هي الجانب المحقق للوحدة وتلزمنا دوافع الوفاء بالحرص عليها والمحافظة على جوهرها .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	يمكن ايجاز مخرجات العلم لمادة اللغة العربية العامة لاقسام غير الاختصاص بالنسبة لمرحلة الدراسة الأولى بالاتي :- 1 - سيتمكن الطالب من التعرف على خصائص اللغة العربية كلغة سامية ، وفهم الخصائص المشتركة للغات السامية ، ومكانة اللغة العربية ضمن هذه العائلة اللغوية مما يعزز من ادراكه لاصولها وتطورها عبر التاريخ . 2- تحليل أصوات اللغة العربية من حيث أماكن وطرق النطق ، والتمييز بين مختلف الأصوات العربية . 3- معالجة القضايا الصرفية وتحليل بنية الكلمات العربية ، وفهم كيفية تكوينها وتغييرها لأداء معان مختلفة مما يطور مهاراته في تكوين وصياغة الكلمات بشكل صحيح . 4- تحديد التراكيب النحوية في اللغة العربية واستخدامها بشكل سليم مما يعزز قدرته على بناء جمل صحيحة نحويا ومعبرة بوضوح . 5- فهم العلاقات الدلالية مثل الترادف والتضاد والتضمين بين الكلمات مما يوسع من ادراكه لمعاني الكلمات ، وتوظيفها في سياقات مختلفة . 6- اتباع قواعد الاملاء الصحيحة وتطبيقها مما يسهم في تحسين كتابته ويضمن وضوح المعنى ، ودقته . 7- تحليل الأنواع الأدبية وتوظيف البلاغة في التعبير مما يعزز من فهمها للنصوص الأدبية ويطور مهارته في الكتابة بأسلوب مؤثر وبلاغي.
Indicative Contents المحتويات الإرشادية	1- مقدمة حول اللغة العربية كجزء من اللغات السامية • التعريف باللغة العربية واصولها واهم خصائصها . • مكانة اللغة العربية ضمن عائلة اللغات السامية وتاريخ تطورها . • دراسة خصائص اللغة العربية المتأصلة في جذورها السامية . 2- أصوات اللغة العربية : النطق والأداء • مقدمة في علم الصوتيات واهمية الفهم الدقيق لاصوات اللغة . • تقسيم الأصوات حسب أماكن النطق : الأصوات الحلقية ، الشفوية ، اللثوية وغيرها . • دراسة طرق النطق المختلفة (مثل : الانفجار والاحتاك) والتطبيقات العلمية للنطق الصحيح 3- التحليل الصرفي للكلمات العربية .

	• شرح أساسي لبنية الكلمة في اللغة العربية واهمية الصرف في بناء المعنى . • دراسة أنواع الكلمات من حيث البناء مثل الأفعال والاسماء والمشتقات . • كيفية تكوين الجذور والاوزان وفهم الصيغ الصرفية المستخدمة في اللغة العربية . • دراسة اساسيات النحو العربي وقواعد الجملة العربية . • التعرف على تراكيب الجملة الفعلية والاسمية والمركبة . • تطبيقات على تركيب الجمل وتصحيحى الأخطاء النحوية الشائعة . • العلاقات الدلالية بين المفردات . • التعريف بالدلالت المختلفة للكلمات والعلاقات بينها مثل الترادف والتضاد • فهم معاني الكلمات في السياقات المختلفة وتوضيح كيفية تداخل المعاني . • دراسة المصطلحات اللغوية المختلفة وطرق استخدامها لتحقيق الدقة في التعبير . • قواعد الاملاء الصحيحة . • أهمية الاملاء في تحسين جودة الكتابة وضمان وضوح المعنى . • دراسة القواعد الأساسية للإملاء ، مثل قواعد الهمزة والالف المقصورة والممدودة . • تدريبات على كتابة القواعد الاملائية بشكل صحيح ؛ لتجنب الأخطاء الكتابية الشائعة . • الادب العربي والبلاغة ، التعرف على الأنواع الأدبية الأساسية مثل : الشعر والنثر والمقالة والقصة . • دراسة الأساليب البلاغية في الادب العربي، واهم أدوات البلاغة مثل التشبيه والاستعارة والمجاز والكناية . • تحليل النصوص الأدبية ، وتوظيف البلاغة في الكتابة لزيادة التأثير والقوة في التعبير .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	ليحقق التدريسي اهداف ونواتج التعلم المستهدفة لا بد من تحقيق الاتي : ١_ التركيز على استراتيجيات تقود الى التعلم النشط ، والتأكيد على دور المتعلم واثارة اهتمامه ودفعه الى المشاركة الايجابية ٢_ الاكثار من النصوص العربية العالية ٣_ وان نعد بعض القطع للقراءة يمتزج فيها درس القواعد بدرس الادب؛ فان ذلك ادعى لتنمية ذوق الطالب في الفهم والحس والكلمات والاساليب واستعمالها . ٤_ منح التدريسي حرية اختيار قطع للقراءة من كتب الادب والنصوص ومن ادب المناسبات الذي ينشر في الصحف والمجلات ، لتصحيح النطق عند الطالب ، وتعويده على القراءة الصحيحة الخالية من اللحن . ٥_ تقع على عاتق التدريسي مهنة اساسية وهي التشويق والتقويم والتصويب في تدريسه اللغة_ العربية العامة لأقسام غير اختصاص . ٦_ تنشيط عنصر الاعتزاز باللغة العربية لدى طالب العلم وتأصيله والعمل على زرع محبته للغة العربية بوصفها اللغة الام لغة القران الكريم لغة الاعجاز والبيان . من خلال عرضه لقصص تراثية تتعلق بحرص العربي على لغته والاعتزاز بها .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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**	4	20% (5)	3 , 6,8,11	LO #1...#3, #4...#6, #7&#8, #9... #11
	Assignments	2	10% (5)	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**	1hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**(الفصل الأول) التعبير القرآني): نص قراني محدد من سورة الكهف (قصة موسى والخضر عليهم السلام) من الاية رقم "60" الى الاية رقم "82" .**
Week 2	**المهارات اللغوية : (1) الحروف الشمسية و القمرية .**
Week 3	**(3) كتابة حرفي الضاد و الظاء .**
Week 4	**(4) كتابة التاء المربوطة و الطويلة .**
Week 5	**(5) علامات الترقيم .**
Week 6	**(الفصل الثاني) الأصوات و المعجم العربي : (6) الأصوات العربية : الأصوات الصامتة و الصائتة .**
Week 7	**(7) أنواع المعاجم (معجمات الألفاظ و معجمات المعاني) و طريقة استخراج الألفاظ من المعجم .**
Week 8	**(الفصل الثالث) القواعد النحوية : (8) أنواع الكلم (الاسم ، و الفعل ، و الحرف) .**
Week 9	**(9) المفرد ، و المثنى ، و الجمع ، و علامات إعرابها .**

Week 10	(10) الجملة الفعلية و الجملة الاسمية .
Week 11	(11) من الأدوات النحوية : أدوات الجر ، أدوات نصب الفعل المضارع ، أدوات جزم الفعل المضارع .
Week 12	(الفصل الرابع) البلاغة و الأدب : (12) من الفنون البلاغية : التشبيه .
Week 13	(13) نصوص من (الشعر الجاهلي = امرئ القيس) ، و (الإسلامي = حسان بن ثابت) .
Week 14	(14) نصوص من (الشعر العباسي = المتنبي) ، و (الأندلسي = الموشحات) .
Week 15	(15) نصوص نثرية عربية قديمة (الخطب ، و الوصايا ، و المقامات) .

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	1 – التعبير القرآني - تأليف الدكتور فاضل السامرائي 2--اللغة العربية العامة لأقسام غير الاختصاص / تأليف مجموعة من أساتذة اللغة العربية. 3- شذا العرف في فن الصرف – تاليف الدكتور احمد الحملاوي 4- البلاغة الواضحة ا – تاليف الدكتور احمد مطلوب	
Recommended Texts		
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	**Mathematics**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1106**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Suhad Kareem Hamid		**e-mail**	suhadkareem@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	MSc	
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	Teaching the student functions and the concept of continuity for functions and inequalities, as well as derivation, methods of integration and operations on them, and how to use them in various scientific subjects and harness them to solve mathematical problems that they face in various scientific subjects. Teaching and educating students on all the necessary and necessary information related to mathematics, which qualifies them to model scientific concepts into mathematical equations..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Enabling students to obtain knowledge and understanding of modern mathematics A2- Enable students to obtain knowledge and understanding of the structure of functions and equations, test their properties, and perform integrations and differentials on them. A3- Enabling students to obtain knowledge and understanding of mathematical integrations and differentials of functions. A4- Enabling students to obtain knowledge and understanding of numerical analysis methods and types of equations B - The soft skills objectives of the course B1 - the skill of knowing - remembering B2 - Memory and analysis skills B3 - Use and modeling skills
Indicative Contents المحتويات الإرشادية	Subtraction-minus, greater than, take away, fewer than, less than, subtract, decreased by. Multiplication-product, multiply, multiplied by, times. Division-quotient, dividend, divide, divided by, each, per, average, divided equally. Equal-the same, equals, the same as, equivalent, is equal to.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #7

assessment	**Final Exam**	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Limits and continuity ,Estimating limits from graphs, Estimating limits from tables Formal definition of limits (epsilon-delta),Properties of limits,Limits by direct substitution, Limits using algebraic manipulation, Strategy in finding limit
Week 2	Continuity at a point, Continuity over an interval, Removing discontinuities, Infinite limits , Limits at infinity, Intermediate value theorem
Week 3	Derivatives: definition and basic rules, Estimating derivatives, definition and basic rules Differentiability, definition and basic rules, Power rule, chain rule and other More chain rule practice,chain rule and other advanced topic
Week 4	Implicit differentiation, Implicit differentiation (advanced examples), Differentiating inverse functions, Derivatives of inverse trigonometric function
Week 5	Second derivatives, Disguised derivatives, Logarithmic differentiation, exponentials differentiation
Week 6	Applications of derivatives,Approximation with local linearity, Applications of derivatives L'Hôpital's rule, L'Hôpital's rule, composite exponential functions
Week 7	Integrals ,Indefinite integrals of common functions, Integrals .Definite integrals of common Integrating with u-substitution,
Week 8	**Midterm Exam**
Week 9	Integrating using long division and completing the squares Integrating using trigonometric identities

Week 10	Integration of rational function, Integration by parts, Integration by fraction partition
Week 11	Sequences, Series and the integral test, Comparison tests
Week 12	Alternating Series, absolute convergence, ratio and root tests
Week 13	Strategy for testing series, Power series, representations of functions as power series
Week 14	Taylor and Maclaurin series
Week 15	Applications of Taylor polynomials
Week 16	**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	*Foundations of the Calculus*, DeBaggis, Henry F.; Miller, Kenneth S. (1966) Differential and Integral Calculus, Philip Franklin ·	Yes
Recommended	Limits and Continuity, Teddy C. J. Leavitt	No

Texts		
Websites	https://www.cuemath.com/calculus/	

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.

Level One

Semester Two

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Volumetric Analytical Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1217**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Chemistry	**College**	College of Science	
Module Leader	Ekhlas Ahmed Abdulkareem		**e-mail**	ekhlasahmed@uodiyala.edu.i	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Msc
Module Tutor	Name (if available)		**e-mail**	ekhlasahmed@uodiyala.edu.i	
Peer Reviewer Name		Ekhlas Ahmed Abdulkareem	**e-mail**	Khloosa123aa@gmail.com	
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	Throughout this course, we will focus on the following learning objectives: 1. Understand the fundamental concepts of chemical equilibrium 2. Parameterize solution behavior and calculate solution concentrations given the appropriate equilibrium constants 3. Apply knowledge of equilibrium constraints to a range of systems of interest including solubility, acid/base chemistry, complex formation, oxidation/reduction, hydrolysis, and phase partitioning. 4. Investigate solution behavior using electrochemical methods, including potentiometry, voltammetry, and ion selective electrodes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this learning unit, the student is able to : This course aims to extend the fundamental formation of 'Analytical Chemistry I' to current instrumental analysis methods. The philosophy and strategy of this programme are identical to those described in . This course not only provides excellent practice in analytical techniques, but also allows the rigorous development of experimental schemes and analysis methods, relying on physical chemistry and analytical reasoning. The objectives of the practical exercises are the following : - To help the understanding of the course - To familiarize the students with the theory-experience relationship - To train the students in a professional practice in a chemistry laboratory - To instil a sense of initiative towards practical processes in the students
Indicative Contents المحتويات الإرشادية	**Class** Molecular absorption spectroscopy, atomic spectrometry and voltamperometric methods: equipment, performances and applications. Electrolysis-based analysis methods: analytical applications.

	Acid-base reactions in non-aqueous media: solvent types and pH calculations. Practical aspects of chromatography in liquid and gas phases. **Exercises** Analysis of samples where application of most of the techniques covered during the course is required. A complete analysis of a 'real' sample will be encouraged, for which the well-thought-out use of titrimetric and instrumental methods is necessary in order to determine the concentration of several ions of a solution. This process will allow the students: (i) to develop and discuss schemes and analysis methods with rigorous analytical reasoning. (ii) to obtain professional laboratory experience of current techniques.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics.

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
Unstructured SWL (h/sem)	106	**Unstructured SWL (h/w)**	7

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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**	5	10% (10)	2,4,6,8 and 10	LO #1, #2, #3, #6, #8, # 10 and #12, #14
	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)	8	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 Analysis, Classification and General Aspect for Volumetric Titrimetry
Week 2	Expressing the concentration of standard solutions
Week 3	Volumetric Calculations Using Molraity and calculations
Week 4	Volumetric Calculations Using Normality and calculations
Week 5	Titer (T) and calculations
Week 6	Back-titration and calculations

Week 7	Neutralization Titration and classifications
Week 8	**Midterm Exam**
Week 9	Theory of Neutralization Titrations of Simple Systems
Week 10	Type of Neutralization Titrations
Week 11	Titration curves
Week 12	Titration Curve for Strong Base vs. Strong Acid with calculations
Week 13	Oxidation and reduction and what oxidizing and reducing agents
Week 14	Evidence of oxidation and reduction And their types
Week 15	oxidizing and reducing agents types and applications
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to quantitative analysis
Week 2	Lab 2: Methods of expressing the concentrations of solutions in analysis and quantitative calculations related to volumeric analysis
Week 3	Lab 3:preparation of(0.1N) HCL solution and sandardization wih sodium carbonate
Week 4	Lab 4: preparation of(0.1N) NaOHL solution and sandardization it with(0.1N)HCL
Week 5	Lab 5: first exam
Week 6	Lab 6: Determintion of hardness of water
Week 7	Lab 7: preparation and sandardization of (0.1N)KMnO4
Week 8	Standardization of permanganate solution with oxalate ion
Week 9	Unknown solution: Practical exam.
Week 10	Determination the concentration of ferrous ion.
Week 11	Unknown solution: Practical exam.

Week 12	Complexometric titration, Determination of total hardness (permanent and temporary) of water
Week 13	Unknown solution: Practical exam.
Week 14	**Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M. West Eight Edition	Yes
Recommended Texts	Analytical Chemistry, Gary Christian Sixth Edition	No
Websites	www.bytoco.com	

Grading Scheme

مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-1218**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Jinan Mohammed Mahmoud		**e-mail**	jinan.mohammed@uodiyala.edu.iq	
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	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. Prepare a generation equipped with a solid foundation in general and inorganic chemistry, both in theoretical and practical contexts. Given the vital role of chemistry in all aspects of life, graduates will be capable of understanding the country's developmental needs and meeting the demands of the labor market across public institutions and the industrial sector. 2. Promote awareness and advancement in chemical sciences by producing qualified researchers and academic professionals who can adapt to rapid scientific and technological developments. Graduates will possess the skills necessary to operate laboratory equipment, synthesize novel compounds, and apply diverse analytical techniques relevant to pharmaceutical and industrial fields. 3. Make meaningful contributions to strengthening the university's engagement with the community by offering expert consultations, as well as by training and developing academic and administrative staff to serve societal needs. 4. Encourage outstanding students in the Chemistry Department to participate as teaching assistants, supporting their academic growth and preparing them for future roles as members of the teaching faculty.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A- Cognitive goals** 1- Enable students to obtain knowledge and understanding of inorganic chemistry. 2- Enable students to obtain knowledge and understanding of the chemical elements in the periodic table. 3- Enable students to obtain knowledge and understanding of the chemical structures of inorganic compounds. 4- Enable students to obtain knowledge and understanding of reactions in inorganic chemistry. 5- Enable students to obtain knowledge and understanding of practical experiments in inorganic chemistry. **B - The soft skills objectives of the course** 1 - knowledge skills - remembering. 2 - application and analysis skills. 3 - Use and development skills. 4- evaluation and creativity skills.

Indicative Contents المحتويات الإرشادية	This semester focuses on the study of atomic structure and the electronic configuration of elements, along with their arrangement in the periodic table according to groups and periods. The course covers the rules and regulations governing the allowed orbitals for electron placement in the main shells. It also explores the periodic properties of elements. Additionally, the course addresses the atomic states (term symbols) of elements to facilitate investigation into the properties and crystal structures of ionic compounds.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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)	6 and 12	LO #2, #4 and #10, #12
	Assignments	2	10% (10)	2 and 13	LO #3, #5 and #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, #11 and #13
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #10
	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 , Lattice energy, Born- Haber Cycle, Polarizations and Covalency.
Week 2	Fajan's Rules in polarization , Hydration of Ions or Solubility of ionic compound.
Week 3	Structure of metal crystals.
Week 4	Covalent compounds and bonding theories : Lewis Structures.
Week 5	Examples and solutions.
Week 6	Assigning Formal Charge on Atoms in compounds, Resonance structure.
Week 7	Valence bond theory (VBT) : Orbital Hybridization
Week 8	**Midterm Exam**
Week 9	Examples and solutions.
Week 10	Valence shell electron pair repulsion (VSEPR) theory

Week 11	Examples and solutions.
Week 12	Molecular Orbital Theory (MOT)
Week 13	Hydrogen : The group1 elements : the alkali metals ,
Week 14	The group2 elements : the alkaline earth metals
Week 15	Hydrogen : The group13 elements , The group14 elements
Week 16	**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	الكيمياء اللاعضوية ، تأليف الدكتورة ثناء جعفر محمد الحسني ، 1989	Yes
Recommended Texts	Inorganic Chemistry principles of structure and reactivity 4th ed, by James E. Huhhey et al, Harper Collins college Puplishers (1993) Inorganic Chemistry, 5th Edition; Gary. L. Miessler and	No

	Donald . A. Tarr (2014).	
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	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.

