

**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

2025–2026

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: Wasit university
Faculty/Institute: College of Science
Scientific Department: Department of Chemistry
Academic or Professional Program Name: Bachelor
Final Certificate Name: Bachelor of Science in Chemistry
Academic System: Courses
Description Preparation Date: 1-10-2025
File Completion Date: 1-10-2025



Signature:

Head of Department Name:

Dr. Kamal Rashed

Date: 1/10/2025

الدكتور
كمال رشيد حسيجان
رئيس قسم الكيمياء

Signature:

Scientific Associate Name:

Dr. Ali Jabar

Date: 1/10/2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance

Department:

Date: 1/10/2025

Signature:

م.م دنيا فاضل عباس
مسؤول شعبة ضمان الجودة والاداء الجامعي

Assis Bro
Dr. Faik Jameel Hassan M. Al-Jabbar
Dean

Approval of the Dean

1/10/2025

1. Program Vision

Leadership and excellence in education and scientific research in the field of chemistry and its applications in serving society and the environment, effective participation with community institutions, and striving to advance the department to ensure its compliance with international standards in the field of chemistry.

2. Program Mission

Preparing scientific competencies in the field of chemistry to contribute to scientific, health, industrial, educational and economic development in the governorate, solving environmental problems through theoretical and applied research and providing distinguished educational, research and training services.

3. Program Objectives

- Preparing graduates specialized in chemistry at a distinguished level in academic terms to supply the labor market in the governorate with its needs of specialists in various fields.
- Participate in finding solutions to the problems of the local environment and national industries through research and development.
- To be an expert in providing scientific consultations to concerned parties, and organizing scientific seminars and advanced research seminars in various fields of chemistry.
- Keeping pace with modern developments in the field of scientific research, by holding periodic discussion sessions and workshops to keep pace with new developments in scientific research.
- Supporting twinning between the chemistry department at the university and chemistry departments in local and international universities to keep pace with progress and scientific development and to participate in scientific research because of its importance in raising the international rankings of our university.

- Enhancing the skills of faculty members, supporting staff, and workers, by holding periodic discussion sessions, workshops, training courses, and participating in local and international scientific seminars and conferences.
- Preparing qualified human resources to contribute to educational progress in the governorate in particular and in Iraq in general.
- Meeting the department's needs for faculty members by appointing distinguished and top performers as teaching assistants and sending them on scholarship to obtain master's and doctoral degrees from distinguished universities in accordance with the college's future study plan.
- Equipping laboratories, conducting various scientific research, and linking the department to the community and its surrounding environment.
 - Providing chemistry courses to serve other specializations in the departments of the College of Science and the Colleges of Medicine, Engineering, Dentistry, Agriculture, Pharmacy, and Education.

4. Program Accreditation

Bachelor of Science in Chemistry

5. Other external influences

Training in health institutions, in medical laboratories, and training in oil facilities

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	–	–	–	–
College Requirements	–	–	–	–

Department Requirements	26	74	–	–
Summer Training	1	2	–	–
Other	–	–	–	–

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

Program Structure			
Academic year: First(Bologna) First course	Theoretical	Practical	Units
Inorganic chemistry	3	---	6
Analytical Chemistry	2	3	8
Arabic language	2	---	3
Human rights	2	---	4
Labortary Sefty	2		4
Cell	2	3	5
TOTAL UNITS		30	

Academic year: First(Bologna) Second course	Theoretical	Practical	Units
Inorganic chemistry	3	---	6
Analytical Chemistry	2	3	8
General physics	2	2	4
Mathematics	2	---	5
English	2	---	3
Computers	---	2	4
TOTAL UNITS		30 ECT	

Academic year: Secod(Bologna) First course	Theoretical	Practical	Units
Inorganic chemistry	2	2	6
Analytical Chemistry	2	2	6
Physical Chemistry	2	2	5

Organic chemistry	2	2	5
Mathematics	2	---	3
Computers			3
Arabic language	2	---	2
TOTAL UNITS	30 ECT		

Academic year: Secod(Bologna) Second course	Theoretical	Practical	Units
Inorganic chemistry	2	2	6
Analytical Chemistry	2	2	5
Physical Chemistry	2	2	5
Organic chemistry	2	2	5
Nano Chemistry	2	---	5
Baath party crimes			2
English language	2	---	2
TOTAL UNITS	30 ECT		

Academic year: Third(Bologna) First course	Theoretical	Practical	Units
Organic chemistry	3	3	6
Physical Chemistry	3	3	6
Inorganic Chemistry	3	3	6
Biochemistry	3	3	6
Principles of Industrial chemistry	2	---	4
Heterocyclic CHEMISTRY	2	---	2
TOTAL UNITS	30 ECT		

Academic year: Third (Bologna) Second course	Theoretical	Practical	Units
Organic chemistry	3	3	6
Physical Chemistry	3	3	6
Consistency Chemistry	2	3	6
Biochemistry	2	3	6

Industrial chemistry	2	---	4
Organic Reactions Mechanism	2	---	2
TOTAL UNITS		30 ECT	

Academic year: Fourth First course	Applied hours	Units	notes
Automated Analysis Chemistry	6	4	Bachelor degree needs (X) hour (29) h/ week 36 units
Quantum Chemistry and Spectroscopy	3	4	
Biochemistry	5	3	
Industrial chemistry	5	3	
Organic Diagnosis	4	2	
Philosophy of Science	2	2	
Graduation Project	2	2	
TOTAL		20 Units	

Academic year: Fourth Second course	Applied hours	Units	notes
Automated Analysis Chemistry	6	4	Bachelor degree needs (X) hour (29) h/ week 36 units
Quantum Chemistry and Spectroscopy	3	4	
Biochemistry	5	3	
Industrial chemistry	5	3	
Organic Diagnosis	4	2	
Private	2	2	
Graduation Project	2	2	
TOTAL		20 Units	