Ministry of Higher Education and Scientific Research - Iraq
University of Diyala

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Human Rights and Democracy**			**Module Delivery**	
Module Type	**Basic learning activities**			☒Theory ☒Lecture ☐Lab ☐ L Tutorial ☐Practical ☐Seminar	
Module Code	**UD04**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level			**Semester of Delivery**		
Administering Department	جميع اقسام الكلية		**College**	College of Engineering	
Module Leader			**e-mail**		
Module Leader's Acad. Title	لجنة حقوق الانسان والديمقراطية		**Module Leader's Qualification**	MSc.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	12/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. يتعلم الطالب خلال السنه الدراسية اساسيات حقوق الانسان والديمقراطية ما حقوقه كيف يدافع عنها بالطرق القانونية وماهي ضماناتها الداخلية والدولية. 2. استحصال المعرفة في مجال الديمقراطية وأنواع أنظمتها واثرها على حقوق الانسان . 3. تنمية شخصية الطالب وتعزيز وعيهم في الأنظمة السياسية الديمقراطية وتفاصيلها وكيفية تطبيقها على ارض الواقع واهمية ان يكون فعال في المجتمع من خلال احترامه لحقوق الاخرين ومعرفه ان الحقوق والحريات تنتهي عند بداية حقوقهم وحرياتهم ويؤدي واجباته بدلا من اكتساب الحقوق فقط. 4. تعزيز ثقافة السلام القائمة على العدل والمساواة.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تمكين الطالب من معرفة اساسيات الدفاع عن حقوقه وحقوق الاخرين بعد معرفتها ومعرفة أهميتها له وللمجتمع بصورة عامة وأيضا معرفه كل شخص حدود حقوقه وحريته . 2. تمكين الطالب في المشاركة السياسية وذلك من خلال معرفته بأهمية مشاركته في الانتخابات وتأثير هذه المشاركة على سير الانتخابات وتشكيل السلطة فيما بعد. 3. معرفة الطالب ضمانات حقوقه وحرياته وماهي مصادرها. 4. معرفة الفرق بين الحقوق والحريات. 5. تمكين الطالب من معرفة ماهي المفهوم العلمي للديمقراطية وماهي جذورها وانواعها واشكالها. 6. يتعلم الطالب كيف يؤثر النظام الديمقراطي على حقوق الانسان وماهي العلاقة بينها. 7. ادراك الطالب ضرورة ان يكون مواطن فعال في المجتمع ايضاً معرفه شروط الناخب وشروط المرشح للانتخابات. 8. معرفة أنظمة الانتخابات وايهما افضل. 9. فهم الطالب للقانون الدولي لحقوق الانسان وايضاً معرفة مختصرة عن المنظمات الدولية والية عملها كالأمم المتحدة ومنظمة الصليب الأحمر وغيرها.
Indicative Contents المحتويات الإرشادية	**الجزء الأول - تعريف حقوق الانسان وحقوق الانسان في الحضارات القديمة** (تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للإنسان والمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية) (٤ساعات) **الجزء الثاني معرف حقوق الانسان في الأديان السماوية واهمها الإسلام (٢ساعة)** مصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الاوربية والأمريكية والدستور)(٢ساعة) ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية)(٢ساعة) الاتفاقيات الدولية والإقليمية لحقوق الانسان (٢ساعة) الحريات العامة وانواعها والمقارنة فيما بينها (٢ساعة) مستقبل حقوق الانسان والعولمة وحقوق الانسان (٢ساعة) تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وانواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني) (٦ساعات) تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي (٦ساعات) العلاقة بين الديمقراطية وحقوق الانسان (٢ساعة)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. زيادة وعي الطالب بأهمية معرفه حقوقه وواجباته اتجاه المجتمع وعلاقة حقوق الانسان بالنظام الديمقراطي 2. ثقافة عامة في مجموعة من المجالات ومنها المجال القانوني و السياسي والاجتماعي ورفع ثقة الطالب بنفسه من خلال ربط المادة النظرية بالواقع العملي

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**33**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**17**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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**	**15% (10)**	**5 and 10**	**LO #1, #2 #,3,and #6 #7#8**
	Assignments	**2**	**10% (10)**	**2 and 12**	**LO #3, #4 and #6, #7**
	Projects / Lab.				
	Report	**1**	**15% (10)**	**13**	**LO #5, #8 and #9**
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	محاضرة تعريفية عن المادة واهميتها ..
Week 2	تعريف الحق والانسان وحقوق الانسان واهمية حقوق الانسان ,حقوق الانسان في الدين الإسلامي والحضارات القديمة.
Week 3	مصادر حقوق الانسان الدولية والإقليمية والمحلية.
Week 4	ضمانات حقوق الانسان الدستورية والقانونية وضمانات حقوق الانسان على الصعيد الدولي.
Week5	ضمانات حقوق الانسان في الإسلام
Week 6	دور المنضمات الإقليمية في حماية حقوق الانسان.
Week 7	خصائص حقوق الانسان وتعريف الحريات العامة وانواعه والمقارنة بينها وبين الحقوق القانون الدولي لحقوق الانسان والقانون الدولي الإنساني ومنظمة الصليب الأحمر.
Week 8	مستقبل حقوق الانسان وسبل تطويرها .
Week 9	العولمة وحقوق الانسان .
Week 10	تعريف الديمقراطية وتطورها التاريخي ومبادئها . الديمقراطية بين العالمية والخصوصية . اشكال الديمقراطية / الديمقراطية المباشرة.
Week 11	الديمقراطية شبه المباشرة والديمقراطية التمثيلية / اركان النظام التمثيلي / اشكال النظام التمثيلي.
Week 12	المجلس النيابي وانواعه / الانتخاب وشروطه / هيئة الناخبين.
Week 13	تنظيم عملية الانتخاب / تحديد الدوائر الانتخابية / القوائم الانتخابية / المرشحون/ الحملة الانتخابية / التصويت .
Week 14	نظم الانتخابات.
Week 15	علاقة الديمقراطية بحقوق الانسان وكيفية التأثير والتأثر فيما بينها.
Week 16	الامتحان النهائي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	حقوق الانسان والطفل والديمقراطية /تأليف ماهر صالح علاوي ورياض عزيز هادي وعلي عبد الرزاق محمد واخرون / العاتك / بيروت / ٢٠٠٩	نعم
Recommended Texts	عباس الدليمي / حقوق الانسان الفكر والممارسة فخري رشيد ،صلاح ياسين /المنظمات الدولية / العاتك لصناعة الكتاب / بغداد عصام العطية / القانون الدولي العام / المكتبة القانونية /بغداد/2012	لا
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	**Cytology**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-12010**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Chem	**College**	CoS	
Module Leader	Najwa Jameel Hameed		**e-mail**	dr.najwajameel@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		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	Preparing specialists who are familiar with the basics of cytology, theoretically and practically, who are able to meet the needs of the labor market, in addition to teaching cytology to students of other departments in the Faculty of Science and some other faculties at the university. Conducting scientific research and trying to keep pace with the scientific development of cytology. Cooperating with state institutions and the private sector by providing advice and scientific advice and conducting cytology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of cytology, enable students to acquire knowledge and understanding of international cytology standards, enable students to acquire knowledge and understanding of the laws of cytology ,enable students to acquire knowledge and understanding of cytolog analysis standards, enabling students to obtain knowledge and understanding of the law of the wrong use of cytological . skills goals special to the programme scientific skills , reminding and analyzing skills and uses , development skills .
Indicative Contents المحتويات الإرشادية	Biochemistry and cell membranes, Application of biochemistry , Biomolecules, cell membrane and cell wall contents , Plasma membranes , Endocytosis , Exocytosis , Alkaline buffer solutions ,

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Clarification and explanation of the study materials by the academic staff through the blackboard, smart board and computer. Providing students with knowledge through homework assignments for academic vocabulary Asking students to visit the library to obtain additional knowledge of the study materials .Improving students' skills by visiting websites to obtain additional knowledge of the study subjects .

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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)	8	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	Biochemistry and cell membranes Application of biochemistry

Week 2	Biomolecules, cell membrane and cell wall contents
Week 3	Cellular transport across cell membranes , mechanisms of transfer materials through cell membranes
Week 4	Active transport, passive transport, carrier proteins
Week 5	proteins channels transport , potassium channels , Sodium potassium pump
Week 6	Endoplasmic reticulum, Golgi apparatus
Week 7	Plasma membranes
Week 8	**Midterm Exam**
Week 9	Endocytosis , Exocytosis
Week 10	Function of water in the body and cell , the solubility of compounds in water, buffer solutions
Week 11	Principal of buffering, acidic buffer solutions , adding acid or base to this buffer
Week 12	Alkaline buffer solutions , adding acid or base to this buffer
Week 13	Calculations involving buffer solutions, acidic buffer solutions ,
Week 14	alkaline buffer solutions
Week 15	Blood buffer
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Biochemistry and cell membrane ,Application to Biochemistry , Biomolecules, Cell membrane, Content of cell wall
Week 2	Cellular activities, Transport Across cell Membrane, Mechanism of transfer of materials through cell membrane
Week 3	Active transport, Passive transport, Carrier Protein, Channel Protein , Channel Protein Transport ,Potassium Channels, Sodium Potassium Pump
Week 4	Endoplasmic Reticulum Golgi apparatus , Plasma Membrane
Week 5	Endocytosis ,Exocytosis , The function of water in the body and cell, the solubility of

	compounds in water, Buffer solutions
Week 6	Principle of buffering, Acidic buffer solutions adding an acid to this buffer solution, adding an alkali to this buffer solution
Week 7	Alkaline buffer solutions, adding an acid to this buffer solution , adding an alkali to this buffer solution, Calculations Involving Buffer Solutions, Acidic Buffer Solutions, Alkaline Buffer Solutions , Buffer Solution in Blood
Week 8	Non-Living Cellular Components1
Week 9	Non-Living Cellular Components1
Week 10	Cell Shape and Size
Week 11	Cell Cycle- Cell Division-Mitosis
Week 12	Cell Cycle- Cell Division-Meiosis
Week 13	Cytogenetics
Week 14	Plant Cytogenetics
Week 15	Human and Cancer cytogenetic
Week 16	**Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1- Essentials of Medical Biochemistry by N.V Bhagavan &Chung Eun-Ha 2- Lehninger Principles of Biochemistry by David L. Nelson & Michael M. Cox	Yes
Recommended Texts		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.

Ministry of Higher Education and
Scientific Research - Iraq
University of Diyala
College of Engineering
Department of Computer Engineering

الملحق ٤: وصف المادة الدراسية

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer I**			**Module Delivery**	
Module Type	**Basic learning activities**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **L Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UD13**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	UGI		**Semester (s) offered**	1	
Administering Department	All Department		**College**	All College of The University	
Module Leader	Dr. Ali N. Albu-Rghaif		**e-mail**	ali.alburghaif@uodiyala.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor	Dr. Bashar Talib AL-Nuaimi		**e-mail**	alnuaimi_bashar@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	19/10/2024		**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, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر	
Module Aims أهداف المادة الدراسية	1. Training students on the basics of using the computer and providing them with the necessary skills to deal with the computer with high efficiency. 2. Assisting the student in distinguishing and developing his scientific and artistic abilities. 3. Enriching the student's skills to be able to deal with the computer with high efficiency. 4. Providing students with a way to use other modern technologies related to the educational process.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will be able to describe the basic concepts functions and primary components of a computer. 2. Students will demonstrate the ability to set up a personal computer. 3. Students will be able to describe the function of an operating system and differentiate between various types. 4. Students will understand and utilize basic GUI elements such as windows, icons, and menus. 5. Students will apply Microsoft Office (Word, Excel, PowerPoint) features. 6. Students will understand how the internet works and effectively use web browsers to search for information. 7. Students will compose and manage emails professionally, including understanding attachments, signatures, and managing contacts. 8. Students will identify and resolve common computer issues related to hardware, and software.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Course Introduction to Computer, Computer Components, and Personal Computer. 2. Working with Operating Systems and Graphical User Interface (GUI). 3. Microsoft Office Word, Excel, and PowerPoint. 4. Working with the Internet and Web browser 5. Working with E-mail and Computer troubleshooting
Course Description	Introduction to Computer: Concepts of Hardware and Software with their components; Concept of Computing, Data and Information; Applications of Information Electronics and Communication Technology (IECT); Connecting input/output devices, and peripherals to CPU. Computer Components: Computer Portions, Hardware Parts, I/O Units, Memory Types, Basic CPU Components, Computer Ports, Personal Computer, Personal Computer (Features and Types). Operating System and Graphical User Interface (GUI): Operating System; Basics of

	Common Operating Systems; The User Interface, Using Mouse Techniques; Use of Common Icons, Status Bar, Using Menu and Menu-selection, Concept of Folders and Directories, Opening and closing of different Windows; Creating Shortcuts. Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting, and thesaurus; Printing of word document. Spreadsheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spreadsheet, printing of Spreadsheet. Presentation Software: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation/handouts. Introduction to Internet and Web Browsers: Computer networks Basic; LAN, WAN; Concept of Internet and its Applications; Connecting to Internet; World Wide Web; Web Browsing software's, Search Engines; Understanding URL; Domain name; IP Address. Communications and Emails: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using emails for document collaboration. Computer Troubleshooting: Identifying and solving common hardware and software problems; Basic troubleshooting techniques and tools for diagnosing and resolving issues.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do practical work. • Encourage students to work in groups.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**12**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**0.8**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	6 and 12	All
	Assignments	2	10% (5)	2 and 13	LO #1 to #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Group Work	2	10% (5)	13	LO #2, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	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 Computer
Week 2	Computer Components
Week 3	Personal Computer
Week 4	Operating Systems
Week 5	Graphical User Interface (GUI)
Week 6	Microsoft Office- Word Introduction
Week 7	Microsoft Office- Word Practice
Week 8	Microsoft Office- Excel Introduction
Week 9	Microsoft Office- Excel Practice
Week 10	Microsoft Office- Power-Point Introduction
Week 11	Microsoft Office- Power-Point Practice
Week 12	Introduction to Internet
Week 13	Web Browser
Week 14	Communications and E-mail
Week 15	Computer Troubleshooting

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the lab and get started with use of computer
Week 2	Computer Components: Computer Portions, Hardware Parts, I/O Units, Memory Types, Basic CPU Components, Computer Ports,
Week 3	Personal Computer (Features and Types).
Week 4	Basic use of Windows operating system
Week 5	Graphical User Interface (GUI): The User Interface, Using Mouse Techniques; Use of Common Icons, Status Bar, Using Menu and Menu-selection.
Week 6	Microsoft Office Word: Getting Started with Word

Week 7	Microsoft Office Word: Editing a Document and Formatting Text and Paragraphs, Adding Tables and Inserting Graphic Objects, Controlling Page Appearance and Proofing a Document.
Week 8	Microsoft Office Excel: Getting Started with Excel
Week 9	Microsoft Office Excel: Sorting, Selecting and Subtotaling data, Microsoft Office Excel: Formulas and Functions, Worksheet Formatting and Presentation
Week 10	Microsoft Office PowerPoint: Getting Started with PowerPoint
Week 11	Microsoft Office PowerPoint: Developing a PowerPoint Presentation, Adding Graphical Elements to Your Presentation and Modifying Objects in Your Presentation, Adding Graphical Elements, tables and charts to Your Presentation and Modifying Objects in Your Presentation, Prepare to deliver your presentation
Week 12	Introduction to Internet: Computer networks Basic; LAN, WAN; Concept of the Internet and its Applications; Connecting to the Internet;
Week 13	Learn Web Browsers: World Wide Web; Web Browsing software, Search Engines; Understanding URL; Domain name; IP Address.
Week 14	Communications and Emails: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using emails for document collaboration.
Week 15	Computer Troubleshooting: Identifying and solving common hardware and software problems; Basic troubleshooting techniques and tools for diagnosing and resolving issues.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Joan Lambert and Steve Lambert, Windows 10 step by step, 1st Edition 2015. • Joan Lambert and Curtis Frye, Microsoft Office 2016 step by step, 1st Edition 2015.	Yes
Recommended Texts	• Michael Miller, ABSOLUTE BEGINNER'S GUIDE TO COMPUTER BASICS, 5th EDITION, QUE Indianapolis, Indiana 46240, 2010. • Paul McFedries, TEACH YOURSELF VISUALLY MICROSOFT WINDOWS 10, ANNIVERSARY	
Websites	Microsoft Help, https://support.microsoft.com/en-us/products Learn Microsoft Office, https://www.goskills.com/Microsoft-Office	

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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	**English Language 1**			**Module Delivery**	
Module Type	**Basic learning activities**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	UD11				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	UGI		**Semester of Delivery**		
Administering Department	All		**College**	All	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name(if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	3/11/2024		**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	The module aims at enabling students to learn and understand the written and spoken form of English. It also aims at teaching functional English to learners and improving their reading, writing and listening skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Read and understand simple texts in English. 2. Answer simple comprehension questions and match sentences about texts. 3. Reconstruct texts by reordering sentences. 4. Understand the main idea of a text. 5. Identify specific information in a text. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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	4	20% (5)	3 , 5,8,11	LO #1...#3, #4...#5, #7&#8, #9... #11
	Assignments	2	10% (5)	5 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	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)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Course Introduction (Course material and objectives, learning outcomes, lessons and assessment discussed with the learners).
Week 2	**Unit 1. Hello** **Vocabulary:** People, introduce each other – ways of greetings, Numbers 1-10 and plurals. **Reading:** Introduction dialogues, Everyday English dialogues. **Listening**: People meet each other and introduce someone else. How are you? What's this in English? **Speaking**: Introductions, Good morning! Practicing introduction dialogues- Information gap. **Writing**: Complete the conversations. **Gramma**r: Verb to be with subject, Possessive adjectives, This is …… .
Week 3	**Unit 2. Your World** **Vocabulary:** A set of cities and countries: Brazil, Spain…. ., Adjectives: awful, really good, fantastic, Nouns: center, hospital, building, park. Numbers 10-20 **Reading:** Two people are on holiday in New York. **Listening**: listening to a conversation about Claude and Holly. **Speaking**: Talking about where people are from. **Writing**: Complete the conversations, countries , cities, adjectives, nouns, and numbers. **Gramma**r: Subject verb agreement, possessive pronouns, questions (what, where … ?).
Week 4	**Unit 3. All About You** **Vocabulary:** Jobs (police officer, nurse..), Personal information (surname, first name, address…..). **Reading:** ' Hello! We're on A Mountain' about different students from different countries. **Listening**: Interview on a mountain. **Speaking**: Practice the interview. **Writing**: Social expressions (I am sorry, that's ok …. .) **Gramma**r: Subject pronoun (negatives and questions) , Possessive adjectives.
Week 5	**Unit 4. Family and friends** **Vocabulary:** Family members (mother, son,…. .) , Describing friend (very clever , funny,…), Alphabet. **Reading:** 'The Walk' An Interview with students on a walk.

	Listening: Listen and identify the people 'Fatima Al Zamil' , 'Paddy McNab and his family' **Speaking**: Talking about family and friends. **Writing**: Write about a good friend , his/ her family , job, favourite shop, and sport , extra…. . **Gramma**r: Possessive adjectives. Possessive 's. Has/ have Adjective + noun Irregular Plurals.
Week 6	**Assessment Test 1. Feedback and Remedial Work**
Week 7	**Unit 5. The way I live?** **Vocabulary:** The lexical set of sports/food/drinks. Verbs (live, work), Languages and nationalities. **Reading:** ' Colin Brodie from Dundee' **Listening:** Listen to the context of likes and dislikes. At a party: Flavia and Terry are at a party in London, At dinner : two people meet and talk. **Speaking:** Role play: Practice the conversation in different situations. **Writing:** Write sentences, questions, make notes. **Grammar:** Present Simple :(I/you/we/they),Indefinite article(a/an),Adjective + noun(a German car).
Week 8	**Unit 6. Everyday** **Vocabulary:** The time, Words that go together: watch TV, get up early, Days of week. **Reading:** 'Lois Maddox ' Talking about daily routines. **Listening:** Lifestyle questionnaire, Listening a phone conversation between Lois and Elliot. **Speaking:** Asking and answering questions about daily routines. **Writing:** Write the correct preposition, Complete the questions. **Grammar:** Present Simple: He/she Question and negatives, Adverbs of frequency Prepositions of time.
Week 9	**Unit 7. My Favourites** **Vocabulary:** Adjectives: lovely, terrible, comfortable, friendly…, Opposite adjectives: new/old, big/small Places: chemist, post office **Reading:** ' The Famous International Footballer' , An email of San Francisco, **Listening**: Listening the requests with Can I……..? A holiday postcard. Describing lifestyles, preferences and places **Speaking:** Role play: conversations in town. **Writing:** Writing an email to a friend. **Grammar:** Question words, Subject pronouns, Object pronouns, Possessive pronouns.
Week 10	**Unit 8. Where I live** **Vocabulary:** Rooms and furniture: living room, bedroom, In and out of town: beach, mountain, sailing,… **Reading: '**Vancouver- a great city'. **Listening:** My home town, Steve talks about living in Vancouver, Listen to the directions. **Speaking:** Talking and asking about rooms and furniture, Giving directions to places. **Writing:** Write about a town you know. **Grammar:** There is /are , Prepositions: in, on, under, next to
Week 11	**Assessment Test 2. Feedback and Remedial Work**
Week 12	**Unit 9. Times Past** **Vocabulary:** Saying years, People and jobs, Irregular verbs Have, do, go: have lunch, do homework, go shopping **Reading:** 'Two Saudi boys find an antiquity vasa' **Listening: '**Magalia Dromard' : Magalia talks about her family. **Speaking:** Telling a story form pictures. **Writing:** complete the sentences, write the words in correct form. **Grammar:** Was/were born , Past simple: irregular verbs (It's a Jackson Pollock).
Week 13	**Unit 10. We had a great time!** **Vocabulary:** Time expressions: on Monday, last night…, Sports and leisure: tennis, skiing, windsurfing… Play or go: play tennis, go skiing , Seasons: winter, summer… . **Listening: '**Jack and Millie Parker's holiday', A couple talk about their holidays. **Speaking:** A questionnaire, Asking about holiday , My last holiday. Making conversations

	Writing: Write about your favourite holiday. **Grammar:** Past simple: regular and irregular, Questions/Negatives, Ago Dialogues with simple past.
Week 14	**Unit 11. I can do that!** **Vocabulary:** Verbs: (draw, run, drive), Verb+noun: (Listen to the radio, chat to friends), Adjective+noun (fast car, busy city, dangerous sport), Opposite adjectives: dangerous/ safe, old/modern. **Reading: '**The Internet ' **Listening:** ' Five people talk about what they do on the internet' **Grammar:** Can / can't, Adverbs, Adjective + noun, Requests and offers.
Week 15	**Unit 12. Please and thank you** **Vocabulary:** Shopping: (bread, milk, fruit) , Food: (cereal, salad, pasta, fish),In a restaurant: (menu, starter, desert, soup, salmon) **Reading:** People different parts of the world. **Listening: '**Conversation with Adam' , 'After my exam'. **Speaking:** Describe what they eat? Discussion-what is a good diet? **Grammar:** I'd like, Some and Any , Like and would like.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	New Headway Pre-Intermediate by:John and Liz Soars. Oxford University Press	Yes
Recommended Texts	None	
Websites	https://www.scribd.com/document/510746145/New-Headway-Plus-Beginner-Student-s-book	

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.