7. Expected learning outcomes of the program
Knowledge

Learning Outcomes 1	<p>1-The student should be familiar with the basics of chemistry.</p> <p>2-The program aims to raise the possibility of the student to the level of understanding in the field of chemistry as far as his specialization is concerned.</p> <p>3- Developing the student's cognitive abilities and raising them.</p>
Skills	
Learning Outcomes 2	<p>1- Teaching the student how to become able to think logically.</p> <p>2- Teaching the student to analyze and employ the prescribed curriculum vocabulary.</p> <p>3- Developing the mental and subjective ability of the student in the specialization is an important part in his field of specialization</p> <p>4- Providing the student with communication skills and using modern teaching techniques effectively</p>
Learning Outcomes 3	
Ethics	
Learning Outcomes 4	<p>1- Asking questions that require answers within short periods of time</p> <p>2- Develop and support discussions within the classroom</p>
Learning Outcomes 5	

8. Teaching and Learning Strategies
<p>1- Lectures</p> <p>2- Asking questions and opening the door for dialogue.</p> <p>3- Computer-supported teaching and presentation of the subject in data show.</p> <p>4- Assigning the student to write some research papers</p> <p>5- Participation in conferences and scientific trips</p>

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9. Evaluation methods
1. Daily, monthly tests. 2. Scientific Research 3. Conducting seminars for students to find out the extent of their understanding of the subject.

10. Faculty						
Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof Dr. Rhameem Azeez	chemical engineering	corrosion electroplating			√	
Prof Dr Subhi Abdul sattar	Chemical engineering	Polymers			√	
Asst. Prof. Dr. Athraa Kitammy	Chemistry	organic chemistry			√	
Asst. Prof. Sadeek Hameed	Chemistry	Pollution			√	
Asst. Prof.Dr. Fatmaa Abas	Chemistry	Analytical chemistry			√	

Asst. Prof. Jawad Abius	Chemistry	organic chemistry			√	
Asst. Prof. Dr. Haider Dawood	Chemistry	Inorganic chemistry			√	
Asst. Prof. Dr. Kamal Rasheed	Chemistry	organic chemistry			√	
Asst. Prof. Dr. Amar Farman	Chemistry	organic chemistry			√	
Asst. Prof. Dr. Atheer Abeer Al saheeb	Chemistry	Inorganic chemistry			√	
Lect. Dr. Zaid Mohamed	Chemistry	Polymer			√	
Lect. Dr. Saraah Bedry	Chemistry	Physical chemistry			√	
Lect. Dr. Assel Farhan	Chemistry	organic chemistry			√	
Lect. Dr. Hussain Sarie	Chemistry	Bio chemistry				√
Lect. Balkes Raheem	Chemistry	Pollution			√	
Lect. Surrah Hameed	Chemistry	Inorganic chemistry			√	
Asst. Lect. Issam Hussian	Chemistry	physical chemistry			√	
Asst. Lect. Suaad Ali	Mathematic	Mathematic			√	
Asst. Lect. Dewia Athab	Educational Science	Law			√	

Asst. Lect. Mohamed Mahdey	Chemistry	Inorganic chemistry			√	
Asst. Lect. Israa Khamess	Chemistry	Analytical chemistry			√	
Asst. Lect. Zena Rassak	Chemistry	organic chemistry			√	
Asst. Lect. Farked Faraaj	Chemistry	Analytical chemistry			√	
Asst. Lect. Mannar Sattar	Chemistry	Bio chemistry			√	
Asst. Lect. Alla Neshmy	Chemistry	organic chemistry			√	
Asst. Lect. Mohameed Rasheed	Chemistry	Bio chemistry			√	
Asst. Lect. Farrah Kathem	Chemistry	Analytical chemistry			√	
Asst. Lect. Israa Sattar	Chemistry	organic chemistry			√	
Asst. Lect. Olla Zuhair	Chemistry	organic chemistry			√	
Asst. Lect. Zaineb Sabry	Chemistry	Bio chemistry			√	
Asst. Lect. Safaa Jumaa	Chemistry	physical chemistry			√	
Asst. Lect. Thaqeef Murtatha	Chemistry	physical chemistry			√	

Asst. Lect. Saiaf Ahmeed	Chemistry	Bio chemistry			√	
Asst. Lect. Saiaf Issa	physics	physics			√	
Asst. Lect. Ali Saleem	physics	general physics			√	
Asst. Lect. Lamess Mohamed	Chemistry	Bio chemistry			√	
Asst. Lect. Wasan Raad	Economics	Economics			√	
Asst. Lect. Zahra Ali Taher	Chemistry	Bio chemistry			√	
Asst. Lect. Diana Khaled	Chemistry	Organic			√	
Asst. Lect. Ali Mohammed Salman	Chemistry	Analytical chemistry			√	

Professional Development

Mentoring new faculty members

Directing new faculty members to work on developing the scientific curriculum, methods of delivering scientific lectures, and how to deliver scientific material to students, whether using classical or modern methods.

Professional development of faculty members

Working on finding development ideas by conducting training courses, working on developing scientific laboratories since the students' specialization is a scientific specialization.

11. Acceptance Criterion

The student must be accepted as a graduate of the sixth preparatory school, scientific branch, with a minimum average at least 80%.

12. The most important sources of information about the program

- 1- The curricula of the teaching methods adopted by the University of Wasit.
- 2- Multiple American and British programs such as the University of Iowa, Arkansas, South Carolina, Leeds, Birmingham

13. Program Development Plan

Personal planning is not ink on paper, it is the first process of success, through: setting visions, visualizing goals and programs, working on their implementation, and then continuous evaluation. Desire for success and achievement

1. Reaching a certain level of efficiency
2. Achieving a specific goal

Acquire new skills

Curriculum skills chart
Please check the boxes corresponding to the individual learning outcomes from the program subject to evaluation
Program Learning Outcomes

Year/Level	Course Name		Course Code	Essential or optional	Knowledge Objectives				Skills objectives of the program				Emotional and value goals				Other skills related to employability and personal development			
	First Semester	Chapter Two			A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	D1	D2	D3	4D
					First stage	Inorganic chemistry	Inorganic chemistry		Essential	√	√	√	√	√	√	√	√	√	√	√
	Analytical Chemistry	Analytical Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
	Cell	General physics	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
	Human rights	Mathematics	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√		
	Arabic	English	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√		