Level Two

Semester Three

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Gravity Analytic Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23113**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Chem		**College**	CoS	
Module Leader	Marwah hashim Abdulateef		**e-mail**	marwahhashim@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2024		**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	Learning students analytical chemistry fundamentals in specific knowledge of gravimetric analysis chemistry, classification of gravimetric analysis, precipitation analysis, types of precipitating reagents, inorganic precipitants and organic precipitants, properties of precipitant used for gravimetric analysis, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates and Solubility product (Ksp), calculation the solubility from Ksp, solubility problems, The affected factors on the solubility of the precipitates, Contamination of the precipitates and its types , avoiding impurities, digestion of precipitates, washing solutions, drying and ignition of the precipitates, Statistic in analytical chemistry with examples. - Learning students, the fundamentals of analytical separation methods: classification of separation methods, masking agents, liquid-liquid extraction, solvent extraction fundamentals, separation and classification of chromatography, separation by ion exchanges. - Teaching and learning students all the subjects, that related to the analytical chemistry course, which allow them to be qualified working in different aspects of analytical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of analytical chemistry. Enable students to acquire knowledge and understanding of international chemical standards. Enable students to acquire knowledge and understanding of the laws of chemistry. Enable students to acquire knowledge and understanding of chemical analysis standards in gravimetric chemistry and separation methods. Enabling students to obtain knowledge and understanding of the law of the wrong use of chemicals.
Indicative Contents المحتويات الإرشادية	analytical chemistry fundamentals, gravimetric analysis chemistry, precipitation analysis, precipitating reagents, inorganic precipitants , organic precipitants, properties of precipitant, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates ,Solubility product (Ksp), solubility problems, affected factors on the solubility of the precipitates, Contamination of the precipitates, impurities, digestion of precipitates, washing solutions, , Statistic in analytical chemistry.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for analytical chemistry. -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some practical problems..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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)	8	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 of analytical chemistry, fundamentals of gravimetric analysis, sampling and sampling treatment
Week 2	The steps of the gravimetric analysis, weight of a sample, solvent of a sample, precipitate of a sample, precipitant digestion, washing of a precipitant, precipitant burning, weight of a precipitant
Week 3	Classification of gravimetric analysis, precipitation analysis, pyrolysis analysis, isolation analysis, the qualities of good precipitants
Week 4	Types of precipitating reagents, inorganic precipitants, and organic precipitants properties of precipitant used for gravimetric analysis
Week 5	precipitating of homogenous solutions, types of homogenous solutions and its applications in gravimetric analysis, organic & inorganic precipitants, and their types & advantages with examples
Week 6	The chemical composition of the precipitates, calculation of gravimetric analysis, gravimetric factor, and examples
Week 7	Solubility of precipitates and Solubility product (Ksp), calculation the solubility from Ksp, solubility problems
Week 8	**Midterm Exam**

Week 9	The affected factors of the solubility: temperature, the physical and chemical nature of the solute, the nature of solvent, common ion effect, oxidation-reduction reactions effect
Week 10	ionic strength of the solution, the effect of pH, the complex formation, the hydrolysis effect, particle size effect of solute, examples, and problems
Week 11	Crystalline composition of the precipitates, their types & advantages with examples, and problems,
Week 12	Colloid composition of the precipitate and their types & advantages with examples, von-weimern for colloidal state
Week 13	Contamination of the precipitates, type of contamination, co-precipitation, post precipitation
Week 14	Treatment of the precipitates, avoiding impurities, digestion of precipitates,
Week 15	**final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction and general idea of gravimetric analysis and the basic principles steps of gravimetric analysis ,gravimetric analysis methods ,Weight analysis steps ,Organic and inorganic precipitators and sediment solubility ,Precipitate contamination and its impact on the accuracy of results and treatment methods
Week 2	An experiment to determine the percentage of water of crystallization in aqueous salt
Week 3	An experiment to determine the percentage of water of crystallization in barium dichloride crystals
Week 4	Experimental estimation of elements by volatilization and dissolution method
Week 5	Calcium estimation experiment in the form of calcium oxalate
Week 6	Experimental determination of iron in the form of ferric oxide
Week 7	Experiment for the determination of nickel in the form of dimethylglyoxime
Week 8	Gravimetric Determination of Sulfate in Tap Water
Week 9	Cation Exchange Column Preparation and Determination of Total Capacity By Used NaCl
Week 10	Determination of Percentage From Sulfate Ion By Used Cation Exchange Chromatography
Week 11	Determination of Chloride By Anion Exchange Chromatography

Week 12	Separation of a Mixture of Halides By Paper Chromatography
Week 13	Separation of a Mixture of Colored Dyes By TLC
Week 14	Separation of Black Ink Components By Paper Chromatography
Week 15	Anion Exchange Column Preparation and Determination of Total Capacity By Used NaCl

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M. West. Eight Edition	Yes
Recommended Texts	1: Analytical Chemistry, Gary, Christian Sixth Edition 2: Chemical Analysis, Modern Instrumentation Methods and Techniques, Francis Rouessac and Annick Rouessac Second Edition	No
Websites	www.chemicalprocessing.com www.bytoco.com	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry III**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23114**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Chem	**College**	CoS	
Module Leader	Khansa Yousif Ahmed		**e-mail**	khansa@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		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	Teaching the students all the necessary information about the Inorganic chemistry subject which make them able to work in the field of Inorganic Chemistry . Give idea about the periodic properties of the elements, study the molecular symmetry, study the standard electrode potential, study and classification of Acids and Bases, Explanation of Main elements in the periodic table from group 3 to 7. Study the basis of Solid State Chemistry including crystal system of Cube. Study the Magneto chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students being able to understand Inorganic Chemistry ,understand Chemical structures of chemical compounds ,understand chemical reactions ,understand the experiments in Inorganic Chemistry .Skills of Knowledge- to remember , skills of analysis and skills of development.
Indicative Contents المحتويات الإرشادية	periodic properties such as ionic and atomic size. Ionization energy, electronegativity and electro affinity , Some periodic properties such as metallic and nonmetallic properties, oxidation state, oxides (acidic, basic and amphoteric) Oxides (Ionic, covalent and middle), Solid and Soft Acids and Bases

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

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 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)	8	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 arrangement of elements inside the periodic table and studying the periodic properties

	such as ionic and atomic size. Ionization energy, electronegativity and electro affinity
Week 2	Some periodic properties such as metallic and nonmetallic properties, oxidation state, oxides (acidic, basic and amphoteric) Oxides (Ionic, covalent and middle)
Week 3	Colors of elements and complexes
Week 4	Standard electrode potential, the relationship between standard electrode potential and the relationship with pH of the solution
Week 5	Types of Electromotive force and Disproportionation
Week 6	Giving examples
Week 7	Molecular Symmetry, the importance of symmetry. Operations and elements of symmetry. Point groups
Week 8	Midterm Exam
Week 9	Giving examples
Week 10	Acids and Bases
Week 11	Solid and Soft Acids and Bases
Week 12	Solid and Soft Acids and Bases
Week 13	Magnetochemistry: Ferromagnetic and Anti-ferromagnetic,
Week 14	Magnetic momentum and EPR spin
Week 15	Orbital and spin role of magnetic momentum, ESR
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Purification of table salt
Week 2	Purification of table salt
Week 3	Find the percentage of water in a hydrolyzed compound

Week 4	Find the percentage of water in a hydrolyzed compound
Week 5	Determine the concentration of hydrogen peroxide in the solution
Week 6	Determine the concentration of hydrogen peroxide in the solution
Week 7	Preparation of potash alum
Week 8	Preparation of potash alum
Week 9	Detection of alum ions
Week 10	Detection of alum ions
Week 11	Calculation of the percentage of crystallization water in potash alum
Week 12	Calculation of the percentage of crystallization water in potash alum
Week 13	Preparation of barium peroxide
Week 14	Preparation of barium peroxide
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	**1- Inorganic chemistry, principles of structure and reactivity,2nd ed., James E. Huheey, 1983** **2-Inorganic chemistry, 3rd ed., Housecroft C.E. and**	Yes
Recommended Texts		No
Websites	ttp://rapidshare.de/files/20322418/Patnaik_P._-_Handbook_of_inorganic_chemicals__McGraw_Hill_2003_.rar	

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	**Thermodynamic Chemistry I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**Che-23115**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	2		**Semester of Delivery**	3	
Administering Department	Chem		**College**	CoS	
Module Leader	Ahmed Najem Abd		**e-mail**	dr.ahmednajemabd@uodiyala.edu.iq	
Module Leader's Acad. Title	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	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	Teach students the chemical reactions of gases and thermochemistry, and know how to solve problems related to them. Clarification of the energies of the bonds of organic interactions and knowledge of the first, second and third laws in thermodynamics And its practical applications aimed at developing and keeping pace with the scientific development of physical chemistry. Teaching and educating students on all the necessary and necessary information related to physical chemistry, which It qualifies them to work and research in all areas of physical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of physical chemistry Enable students to obtain knowledge and understanding of gas reactions Enable students to obtain knowledge and understanding of the first, second and third laws of thermodynamics Enable students to obtain knowledge and understanding of examples and problems of physical chemistry.
Indicative Contents المحتويات الإرشادية	physical chemistry, gas reactions , laws of thermodynamics , Volume, pressure , work , first –law of thermodynamic , enthalpy cycle , heat capacity , joule –thomson effect , second laws of thermodynamics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for physical chemistry. -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some practical problems..

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 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)	8	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 gases
Week 2	The system and The energy
Week 3	Reversible and irreversible processe
Week 4	Volume, pressure , work
Week 5	The first –law of thermodynamic
Week 6	Enthalpy
Week 7	Enthalpy cycle
Week 8	**Midterm Exam**
Week 9	Standard enthalpy change of formation
Week 10	Heat capacity
Week 11	The joule experimental
Week 12	The joule –thomson effect
Week 13	The relationship between Cv and Cp
Week 14	The second laws of thermodynamics

Week 15	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Set the burette spill constant
Week 2	Determine the molecular weight using the Dumas method.
Week 3	Determination of the molecular weight by the freezing point method of a non-volatile solid
Week 4	Determine the solubility of sodium sulfate in water and find the transition point
Week 5	Determine the solubility of benzoic acid in water at different temperatures and calculate the heat of the solution
Week 6	Solubility as a function of temperature
Week 7	Find the mutual solubility between phenol and water
Week 8	Part A: Thermochemistry/ Determination of calorimetric constant. Part B: Heat of neutralization/ Determination of heat of neutralization of a strong acid with a strong base. Part C: Heat of solution/ Determination of the heat of a solution.
Week 9	Equilibrium Constant/ Determination the formula of a complex formed between Copper (II) ion and Ammonia.
Week 10	Properties of dilute solutions/ Distribution of a solute between immiscible solvents.
Week 11	Relative molecular mass/ Determine the relative molecular mass of a polymer from viscosity measurements.
Week 12	Three components liquid system/ The Triple system.
Week 13	Adsorption from solution.
Week 14	Revision for all Experiment to prepare for the final exam+ Repetition for some experiments which some student have missed throughout the course.
Week 15	**Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Phy.chem.gases and thermodynamics ,A.F.Dawood Al-Niaimi	Yes
Recommended Texts	1-PHy.chem. water J.Moor 2--Phy.chem. Danials 3-Atkins 4-Phy.chem. J.Barroue 4-Element of chemical thermodynamic L.K.Nash 5-Thermodynamics for chemistry	No
Websites	www.byPhysical Chemistry Books Adwww.scienceforums.com/forum/chemistr toco.com	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Organic Chemistry I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**Che-23116**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	2	**Semester of Delivery**	3		
Administering Department	Chem	**College**	CoS		
Module Leader	Wassan Baqir Ali	**e-mail**	dr.wassan976@uodiyala.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	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	Preparing specialists who are familiar with the basics of chemistry, theoretically and practically, who are able to meet the needs of the labor market, in addition to teaching chemistry to students of other departments in the Faculty of Science and some other faculties at the university. Conducting scientific research and trying to keep pace with the scientific development of chemistry. Cooperating with state institutions and the private sector by providing advice and scientific advice and conducting chemical analyzes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of chemistry, enable students to acquire knowledge and understanding of international chemical standards, enable students to acquire knowledge and understanding of the laws of chemistry ,enable students to acquire knowledge and understanding of chemical analysis standards, enabling students to obtain knowledge and understanding of the law of the wrong use of chemicals . skills goals special to the programme scientific skills , reminding and analyzing skills and uses , development skills .
Indicative Contents المحتويات الإرشادية	Preparation of alkanes and their properties , Reactions of Alkanes , Nomenclature of alkenes and properties , Alkynes , Dienes, structure and synthesis and stabilization

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Clarification and explanation of the study materials by the academic staff through the blackboard, smart board and computer. Providing students with knowledge through homework assignments for academic vocabulary, Asking students to visit the library to obtain additional knowledge of the study materials .Improving students' skills by visiting websites to obtain additional knowledge of the study subjects .

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 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)	8	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 organic chemistry

Week 2	Hydrocarbons
Week 3	Saturated hydrocarbons, primarily methane and properties
Week 4	Preparation of alkanes and their properties
Week 5	Reactions of Alkanes
Week 6	Unsaturated hydrocarbons
Week 7	Nomenclature of alkenes and properties
Week 8	**Midterm Exam**
Week 9	Preparation method of alkenes
Week 10	Reaction of alkenes
Week 11	Alkynes , naming ,properties and properties
Week 12	Reactions of alkenes
Week 13	Dienes, structure and synthesis and stabilization
Week 14	Reactions of Dienes
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory safety information,
Week 2	Introduction to organic chemistry
Week 3	Experimental of measure the melting point of solid chemicals,
Week 4	experimental of boiling point of liquid chemicals
Week 5	Sublimation , Conducting a recrystallization
Week 6	experiment to purify solid chemicals
Week 7	Perform an extraction experiment ,

Week 8	Do a distillation experiment
Week 9	Experimental of simple distillation, Experimental of fractional distillation ,
Week 10	Experimental of thin layer chromatography
Week 11	Reactions of Dienes
Week 12	Reactions of Dienes
Week 13	Sodium smelting experiment and detection of some elements in organic compounds
Week 14	Sodium smelting experiment and detection of some elements in organic compounds
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Organic chemistry, Morrison and Boyd (1)	Yes
Recommended Texts	Organic Chemistry, Clayden J., Creeves N., Warren S and Wother P., Oxford, 2001	No
Websites	www.chemicalprocessing.com	

Grading Scheme

مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Nanotechnology**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-23017**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		2	**Semester of Delivery**		4
Administering Department		Chem	**College**	CoS	
Module Leader	Omer Kazi		**e-mail**	omerkazi@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**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	Teach students the nanotechnology, and know how to solve problems related to them. Clarification material and its description according to classical and modern theories And its practical applications aimed at developing and keeping pace with the scientific development of nanotechnology .Teaching and educating students on all the necessary and necessary information related to nanotechnology, which It qualifies them to work and research in all areas of nanotechnology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of nanotechnology Enable students to obtain knowledge and understanding of Classification of nanomaterial .Enable students to obtain knowledge and understanding Characterization of nanomaterial .Enable students to obtain knowledge of Applications of nanomaterial in medicine , applications of nanomaterial in different fields
Indicative Contents المحتويات الإرشادية	Nanotechnology , classical and modern theories , Molecules, chemical bonds , Classification of nanomaterial , Characterization of nanomaterial , Applications of nanomaterial in medicine , applications of nanomaterial in different fields

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for nanotechnology -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some application..

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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	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)	8	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 of nanotechnology

Week 2	Material and its description according to classical and modern theories
Week 3	Molecules, chemical bonds,
Week 4	crystals, grains,
Week 5	Effect of particle size on the material properties
Week 6	Classification of nanomaterials
Week 7	Properties of nanomaterials
Week 8	**Midterm Exam**
Week 9	Synthesis of nanomaterials methods
Week 10	Characterization of nanomaterials(STM,XRD,SAXRD,)
Week 11	Characterization of nanomaterials(SEM,TEM)
Week 12	Characterization of nanomaterials(AFM,)
Week 13	Characterization of nanomaterials(UV-Visible)
Week 14	Characterization of nanomaterials(Raman spectroscopy)
Week 15	Applications of nanomaterials in medicine , applications of nanomaterials in different fields
Week 16	**Midterm Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
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	**Nanomaterials and Nanochemistry . Catherine Brechignac ,Philippe Houdy ,Marcel Lamani 2008**	Yes
Recommended Texts	**Nanochemistry ,Biotechnology, Nanomaterials, and Their Application,Olena Fesenko, Leonid Yatsenko ,2017**	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
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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Ministry of Higher Education and
Scientific Research - Iraq
University of Diyala
College of Engineering
Department of Computer Engineering

الملحق ٤: وصف المادة الدراسية

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer II**			**Module Delivery**	
Module Type	**Basic learning activities**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **L Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**UD23**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	UGI		**Semester (s) offered**		
Administering Department	All Department		**College**	All College of The University	
Module Leader	Dr. Ali N. Albu-Rghaif		**e-mail**	ali.alburghaif@uodiyala.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor	Dr. Bashar Talib AL-Nuaimi		**e-mail**	alnuaimi_bashar@uodiyala.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	3/11/2024		**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, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر	
Module Aims أهداف المادة الدراسية	1. Training students on the fundamentals of computer networks. 2. Exploring the concept of e-commerce and electronic banking services. 3. Developing practical skills in computer troubleshooting. 4. Providing a foundational understanding of Artificial Intelligence (AI). 5. Introducing various applications of AI across industries. 6. Analyzing the social implications of AI on society and international relations. 7. Addressing ethical challenges associated with AI technology. 8. Exploring future trends and advancements in AI.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students can describe basic network components, explain their functions, and understand network security fundamentals. As well as diagnose and resolve common network issues. 2. Students will know the concepts of electronic banking services and identify different forms of online banking. 3. Students will be able to identify common hardware and software problems encountered by computer users. 4. Students will describe various AI techniques and approaches, and discuss their applications. 5. Students will be able to analyze the impact of AI on daily tasks and interactions. 6. Students will identify and discuss AI applications in fields such as education, healthcare, finance, transportation, marketing, and advertising. 7. Students will reflect on the potential societal changes brought by AI technology. 8. Students will analyze the role of ethics in guiding the development and application of AI. 9. Students will evaluate potential future applications of AI and consider their societal and technological implications
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Course Introduction Security and Networking, Basic Network Components, and Network Security Basics. 2. Working with Concepts of electronic banking services. 3. Working with Computer Troubleshooting. 4. Introduction to AI, Techniques, Approaches, Challenges, Ethical Considerations and Applications 5. AI and Society, Ethical Challenges in AI and The Future of AI

Course Description	Security and Networking: What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting E-Commerce: Concepts of electronic banking services, this includes online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues. Introduction to AI: Definition of AI, History of AI, AI Techniques and Approaches, Challenges and Ethical Considerations. AI in Our Daily Lives: AI in smartphones and virtual assistants like Siri or Google Assistant. Applications of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising. AI and Society: (How AI affects social, AI and international relations, AI and the future of humanity). Ethical Challenges in AI: (AI ethics, privacy and surveillance, the impact of AI on the job market). The Future of AI: (Future trends in AI, recent research and emerging technologies).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do practical work. • Encourage students to work in groups.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**12**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**0.8**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	6 and 12	All
	Assignments	2	10% (5)	2 and 13	LO #1 to #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Group Work	2	10% (5)	13	LO #2, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction Security and Networking
Week 2	E-Commerce
Week 3	Computer Troubleshooting
Week 4	Basic troubleshooting techniques and tools
Week 5	Introduction to AI
Week 6	AI Techniques and Approaches
Week 7	AI in Our Daily Lives
Week 8	AI and virtual assistants like Siri or Google Assistant
Week 9	Applications of AI: Education and Healthcare
Week 10	Applications of AI: Finance and Transportation
Week 11	Applications of AI: Marketing and Advertising
Week 12	AI and Society: AI and International Relations
Week 13	AI and Society: AI and the future of humanity
Week 14	Ethical Challenges in AI
Week 15	The Future of AI

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Networking Tools and Setup • Lab Orientation: Introduction to networking equipment and basic networking tools. • Setup of a simple network, understanding network topologies.
Week 2	Basic Network Configuration • Configuring IP addresses, subnetting, and basic router setup. • Ping and traceroute commands to test network connectivity.
Week 3	Network Security Basics • Hands-on with firewalls: Configuring basic firewall rules.

	• Understanding packet sniffing and analyzing network traffic with tools like Wireshark.
Week 4	Troubleshooting Network Issues • Common network troubleshooting commands: `ipconfig`. • Diagnosing connectivity issues and network troubleshooting scenarios.
Week 5	Introduction to E-Commerce Platforms • Overview of popular e-commerce platforms and payment gateways. • Setting up a demo e-commerce website and exploring payment options.
Week 6	Digital Banking Simulation • Simulating online banking transactions (ATM, debit card, mobile banking).
Week 7	Computer Troubleshooting (Hardware) • Identifying and diagnosing common hardware issues. • Practicing component replacement (e.g., RAM, hard drive) and system optimization.
Week 8	Computer Troubleshooting (Software) • Diagnosing and fixing common software issues (e.g., system crashes, software conflicts). • Using system diagnostic tools and software repair utilities.
Week 9	Introduction to AI Tools and Software • Exploring basic AI tools and platforms, such as Python libraries (NumPy, Pandas).
Week 10	AI in Daily Life: Virtual Assistants • Setting up and experimenting with virtual assistants like Siri, Google Assistant, or Alexa.
Week 11	AI in Various Industries • Case study labs focusing on AI applications in healthcare, finance, or marketing.
Week 12	AI and Society • Analyzing AI-driven social media algorithms. • Experimenting with recommendation systems and discussing ethical concerns.
Week 13	Ethical AI and Privacy • Using tools to analyze privacy and surveillance aspects of AI (e.g., face recognition demo).
Week 14	Future Trends in AI • Hands-on session with generative AI models or recent AI advancements.
Week 15	Capstone Lab Project and Review • Students work on a mini-project integrating networking, e-commerce, troubleshooting, or AI.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• William Stallings, Network Security Essentials: Applications and Standards, 6th Edition, 2020. • Kenneth Laudon and Carol Guercio Traver, *E-Commerce 2024: Business, Technology, and Society*, 18th Edition, 2024 • Melanie Mitchell, *Artificial Intelligence: A Guide for Thinking Humans*, 1st Edition, 2019. • Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, 4th Edition, 2020.	No
Recommended Texts	• Wendell Odom, *CCNA 200-301 Official Cert Guide*, 1st Edition, 2019. • Mark Miller, *Digital Banking Tips and Solutions*, 1st Edition, 2021. • Dan Gookin, *Troubleshooting and Maintaining Your PC All-in-One For Dummies*, 3rd Edition, 2021. • Max Tegmark, *Life 3.0: Being Human in the Age of Artificial Intelligence*, 1st Edition, 2017. • Wendell Wallach, *The Ethics of Artificial Intelligence and Robotics*, 1st Edition, 2020.	
Websites	• Eli the Computer Guy (youtube.com/user/elithecomputerguy) • AI for Everyone by Andrew Ng (coursera.org) • Google AI Experiments (experiments.withgoogle.com/ai) • UNESCO AI and Society (unesco.org) • AI Ethics Lab (aiethicslab.com)	

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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	**اللغة العربية 2**			**Module Delivery**	
Module Type	**Basic learning activities**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UD22**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	UGII		**Semester of Delivery**		
Administering Department	All		**College**	All	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Lecturer		**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	3/11/2024		**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	الهدف الأساس في تدريس اللغة العربية للأقسام العلمية : • اخذ الطالب الى روعة بيان القران الكريم ، وادراكه يقينا ان التعبير القراني تعبير فني مقصود ، كل لفظة ، وكل حرف وضع وضعا فنياً مقصوداً • تقويم اللسان العربي . واعتماد العربية الفصحى في الحديث والكتابة ، ولزيادة رصيد الطالب من ادب وتراث ، على تناول النصوص المختارة من العصور الأدبية المختلفة ، لزيادة رصيد ادب لتراث والادب المعاصر . • التأكيد على دور الطالب في المتابعة واثراء المعرفة باللغة العربية وفنونها بجهد خاص ، ذا ما وضعنا مفاتيح المنهاج الدراسي لتقع على الطالب بعد ذلك مهمة فتح الأبواب والنوافذ الى مصادر المعرفة الواسعة . في جعل العربية الفصيحة تحتل موضع الصدارة وتجاوز العامية ، خدمة الى لغتنا العربية المقدسة. وحفاظا على قوتها وجمالها . • ومن نافلة القول في اهداف تدريس اللغة العربية : هي الجانب المحقق للوحدة وتلزمنا دوافع الوفاء بالحرص عليها والمحافظة على جوهرها .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	يمكن ايجاز مخرجات العلم لمادة اللغة العربية العامة لاقسام غير الاختصاص بالنسبة لمرحلة الدراسة الأولى بالاتي :- * علمه اليقين بان القران الكريم قد اعطى للغة قيمة عليا ، ومنزلة رفيعة . واجبه الحفاظ عليها وصيانتها من اللحن والخطا ، ومن كل ما يشوبها . * تمكين الطالب من قراءة النص القراني بنفسه وتمكنه من معرفة ما في الايات الكريمة من امور لغوية وبلاغية ومعنوية ، وتمكنه من فحصها فحصاً دقيقاً . * سيتمكن الطالب من معرفة ما في لغته العربية من دقة في التعبير واحكام في الفن والعلو في الصنعة . * إظهار القواعد العلمية ، والأسس الفنية ، التي يقوم عليها العمل الأدبي في جزئياته وكلياته . لبيان الروح الجمالية والإبداعية التي تتجلى في النص الأدبي. * فهم طبيعة اللغة من حيث اعرابها (علم النحو) ، من الفعل والفاعل الذي يقع عليه فعل الفاعل ، والحال والتمييز والاوجه الاعرابية لما بعد التمييز . * تمكين الطالب من التفريق بين الافعال الثلاثية والرباعية والخماسية ، وتمكينه من التمييز بين الافعال ومصادر الافعال ، فالفعل : لفظ يدل على حدث الى جانب دلالته على الزمن ، مصدره لا يدل على زمنه أي زمن فعله. * التعريف بالمفهوم الزمني الفني : للحداثة والمعاصرة في الأدب ، وإعطاء صورة لتطور أدب وصولا إلى أدب العصر الحديث . * معرفة الطالب لمفهوم النثر العربي , وكيفية تطور النثر من القديم وكيفية تطور من القديم الى العصر الحديث من: المقالة والقصة والمسرحية ، ومعرفة اهم خصائصه الفنية ، وتطور المصطلح من النثر الى مفهوم السرد في العصر الحديث . * تعريف الطالب بمفهوم الشعر الحر او " شعر التفعيلة " ورواد مدرسة الشعر الحر ، نازك الملائكة وبدر شاكر السياب ، وكيف تفجرت حركة الشعر كلون من الوان الاحتجاج على الواقع الفني العربي .
Indicative Contents المحتويات الإرشادية	1- الاهتمام بالكلام ، ومحاولة التعمق في دراسة قواعده واصوله وتاريخه . 2- الاهتمام بقواعد اللغة تاصيلا وتقعيدا ، وتاريخ ادبها تسجيلا وتدوينا ، ونقد نصوصها تفسيرا وتاويلا .

3- الفهم الدقيق لاصوات اللغة العربية ، ومعرفة مخارج الاصوات ، ومعرفة مخرج كل صوت من اصوات العربية بطريقة مبسطة .وعلاقة الدال بالمدلول . 4- البحث في نشاة اللغة ، وعلاقتها بغيرها ، وخصائص اصواتها ، وابنية مفرداتها وتراكيبها . 5- البحث في عناصر لهجاتها وتطور دلالالتها ، والعوامل التي اثرت فيها ، والقوانين التي تحكم الصلة بين الفاظها . 6- الاهتمام بالكلام ومحاولة التعمق في دراسة قواعده واصوله وتاريخه . 7- - توليد القدرة على تذوق النصوص ، وفتح نافذة القدرة على التحليل والتاويل ، ومعرفة ما يريد ان يقوله النص الادبي . 8- دراسة اساسيات النحو العربي وقواعد الجملة العربية . 9- التعرف على تراكيب الجملة الفعلية والاسمية والمركبة .	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	ليحقق التدريسي اهداف ونواتج التعلم المستهدفة لا بد من تحقيق الاتي : ١_ التركيز على استراتيجيات تقود الى التعلم النشط ، والتأكيد على دور المتعلم واثارة اهتمامه ودفعه الى المشاركة الايجابية ٢_ الاكثار من النصوص العربية العالية ٣_ وان نعد بعض القطع للقراءة يمتزج فيها درس القواعد بدرس الادب؛ فان ذلك ادعى لتنمية ذوق الطالب في الفهم والحس والكلمات والاساليب واستعمالها . ٤_ منح التدريسي حرية اختيار قطع للقراءة من كتب الادب والنصوص ومن ادب المناسبات الذي ينشر في الصحف والمجلات ، لتصحيح النطق عند الطالب ، وتعويده على القراءة الصحيحة الخالية من اللحن . ٥_ تقع على عاتق التدريسي مهنة اساسية وهي التشويق والتقويم والتصويب في تدريسه اللغة_ العربية العامة لأقسام غير اختصاص . ٦_ تنشيط عنصر الاعتزاز باللغة العربية لدى طالب العلم وتأصيله والعمل على زرع محبته للغة العربية بوصفها اللغة الام لغة القران الكريم لغة الاعجاز والبيان . من خلال عرضه لقصص تراثية تتعلق بحرص العربي على لغته والاعتزاز بها .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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	4	20% (5)	3 , 5,8,11	LO #1...#3, #4...#5, #7&#8, #9... #11
	Assignments	2	10% (5)	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	1hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	(الفصل الأول) مهارات التعبير و فن الإنشاء و مهارات التعبير : (1) كتابة الإنشاء .
Week 2	(2) كتابة الخاطرة و المقالة .
Week 3	(الفصل الثاني) من القواعد الصرفية : (3) الأفعال الثلاثية و الرباعية و الخماسية و السداسية .
Week 4	(4) من مصادر الأفعال .
Week 5	(الفصل الثالث) القواعد النحوية : (5) الفاعل ، و نائب الفاعل .
Week 6	(6) الأفعال الناقصة (كان و أخواتها) .
Week 7	(7) الأحرف المشبهة بالفعل (إنَّ و أخواتها) .
Week 8	(8) من أنواع المفاعيل (المفعول به + المفعول المطلق + ظرفا الزمان و المكان) .
Week 9	(9) الحال ، و التمييز ، و الاستثناء .
Week 10	(10) من أنواع التوابع : (النعت و التوكيد) .
Week 11	(11) قواعد كتابة العدد .
Week 12	(الفصل الرابع) الأدب العربي : (12) نصوص من الشعر الحديث (محمد مهدي الجواهري) .
Week 13	(13) نصوص من الشعر الحر (أ) بدر شاكر السياب) .
Week 14	(14) (ب) (نازك الملائكة) .
Week 15	(15) من فنون النثر الحديث (الرواية و المسرحية) .

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- التعبير ألقراني – الدكتور : فاضل السامرئي 2- شرح ابن عقيل على الفية ابن مالك – لابن عقيل 3- علم اساليب البيان – غازي يموت. 4- اللغة العربية لاقسام غير الاختصاص مجموعة من اساتذة اللغة العربية .	
Recommended Texts		
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.

Level Two

Semester Four

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Separation methods**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-24119**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Chem		**College**	CoS	
Module Leader	Marwah Hashim Abdulateef		**e-mail**	marwahhashim@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**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	Learning students analytical chemistry fundamentals in specific knowledge of gravimetric analysis chemistry, classification of gravimetric analysis, precipitation analysis, types of precipitating reagents, inorganic precipitants and organic precipitants, properties of precipitant used for gravimetric analysis, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates and Solubility product (Ksp), calculation the solubility from Ksp, solubility problems, The affected factors on the solubility of the precipitates, Contamination of the precipitates and its types , avoiding impurities, digestion of precipitates, washing solutions, drying and ignition of the precipitates, Statistic in analytical chemistry with examples. - Learning students, the fundamentals of analytical separation methods: classification of separation methods, masking agents, liquid-liquid extraction, solvent extraction fundamentals, separation and classification of chromatography, separation by ion exchanges. - Teaching and learning students all the subjects, that related to the analytical chemistry course, which allow them to be qualified working in different aspects of analytical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of analytical chemistry. Enable students to acquire knowledge and understanding of international chemical standards. Enable students to acquire knowledge and understanding of the laws of chemistry. Enable students to acquire knowledge and understanding of chemical analysis standards in gravimetric chemistry and separation methods.- Enabling students to obtain knowledge and understanding of the law of the wrong use of chemicals.
Indicative Contents المحتويات الإرشادية	analytical chemistry fundamentals, gravimetric analysis chemistry, precipitation analysis, precipitating reagents, inorganic precipitants , organic precipitants, properties of precipitant, calculation of gravimetric analysis, gravimetric factor, solubility of precipitates ,Solubility product (Ksp), solubility problems, affected factors on the solubility of the precipitates, Contamination of the precipitates,

	impurities, digestion of precipitates, washing solutions, , Statistic in analytical chemistry.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for analytical chemistry. -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some practical problems..

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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)	8	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	Washing of precipitates, washing solutions, drying and ignition of the precipitates
Week 2	Statistic in analytical chemistry with examples
Week 3	Introduction and fundamentals of separation methods, and their types
Week 4	Classification of separation methods, their advantages with examples,
Week 5	Separation by chemical precipitation and their applications with examples, masking agents
Week 6	separation by distillation fundamentals, their types and applications, affected factor on distillation separation
Week 7	separation, solvent extraction fundamentals, extraction methods, liquid-liquid extraction, solid-liquid extraction, extraction efficiency, examples
Week 8	**Midterm Exam**
Week 9	The affected factor on the extraction separation, the effect of of pH, the effect of complexes formation, extraction techniques
Week 10	Introduction of Chromatographic separation, chromatographic separation fundamentals,

	chromatographic methods classification, mobile phase, and stationary phase
Week 11	Thin layer chromatography, paper chromatography و column chromatography with adsorption, gas chromatography, applications with examples
Week 12	Chromatographic separation techniques, separation by HPLC technique, ion exchange
Week 13	Chromatographic analysis fundamentals, Van-Deemter equation, retention time, rate separation and resolution, resolution with retention time, rate and plate theories, examples with problems
Week 14	Separation by ion exchanges fundamentals, anion exchange, cation exchange, ion exchanges classification, capacity of ion exchange, equilibrium of ion exchange with examples and applications
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Experiment for determination of chloride in the form of silver chloride
Week 2	Experiment for determination of chloride in the form of silver chloride
Week 3	Experiment of determination of sulfate in the form of barium sulfate
Week 4	Experiment of determination of sulfate in the form of barium sulfate
Week 5	Experimental determination of lead in the form of lead chromate
Week 6	Experimental determination of lead in the form of lead chromate
Week 7	Experiment with the determination of aluminum in the form of aluminum oxaniate
Week 8	Experiment with the determination of aluminum in the form of aluminum oxaniate
Week 9	Experiment with determination of magnesium in the form of magnesium pyrophosphate
Week 10	Experiment with determination of magnesium in the form of magnesium pyrophosphate
Week 11	Laboratory analysis of a cement sample
Week 12	Laboratory analysis of a cement sample
Week 13	Define the student By direct and indirect methods of separation

Week 14	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M. West. Eight Edition	Yes
Recommended Texts	1: Analytical Chemistry, Gary, Christian Sixth Edition 2: Chemical Analysis, Modern Instrumentation Methods and Techniques, Francis Rouessac and Annick Rouessac Second Edition	No
Websites	www.chemicalprocessing.com www.bytoco.com	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Inorganic Chemistry IV**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-24120**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Chem		**College**	CoS	
Module Leader	Khansa Yousif Ahmed		**e-mail**	khansa@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	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	Teaching the students all the necessary information about the Inorganic chemistry subject which make them able to work in the field of Inorganic Chemistry . Give idea about the periodic properties of the elements, study the molecular symmetry, study the standard electrode potential, study and classification of Acids and Bases, Explanation of Main elements in the periodic table from group 3 to 7. Study the basis of Solid State Chemistry including crystal system of Cube. Study the Magneto chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students being able to understand Inorganic Chemistry ,understand Chemical structures of chemical compounds ,understand chemical reactions ,understand the experiments in Inorganic Chemistry .Skills of Knowledge- to remember , skills of analysis and skills of development.
Indicative Contents المحتويات الإرشادية	periodic properties such as ionic and atomic size. Ionization energy, electronegativity and electro affinity , Some periodic properties such as metallic and nonmetallic properties, oxidation state, oxides (acidic, basic and amphoteric) Oxides (Ionic, covalent and middle), Solid and Soft Acids and Bases

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard. Explanation and clarification. Providing students with the basics and additional topics related to the outputs of inorganic chemical thinking and analysis. Forming discussion groups during lectures to discuss inorganic chemistry topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

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 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)	8	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	basics of solid state chemistry Packing methods, Cubic crystal system

Week 2	Ionic compounds and X-Ray
Week 3	Examples and solutions
Week 4	Introduction to Boron group , Oxidation state properties, reactions and compounds
Week 5	Introduction to Carbon group , Oxidation state properties, Carbon oxides and carbides
Week 6	Introduction to Nitrogen group , Oxidation state properties, Nitrogen oxides Nitrogen and hydrogen compounds
Week 7	Introduction to Fifth group (phosphorous, Arsenic, Bismuth and Antimon properties and compounds
Week 8	**Midterm Exam**
Week 9	Introduction to Oxygen, Coordination numbers of Oxygen, Ozone, Oxide ion, Peroxides, Superoxide, ozonide
Week 10	Introduction to Sulfur and other group elements properties and existence.
Week 11	Sulfur compounds and other group elements (oxides, oxoacides fluorides sulfides hydrides
Week 12	Introduction to Halogens, properties Oxides, oxidation states and pseud-halides
Week 13	Activity series of halogens, Reactions, oxoacides hydrogen halides ,, ionic and covalent halides
Week 14	Introduction to Noble gases, Xenon compounds
Week 15	**Midterm Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Study of some barium peroxide reactions
Week 2	Study of some barium peroxide reactions
Week 3	Estimation of water hardness
Week 4	Estimation of water hardness
Week 5	Properties of magnesium metal and magnesium ion interactions
Week 6	Properties of magnesium metal and magnesium ion interactions

Week 7	Preparation of chrome alum
Week 8	Preparation of chrome alum
Week 9	Detection of chromium alum ions
Week 10	Detection of chromium alum ions
Week 11	Investigation of the reaction between copper sulfate and sodium hydroxide
Week 12	Investigation of the reaction between copper sulfate and sodium hydroxide
Week 13	Some reagents and graph
Week 14	Some reagents and graph
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**1- Inorganic chemistry, principles of structure and reactivity,2nd ed., James E. Huheey, 1983** **2-Inorganic chemistry, 3rd ed., Housecroft C.E. and**	Yes
Recommended Texts		No
Websites	ttp://rapidshare.de/files/20322418/Patnaik_P._-_Handbook_of_inorganic_chemicals__McGraw_Hill_2003_.rar	

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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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	**Thermodynamic Chemistry II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**Che-24121**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	2		**Semester of Delivery**		4
Administering Department	Chem		**College**	CoS	
Module Leader	Ahmed Najem Abd		**e-mail**	dr.ahmednajemabd@uodiyala.edu.iq	
Module Leader's Acad. Title	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	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	Teach students the chemical reactions of gases and thermochemistry, and know how to solve problems related to them. Clarification of the energies of the bonds of organic interactions and knowledge of the first, second and third laws in thermodynamics And its practical applications aimed at developing and keeping pace with the scientific development of physical chemistry. Teaching and educating students on all the necessary and necessary information related to physical chemistry, which It qualifies them to work and research in all areas of physical chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of physical chemistry Enable students to obtain knowledge and understanding of gas reactions Enable students to obtain knowledge and understanding of the first, second and third laws of thermodynamics Enable students to obtain knowledge and understanding of examples and problems of physical chemistry. knowledge skills – remembering , the skills of recall and analysis Use and development skills
Indicative Contents المحتويات الإرشادية	physical chemistry, gas reactions , Entropy, Entropy of mixing ideal gases , Maxwell reaction , Gibbs-Helmholtz equation , Statistical thermodynamics , The Boltzmann law

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	Method of lectures (clarification and explanation of the study materials) through the blackboard, smart board, and computer. -Providing students with the basics and additional topics related to previous education outcomes for skills to solve scientific problems. -Providing students with knowledge through homework and assignments for physical chemistry. -Asking students to visit the library to obtain additional knowledge of the study materials. -Improving students' skills by visiting websites to obtain additional knowledge of the study subjects. -Asking students during the lecture to solve some practical problems..