	Occupational safety	Computers	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Second stage	Inorganic chemistry	Inorganic chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Analytical Chemistry	Analytical Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Physical Chemistry	Physical Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Organic chemistry	Organic chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Mathematics	Nano chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Arabic	English	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Computers	Baath party crimes	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Phase 3	Organic chemistry	Organic chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Physical Chemistry	Physical Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Consistency Chemistry	Consistency Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Biochemistry	Biochemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	Industrial chemistry	Industrial chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Heterocyclic CHEMISTRY	Nano chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Phase 4	Automated Analysis Chemistry	Automated Analysis Chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Quantum Chemistry and Spectroscopy	Quantum Chemistry and Spectroscopy	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Biochemistry	Biochemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Industrial chemistry	Industrial chemistry	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Organic Diagnosis	Organic Diagnosis	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	English	Philosophy of Science	-	Essential	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	Graduation Project																			

Course Description Form

1. Course Name: Instrumental Analysis					
2. Course Code:					
3. Semester / Year: Semester					
4. Description Preparation Date:					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total)					
7. Course administrator's name (mention all, if more than one name)					
Name: Fatma Abbas Khazaal Email: fkhazal@uowasit.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • • • 			
9. Teaching and Learning Strategies					
Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
16	2		<ol style="list-style-type: none"> 1. Types of analytical methods and instrumental analysis techniques – electromagnetic spectrum, nature of electromagnetic radiation, and its wave and particle properties. 2. Interaction of electromagnetic radiation with matter – refraction, refractive index, absorption, atomic and molecular absorption. 3. Spectroscopic analysis – atomic and molecular spectra, types of transitions, and UV-Vis spectroscopy. 4. Analytical applications in the UV-Vis region. 5. Quantitative analysis using radiation absorption in the UV-Vis region and the Beer–Lambert Law. 6. Solving examples on the application of the Beer– 	<input type="checkbox"/> Lectures (Theoretical Teaching) Deliver structured lectures to explain fundamental and advanced concepts such as electromagnetic radiation, spectroscopic principles, and analytical techniques. <input type="checkbox"/> Interactive Presentations Use PowerPoint presentations, diagrams, and visual models to illustrate concepts like UV-Vis absorption, IR spectra, and atomic transitions. <input type="checkbox"/> Laboratory Experiments	<input type="checkbox"/> Written Examinations <ul style="list-style-type: none"> • Midterm exam to assess understanding of theoretical concepts (e.g., electromagnetic radiation, spectroscopy principles). • Final exam to evaluate comprehensive knowledge of all topics. <input type="checkbox"/> Quizzes <ul style="list-style-type: none"> • Short quizzes to assess continuous understanding of topics such as

			<p>Lambert Law for single solutions and mixtures.</p> <ol style="list-style-type: none"> 7. Monthly exam. 8. Qualitative analysis in UV-Vis spectroscopy and the chemical and instrumental causes of deviations from the Beer–Lambert Law. 9. Quantitative analysis in UV-Vis spectroscopy and determination of the metal-to-ligand ratio using the mole ratio method and continuous variation method. 10. Single-beam and double-beam spectrophotometers. 11. Infrared (IR) spectroscopy and its use in qualitative and quantitative analysis, absorption theory, Hooke’s Law, standard formulas, and types of vibrations. 12. Calibration of IR spectrophotometer, instrument components, and sample preparation for measurement. 13. Atomic absorption spectroscopy (AAS): theoretical principles, atomization, types of atomizers, flame and non-flame atomization. 14. Instrument components and the function of each part. 15. Calibration/standardization, chemical and physical interferences in atomic absorption methods, sensitivity, detection limit, and background correction. 16. Final exam. 	<p>(Practical Learning) Conduct hands-on experiments using instruments such as UV-Vis spectrophotometers, IR spectrometers, and atomic absorption spectrometers to reinforce theoretical knowledge.</p> <p><input type="checkbox"/> Demonstration Method Demonstrate the operation, calibration, and components of analytical instruments (single-beam, double-beam, IR, AAS).</p> <p><input type="checkbox"/> Problem-Based Learning (PBL) Engage students in solving real analytical problems such as applying the Beer–Lambert Law and interpreting spectroscopic data.</p> <p><input type="checkbox"/> Worked Examples and Exercises Practice numerical problems, especially for quantitative analysis and Beer–Lambert Law applications for single and mixed solutions.</p> <p><input type="checkbox"/> Group Work and Collaborative Learning Assign students to work in groups to analyze data, discuss results, and present findings.</p> <p><input type="checkbox"/> Research-Based Learning Encourage students to review scientific articles related to spectroscopy and analytical chemistry techniques.</p> <p><input type="checkbox"/> E-Learning and Digital Tools Use simulation software, virtual labs, and online platforms</p>	<p>Beer–Lambert Law, UV-Vis, IR, and AAS.</p> <p><input type="checkbox"/> Homework Assignments</p> <ul style="list-style-type: none"> • Problem-solving exercises (e.g., quantitative calculations using Beer–Lambert Law). • Conceptual questions related to spectroscopic techniques. <p><input type="checkbox"/> Laboratory Assessment</p> <ul style="list-style-type: none"> • Evaluation of practical skills أثناء إجراء التجارب باستخدام الأجهزة (UV-Vis, IR, AAS). • Assessment of accuracy, technique, and safety compliance. <p><input type="checkbox"/> Laboratory Reports</p> <ul style="list-style-type: none"> • Written reports to evaluate data analysis, interpretation, and scientific writing skills. <p><input type="checkbox"/> Practical Examinations</p> <ul style="list-style-type: none"> • Hands-on tests to assess students’ ability to operate instruments, prepare samples, and analyze results. <p><input type="checkbox"/> Oral Assessment</p> <ul style="list-style-type: none"> • Presentations on selected topics
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				<p>to demonstrate spectroscopic techniques and data analysis.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Self-Directed Learning Assign individual tasks such as reports, literature reviews, and problem-solving exercises to promote independent learning. <input type="checkbox"/> Case Studies Analyze real-world applications of spectroscopic methods in environmental, medical, and industrial fields. <input type="checkbox"/> Continuous Practice and Assessment Activities Include quizzes, assignments, and class exercises to reinforce understanding of concepts and techniques. 	<p>(e.g., spectroscopic methods and applications).</p> <ul style="list-style-type: none"> • Oral questioning during lab sessions to assess understanding. <ul style="list-style-type: none"> <input type="checkbox"/> Project Work / Mini-Research <ul style="list-style-type: none"> • Small research projects involving data collection, analysis, and interpretation in analytical chemistry. <input type="checkbox"/> Class Participation
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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)	
Main references (sources)	1-Skoog, D.A., Holler, F.J., Crouch, S.R., <i>Principles of Instrumental Analysis</i> , 7th Edition.
Recommended books and references (scientific journals, reports...)	2-Harris, D.C., <i>Quantitative Chemical Analysis</i> , 10th Edition. 3-Harvey, D., <i>Modern Analytical Chemistry</i> , 2nd Edition.
Electronic References, Websites	***

Course Description Form

1. Course Name: ANALYTICAL CHEMISTRY

2. Course Code: ANALY CHEM	
3. Semester / Year: first semester/ 2023-2024	
4. Description Preparation Date: 1-9-2023	
5. Available Attendance Forms: Presence	
6. Number of Credit Hours (Total) 3 hours practical / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Farah kadhim mohsin Email: Farah@uowasit.edu.iq	
8. Course Objectives	
Course Objectives	<p>1–Raising the level of chemistry science in all fields</p> <p>2– Transferring what is new about these sciences to serve society</p> <p>3–Raising the economic level of the country</p> <p>4– Providing relevant institutions and departments with technical and scientific graduates</p> <p>The new ones</p> <p>5– Joint cooperation with state institutions and the private sector for work</p> <p>Scientific research to solve related problems</p>
9. Teaching and Learning Strategies	
Strategy	<p>1-Providing students with the theoretical basics of knowing chemical variables .</p> <p>2- Practical training on calculating the absorbance of colored and transparent solutions .</p>

10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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Course Description Form

1. Course Name: Organic Spectroscopy					
2. Course Code: ORG SPECT					
3. Semester / Year: First semester/ 2025-2026					
4. Description Preparation Date: 1-9-2025					
5. Available Attendance Forms: Presence					
6. Number of Credit Hours (Total) 2 hours theoretical + 3 hours lab works/ Number of Units (Total)					
7. Course administrator's name (mention all, if more than one name) Name: Assist Prof Dr Jawad Kadhim Abaies Email: jabaies@uowasit.edu.iq					
8. Course Objectives					
Course Objectives	1-Raising the level of chemistry in all fields 2-Transferring what is new about these sciences to serve society 3-Raising the economic level of the country 4-Providing relevant institutions and departments with technical and scientific graduates the new ones 5- Joint cooperation with state institutions and the private sector for work scientific research to solve related problems				
9. Teaching and Learning Strategies					
Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately with their abilities and orientations in different specializations				
10. Course Structure					
Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1 st	2	Identification of organic compounds and its importance	Identification of organic compounds and its importance	Paper lectures	Daily exam and discussion
2 nd	2	Spectroscopy and electromagnetic spectrum	Spectroscopy and electromagnetic spectrum	Paper lectures	Daily exam and discussion
3 rd	2	UV-Visible Spectroscopy	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
4 th	2	Absorption of light by organic compound and UV-VIS spectra	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
5 th	2	Term utilized in UV-Vis: Chromophore, Auxochrome, Red shift, Blu Shif...etc	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
6 th	2	Types of bands in UV-VIS spectrum and factors effected on them	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
7 th	2	Effect of conjugation on UV-VIS spectra of dienes and conjugated systems	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
8 th	2	The Woodward–Fieser prediction rules of λ_{max} for dienes and enonones	UV-Visible Spectroscopy	Paper lectures	Daily exam and discussion
9 th		Monthly Exam	-	-	-
10 th	2	IR Spectroscopy (introduction)	IR Spectroscopy	Paper lectures	Daily exam and discussion
11 th	2	Scientific principles of FTIR spectrum	IR Spectroscopy	Paper lectures	Daily exam and discussion
12 th	2	Types of Vibrations after IR absorption by molecule.	IR Spectroscopy	Paper lectures	Daily exam and discussion
13 th	2	Types, shapes and location of bands appear in FTIR Spectrum	IR Spectroscopy	Paper lectures	Daily exam and discussion
14 th	2	FTIR spectra analysis of various aliphatic compounds	IR Spectroscopy	Paper lectures	Daily exam and discussion
15 th	2	FTIR spectra analysis of various aromatic compounds	IR Spectroscopy	Paper lectures	Daily exam and discussion
		Monthly Exam		Paper lectures	Daily exam and discussion
11. Course Evaluation					

Distributing the score out of 100 % (Theoretical lectures + lab works) according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, lab works, reports etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Spectrometric Identification of Organic Compounds 8th Edition Robert M. Silverstein, Francis X. Webster, David J. Kiemle, David L. Bryce
Main references (sources)	
Recommended books and references (scientific journals, reports...)	1-Introduction to Spectroscopy by Donald L. Pavia , Gary M. Lampman & George S . Kriz. 2-Elementary Organic Spectroscopy “Principles and chemical Application by Y. R. Sharma, Chand and Company Ltd, New Delhi, India, 2009.
Electronic References, Websites	

Course Description Form

1. Course Name: Organic Spectroscopy
2. Course Code: ORG SPECT
3. Semester / Year: First semester/ 2023-2024
4. Description Preparation Date: 1-9-2024
5. Available Attendance Forms: Presence
6. Number of Credit Hours (Total) 2 hours theoretical + 3 hours lab works/ Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Assist Prof Dr Jawad Kadhim Abaies Email: jabaies@uowasit.edu.iq
8. Course Objectives

Course Objectives	1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates the new ones 5– Joint cooperation with state institutions and the private sector for work scientific research to solve related problems
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9. Teaching and Learning Strategies

Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately with their abilities and orientations in different specializations
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10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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Course Description Form