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 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)	8	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	Entropy
Week 2	Spontaneous processes and entropy
Week 3	Entropy changes for typical processes
Week 4	Entropy of mixing ideal gases
Week 5	Free energy functions
Week 6	Maxwell reaction
Week 7	Gibbs-Helmholtz equation
Week 8	**Midterm Exam**
Week 9	Phase equilibrium
Week 10	Phase diagrams of Mixtures
Week 11	Liquid –Liquid phase diagrams
Week 12	Statistical thermodynamics
Week 13	The Boltzmann law
Week 14	The partition function, Thermodynamics functions for rotation, vibration, and electronic excitation
Week 15	**Midterm Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Phase diagram of a binary group consisting of (solid - solid)
Week 2	Phase diagram of a binary group consisting of (solid - solid)
Week 3	Determine the relative and absolute densities of an unknown liquid
Week 4	Determine the relative and absolute densities of an unknown liquid
Week 5	Find the density of water at different temperatures
Week 6	Find the density of water at different temperatures
Week 7	Adsorption in solutions
Week 8	Adsorption in solutions
Week 9	Adsorption in solutions
Week 10	Adsorption in solutions
Week 11	Distribution of acetic acid between benzene and water
Week 12	Distribution of acetic acid between benzene and water
Week 13	Distribution of acetic acid between benzene and water
Week 14	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Phy.chem.gases and thermodynamics ,A.F.Dawood Al-Niaimi	Yes
Recommended Texts	1-PHy.chem. water J.Moor 2--Phy.chem. Danials 3-Atkins 4-Phy.chem. J.Barroue 4-Element of chemical thermodynamic L.K.Nash	No

	5-Thermodynamics for chemistry	
Websites	www.byPhysical Chemistry Books Adwww.scienceforums.com/forum/chemistr toco.com	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Organic Chemistry II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**Che-24122**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	2	**Semester of Delivery**	4		
Administering Department	Chem	**College**	CoS		
Module Leader	Wassan Baqir Ali	**e-mail**	dr.wassan976@uodiyala.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	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	Preparing specialists who are familiar with the basics of chemistry, theoretically and practically, who are able to meet the needs of the labor market, in addition to teaching chemistry to students of other departments in the Faculty of Science and some other faculties at the university. Conducting scientific research and trying to keep pace with the scientific development of chemistry. Cooperating with state institutions and the private sector by providing advice and scientific advice and conducting chemical analyzes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to gain knowledge and understanding of the intellectual framework of chemistry, enable students to acquire knowledge and understanding of international chemical standards, enable students to acquire knowledge and understanding of the laws of chemistry ,enable students to acquire knowledge and understanding of chemical analysis standards, enabling students to obtain knowledge and understanding of the law of the wrong use of chemicals . skills goals special to the programme scientific skills , reminding and analyzing skills and uses , development skills .
Indicative Contents المحتويات الإرشادية	Preparation of alkanes and their properties , Reactions of Alkanes , Nomenclature of alkenes and properties , Alkynes , Dienes, structure and synthesis and stabilization

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Clarification and explanation of the study materials by the academic staff through the blackboard, smart board and computer. Providing students with knowledge through homework assignments for academic vocabulary Asking students to visit the library to obtain additional knowledge of the study materials .Improving students' skills by visiting websites to obtain additional knowledge of the study subjects .

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 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)	8	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	Aliphatic cyclic compounds, structure and physical properties, synthesis, and reactions

Week 2	Aromaticity, structure, and stability of benzene
Week 3	The Hückel 4n + 2 rule, synthesis and electrophilic aromatic substitution
Week 4	Electrophilic aromatic substitution of aromatic compounds
Week 5	Arenes, structure, synthesis, and reactions
Week 6	Alkyl halide, structure and physical properties, synthesis of alkyl halides
Week 7	reactions SN1 , Reactions and mechanism of SN2
Week 8	**Midterm Exam**
Week 9	Reactions and mechanism of E1
Week 10	Reactions and mechanism of E2
Week 11	Alcohols, structure and physical properties
Week 12	synthesis, and reactions of Alcohols
Week 13	Ethers, structure and physical properties
Week 14	synthesis and reactions of Ethers
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Detection of nitrogen in organic chemical compounds
Week 2	Detection of nitrogen in organic chemical compounds
Week 3	Detection of sulfur in organic chemical compounds
Week 4	Detection of sulfur in organic chemical compounds
Week 5	Detection of halogens in organic chemical compounds
Week 6	Detection of halogens in organic chemical compounds
Week 7	Preparation and detection of CH4 methane, Study the properties and interactions of alcohols

Week 8	Preparation and detection of CH4 methane, Study the properties and interactions of alcohols
Week 9	Conducting an experiment to detect alcohols in general and especially to find out primary, secondary or tertiary alcohol using chemicals
Week 10	Conducting an experiment to detect alcohols in general and especially to find out primary, secondary or tertiary alcohol using chemicals
Week 11	Detection of iodoform , properties of alkyl halides , Preparation of alkyl halide
Week 12	Detection of iodoform , properties of alkyl halides , Preparation of alkyl halide
Week 13	Alcohols, structure and physical properties , synthesis, and reactions of Alcohols
Week 14	Alcohols, structure and physical properties , synthesis, and reactions of Alcohols
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Organic chemistry, Morrison and Boyd (1)	Yes
Recommended Texts	Organic Chemistry, Clayden J., Creeves N., Warren S and Wother P., Oxford, 2001	No
Websites	www.chemicalprocessing.com	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Statistics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Che-24024**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Chem		**College**	CoS	
Module Leader	Suhad Kareem Hamid		**e-mail**	Suhadkareem@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc.	
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	Providing the student the skills of understanding, applying and analyzing statistical and probability measures in quantitative and descriptive data in various administrative fields , Giving the graduate the skills of collecting, presenting and analyzing data in order to extract and draw conclusions about the various phenomena under study , Use of statistical methods in different fields
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Enable students to obtain knowledge and understanding of advanced mathematics Enable students to obtain knowledge and understanding of the structure of statistic Enable students to obtain knowledge and applying and analyzing statistical and probability measures , Solving issues related to scientific material, writing scientific reports and analyzing data , Giving lectures and using textbooks ,knowledge skills – remembering, the skills of recall and analysis ,skills of use and modeling
Indicative Contents المحتويات الإرشادية	The statistics course for second-year Chemistry students covers an introduction to statistics and its importance in scientific data analysis, types of data and methods of presentation, measures of central tendency (mean, median, mode), and measures of dispersion (range, standard deviation). It also includes basic probability concepts, probability distributions—especially the normal distribution—correlation and simple linear regression, and hypothesis testing using the t-test. The course emphasizes practical applications in chemistry, such as analyzing experimental results and instrument readings.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Power point lecture method using data show and whiteboard.

	Explanation and clarification. Providing students with the basics and additional topics related to the outputs of mathematics thinking and analysis. Forming discussion groups during lectures to discuss mathematics topics that require thinking and analysis. Asking students a set of thinking questions during the lectures such as what, how, when and why for specific topics. Giving students homework that requires self-explanations in causal ways.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	28	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	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)	8	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	events, elementary concepts and rules about probabilities, random events,types of random events, regular events ,and methods of calculating probabilities
Week 2	independent events , dependents events, the constitution of total probabilities
Week 3	conditional probabilities, totality and Bayesian theory, numerical computation methods, permutation and combinations
Week 4	definition of random variable, mathematical and statistical definition
Week 5	discrete random variable (intermittent),probability distribution and probability density function
Week 6	continuous random variable (continuous)), probability distribution and probability density function
Week 7	the statistical features of the random variable (expectation, variance and standard deviation)
Week 8	**Midterm Exam**
Week 9	probability distribution function, probability density function
Week 10	probability distributions, binomial distribution, cumulative distribution function for binomial distribution
Week 11	Poisson probability distribution
Week 12	normal distribution law, standard normal distribution
Week 13	Estimating the parameters of a distribution, method of movement
Week 14	maximum likehood, least squares

Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Mathematical Statistics Hogg & Criug Elements of Mathematical Stats. Ractliffe	Yes
Recommended Texts	www.mathwords.com	No
Websites	www.freebookcentre.net	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	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.

Ministry of Higher Education and Scientific Research - Iraq
University of Diyala
College of Engineering
Department of Computer Engineering

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	جرائم نظام البعث في العراق			**Module Delivery**	
Module Type	Basic learning activities			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☒ Seminar	
Module Code	UD24				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	2		**Semester of Delivery**		
Administering Department	جميع اقسام الكلية		**College**	College of	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**	MSc.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	9/09/2024		**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. التعرف على ماهية الجريمة لغة واصطلاحاً وماهية أقسام الجرائم. 2. التعرف على جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م. 3. تنمية وعي الطلب بجرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا لسنة 2005م. 4. دراسة الجرائم التي ارتكبها نظام البعث على مدى سنوات طويلة واثارها النفسية والاجتماعية . 5. التعرف على صور انتهاكات حقوق الانسان وجرائم السلطة والتعرف على الجرائم البيئية لنظام البعث في العراق. 6. تعزيز الوعي بحقيقة ما جرى من مآسي المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تمكين الطالب من معرفة المفاهيم النظرية للجرائم وأركان الجرئم . 2. تمكين الطالب من معرفة أقسام الجرائم . 3. تمكين الطالب من معرفة قانون المحكمة الجنائية العراقية العليا لسنة 2005. 4. فهم تشكيل المحكمة الجنائية العراقية العليا لسنة 2005 والتعرف على تشكيل المحكمة أجراءات التقاضي امام المحكمة. 5. يتعلم الطالب أنواع الجرائم الدولية على وفق النظام الاساسي للمحكمة الجنائية الدولية. 6. معرفة الطالب بألاثار النفسية والاجتماعية لجرائم نظام البعث. 7. يتمكن الطالب من فهم موقف النظام البعثي من الدين من خلال فهم عقيدة النظام السياسي سبيلاً لفهم موقف النظام من الدين. 8. يتمكن الطالب من التعرف على صور أنتهاكات القوانين العراقية وأنتهاكات حقوق الانسان وجرائم السلطة. 9. تمكين الطالب من التعرف على بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث. 10- يتعرف الطالب على أماكن السجون والاحتجاز لنظام البعث. 11- معرفة الطالب بالجرائم البيئية وبأثار الجرائم البيئية لنظام البعث، ويتعرف جرائم المقابر الجماعية.
Indicative Contents المحتويات الإرشادية	**<u>الجزء الاول</u> : جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لعام 2005م، والجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق:** التعريف بالجريمة لغة وأصطلاحاً، اركان واقسام الجريمة (2 ساعة). جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م : أنواع الجرائم الدولية، القرارات الصادرة من المحكمة الجنائية العليا (2 ساعة). وابرز القضايا التي نظرت فيها المحكمة (2 ساعة).الجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق: الجرائم النفسية، اليات الجرائم النفسية (2 ساعة). اثار الجرائم النفسية ، الجرائم الاجتماعية (2 ساعة) . عسكرة المجتمع، موقف النظام البعثي من الدين (2 ساعة) . أنتهاكات القوانين العراقية، صور أنتهاكات حقوق الانسان (2 ساعة) . جرائم السلطة، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث (2 ساعة). **<u>الجزء الثاني : الجرائم البيئية لنظام البعث في العراق، جرائم المقابر الجماعية :</u>** الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – أستعمال الاسلحة المحرمة دولياً ومخاطر الالغام. (2 ساعة). التلوث بالمواد المشعة، أثار أستخدام الاسلحة المحرمة دولياً (2 ساعة). تدمير المدن والقرى (سياسة الارض المحروقة): قصف المدن، قصف العتبات المقدسة والمساجد والحسينيات، معركة نهر جاسم ، حرق آبار النفط (2 ساعة). تجفيف الاهوارو أثارها البيئية والاجتماعية والاقتصادية (2 ساعة). ، تجريف بساتين النخيل والاشجار والمزروعات (2 ساعة). جرائم المقابر الجماعية وموقف الامم المتحدة منها (2 ساعة). احداث المقابر الجماعية المرتكبة من النظام البعثي في العراق، التصنيف الزمني لمقابر ابادة الجماعية في العراق للمدة 1963- 2003 (2 ساعة).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- زيادة وعي الطالب بالجرائم التي ارتكبها نظام البعث في العراق وحقيقة ما جرى من مآسي وويلات بحق الشعب العراقي. 2- اكتساب الطالب ثقافة عامة بماهية الجرائم واركانها واقسامها وموقف المشرع العراقي منها. 3- زيادة وعي الطالب بموقف القانون الدولي والمحاكم الجنائية الدولية من الجرائم والانتهاكات التي ترتكبها الانظمة السلطوية.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**33**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**17**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة واهميتها.
Week 2	التعريف بالجريمة لغة واصطلاحا، أقسام الجريمة، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م ، أنواع الجرائم الدولية.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، وأبرز القضايا التي نظرت فيها المحكمة.
Week 4	الجرائم النفسية، اليات الجرائم النفسية.
Week5	اثار الجرائم النفسية، الجرائم الاجتماعية
Week 6	عسكرة المجتمع، موقف النظام البعثي من الدين.
Week 7	انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان، جرائم السلطة.
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث.
Week 9	الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام.
Week 10	التلوث بالمواد المشعة، أثار أستخدام الاسلحة المحرمة دولياً
Week 11	تدمير المدن والقرى (سياسة الارض المحروقة).
Week 12	تجفيف الأهوار أثارها البيئية والاجتماعية والاقتصادية .
Week 13	تجريف بساتين النخيل والاشجار والمزروعات.
Week 14	جرائم المقابر الجماعية، أحداث المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Week 15	التصنيف الزمني لمقابرالابادة الجماعية في العراق للمدة 1963- 2003.
Week 16	الامتحان النهائي

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	المنهج المقر الدراسي للجامعات الحكومية و الأهلية كافة كتاب وزارة التعليم والبحث العلمي ذي العدد (ت م 3/ 7588 في 2023/10/19)	نعم
Recommended Texts		لا
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	**English Language 2**			**Module Delivery**	
Module Type	**Basic learning activities**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	UD21				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	UGII		**Semester of Delivery**		
Administering Department	All		**College**	All	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name(if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	3/11/2024		**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	The module aims at enabling students to learn and understand the written and spoken form of English. It also aims at teaching functional English to learners and honing their reading, writing and listening skills>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Read and understand simple texts in English. 2. Answer simple comprehension questions and match sentences about texts. 3. Reconstruct texts by reordering sentences. 4. Understand the main idea of a text. 5. Identify specific information in a text. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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	4	20% (5)	3 , 6,8,11	LO #1...#3, #4...#6, #7&#8, #9... #11
	Assignments	2	10% (5)	5 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	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)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Course Introduction (Course material and objectives, learning outcomes, lessons and assessment discussed with the learners).
Week 2	**Unit 1. Getting to know you** **Reading:** People, the great communicators' - the many ways we communicate **Listening**: Neighbours - Steve and Mrs Snell talk about each other as neighbours **Speaking**: Information gap - Joy Darling **Writing**: Informal letters - A letter to a pen friend **Grammar**: Tenses: present, past and future
Week 3	**Unit 2. The way we live** **Reading:** 'Living in the USA' - three people talk about their experiences **Listening**: You drive me mad (but I love you)!' - what annoys you about the people in your life? **Speaking**: Information gap - people's Lifestyles. Exchanging information about immigrants to the USA **Writing**: Linking words, but, however. Describing a person **Grammar**: Present tense , present continuous
Week 4	**Unit 3. It all went wrong** **Reading:** 'The burglars' friend'. Newspaper stories. A short story - 'The perfect crime **Listening**: A radio drama - 'The perfect crime **Speaking**: Information gap - Zoe's party. Telling stories **Writing**: Linking words: while, during, and for. Writing a story **Grammar**: Past tenses: Past Simple and past continuous
Week 5	**Unit 4. Let's go shopping!** **Reading:** 'The best shopping street in the world' **Listening**: 'My uncle's a shopkeeper' , Buying things **Speaking**: Town survey - the good things and bad things about living in your town, Discussion - attitudes to shopping p **Writing**: Filling in forms **Grammar**: Quantity , Articles
Week 6	**Assessment Test 1. Feedback and Remedial Work**

Week 7	**Unit 5. What do you want to do?** **Reading:** 'Hollywood kids - growing up in Los Angeles ain't easy **Listening:** A song - You've got a friend **Speaking:** What are your plans and ambitions? Being a teenager **Writing:** Writing a postcard **Grammar:** Verb patterns 1, future intentions
Week 8	**Unit 6. Tell me! What's it like?** **Reading:** A tale of two millionaires' - one was mean and one was generous **Listening:** Living in another country — an interview with a girl who went to live in Sweden **Speaking:** Information gap – comparing cities **Writing:** Relative clauses 1 who/that/which/where. Describing a place **Grammar:** Comparative and superlative adjectives big, bigger, biggest, good, better, best
Week 9	**Unit 7. Famous couples** **Reading:** Celebrity interview from Hi! Magazine with the pop star and the footballer who are in love **Listening**: An interview with the band Style **Speaking:** Mingle - Find someone who ... Role play - interviewing a band **Writing:** Relative clauses 2 who/ which/ that as the object. Writing a biography **Grammar:** Present Perfect and Past Simple
Week 10	**Unit 8. Do's and don'ts** **Reading:** Problems and suggestions **Listening:** Holidays in January - three people's advice on what to do in their country in January **Speaking:** Jobs - a game. Discussion - house rules, Asking questions about place **Writing:** Writing letters- Formal letters **Grammar:** have (got) to, should, must
Week 11	**Assessment Test 2. Feedback and Remedial Work**
Week 12	**Unit 9. Going places** **Reading:** The world's first megalopolis - a city of 40 million people **Listening:** Life in 2050 - an interview with Michio Kaku, Professor of Theoretical Physics **Speaking:** What will you do? Discussion - what will life be like in the 21st century? **Writing:** Linking words 2, Advantages and disadvantages **Grammar:** Time and conditional clauses
Week 13	**Unit 10. Scared to death** **Reading:** 'Don't look down' - walking on a dangerous footpath, 'Into the wild' **Listening:** When I was young p80 It was just a joke - a boy called Jamie kidnapped his friend **Speaking:** 'When I was young' - talking about your childhood **Writing:** Writing letters Formal and informal letters 1 **Grammar:** Verb patterns 2 manage to do, used to do, go walking, Infinitives, Purpose
Week 14	**Unit 11. Things that changed the world** **Reading:** Three plants that changed the world - tobacco, sugar and cotton **Listening:** The world's most common habit: chewing gum **Speaking:** Exchanging information about three plants **Writing:** Writing a review of a book or film **Grammar:** Passive
Week 15	**Unit 12. Dreams and reality** **Reading:** The vicar who's a ghostbuster **Listening:** An interview with a woman who heard voices **Speaking:** Giving advice - If I were you, I'd….. **Writing:** Writing letters Expressions in different kinds of letters **Grammar:** Second conditional

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	New Headway Pre-Intermediate by:John and Liz Soars. Oxford University Press	Yes
Recommended Texts	None	
Websites	https://apoyanblog.wordpress.com/wp-content/uploads/2016/09/new-headway-pre-intermediate-students-book.pdf	

Grading Scheme مخطط الدرجات				
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Level Three

Course Description Form

1. Course Name:

Kinetic chemistry

2. Course Code:

301CHKC

3. Semester / Year:

First semester /Third year

4. Description Preparation Date:

1/10/2024

5. Available Attendance Forms:

Mandatory

6. Number of Credit Hours (Total) / Number of Units (Total)

45h – 4 units

7. Course administrator's name (mention all, if more than one name)

Name: Amir .F. Dawood
Email: dr.amer960@uodiyala.edu.iq
Name: Ahmed Ismail Kareim
Email: ahmed_kandory@uodiyala.edu.iq