1. Course Name: BIO Chemistry	
2. Course Code: BIO CHEM	
3. Semester / Year: first semester/ 2025-2026	
4. Description Preparation Date: 1-9-2023	
5. Available Attendance Forms: Presence	
6. Number of Credit Hours (Total) 3 hours theoretical / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: manar satar jabar Email: manarsatar@uowasit.edu.iq	
8. Course Objectives	
Course Objectives	1–Raising the level of chemistry science in all fields 2– Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4– Providing relevant institutions and departments with technical and scientific graduates The new ones 5– Joint cooperation with state institutions and the private sector for work Scientific research to solve related problems
9. Teaching and Learning Strategies	

Strategy	1- Providing students with the theoretical foundations for knowing biochemical variables 2- Practical training on tests to detect metabolic reactions
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10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1 st	3	Carbohydrate	biochemistry	Paper lectures	Daily exam and discussion
2 nd	3	Reaction of carbohydrate	biochemistry	Paper lectures	Daily exam and discussion
3 rd	3	Metabolism glucolysis	biochemistry	Paper lectures	Daily exam and discussion
4 th	3	Krebs cycle	biochemistry	Paper lectures	Daily exam and discussion
5 th	3	Examination	biochemistry	Paper lectures	Daily exam and discussion
6 th	3	Gluconeogenesis	biochemistry	Paper lectures	Daily exam and discussion
7 th	3	Glycogenesis	biochemistry	Paper lectures	Daily exam and discussion
8 th	3	Pentose phosphate	biochemistry	Paper lectures	Daily exam and discussion
9 th	3	Examination	biochemistry	Paper lectures	Daily exam and discussion
10 th	3		biochemistry	Paper lectures	Daily exam and discussion
11 th	3		biochemistry	Paper lectures	Daily exam and discussion
12 th	3		biochemistry	Paper lectures	Daily exam and discussion
13 th	3		biochemistry	Paper lectures	Daily exam and discussion
14 th	3		biochemistry	Paper lectures	Daily exam and discussion
15 th	3		biochemistry	Paper lectures	Month exam

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)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Biochemistry-lehninger <u>VOET-Fundamentals of Biochemistry</u>
Electronic References, Websites	www.chemicalprocessing.com

Course Description Form

1. Course Name: corrosion chemistry
2. Course Code: CORROCHEM
3. Semester / Year: first semester /fourth stage/ 2025-2026
4. Description Preparation Date: 1-9-2025
5. Available Attendance Forms: Presence
6. Number of Credit Hours (Total) 2 hours theoretical / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Raheem Aziz Hussein Email: razeez@uowasit.edu.iq
8. Course Objectives

Course Objectives	1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates the new ones 5– Joint cooperation with state institutions and the private sector for work Scientific research to solve related problems
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9. Teaching and Learning Strategies

Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately with their abilities and orientations in different specializations
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1 st	2	Definition of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
2 nd	2	Reactions and classification of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
3 rd	2	Types of corrosion and kinetics	Corrosion chemistry	Paper lectures	Daily exam and discussion
4 th	2	Types of corrosion and kinetics	Corrosion chemistry	Paper lectures	Daily exam and discussion
5 th	2	Thermodynamics basic of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
6 th	2	Determine rate of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
7 th	2	Determine rate of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
8 th	2	Electrodes and Cells of corrosion	Corrosion chemistry	Paper lectures	Daily exam and discussion
9 th	2	Open circuit potential OCP	Corrosion chemistry	Paper lectures	Daily exam and discussion
10 th	2	Protection of corrosion, coating and inhibitors	Corrosion chemistry	Paper lectures	Daily exam and discussion
11 th	2	Localized corrosion and types it	Corrosion chemistry	Paper lectures	Daily exam and discussion
12 th	2	Localized corrosion and types it	Corrosion chemistry	Paper lectures	Daily exam and discussion
13 th	2	Series of electrochemicals	Corrosion chemistry	Paper lectures	Daily exam and discussion
14 th	2	Series of electrochemicals	Corrosion chemistry	Paper lectures	Daily exam and discussion
15 th	2	Series of electrochemicals	Corrosion chemistry	Paper lectures	Monthly exam

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)	
Main references (sources)	التاكل/اسبابه/انواعه/طرق الحماية/ للاستاذ الدكتور قحطان خلف الخزرجي
Recommended books and references (scientific journals, reports...)	الكيمياء والتاكل/ ا.د. نبيل عادل فخري / جامعة صلاح الدين/ اربيل- ا.د. كامران شكر حسين / جامعة كركوك/ ا.م.د. عيسى اسماعيل احمد/ صلاح الدين/ اربيل اساسيات هندسة التاكل/ د. عيسى مسعود بغني اختيار المواد الهندسية/ ا.د. قحطان خلف الخزرجي

	الحماية من التآكل/ محمد احمد السيد خليل
Electronic References, Websites	Corrosion and protection Basic of corrosion Corrosion and corrosion control

Course Description Form

1. Course Name: Quantum Chemistry	
2. Course Code: Quan. Chem.	
3. Semester / Year: first semester/ 2024-2025	
4. Description Preparation Date: 15-10-2024	
5. Available Attendance Forms: Presence	
6. Number of Credit Hours (Total) 3 hours theoretical / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Sarah Badri Jasim Email: saltaiy@uowasit.edu.iq	
8. Course Objectives	
Course Objectives	1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates; the new ones 5– Joint cooperation with state institutions and the private sector for work Scientific research to solve related problems
9. Teaching and Learning Strategies	
Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately

with their abilities and orientations in different specializations

10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1 st	2	Potential energy curve	Quantum chemistry	Blended learning	Daily exam and discussion
2 nd	2	Classical mechanics	Quantum chemistry	Blended learning	Daily exam and discussion Daily exam and discussion
3 rd	2	Newton's equations	Quantum chemistry	Blended learning	Daily exam and discussion
4 th	2	Lancmiur equations	Quantum chemistry	Blended learning	Daily exam and discussion
5 th	2	Hamelton equations	Quantum chemistry	Blended learning	Daily exam and discussion
6 th	2	First month exam	Quantum chemistry	Blended learning	Exam
7 th	2	Black body radiation	Quantum chemistry	Blended learning	Daily exam and discussion
8 th	2	Uncertainty principle	Quantum chemistry	Blended learning	Daily exam and discussion
9 th	2	Harmonic oscillator	Quantum chemistry	Blended learning	Daily exam and discussion
10 th	2	Particle in a box	Quantum chemistry	Blended learning	Daily exam and discussion
11 th	2	Spectra of hydrogen atom	Quantum chemistry	Blended learning	Daily exam and discussion
12 th	2	Quantum theory	Quantum chemistry	Blended learning	Daily exam and discussion
13 th	2	Degeneracy of energy	Quantum chemistry	Blended learning	Daily exam and discussion

14 th	2	Second month exam	Quantum chemistry	Blended learning	Daily exam and discussion
15 th	2	Final exam	Quantum chemistry	Blended learning	
	2			Blended	
	2				

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Quantum Chemistry / Dr. Sarah Badri Jasim
Main references (sources)	1- Atkins . sixth edition, Volume 2. 2- Quantum chemistry.
Recommended books and references (scientific journals, reports...)	Advance Quantum Chemistry. Articles and Books in College Library
Electronic References, Websites	https://www.cambridge.org/core/books/abs/fundamentals-of-quantum-mechanics/references/07B046B8CD5888864971D675065C8F

Course Description Form

1. Course Name: Petrochemical Industry	
2. Course Code: PTRO CHEM	
3. Semester / Year: first semester/ 2026 - 2025	
4. Description Preparation Date: 1-9-2025	
5. Available Attendance Forms: Presence	
6. Number of Credit Hours (Total) 2 hours theoretical / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Zaid Mohammed Abbas Email: zabbas@uowasit.edu.iq	
8. Course Objectives	
Course Objectives	1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates the new ones 5– Joint cooperation with state institutions and the private sector for work Scientific research to solve related problems
9. Teaching and Learning Strategies	
Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately

with their abilities and orientations in different specializations

10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1 st	2	Petrochemical Industry and its importance	Petrochemical Industry	Paper lectures	Daily exam and discussion
2 nd	2	Type of products in Petrochemical Industry	Petrochemical Industry	Paper lectures	Daily exam and discussion
3 rd	2	Important consideration taken into account for Petrochemical Industry	Petrochemical Industry	Paper lectures	Daily exam and discussion
4 th	2	Economic evaluation of the Petrochemical Industry	Petrochemical Industry	Paper lectures	Daily exam and discussion
5 th	2	Catalytic processes and types of catalysts	Petrochemical Industry	Paper lectures	Daily exam and discussion
6 th	2	Catalytic reactors and their types	Petrochemical Industry	Paper lectures	Daily exam and discussion
7 th	2	Physical processes in Petrochemical Industry and separation methods	Petrochemical Industry	Paper lectures	Daily exam and discussion
8 th	2	Industrial distillation processes and their types	Petrochemical Industry	Paper lectures	Daily exam and discussion
9 th	2	Industrial extraction processes and their types	Petrochemical Industry	Paper lectures	Daily exam and discussion
10 th	2	Industrial adsorption and absorption processes	Petrochemical Industry	Paper lectures	Daily exam and discussion
11 th	2	Size reduction processes and electrical and magnetic separation methods	Petrochemical Industry	Paper lectures	Daily exam and discussion
12 th	2	Factory design in the Petrochemical Industry	Petrochemical Industry	Paper lectures	Daily exam and discussion
13 th	2	Industrial drying and crystallization processes	Petrochemical Industry	Paper lectures	Daily exam and discussion
14 th	2	Gaseous pollutants in the Petrochemical Industry and treatment methods	Petrochemical Industry	Paper lectures	Daily exam and discussion
15 th	2	Examination	Petrochemical Industry	Paper lectures	Month exam

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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)	Chemistry of petrochemical processes <u>Book by Sami Matar</u>
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Handbook of Petrochemical Processes <u>By James G. Speight</u>
Electronic References, Websites	www.chemicalprocessing.com

Course Description Form

13.	Course Name: Instrumental Analysis	
14.	Course Code:	
15.	Semester / Year: Semester	
16.	Description Preparation Date:	
17.	Available Attendance Forms:	
18.	Number of Credit Hours (Total) / Number of Units (Total)	
19.	Course administrator's name (mention all, if more than one name)	
	Name: Fatma Abbas Khazaal Email: fkhazal@uowasit.edu.iq	
20.	Course Objectives	
	Course Objectives	<ul style="list-style-type: none"> • • •
21.	Teaching and Learning Strategies	
	Strategy	
22.	Course Structure	

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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.

25. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

1-Skoog, D.A., Holler, F.J., Crouch, S.R., *Principles of Instrumental Analysis*, 7th Edition.

2-Harris, D.C., *Quantitative Chemical Analysis*, 10th Edition.

3-Harvey, D., *Modern Analytical Chemistry*, 2nd Edition.

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

Course Description Form

1. Course Name: ANALYTICAL CHEMISTRY
2. Course Code: ANALY CHEM
3. Semester / Year: first semester/ 2023-2024
4. Description Preparation Date: 1-9-2023
5. Available Attendance Forms: Presence
6. Number of Credit Hours (Total) 3 hours practical / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Farah kadhim mohsin Email: Farah@uowasit.edu.iq
8. Course Objectives

Course Objectives	<p>1–Raising the level of chemistry science in all fields</p> <p>2– Transferring what is new about these sciences to serve society</p> <p>3–Raising the economic level of the country</p> <p>4– Providing relevant institutions and departments with technical and scientific graduates</p> <p>The new ones</p> <p>5– Joint cooperation with state institutions and the private sector for work</p> <p>Scientific research to solve related problems</p>
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9. Teaching and Learning Strategies

Strategy	<p>1-Providing students with the theoretical basics of knowing chemical variables .</p> <p>2- Practical training on calculating the absorbance of colored a transparent solutions .</p>
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10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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Course Description Form