8. Course Objectives

Course Objectives	**The objective of this course is for students to gain a firm understanding of the mathematical and physical aspects of the behavior of chemical systems, chemical kineti and the properties of matter, electrochemistry and photochemistry.**

9. Teaching and Learning Strategies

Strategy	**Engage, Explore, Explain, Elaborate, and Evaluate**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	**To develop the basic knowledge of students about gases.**	Kinetic molecular the of gases	**Lecture, Tutorials**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv** homework
2	3	**Students are taught the Distribution velocity**	Molecular velocity distribution	**Lecture, Tutorials**	**The evaluation is done through c**

					activities answer a set of questions, then the students are asked to solv homework assignment related to lesson
3	**3**		Maxwell-Boltzmann distribution	**Lecture, Tutorials**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
4	**3**		The principle of e distribution of energi	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
5	**3**	**Complete knowledge about spectroscopy**.	Photochemistry reg of the spectrum	**Lecture, Tutorials**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
6	**3**	**Students come to know about photochemistry**	The rules photochemistry	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
7	**3**		Exam	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
8	**3**		Selectivity of the photochemical reacti	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
9	**3**		Molecular orbitals types of elec transitions	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
10	**3**		spin, single and tr cases	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
11	**3**		Picking rules	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**
12	**3**		Types of trans prohibited and allowe	**Lecture, Tutorial**	**The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to lesson**

13	3		Potential energy cu of molecules	Lecture, Tutorial	The evaluation is done through cl activities answer a set of questions, a then the students are asked to solv homework assignment related to lesson
14	3		electronic spectra	Lecture, Tutorial	The evaluation is done through cl activities answer a set of questions, a then the students are asked to solv homework assignment related to lesson
15	3		Exam	Lecture, Tutorial	The evaluation is done through cl activities answer a set of questions, a then the students are asked to solv homework assignment related to lesson

11. Course Evaluation

Assignments and Report 10%, Quizzes 10%, Midterm Exam 30%, and Final Exam 50% Then the total is 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Thermodynamic and photochemistry By Dr. Jalal Mohamed Saleh**
Main references (sources)	**Physical chemistry by Atkins**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**Physical chemistry:Books-Amazon.com**

Course Description Form

1. Course Name:
Organic Chemistry 3
2. Course Code:
302CHOC3
3. Semester / Year:
First semester /Third year
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
30h – 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Luma Salman Abd Email:Luma _Salman@uodiyala.edu.iq

8. Course Objectives	
Course Objectives	Teaching the student organic chemical reactions and chemical structures and knowledge of the structure of organic compounds and clarification of the mechanism of organic reactions and their practical applications aimed at developing and keeping pace with the scientific development of organic chemistry

9. Teaching and Learning Strategies	
Strategy	- Clarification and explanation of the study materials by the academic staff through the blackboard, smart board and computer. - Providing students with knowledge through homework assignments for academic vocabulary - Asking students to visit the library to obtain additional knowledge of the study materials Improving students' skills by visiting websites to obtain additio knowledge of the study subjects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
1	2	Introduction to carbonyl compounds	carbonyl compounds	Board and data show
2	2	properties of aldehydes and ketones	Aldehydes and ketones	=
3	2	Aldehydes and ketones reactions	Aldehydes and ketones	=
4	2	Methods of preparation	Aldehydes and ketones	=
5	2	The acidity of the hydrogen atom	Condensation reaction	=
6	2	Their reactions (aldol condensation)	Aldol condensation)	=
7	2	Carboxylic acids physical properties	Carboxylic acids	=
8	2	their chemical properties (chemical reactions)	Carboxylic acids	=
9	2	Methods of preparation	Carboxylic acids	=
10	2	Dicarboxylic acid Naming	Dicarboxylic acid	=
11	2	Methods of preparation	Dicarboxylic acid	=
12	2	Derivatives of carboxylic acids / Naming	Derivatives of carboxylic acids	=
13	2	(its chemical reactions)	Derivatives of carboxylic acids	=
14	2	Methods of preparation	Derivatives of carboxylic acids	=
15	2	Additional important information about carboxylic acid derivatives	Additional important information about Carboxylic acid derivatives	

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports .... etc

12 –Learning and Teaching Resources

Required textbooks (curricular books, if any)	Organic chemistry, Morrison and Boyd (1)
Main references (sources)	1- Essential organic chemist second addition 2- Organic chemistry (sixth edition) 3- Interne
Recommended books and references (scientific journals, reports…)	www.chemicalprocessing.com
Electronic References, Websites	www.bytoco.com

Course Description Form

1. Course Name:
Biochemistry 1
2. Course Code:
304CHBC1
3. Semester / Year:
First semester /Third year
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (120) / Number of Units (2)
30h – 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Ekhlas Abdallah Hassan Email: ekhlasbiochemistry@gmail.com ekhlasabdullah@uodiyala.edu.iq
8. Course Objectives

Course Objectives	**1- Giving the student broad information about biochemistry** **2- How the student knows how to understanding the chemistry of macromolecules** **3- Giving the student sufficient information bout macromolecules and knowing the chemical sources related to them,**

9. Teaching and Learning Strategies	
Strategy	**Engage, Explore, Explain, Elaborate, and Evaluate**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	CARBOHYDRATE CHEMISTRY	• Definition, •Classification and Functions of Carbohydrates n • Structure of Glucose	blackboard + PowerPoint	Daily exams and homework + monthly exams
2	**2**	CARBOHYDRATE	• Isomerism	blackboard +	Daily exams and

		CHEMISTRY	• Mutarotation • Chemical •Properties of Monosaccharides •Glycoside Formation	PowerPoint	homework + monthly exams
3	**2**	CARBOHYDRATE CHEMISTRY	Derivatives of Monosaccharides • Disaccharides • Polysaccharides (Glycans) • Glycoproteins	blackboard + PowerPoint	Daily exams and homework + monthly exams
4	**2**	CHEMISTRY OF LIPI	-Definition, Classification and Functions of Lipids • Fatty Acids • Essential Fatty Acids	=	=
5	**2**	CHEMISTRY OF LIPI	• Reactions of Lipids Characterization of Fat • Triacylglycerols or Triacylglycerides or Neutral Fat	=	=
6	**2**	CHEMISTRY OF LIPI	Phospholipids • Glycolipids Cholesterol Lipoproteins	=	=
7	**2**	CHEMISTRY OF LIPI	Eicosanoids • Micelles, Lipid Bilayer and Liposomes Detergents	=	=
8	**2**	CHEMISTRY OF PROTEINS	• General Nature of Amino Acids Classification of Amino Acids	=	=
9	**2**	CHEMISTRY OF	• Modified or	=	=

		PROTEINS	Nonstandard Amino Acids Properties of Amino Acids		
10	**2**	CHEMISTRY OF PROTEINS	• Biologically Important Peptides • Definition, Classification and Functions of Proteins • Structure of Proteins • Properties of Proteins • Denaturation of Proteins	=	=
11	**2**	ENZYMES	• Definition • Zymogen or Proenzyme • Cofactors (Coenzyme and Activator) • How Enzymes Work • Mechanism of Enzyme Action	=	=
12	**2**	ENZYMES	Enzyme Classification • Specificity of Enzyme Action • Factors	=	=
13	**2**	ENZYMES	Affecting the Velocity of Enzyme Reaction • Enzyme Kinetics • Enzyme Inhibition	=	=
14	**2**	ENZYMES	Allosteric Enzyme • Isoenzyme • Clinical Significar of Enzymes	=	=
15	**2**	CHEMISTRY OF NUCLEIC ACIDS	Nucleic Acids • Nucleotide • Biologically	=	=

			Important		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

1. Books Required reading:	ESSENTIALS OF BIOCHEMISTRY. Pankaja Naik PhD Professor and Head Department of Biochemistry MVPS Dr Vasantrao Pawar Medical College Nashik, Maharashtra India
2. Main references (sources)	Harper's Illustrated Biochemistry, 31e
A- Recommended books and references (scientific journals, reports…).	
B-Electronic references, Internet sites…	Textbook of Biochemistry - Medical Students, 6th Edition

Course Description Form

1. Course Name:
Principles of Industrial chemistry
2. Course Code:
303CHIC1
3. Semester / Year:
First semester /Third year
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
Mandatory attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: 1- Asst. prof. Dr. Noor sabah ahmed noorsabah@uodiyala.edu.iq 2- Asst. prof. Dr. mohammed alwan farhan Mohammed.alwan@uodiyala.edu.iq

8. Course Objectives	
Course Objectives	**Teaching the student about oil and polymer chemistry, knowledge of the petrochemical industries related to them, how to manufacture raw materials in the petrochemical industries, knowledge of corrosion and its types, pollution and its types, dyes and plastics and their practical applications aimed at developing and keeping pace with the scientific development of Yamiya Industrial.** **Teaching and teaching students all the necessary and essential information related to industrial chemistry, which qualifies them to work and research in all fields of industrial chemistry.**

9. Teaching and Learning Strategies	
Strategy	Explanation and clarification Lecture method and questioning method Model display method

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introducing the stude to industrial chemist and its importance in our lives	Historical introductio branches of chemistry Types of chemical industries- Principles of chemi industries	Lecture using blackboard a data show a discussion	Daily exams, homework, an monthly exam
2	2	Student knowledge In chemical industrie	Definitions and important informatio in the chemical indust	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
3	2	Student knowledge o economics Chemical industries	Economics of chemi industries	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
4	2	The student knows basics of choos chemical reactions	The foundations of selecting chemical reactions and the technology of transferring them to t industrial level	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
5	2	The student's knowledge of physica processes in chemica industries and separation methods	Physical processes in chemical industries a separation methods	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
6	2	The student's knowledge of the distillation process	Industrial units/distillation process	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
7	2	The student's knowledge of the chemical absorption process	Chemical absorpt process	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
8	2	The student's knowledge of metho for the adsorption process	Adsorption process	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
9	2	The student's knowledge of the extract ion process	Extraction process	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
10	2	The student's knowledge of the		Lecture using blackboard and	Daily exams, homework, an

		nomination method	Filtration process	show and discussio	monthly exam
11	2	The student's knowledge of chemic reactions and chemic reactors	Chemical reactions a chemical reactors	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
12	2	Student definition of contributing factors (motivating factors)	Catalysts in the chemical industry	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
13	2	Introducing the stud to how to calculate balance of matter in chemical industry	Calculating mat balance in the chemi industry	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam
14	2	Material balance calculations in combustion processe	Material balance calculations in combustion processes	Lecture using blackboard a data show a discussion	Daily exams, homework, an monthly exam
15	2	Student knowledge fuel and energy/oil gas	Introducing the stud to fuel a energy/oil/gas	Lecture using blackboard and show and discussio	Daily exams, homework, an monthly exam

11. Curse Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Foundations and applications in industr chemistry / written by Dr. Latif Har Ali/University of Mosul
Main references (sources)	Foundations of industrial chemistry / written Dr. Aziz Ahmed Amin
Recommended books and references (scientific journals, reports…)	www.chemicalprocessing.com/
Electronic References, Websites	www.bytoco.com

Course Description Form

1. Course Name:
Coordination chemistry 1
2. Course Code:
305CHCC1
3. Semester / Year:
First semester /Third year
4. Description Preparation Date:
1/10/2024
5. Available Attendance Forms:
mandatory
6. Number of Credit Hours (Total) / Number of Units (Total)
30h – 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. prof. Dr. Areej Ali Jarullah Email: dr.areej977@uodiyala.edu.iq Assist. prof. Jinan Mohammed Mahmood jinan.mohammed@uodiyala.edu.iq
8. Course Objectives

Course Objectives	Teaching the student inorganic chemical reactions and chemical structures, knowledge of the structure of inorganic compounds and how to clarify the mechanics of inorganic reactions and their practical applications aimed at developing and keeping pace with the scientific development of inorganic chemistry
	Teaching and educating students on all necessary and necessary information related to inorganic chemistry, which qualifies them to work and research in all areas of inorganic chemistry

9. Teaching and Learning Strategies

Strategy	Explanation and clarification Lecture method and questioning method Model display method

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to the chemistr transitional elements, Some periodic properties and oxidation states of transitior elements	Transitional elements	Board and data show	Daily exams Homework Monthly exam
2	2	A historical look at the development of coordinatio chemistry, Chain theory, Warner's coordination theor	Coordination Chemistry	=	=
3	2	Coordination number, Type ligands, Nomenclature of coordination complexes,	Coordination Chemistry	=	=
4	2	Isomerism in metal Comple	Coordination Chemistry	=	=
5	2	The effective atomic numbe	Theories that explain the coordination complexes	=	=
6	2	Valance bond theory-Hybridization of atomic orbitals	Theories that explain the coordination complexes	=	=
7	2	Crystal field theory	Theories that explain the coordination complexes	=	=
8	2	Crystal field stabilization energy for strong and weak field complexes, A compari between valence bond theor and crystal field theory	Theories that explain the coordination complexes	=	=
9	2	First exam - first semester			
10	2	Molecular orbital theory, Orbital Symmetry	Theories that explain the coordination complexes	=	=
11	2	Various preparation method Substitution reactions in aqueous and non-aqueous solvents and in the absence the solvent, Thermal dissociation of complexes, oxidation- reduction reactio	Methods for preparing the coordination complexes and their interactions	=	=
12	2	ligand mechanism (SN1, SN	Methods for preparing the coordination complexes and their interactions	=	=
13	2	Homogeneous and heterogeneous catalytic Age	Catalysis	=	=
14	2	Preparation isomerism of ci and trans.	Trans effect	=	=
15	2	Second exam - first semester			

11.

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Inorganic chemistry - chemistry of transition elements, principles of coordination, Dr. Noman Al-Naimi and others.
Main references (sources)	-Inorganic chemistry, Catherine E. Housecroft and Alan G. Sharpe, 3rd ed., 2008. -Inorganic chemistry, Catherine E. Housecroft and Alan G. Sharpe, 4th ed., 2012. -Inorganic chemistry, James E. Huheey, Ellen A. Keiter and Richard L. Keiter, 4th ed.,1993.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Environmental pollution
2. Course Code:
306CHEC
3. Semester / Year:
Firs t semester/third stage
4. Description Preparation Date:
2024/10/1
5. Available Attendance Forms:
Weekly/ mandatory
6. Number of Credit Hours (30) / Number of Units (2)
30 h- 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: Wafaa Sh. Al-Zuhairi Email: wafaashamkhi@uodiyala.edu.iq
8. Course Objectives

Course Objectives	**1- Giving the student broad information about environmental pollution and knowing the sources that lead to environmental pollution around us.** **2- How the student knows how to treat pollution and get rid of its sources.** **3- Giving the student sufficient information about water pollution, soil pollution, a air pollution, knowing the chemical sources related to them, and how to get rid harmful environmental pollutants in safe ways.**

9. Teaching and Learning Strategies

Strategy	• Lectures using data show • Oral explanation • Illustration using white board and animated vedios

10. Course Structure

Week	Hours	Required	Unit or subject	Learning method	Evaluation method

		Learning Outcomes	name		
1	2		Sufficient information about the environment around us	Blackboard/Powerpo	Daily exams and homework, in additio to monthly exams
2	2	Water Polluti	Adequate information about the sources of wat pollution	=	=
3	2	air pollution	Sufficient information about pollution around u	=	=
4	2	Oil pollution	Sufficient information about pollution and its impact on the environment	=	=
5	2	Radioactive pollution	Pollution resulting from radioactive elements	=	=
6	2	Climate chan	Sufficient information about climate change an its impact on the environment	=	=
7	2	Heavy eleme	Sufficient information about pollution resulting from heavy metals and its impact on t environment	=	=
8	2	First month exam	A theoretical exan the subject mentioned above	=	=
9	2	Soil contaminatio	Soil pollution and what are the sourc of this pollution	=	=
10	2	Renewable energy	Adequate information about renewable energy and the sources of this energy	=	=

11	2	Green buildir and their role reducing environmenta pollution	The role of green buildings in reduc environmental pollution	=	=
12	2	Depleted uranium	Pollution from depleted uranium	=	=
13	2	Water analys	Sufficient information about water analyses	=	=
14	2	Noise Polluti	Sufficient information about noise pollution in environment arou us	=	=
15	2	Second mont exam	A theoretical exan the subject mentioned above		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Environmental Chemistry book written by Gary Van Loon and Steve Duffy
Main references (sources)	Environmental pollution, its sour and types Science and Technology Magazine
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

13. Course Name:
Electro chemistry
14. Course Code:
307CHEC
15. Semester / Year:
second semester /Third year
16. Description Preparation Date:
2025
17.Available Attendance Forms:
mandatory
18.Number of Credit Hours (Total) / Number of Units (Total)
45h – 4 units
19. Course administrator's name (mention all, if more than one name)
Name: Amir .F. Dawood **Email: dr.amer960@uodiyala.edu.iq** **Name: Ahmed Ismail Kareim** **Email: ahmed_kandory@uodiyala.edu.iq**
20. Course Objectives

Course Objectives	The objective of this course is for students to gain a firm understanding of the mathematical and physical aspects of the behavior of chemical systems, chemical kineti and the properties of matter, electrochemistry and photochemistry.

21. Teaching and Learning Strategies	
Strategy	**Engage, Explore, Explain, Elaborate, and Evaluate**

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3		Photo sensitivity	Lecture, , Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the les
2	3		Quantum yield	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the les

3	3	students get knowledge of chemical reactions	Chemical kinetics	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
4	3	Make the students to able to determine rate of reaction	Rate reactions	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
5	3		Order reaction a molecularity	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
6	3		Integrated ra equations	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
7	3		Half-life	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
8	3		Exam	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
9	3	Have a good knowledge About the mechanism Of reaction	Collision theory, activated-complex theo	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
10	3	Students get famil with electrochemistry	Electrical conductance solutions	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
11	3		Dissociation constant Of electrolyte	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
12	3	Students get to learn Various types of cells	Electrochemi cells	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
13	3		Redox potent	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
14	3	students are taught fundamental aspects surface chemistry	Surface chemistry	Lecture, Tutorials	The evaluation is done through c activities answer a set of questions, then the students are asked to solv homework assignment related to the less
15		Exam			

23. Course Evaluation

Assignments and Report 10%, Quizzes 10%, Midterm Exam 30%, and Final Exam 50% Then the total is 100%

24. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Thermodynamic and photochemistry By Dr. Jalal Mohamed Saleh**
Main references (sources)	**Physical chemistry by Atkins**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	**Physical chemistry:Books-Amazon.com**

Course Description Form

11. Course Name:	
Organic Chemistry 4	
12. Course Code:	
308 CHOC4	
13. Semester / Year:	
Second semester /Third year	
14. Description Preparation Date:	
1/10/2024	
15.Available Attendance Forms:	
mandatory	
16.Number of Credit Hours (Total) / Number of Units (Total)	
60h – 3 units	
17. Course administrator's name (mention all, if more than one name)	
Name: Dr. Luma Salman Abd Email:Luma _Salman@uodiyala.edu.iq	
18. Course Objectives	
Course Objectives	Teaching the student organic chemical reactions and chemical structures and knowledge of the structure of organic compounds and clarification of the mechanism of organic reactions and their practical applications aimed at developing and keeping pace with the scientific development of organic chemistry
19. Teaching and Learning Strategies	
Strategy	- Clarification and explanation of the study materials by the academic staff through the blackboard, smart board and computer. - Providing students with knowledge through homework assignments for academic vocabulary - Asking students to visit the library to obtain additional knowledge of the study materials Improving students' skills by visiting websites to obtain additio knowledge of the study subjects

20. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method
1	2	Additional important information about carboxylic acid derivatives	Additional impor information about Carbox acid derivatives	Data show and Bord
2	2	Introduction to the stereochemistry of isomers	Stereochemistry	=
3	2	Types of isomers/ their properties and applications of stereochemistry in reactions	Stereochemistry	=
4	2	Aryl halides nomenclature and their physical properties	Aryl halides	=
5	2	(Their chemical reactions) and their application in the Diels Alder reaction	Aryl halides	=
6	2	Methods of preparation	Aryl halides	=
7	2	Ester enolate and applications	Ester enolate	=
8	2	Alpha-beta unsaturated carbonyl compounds	Ester enolate	=
9	2	Special Additions of this type	Ester enolate	=
10	2	Amines and their physical properties	Amines	=
11	2	Preparation of amines	Amines	=
12	2	(its chemical reactions)	Amines	=
13	2	Introduction to the chemistry of heterocyclic rings	heterocyclic rings	=
14	2	Phenols and their physical properties with the name of the most important compounds	Phenol	=
15	2	its chemical reactions/ Preparation of phenols	Phenol	=