1. Course Name: Organic Spectroscopy	
2. Course Code: ORG SPECT	
3. Semester / Year: Second semester/ 2025-2026	
4. Description Preparation Date: 1-9-2025	
5. Available Attendance Forms: Presence	
6. Number of Credit Hours (Total) 2 hours theoretical+3 hours lab works / Number of Units (Total)	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist Prof Dr Jawad Kadhim Abaies Email: jabaies@uowasit.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> 1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates the new ones 5– Joint cooperation with state institutions and the private sector for work scientific research to solve related problems
9. Teaching and Learning Strategies	
Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately with their abilities and orientations in different specializations

10. Course Structure					
Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1 st	2	Introduction to NMR Spectroscopy	NMR Spectroscopy	Paper lectures	Daily exam and discussion
2 nd	2	Principles of NMR Spectroscopy	NMR Spectroscopy	Paper lectures	Daily exam and discussion
3 rd	2	Chemical shift in ¹ H NMR	¹ H NMR	Paper lectures	Daily exam and discussion
4 th	2	Shielding and de-shielding	¹ H NMR	Paper lectures	Daily exam and discussion
5 th	2	¹ H NMR Spectrum and factors effect on signal position	¹ H NMR	Paper lectures	Daily exam and discussion
6 th	2	Signal splitting and multiplicity	¹ H NMR	Paper lectures	Daily exam and discussion
7 th	2	Spin-Spin coupling, Pascal's triangle and coupling constant	¹ H NMR	Paper lectures	Daily exam and discussion
8 th	2	Integration in ¹ H NMR	¹ H NMR	Paper lectures	Daily exam and discussion
9 th	2	¹³ C NMR and its importance	¹³ C NMR	Paper lectures	Daily exam and discussion
10 th	2	Chemical shift in ¹³ C NMR	¹³ C NMR	Paper lectures	Daily exam and discussion
11 th	2	Analysis of ¹³ C NMR spectra	¹³ C NMR	Paper lectures	Daily exam and discussion
12 th	2	Mass spectroscopy and its Applications	Mass spectroscopy	Paper lectures	Daily exam and discussion
13 th	2	Principles of Mass spectroscopy	Mass spectroscopy	Paper lectures	Daily exam and discussion
14 th	2	Analysis of Mass spectra	Mass spectroscopy	Paper lectures	Daily exam and discussion
15 th	-	Monthly Exam	Monthly Exam		Monthly Exam

11. Course Evaluation

Distributing the score out of 100 % (Theoretical lectures + lab works) according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, lab works, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Spectrometric Identification of Organic Compounds 8th Edition by Robert M. Silverstein, Francis X. Webster, David Kiemle, David L. Bryce
Main references (sources)	
Recommended books and references (scientific journals, reports...)	1-Introduction to Spectroscopy by Donald L. Pavia , Gary M. Lampman & George S . Kriz. 2-Elementary Organic Spectroscopy "Principles and chemical Application by Y. R. Sharma, Chand and Company Ltd, New Delhi, India, 2009.
Electronic References, Websites	

Course Description Form

1. Course Name: Organic Spectroscopy

2. Course Code: ORG SPECT

3. Semester / Year: First semester/ 2023-2024

4. Description Preparation Date: 1-9-2024

5. Available Attendance Forms: Presence

6. Number of Credit Hours (Total) 2 hours theoretical + 3 hours lab works/ Number of Units (Total)

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

Name: Assist Prof Dr Jawad Kadhim Abaies

Email: jabaies@uowasit.edu.iq

8. Course Objectives

Course Objectives

- 1-Raising the level of chemistry in all fields
- 2-Transferring what is new about these sciences to serve society
- 3-Raising the economic level of the country
- 4-Providing relevant institutions and departments with technical and scientific graduates the new ones
- 5- Joint cooperation with state institutions and the private sector for work scientific research to solve related problems

9. Teaching and Learning Strategies

Strategy

Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately

with their abilities and orientations in different specializations

10. Course Structure

Week	Hour	Required Learning Outcome	Unit or subject name	Learning method	Evaluation method
1 st	3	Introducing the student to systematic method of org diagnosis	Systematic method for org identification	Direct educa Paper lecture	Daily exam and discuss
2 nd	3	Introducing the student to method of measuring phys constants	Method of measuring phys constants	Direct educa Paper lect and prac application	Daily exam and discuss
3 rd	3	Introducing the student to method of detecting elem using sodium smelting	Detection of elements using sod smelting	Direct educa Paper lect and prac application	Daily exam and discuss
4 th	3	Introducing the student to solubility of organic substance	Solubility	Direct educa Paper lect and prac application	Daily exam and discuss
5 th	3	Definition of student Detection of alcohols, aldehy and ketones	Statements of effective totals	Direct educa Paper lect and prac application	Daily exam and discuss
	3	Introducing the student to detection of carbohydrates, detection of amines, and	Statements of effective totals	Direct educa Paper lect and prac application	Daily exam and discuss

6 th	3	detection of aromatic hydrocarbons	Statements of effective totals	practical application	Daily exam and discussion
		Introducing the student searching for the names of organic compounds		practical application	Daily exam and discussion
7 th	3	Definition of student	A source containing compounds their melting and boiling points	practical application	Daily exam and discussion
		Detection of unknown organic substances			Daily examination discussion, and writing report
8 th	3	Definition of student	practical application	practical application	writing a report
		Detection of unknown organic substances			writing a report
9 th	3	Definition of student	practical application	practical application	writing a report
		Detection of unknown organic substances			writing a report
10 th	3	Definition of student	practical application	practical application	writing a report
		Detection of unknown organic substances			writing a report
	3	Definition of student	practical application		

11 th	3	Detection of unknown org substances Definition of student	practical application	Monthly Exam	writing a report
12 th	3	Detection of unknown org substances Monthly Exam	practical application		writing a report
13 th	3		practical application		Monthly Exam
14 th	3		Monthly Exam		
15 th					

11. Course Evaluation

Distributing the score out of 100 % (Theoretical lectures + lab works) according to the tasks assigned to the student such as d preparation, daily oral, monthly, or written exams, lab works, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Spectrometric Identification of Organic Compounds 8th Edition
Robert M. Silverstein, Francis X. Webster, David J. Kiemle, D
L. Bryce