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports .... etc

12 –Learning and Teaching Resources

Required textbooks (curricular books, if any)	Organic chemistry, Morrison and Boyd (1)
Main references (sources)	1- Essential organic chemist second addition 2- Organic chemistry (sixth edition) 3- Interne

Recommended books and references (scientific journals, reports…)	www.chemicalprocessing.com
Electronic References, Websites	www.bytoco.com

Course Description Form

13. Course Name:
Biochemistry 2
14. Course Code:
310BC2
15. Semester / Year:
Second semester /Third year
16. Description Preparation Date:
1/10/2024
17.Available Attendance Forms:
mandatory
18.Number of Credit Hours (120) / Number of Units (2)
60h – 3 units
19. Course administrator's name (mention all, if more than one name)
Name: Ekhlas Abdallah Hassan Email: ekhlasbiochemistry@gmail.com ekhlasabdullah@uodiyala.edu.iq
20. Course Objectives

Course Objectives	**1- Giving the student broad information about biochemistry** **2- How the student knows how to understanding the chemistry of macromolecules** **3- Giving the student sufficient information bout macromolecules and knowing the chemical sources related to them,**
21. Teaching and Learning Strategies	
Strategy	**Engage, Explore, Explain, Elaborate, and Evaluate**

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	CHEMISTRY OF NUCLEIC ACIDS	Nucleotides • Synthetic Analogues of Nucleotides or Antimetabolites •	blackboard + PowerPoint	Daily exams and homework + monthly exams
2	**2**	CHEMISTRY OF	DNA	blackboard +	Daily exams and

		NUCLEIC ACIDS	Structure an Function • Organizatio of DNA • RNA Structure an Function	PowerPoint	homework + monthly exams
3	**2**	vitamins	Definition and Classification of Vitamins	blackboard + PowerPoint	Daily exams and homework + monthly exams
4	**2**	vitamins	• Water Soluble Vitamins	=	
5	**2**	vitamine	• Fat Solubl Vitamins	=	=
6	**2**	**MECHANISM OF HORMONE ACTION**	• Classification of Hormones • Mechanism of Hormone Action		
7	**2**	**MECHANISM OF HORMONE ACTION**	• Mechanism of Hormone Action at Cytosolic or Nuclea Level	=	
8	**2**	**MECHANISM OF HORMON ACTION**	• Cell Membrane Receptor Mechanism Hormone action	=	=
9	**2**	CHEMISTRY OF HEMOGLOBIN	•Structure a Function of	=	=
10	**2**	CHEMISTRY OF HEMOGLOBIN	Hemoglobin • Binding Sites for Oxygen, Hydrogen (H+) and Carbon dioxide (CO2) with Hemoglobin		
11	**2**	CHEMISTRY OF HEMOGLOBIN	• Tense (T) and Relaxed (R) Forms of Hemoglobin • Types of Normal and Abnormal Hemoglobin		

			• Derivative of Hemoglobi		
12	**2**	PLASMA PROTEINS AND IMMUNOGLOBULINS	• Plasma Proteins		
13	**2**	PLASMA PROTEINS AND IMMUNOGLOBULINS	Immunoglobins (Ig)	=	
14	**2**	CHEMISTRY OF NUCLEIC ACIDS	Nucleotides • Synthetic Analogues of Nucleotides or Antimetabolites •	=	=
15	4	Exam			

23. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

24. Learning and Teaching Resources

1. Books Required reading:	ESSENTIALS OF BIOCHEMISTRY. Pankaja Naik PhD Professor and Head Department of Biochemistry MVPS Dr Vasantrao Pawar Medical College Nashik, Maharashtra India
2. Main references (sources)	Harper's Illustrated Biochemistry, 31e
A- Recommended books and references (scientific journals, reports…).	
B-Electronic references, Internet sites…	Textbook of Biochemistry - Medical Students, 6th Edition

Course Description Form

13. Course Name:
Industrial chemistry applications
14. Course Code:
309CHIC2
15. Semester / Year:
Second semester /Third year
16. Description Preparation Date:
1/10/2024
17.Available Attendance Forms:
Mandatory attendance
18.Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 2 units
19. Course administrator's name (mention all, if more than one name)
Name: 1- Asst. prof. Dr. Noor sabah ahmed noorsabah@uodiyala.edu.iq 2- Asst. prof. Dr. mohammed alwan farhan Mohammed.alwan@uodiyala.edu.iq
20. Course Objectives

Course Objectives	**Teaching the student about oil and polymer chemistry, knowledge of the petrochemical industries related to them, how to manufacture raw materials in the petrochemical industries, knowledge of corrosion and its types, pollution and its types, dyes and plastics and their practical applications aimed at developing and keeping pace with the scientific development of Yamiya Industrial.** **Teaching and teaching students all the necessary and essential information related to industrial chemistry, which qualifies them to work and research in all fields of industrial chemistry.**

21. Teaching and Learning Strategies	
Strategy	Explanation and clarification Lecture method and questioning method Model display method

22. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	The student's knowled of nuclear energy reactions	Nuclear Energy	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
2	2	Introducing the student to solar energy	solar energy	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
3	2	Introducing the studen to water and its uses ir the chemical industry	Water and its uses in th chemical industry	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
4	2	The student's knowlec of water treatment - domestic and industria	Water treatment – domestic and industrial	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
5	2	Student knowledge of pollution/air pollution	Pollution/air pollution	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
6	2	The student's knowlec of water and land pollution	Water and land pollutio	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
7	2	The student's knowlec of corrosion methods	Corrosion	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
8	2	Introducing the studen to the cement industry	Cement industry	Lecture using th blackboard and data show and discussion	Daily exams, homework, and monthly exams
9	2	Introducing the studen to the glass industry	Glass industry	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
10	2	The student's knowlec of soap making	soap production	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
11	2	Student knowledge of paper making	Paper Industry	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
12	2	The student's knowlec of sugar manufacturin methods	Sugar industry	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams

13	2	The student's knowled of fertilizer manufacturing method	Fertilizer industry	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
14	2	The student's knowled of applied electrochemical reactio and processes	Reactions of applied electrochemical proces	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams
15	2	Student knowledge of electroplating	Electroplating	Lecture using the blackboard and da show and discussio	Daily exams, homework, and monthly exams

23. Curse Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Foundations and applications in industr chemistry / written by Dr. Latif Har Ali/University of Mosul
Main references (sources)	Foundations of industrial chemistry / written Dr. Aziz Ahmed Amin
Recommended books and references (scientific journals, reports…)	www.chemicalprocessing.com/
Electronic References, Websites	www.bytoco.com

Course Description Form

13. Course Name:	
Coordination chemistry 2	
14. Course Code:	
311CC2	
15. Semester / Year:	
Second semester /Third year	
16. Description Preparation Date:	
1/10/2024	
17.Available Attendance Forms:	
mandatory	
18.Number of Credit Hours (Total) / Number of Units (Total)	
60h – 3 units	
19. Course administrator's name (mention all, if more than one name)	
Name: Assist. prof. Dr. Areej Ali Jarullah Email: dr.areej977@uodiyala.edu.iq Assist. prof. Jinan Mohammed Mahmood jinan.mohammed@uodiyala.edu.iq	
20. Course Objectives	
Course Objectives	Teaching the student inorganic chemical reactions and chemical structures, knowledge of the structure of inorganic compounds and how to clarify the mechanics of inorganic reactions and their practical applications aimed at developing and keeping pace with the scientific development of inorganic chemistry
	Teaching and educating students on all necessary and necessary information related to inorganic chemistry, which qualifies them to work and research in all areas of inorganic chemistry
21. Teaching and Learning Strategies	
Strategy	Explanation and clarification Lecture method and questioning method Model display method

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Magnetic properties of coordination complexes	Properties of coordination complexes	Board and data show	Daily exams Homework Monthly exam
2	2	Spectral properties of coordination complexes	Properties of coordination complexes	=	=
3	2	Kinetic stability, thermodynamic stability	Stability of complexes formation in solutions	=	=
4	2	Calculation of stability constants of coordination complexes and factors affec them	Stability of complexes formation in solutions	=	=
5	2	Labile and Inert Complexes	Stability of complexes formation in solutions	=	=
6	2	A comparative study of the elements of the three transit chains	Transition Elements	=	=
7	2	First exam - second semester			
8	2	Its preparation	Carbonyl chemistry	=	=
9	2	Reactions and properties	Carbonyl chemistry	=	=
10	2	Introduction to organometal complexes	Organometallic complexes	=	=
11	2	Preparations and reactions	Organometallic complexes	=	=
12	2	Properties	Organometallic complexes	=	=
13	2	Introduction to the internal transition elements chemistr (Lanthanides and Actinides)	Internal transition elements	=	=
14	2	Comparison A comparative study of lanthanides and transition elements	Internal transition elements	=	=
15	2	Second exam - second semeste			

23.

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Inorganic chemistry - chemistry of transition elements, principles of coordination, Dr. Noman Al-Naimi and others.
Main references (sources)	-Inorganic chemistry, Catherine E. Housecroft and Alan G. Sharpe, 3rd ed., 2008. -Inorganic chemistry, Catherine

	E. Housecroft and Alan G. Sharpe, 4th ed., 2012. -Inorganic chemistry, James E. Huheey, Ellen A. Keiter and Richard L. Keiter, 4th ed.,1993.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

25. Course Name:	
Surface Chemistry	
26. Course Code:	
312SC	
27. Semester / Year:	
Semester	
28. Description Preparation Date:	
2-2-2025	
29. Available Attendance Forms:	
Mandatory	
30. Number of Credit Hours (Total) / Number of Units (Total)	
Two hours per week/	
31. Course administrator's name (mention all, if more than one name)	
Name: Muaathe A Ibraheem Email: Muaathe.a@gmail.com; m.a.ibraheem@uodiyala.edu.iq	
32. Course Objectives	
Course Objectives	• **This course is designed to help students to understand the differ surface phenomena and its fundamental background. The course deals with chemical and physical phenomena that are important within heterogeneous catalysis and understanding the colloidal state**
33. Teaching and Learning Strategies	
Strategy	▪ Using both summative and formative assessments for be evaluation ▪ of learning. ▪ give clear and detailed instructions. ▪ concentrate on the main terms and concepts. ▪ Boost student engagement with effective questio techniques. ▪ Asking relevant and thoughtful questions can encou participation ▪ and enhance classroom discussions.

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding Miller indices Include surface-specific phenomena Understanding Young equation and their relation to wetting and surfactant action crucial to this course. Describe the relation between surface stability a surface energy. Give a brief description of the concept of surfac relaxation and reconstruction Recognize the essential adsorpti concept and adsorption isotherm.	Miller Indices, Surface energy. Younge equation, wettability, surface instability, relaxation, reconstruction. Introduction to adsorption, type of adsorption, Surface Area of Adsorption, Adsorption isotherm types Kinetic of adsorption, Langmuir isotherm, BET	presentation	Discussion w students, daily c questions, exam
2	2				
3	2				
4	2				

5	2	Recognize the essential adsorpti concept and adsorption isotherm.	isotherm, Determination of Specific Surface Area		
6	2	Understanding kinetic adsorptio types	Introduction to catalysis, properties of th catalysts,		
7.	2	Realizing catalys fundamentals and catalysts classification	catalyst classification, Heterogeneous catalyst, Characteristics c effective catalyst		
8.	2		Catalysis theorie Deactivation of		
9.	2	Extend knowledg catalysis theory, Give a comprehensive explanation abou catalyst deactivation.	catalysts Fouling, poisoning, Thermal degradation and Sintering. promoter		
10	2		Test1		
11	2	Shows the cataly process Concept and explain the selectivity of the catalysis process	Catalysts proces selectivity of catalysts, preparation of catalysts Dry catalysts preparation methods, Wet		
12	2	Give a brief description relate to catalyst preparation methods.	catalysts preparation method		
13	2	Explain what the colloidal state is.	Introduction Colloidal state, Dispersed Phase and Dispersion Medium, genera physical propert of colloidal material		
14		Demonstrates in detail classificati			

15		of colloidal state according to different criteria Extend learning colloidal state classification. Understanding th Coagulation or Flocculation, Hardy-Schulze ru Describe coagulation, including the coagulation system's properti and the coagulati system's classification. Learn about the Coagulation or Flocculation of colloidal materia Understand the principle of the Hardy-Schulze ru Explain the Elect osmosis, Protecti Colloids and Gol Number	Classification of colloidal materia according to physical state, Classification of colloids based o the nature of the interaction between dispers phase and dispersion medium. Tyndall Effect, mechanical properties of colloidal. Electrical Properties of Colloidal Solutions, exam The coagulation principle of collide state, Coagulation system classification, flocculation of colloidal materia and fluctuate fac Electro-osmosis Hardy-Schulze rule, Protective Colloids and Go Number		
35. Course Evaluation					

Distributing the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily oral, monthly, or written exams, reports .... etc 70% exam, 30% daily oral	
36. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Articles, books and websites
Recommended books and references (scientific journals, reports...)	Physical Chemistry P.W Atkins 9th ed. page 892. Introduction to Colloid and Surface Chemistry. (Elsevier, 1992). doi:10.1016/C2009-0-24070-0. Birdi, K. S. Surface and Colloid Chemistry. (CRC Press, 2009). doi:10.1201/b10154.
Electronic References, Websites	http://www.smartway2study.com/2016/03/salient-fea of-miller-indices-of.html https://www.slideshare.net/ErPrabhakar1/miller-indic crystallography-planes https://www.kruss.de/services/education-theory/glossary/youngs-equation/ https://www.emedicalprep.com/study-material/chemistry/surface-chemistry/adsorption/ http://www.chemistrylearning.com/adsorption/#prett

Level Four

Course Description Form

37. Course Name:	
Biochemistry	
38. Course Code:	
404CHBC2	
39. Semester / Year:	
Year	
40. Description Preparation Date:	
1/ 10/ 2024	
41. Available Attendance Forms:	
Weekly / obligatory(mandatory)	
42. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours- 6 – unit	
43. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Khalid Shaalan Sahab Email: Khalidshalaan@yahoo.com	
44. Course Objectives	
Course Objectives	- Define the metabolism and it is importance - Biosynthesis of molecules of cells - Catabolism of dietary molecules to liberation the energy - Define the fates of molecules(clinical importance) that produced from metabolism - Knowledge the chemistry of blood - Define the determination methods used to estimation the blood molecules and it is applications - Teaching and learning the students any essential and necessary information related to biochemistry.
45. Teaching and Learning Strategies	
Strategy	- Lecture method and use of interactive whiteboard with explanation and clarification - Provide students with the basics and additional topics related to the outcomes of thinking and biochemical analysis - Homework that requires subjective explanations in causal ways

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduce biochemical processes to students	Introduction to metabolism	Board and interactive whiteboard	- Daily exams - Homework - Monthly exams
2	2	Digestion and absorption of dietary carbohydrate	Nutrition / Digestion and absorption of dietary carbohydrate	=	=
3	2	-Fate of absorbed glucose/ -glycolysis and formation of pyruvate	Catabolism of glucose	=	=
4	2	Conversion of pyruvate to acytyl-CoA/ Krebs cycle	Explain Krebs cycle	=	=
5	2	Energy calculation from catabolism of glucose, Conversion of pyruvate to lactate and Cori cycle	Energy liberated from catabolism of glucose/ Cori cycle	=	=
6	2	Glycogenesis and glycogenolysis	Glycogenesis and glycogenolysis	=	=
7	2	-Gluconeogenesis -pentose phosphate pathw	Gluconeogenesis and pentose phosphate pathway	=	=
8		First exam of first course			
9	2	Digestion and absorption of dietary lipids Beta-oxidation of fatty acids	Nutrition / Digestion and absorption of dietary lipids Beta-oxidation of fatty acids	=	=
10	2	Energy from oxidation of fatty acids Fatty acids Biosynthesis	Energy from oxidation of fatty acids Fatty acids Biosynthesis	=	=
11	2	Biosynthesis of Triglycerides and phospholipids	Biosynthesis of Triacylglycerol and phospholipids	=	=
12	2	Biosynthesis of cholesterol Ketone bodies	Biosynthesis of cholesterol Ketone bodies	=	=
13	2	Nutrition / Digestion and absorption of dietary proteins/ State of oxidation of amino acids	-absorption of dietary proteins/ -Oxidative-degradation State of amino acids	=	=
14	2	Transformation of amino group in liver	Transformation of amino group in liver	=	=
15	2	Glutamine transfer amino	Glutamine transfer of	=	=

		from extra-hepatic cells to liver	amino group via blood to liver		
16	2	Alanine transfer amino group from muscles to liver	alanine transfer amino via blood to liver	-	=
17	2	Second exam of first course			
18	2	Excretion methods of nitrogen and urea cycle		=	=
19	2	Urea cycle and Krebs cycle	Krebs bicycles/ aspartate-argininosuccinate shunt	=	=
20	2	Genetic defects of urea cycle enzymes	Genetic defects of urea cycle enzymes	=	=
21	2	Metabolism of nucleotides/ anabolism of purine nucleotides	Metabolism of nucleotides	=	=
22	2	Anabolism of pyrimidine nucleotides Catabolism of nucleotides	Metabolism of nucleotides	=	=
23	2	Replication and transcription of DNA	Replication, transcription and translation of genetic information	=	=
24	2	Translation of genetic information and biosynthesis of proteins	Replication, transcription and translation of genetic information	=	=
25	2	First exam of second course			
26	2	Constituents of blood/ Blood proteins and its biological role	Blood chemistry	=	=
27	2	Red and white blood cells and its biological role	Blood chemistry	=	=
28	2	Human nutrition	Human nutrition	=	=
29	2	Human nutrition	Human nutrition	=	=
30	2	Second exam of second course			

47. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

48. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	**1- Harpers Illustrated Biochemistry,** **2- Principle of Bio Chemistry, Smith & White** **3- Biochemistry by Armstrong** **4-Lehninger Principle of Bio Chemistry**

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Quantum and spectra
2. Course Code:
402CHQS
3. Semester / Year:
Year 4
4. Description Preparation Date:
1 October 2024
5. Available Attendance Forms:
Weekly
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / 6 units
7. Course administrator's name (mention all, if more than one name)
Name: Zaid Hameed Mahmoud Email: zaidhamid@uodiyala.edu.iq
8. Course Objectives

Course Objectives	**Introduce the students quantum chemistry and its applications, as well as, the the application of molecular spectrums**

9. Teaching and Learning Strategies	
Strategy	Lecture method and using data show Explanation and clarification

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Theoretical to introduction quantum chemistry, and introduction to mathematics		Data show an expansion	Reports and hon work
2	3	Classical an mechanics Newton laws		=	=

3	3	Harmonic Oscillator by spheric coordinates		=	=
4	3	Wave, particles, dual nature o light, Heisenberg uncertainty		=	=
5	3	Black body radiation and photoelectric effect		=	=
6	3	Bohr Rutherford theory		=	=
7	3	Spectral lines of atoms		=	=
8	3	Particle in a box problem		=	=
9	3	Schrödinger equation and wav function		=	=
10	3	Principles and postulates of Quantum mechanics		=	=
11	3	Applications of Schrödinger equation		=	=
12	3	Angular momentum and Hydrog atom		=	=
13	3	Degeneration of energy states		=	=
14	3	Atomic structure and periodic l		=	=
15	3	Rigid Rotor		=	=
16	3	Molecular orbital theory		=	=
17	3	Ground and excited states and molecular spectroscopy		=	=
18	3	Rotation spectra, moment of inertia Molecules classifying		=	=
19	3	Degree of freedom and types o vibrations		=	=
20	3	Rotational spectra, theory and applications		=	=
21	3	Type of electronic transition		=	=
22	3	Selection rules		=	=
23	3	Electronic absorption spectra		=	=
24	3	Fluorescence and Phosphorescence		=	=
25	3	Electronic spectra in polyaroma molecules		=	=
26	3	Franck codon transition		=	=
27	3	Intensity distribution within th band		=	=
28	3	vibrational structure of electron bands in diatomic molecules		=	=
29	3	Theory of rotation and rotatio vibration spectra		=	=
30	3	Nuclear spin resonance, theor and practice		=	=

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily

preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	P.W.Atkins, Physical Chemistry, C.N.Banwell, Fundamental of Molecular Spectroscopy
Main references (sources)	Lecture notes of MIT
Recommended books and references (scientific journals, reports…)	Quantum Mechanics and Spectroscopy I and II by J. E. Parke
Electronic References, Websites	

Course Description Form

13. Course Name:	
Industrial Chemistry	
14. Course Code:	
Industrial Chemistry/403CHIC2	
15. Semester / Year:	
Year	
16. Description Preparation Date:	
1-10-2024	
17. Available Attendance Forms:	
Regularity.	
18. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours	
19. Course administrator's name (mention all, if more than one name)	
Name: Abdlwahhab Hameed Majeed Email: abdulwahhab@uodiyala.edu.iq Name: Omar Ghazi Hamoodi Email: omerkazi@uodiyala.edu.iq	
20. Course Objectives	
Course Objectives	• Enabling students to understand the principles and concepts of industrial chemistry. • Training students on the characterization of polymeric compounds using modern instrumentation. • Explaining the theoretical principles underlying the measurement of molecular weight for various polymers. • Clarifying petrochemical industries, their chemical formulations, components, and applications. • Providing university-level students with theoretical and applied knowledge to enhance their understanding and critical thinking skills. • Identifying various industries, their manufacturing processes, and the significant role of chemistry in industry, as well as utilizing them as a foundation for further study in chemistry to develop a chemist's personality.
21. Teaching and Learning Strategies	

Strategy	1. Explanation and Clarification 2. Lecture Method 3. Presentation of Models

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introducing the student to the chemistry of polymers and the degree of polymerization and how to calculate it	Polymer Chemistry	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
2	2	Introduce the student to the classification of polymers and know the types of each class	classification of polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
3	2	Definition of the student naming polymers	nomenclature of polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
4	2	Factors affecting polymers	Factors affecting polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
5	2	Types of Molecular Weight of Polymers, Molecular Weight Diffusion Rate of Polymers	Molecular weight of polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
6	2	The most important types of reactions leading to the formation of condensing polymers, controlling the molecular weight of condensing polymers	condensation polymerization	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
7	2	The most important types of reactions leading to the formation of condensing polymers, controlling the molecular weight of condensing polymers	Condensation polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
8	2	The most important types of condensing polymers: Polyesters,	Industrial condensing polymers	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams

		polyamides, polyurea, polyurethane, copolymers			
9	2	The first month exam	is a theoretical exam in the previous article mentioned above		
10	2	Ionic polymerization and its types, its importance, the difference between condensation and addition polymerization	addition polymerization	blackboard + PowerPoint+ data show	
11	2	Types of addition polymerization, free radical polymerization, its mechanisms, initiators , the most important polymers that exhibit this type of polymerization	negative ionic addition polymerization	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
12	2	Ionic addition polymerization, types, anionic ionic addition polymerization, its initiations, polymerization mechanism, the most important polymers that exhibit this mechanism	Anionic addition polymerization	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
13	2	Cationic addition polymerization, its precursors, the polymerization mechanism, the most important polymers that exhibit this mechanism	Cationic addition polymerization	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
14	2	The most important factors affecting on the ionic addition polymerization, temperature, polarity of the solvent, type of monomer, nature of the polymeric chain, live polymerization	Ionic addition and coordination polymerization	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
15	2	Different polymerization	Polymerization processes and	blackboard + PowerPoint+ data	Daily exams and homework +

		processes and conditions	conditions	show	monthly exams
16	2	The second month exam	is a theoretical exam in the previous article mentioned above		
17	2	Teaching the student the chemistry of oil, the beginning of the emergence of oil, the most important theories that explain the emergence of oil	Chemistry of petroleum	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
18	2	The most important hydrocarbon and non-hydrocarbon components and the percentage of their presence in crude oil	Chemical composition of crude oil	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
19	2	Classification of crude oil in relation to its basis, the most important general characteristics of crude oil	Crude oil basics	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
20	2	Characteristics of oil derivatives, their importance and the extent to which they are related to different oil products	Characteristics of petroleum products	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
21	2	Crude oil treatment and re-refining, separation of water and salts, separation of emulsions, separation of gases, physical processes: distillation and its types, extraction with solvents, absorption and stripping, thermal diffusion,	Crude oil processing and re-refining	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
22	2	Chemical processes in oil refining, thermal cracking, thermal catalytic cracking, catalytic alkylation	Chemical processes in oil refining	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
23	2	Catalytic structural transformation processes and their types, catalytic isomerization	Chemical processes in oil refining	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams

		processes, catalytic polymerization processes			
24	2	The third month exam	is a theoretical exam in the previous article mentioned above		
25	2	Treatment and purification processes, impurities to be removed, treatment with sulfuric acid, removal of mercaptans	Processing and purification	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
26	2	Treatment and purification processes, treatment with clay, treatment with molecular sieves, desalination, treatment with hydrogen gas and its types	Processing and purification	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
27	2	The most important oil derivatives (an overview), natural gas, its types, methods of separation and its importance, gasoline and its composition, natural gasoline, automotive gasoline and its importance, improving the quality of gasoline.	Petroleum products	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
28	2	Kerosene and its importance, lighting and heating kerosene, engine and aircraft kerosene, aircraft kerosene and its types, gas oil (diesel fuel), fuel oils, lubricating oils and their types, oil greases, their composition and importance	Petroleum products	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
29	2	Petroleum wax, petroleum asphalt, petroleum solvents or naphtha	Petroleum products	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
30	2	The forth month	is a theoretical exam		

		exam	in the previous article mentioned above		

23. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Polymer Chemistry (Koltzenburg, Sebastian, Maskos, Michael, Nuyken, Oskar) The Chemistry and Technology of Petroleum (James G. Speight)
Main references (sources)	Introduction to Polymer Chemistry (Charles E. Carraher Jr.) Petroleum Chemistry (Mohamed Sikkander)
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://www.goodreads.com/book/show/13898.The_Chemistry_And_Technology_Of_Petroleum https://www.kobo.com/gr/en/ebook/textbo-of-polymer-chemistry

Course Description Form

25. Course Name:
Instrumental Analysis
26. Course Code:
405CHIA
27. Semester / Year:
Year
28. Description Preparation Date:
1-10-2024
29. Available Attendance Forms:
Regularity.
30. Number of Credit Hours (Total) / Number of Units (Total)
90 hours-6 unit
31. Course administrator's name (mention all, if more than one name)
Name: Lecturer Sahar Raihan Fadhel saharraihan@uodiyala.edu.iq
32. Course Objectives

Course Objectives	Teaching the student the scientific and theoretical concept of the foundations of automated analysis, what are the most important methods used in automated analysis, how to use advanced automated laboratory Instrumentation in completing analysis, the mechanics of the work of these Instrumentation, their most important components, the most important areas of application, and keeping pace with the scientific development of Instrumental Analysis. Teaching and educating students on all the necessary and necessary information for the subject of instrumental analysis, which qualifies them to work and research in all areas of analytical and research chemistry

33. Teaching and Learning Strategies

Strategy	4. Explanation and Clarification 5. Lecture Method 6. Presentation of Models

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduce the student to Definition of electromagnetic radiation	Spectrum regions, the effect of electromagnetic radiation with matter,	Lecture and discussion	Daily exams Homework Monthly exams

			absorption and emission of radiation by atoms and molecules		
2	3	Introduce the student to spectroscopic methods	Spectral methods and their types and the interaction of the spectrum with matter	Lecture and discussion	Daily exams Homework Monthly exams
3	3	Introducing the student to the methods of analysis by molecular spectra UV- VIS	analysis by Ultraviolet - Visible Spectrophotometry	Lecture and discussion	Daily exams Homework Monthly exams
4	3	Introducing the student to the methods of analysis by molecular spectra UV- VIS	Instrumentation used in Spectrophotometry analysis of the ultraviolet and visible region	Lecture and discussion	Daily exams Homework Monthly exams
5	3	Introducing the student to the methods of analysis by molecular spectra VIS UV-	The most important applications of molecular Spectrophotometry VIS UV-	Lecture and discussion	Daily exams Homework Monthly exams
6	3	Introduce the student to analysis with infrared spectroscopy	Chemical analysis using Infrared spectroscopy	Lecture and discussion	Daily exams Homework Monthly exams
7	3	Introduce the student to analysis with infrared spectroscopy	The most important Instrumentation used in spectroscopy using infrared, its components and applications	Lecture and discussion	Daily exams Homework Monthly exams
8	3	Introduce the student to the methods of fluorescence and phosphorylation	The phenomenon of fluoridation and phosphorylation and the most important	Lecture and discussion	Daily exams Homework Monthly exams

			principles and how it occurs		
9	3	Introduce the student to the methods of scattering and turbidity	Analysis using the phenomenon of light scattering and turbidity and its applications	Lecture and discussion	Daily exams Homework Monthly exams
10	3	Introduce the student to the analysis by atomic absorption spectrophotometry	Analysis using atomic absorption spectrophotometry	Lecture and discussion	Daily exams Homework Monthly exams
11	3	Introduce the student to the analysis by atomic absorption spectrophotometry	Atomic absorption Instrumentation and their components and applications of atomic absorption	Lecture and discussion	Daily exams Homework Monthly exams
12	3	Introduce the student to the analysis by atomic emission spectroscopy	Analysis using atomic emission spectroscopy	Lecture and discussion	Daily exams Homework Monthly exams
13	3	Introduce the student to the analysis by atomic emission spectroscopy	Atomic emission Instrumentation and their components and applications of atomic emission	Lecture and discussion	Daily exams Homework Monthly exams
14	3	Introduce the student to analysis by using X-ray technique	X-rays, theoretical foundations, Instrumentation, how to Analysis and applications	Lecture and discussion	Daily exams Homework Monthly exams
15	3	Introduce the student to analysis using the CHN technique	CHN technique, theoretical foundations, Instrumentatio		Daily exams Homework Monthly exams

			n, how to Analysis and applications		
16	3	first exam			
17	3	Introduce the student to Analysis by Electrochemical Methods	Electrochemical Methods and cell types	Lecture and discussion	Daily exams Homework Monthly exams
18	3	Introduce the student to Analysis by Electrochemical Methods	Potentiometric measurements, potentiometric titrations and types of electrodes	Lecture and discussion	Daily exams Homework Monthly exams
19	3	Introducing the student to the methods of Voltammetry، Polarography and Amperometric Titrations	Analysis using voltammetry, polarography and Polarography wave techniques and Instrumentation	Lecture and discussion	Daily exams Homework Monthly exams
20	3	Introducing the student to the methods of Voltammetry، Polarography and Amperometric Titrations	Amperometric Titrations and applications	Lecture and discussion	Daily exams Homework Monthly exams
21	3	Introduce the student to Electrodeposition and coulometric Methods	Analysis using Electrodeposition and coulometric technique, theoretical foundations, Instrumentation and applications	Lecture and discussion	Daily exams Homework Monthly exams
22	3	Introduce the student to Conductometry	Analysis using Conductometry, theoretical foundations, Instrumentation and applications	Lecture and discussion	Daily exams Homework Monthly exams

23	3	Introduce the student to the methods of thermal analysis	Thermal analysis methods and their applications	Lecture and discussion	Daily exams Homework Monthly exams
24	3	Introduce the student to the methods of thermal analysis	Thermal analysis and curves	Lecture and discussion	Daily exams Homework Monthly exams
25	3	Introduce the students to chromatography techniques	Theoretical foundations of chromatography, types of chromatography and applications	Lecture and discussion	Daily exams Homework Monthly exams
26	3	Introducing the student to gas chromatography technique	Theoretical foundations of gas chromatography and how to analysis	Lecture and discussion	Daily exams Homework Monthly exams
27	3	Introducing the student to gas chromatography technique	Instrumentation and it's components and applications	Lecture and discussion	Daily exams Homework Monthly exams
28	3	Introducing the student to high performance liquid chromatography technology technique	Theoretical foundations of high-performance liquid chromatography and how to analysis	Lecture and discussion	Daily exams Homework Monthly exams
29	3	Introducing the student to high performance liquid chromatography technology technique	Instrumentation and it's components and applications	Lecture and discussion	Daily exams Homework Monthly exams
30	3	Second Exam			

35. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

36. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of Instrumental Analysis ,

	Douglas A. Skoog , James Holler, Stanly R. Crouch,"7th" Edition , 2007.
Main references (sources)	1- Fundamentals of Analytical Chemistry, Douglas A. Skoog and Donald M.West , Eight Edition, 2004. 2- Analytical Chemistry, Gary Christian Sixth Edition 3- Chemical Analysis, Modern Instrumentation Methods and Techniques, Francis Rouessac and Annick Rouessac Second Edition 4- Modern Analytical Chemistry, David Harvey , Mc Graq Hill Company, 2000.
Recommended books and references (scientific journals, reports…)	www.chemicalprocessing.com
Electronic References, Websites	www.bytoco.com

Course Description Form

21. Course Name:
Hormones
22. Course Code:
407CHH
23. Semester / Year:
Firs t semester/2024
24. Description Preparation Date:
1/10/2024
25.Available Attendance Forms:
Weekly/ mandatory
26.Number of Credit Hours (Total) / Number of Units (Total)
30 Hours / 2 units
27. Course administrator's name (mention all, if more than one name)
Name: Dr. Najwa Jameel Hameed Email: dr.najwajameel@gmail.com
28. Course Objectives

Course Objectives	• **Giving to students condensed information about hormones….** • **Hormones disorders and relate medical conditions….** • …..
29. Teaching and Learning Strategies	
Strategy	• Lectures using data show • Oral explanation • Illustration using white board and animated vedios

30. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Learning ab Hormones world	Hormones , hormo importance,	Data show, wl board	Quiz,reports, arguments
2	2	How hormones work	Hormones characteristics mechanisms of funct	Data show, wl board	Quiz,reports, arguments
3	2	How hormones worl molecular level	The Mechanisms of first messenger	Data show, wl board	Quiz,reports, arguments
4	2	How hormones worl molecular level	The Mechanisms of second messenger	Data show, wl board	Quiz,reports, arguments
5	2	Hormones receptors	Hormones Recept Receptor regulat Hormonal regulation	Data show, wl board	Quiz,reports, arguments
6	2	Endocrine system	Endocrine system, endocrine glands	Data show, wl board	Quiz,reports, arguments
7	2	Endocrine system	Hypothalamus anterior pituitary gla stimuli for hormo secretion	Data show, wl board	Quiz,reports, arguments
8	2	Endocrine system	Hypothalamic pituitary disorders	Data show, wl board	Quiz,reports, arguments
9	2	Endocrine system	HPT axis, stimulus, secretion	Data show, wl board	Quiz,reports, arguments

10	2	Endocrine system	HPT axis, stimu and secretion	Data show, wh board	Quiz,reports, arguments
11	2	Endocrine system	HPT disorder	Data show, wh board	Quiz,reports, arguments
12	2	Endocrine system	HPA axis, stimulus, secretion	Data show, wh board	Quiz,reports, arguments
13	2	Endocrine disease	HPA disorders diseases	Data show, wh board	Quiz,reports, arguments
14	2	Hormones as drugs	Hormones applicati as drugs	Data show, wh board	Quiz,reports, arguments
15	2	Examination	Examination		

31. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

32. Learning and Teaching Resources

Required textbooks (curricular books, if any)	○ Hormones by Anthony Norman, Gerald Litwack ○ Hormones and the Endocri System ○
Main references (sources)	Above mentioned

Recommended books and references (scientific journals, reports…)	Above mentioned are enough
Electronic References, Websites	Wikipedia

Course Description Form

49. Course Name:	
Spectral Identification	
50. Course Code:	
406CHSI	
51. Semester / Year:	
Year	
52. Description Preparation Date:	
1/10/2024	
53. Available Attendance Forms:	
Regularity.	
54. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours	
55. Course administrator's name (mention all, if more than one name)	
Name: Safaa Abdulhameed Dadoosh Email: safaabdulhameed@uodiyala.edu.iq	
56. Course Objectives	
Course Objectives	Studying the spectroscopic diagnosis of organic compounds and teaching students all the necessary information related to the subject of spectroscopic diagnosis to know the structural structure of organic compounds, which qualifies them to work and research in all fields of spectroscopic diagnosis of organic compounds. • Giving an idea about the structural structure and stereomorphology of organic compounds using nuclear magnetic resonance (NMR) spectroscopy and knowing the main functional groups using infrared spectroscopy, in addition to knowing the wavelengths of organic compounds using ultraviolet radiation.
57. Teaching and Learning Strategies	
Strategy	Power point lecture method using data show and interactive whiteboard. 7. - Explanation and clarification. 8. - Providing students with the basics and additional topics related to the outcomes of thinking and chemical spectroscopic diagnosis of organic compounds. 9. - Forming discussion groups during lectures to discuss organic chemistry topics that require thinking and analysis. 10. Asking students a set of thinking questions during lectures, such as what, h when, and why for specific topics. 11. Giving students homework that requires self-explanation in causal ways.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	An introductory introduction to areas of electromagnetic radiation	Microwave and radio radiation - infrared radiation - visible radiation - ultraviolet radiation - X-rays - cosmic rays	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
2	2	Definition of ultraviolet radiation and its sources	The sun - stars and planets	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
3	2	Addressing Berlamert's law	Equations and derivations	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
4	2	Identify electronic transfers in organic molecules	Synergistic, non-synergistic, and anti-synergistic bonds	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
5	2	Explanation and clarification of the synergistic, non-synergistic, and anti-associative bonds	Synergistic, non-synergistic, and anti-synergistic bonds	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
6	2	Identify the Woodward-Fiser rule to calculate the wavelength of dienes	Calculate the wavelength of dienes	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
7	2	Factors affecting the positions of beams in the UV spectrum	The effect of succession - the effect of steric obstruction - the effect of the solvent	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
8	2	The first month exam			
9	2	Solvent irritation at wavelength	Properties of solvents used in UV spectroscopy (polar and nonpolar solvents)	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
10	2	The effect of compensated aggregates on wavelength	Pulling compensated aggregates and pushing compensated aggregates	blackboard + PowerPoint+ data show	Daily exams and homework + monthly
11	2	Identify infrared spectroscopy and its regions	Far, near and medium infrared	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
12	2	Discussing the types of molecular vibrations	Stretching vibrations and bending vibrations	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
13	2	Factors affecting the vibration of bonds	Bond elasticity - relative mass - hybridization - resonance	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams

14	2	Identify the main adsorbents of functional groups of alkanes, alkenes, and alkynes	Saturated and unsaturated hydrocarbons	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
15	2	The second month exam			
16	2	Identify the main absorptions of functional groups of alcohols, phenols, amines and aromatic compounds.	Hydroxyl group - amine group - double bond	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
17	2	Factors affecting double joint stretching vibrations	Cascade effect - the effect of ring size	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
18	2	Factors that affect the stretching vibration of the (C=O) group.	The effect of hydrogen bonding - compensation in the carbon atom (α) - the effect of succession - the effect of the ring size	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
19	2	Discuss a number of infrared spectra of different organic compounds	Students participate in discussion and solutions	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
20	2	Examples and solutions for functional groups of various organic compounds	Students participate in discussion and solutions	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
21	2	The origin of the phenomenon of nuclear magnetic resonance	Nuclear magnetic resonance phenomenon	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
22	2	Proton nuclear spin states	Rotation towards the magnetic field and rotation against the direction of the magnetic field	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
23	2	How to obtain an NMR spectrum	NMR spectroscopy	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
24	2	Identify the NMR device and how to process the model	One proton-carbon 13- How to prepare the model	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
25	2	The third month exam			
26	2	Study of the effect of blocking and chemical displacement	The effect of blocking and the effect of lifting the block	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
27	2	Chemical displacement and factors affecting their locations	Blocking - electronegativity - pulling groups - driving groups	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams

28	2	Solvents used in NMR spectra and their locations	The basic solvents used, their characteristics and locations on the spectrum	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
29	2	Types of nuclear fission in the nuclear magnetic resonance spectrum	Single, binary, triple, quadruple, and five-fold fissions	blackboard + PowerPoint+ data show	Daily exams and homework + monthly exams
30	2	The forth month exam			

59. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

60. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Spectrometric Identification of Organic Compounds. by Robert M. Silverstein, Francis X.
Main references (sources)	Identification of Organic . Silverstein and Bassler - - Infrared spectroscopy fundamental and application by Barbara Stuart , 2004
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://www.wiley.com/en-us/Spectral+and+Chemical+Characterization+of+Organic+Compounds%3A+A+Laboratory+Handbook%2C+3rd+Edition-p-9780471927150 https://www.amazon.in/Stereochemistry-Organic-Compounds-Principles-Applications/dp/0470216395