Main references (sources)	
Recommended books and references (scientific journals, reports...)	<p>1-Introduction to Spectroscopy by Donald L. Pavia , Gary M. Lampman & George S . Kriz.</p> <p>2-Elementary Organic Spectroscopy “Principles and chemical Application by Y. R. Sharma, Chand and Company Ltd, New Delhi, India, 2009.</p>
Electronic References, Websites	

Ministry of Higher Education and Scientific Research
 Scientific Supervision and Scientific Evaluation Apparatus
 Directorate of Quality Assurance and Academic Accreditation
Course Description Form

Wasit University	University Name	Stereochemistry	Course Name
College of Science	College / Institute	CHEM 401	Course Code
Chemistry	Scientific Department	Fourth /second	Year / Semester
B.Sc. / Chemistry	Academic Program	2 Credit Hours (Theoretical)	Credit Hours
Asst. Prof. Dr. Aseel Farhan Abdullah	Course Administrator	1/12/2025	Description Date

Course Objectives

1. To introduce students to the concept of stereochemistry and its importance in organic, pharmaceutical, and biochemical fields.
2. To enable students to understand and identify types of isomerism (structural and stereochemical) and their fundamental concepts.
3. To equip students with the ability to identify chiral centers and draw stereoisomers using various representation methods.
4. To train students in naming stereochemical compounds according to the R/S and D/L systems using CIP rules.
5. To understand optical rotation phenomena and polarimetry and their practical applications.
6. To distinguish between enantiomers, diastereomers, and meso compounds, and understand racemic mixtures and their separation.

Teaching and Learning Strategies

1. Interactive Lectures: Detailed explanation of the subject matter using 3D molecular models, diagrams, and real-world examples.
2. Interactive Questions: Posing stimulating questions during class to promote critical thinking and student engagement.
3. Problem Solving: Training students to solve exercises related to configuration assignment (R/S, D/L, E/Z).
4. Visual Presentations: Using slides and graphical illustrations to clarify complex spatial structures.
5. Discussion and Dialogue: Encouraging students to discuss concepts related to stereochemical topics.

Weekly Course Structure

Week	Unit or Subject Name	Required Learning Outcomes
1	Introduction to Stereochemistry – Definition and Importance	Student understands the definition and importance of stereochemistry
2	Concept of Isomerism and Its Types (Structural and Stereoisomerism)	Student distinguishes between types of isomerism
3	Structural Isomerism: Chain, Positional, Functional, Metamerism, Tautomerism	Student identifies structural isomerism types with examples
4	Geometric Isomerism (Cis/Trans) – Requirements and Examples	Student recognizes conditions for geometric isomerism and draws them
5	E/Z System for Naming Geometric Isomers (CIP Rules)	Student applies CIP rules to assign E or Z configuration
6	Chiral Center – Definition, Requirements, and Optical Activity	Student identifies chiral centers and understands optical activity
7	Enantiomers – Properties and Mirror-Image Relationships	Student compares and contrasts enantiomers
8	Methods of Representing Spatial Structures: Fischer Projection, Wedge-Dash	Student draws spatial structures using different methods
9	R/S Nomenclature for Compounds with One Chiral Center	Student accurately names chiral compounds using R/S system
10	R/S Nomenclature for Compounds with Two Chiral Centers	Student applies R/S nomenclature to multi-chiral compounds
11	D/L Nomenclature System (Sugars and Amino Acids)	Student distinguishes between D and L configurations
12	Diastereomers and Meso Compounds	Student differentiates between diastereomers and meso compounds
13	Polarimetry and Calculation of Specific Rotation	Student calculates specific rotation from experimental data
14	Le Bel-Van't Hoff Rule and Generation of Chiral Centers	Student applies the rule to calculate the number of isomers

15	Racemic Mixture, Resolution Methods – Stereoselective and Stereospecific Reactions	Student explains racemic mixtures and resolution methods
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Expected Learning Outcomes of the Course

Knowledge:

A1 – Understand the concept of stereochemistry and its relationship to the physical, chemical, and biological properties of molecules.

A2 – Recognize the different types of isomerism and their conditions.

A3 – Appreciate the importance of optical activity in pharmacy and biochemistry.

Skills:

B1 – Ability to identify chiral centers in complex organic compounds.

B2 – Draw spatial structures using Fischer projection and wedge-dash notation.

B3 – Apply CIP rules to name compounds using R/S, D/L, and E/Z systems.

B4 – Calculate specific rotation and interpret polarimetry data.

Ethics and Values:

C1 – Develop analytical and critical thinking in addressing chemical problems.

C2 – Promote scientific accuracy and systematic approach in problem solving.

C3 – Recognize the importance of stereochemistry in real-world applications.

Evaluation Method	Score
Monthly Examinations (Two Exams)	30 Marks
Course Work / Daily Activities / Reports	20 Marks
Final Examination (End of Year/Semester)	50 Marks
Total	100 Marks

Learning and Teaching Resources

Required Textbooks:

1. Lecture Notes: Asst. Prof. Dr. Aseel Farhan Abdullah – Stereochemistry, Wasit University, 2024.

Main References:

1. Clayden, J., Greeves, N., Warren, S. (2012). Organic Chemistry. Oxford University Press.

2. Clayden, J. (2013). Stereochemistry – Oxford Chemistry Primers. Oxford University Press.

3. Eliel, E. L., Wilen, S. H. (1994). Stereochemistry of Organic Compounds. John Wiley & Sons.

Electronic References:

1. Khan Academy – Organic Chemistry: www.khanacademy.org

2. ChemLibreTexts – Stereochemistry: chem.libretexts.org

Quality Assurance Director

Course Administrator

Head of Department

Name:	Asst. Prof. Dr. Aseel Farhan Abdullah	Name:
Signature:	Signature:	Signature:
Date:	1/12/2025	Date:

Course Description Form

1. Course Name: Industrial Chemistry
2. Course Code: INDUS CHEM
3. Semester / Year: first semester/ 2025-2026
4. Description Preparation Date:
5. Available Attendance Forms: Presence
6. Number of Credit Hours (Total) 2 hours theoretical / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Zaid Mohammed Abbas Email: zabbas@uowasit.edu.iq
8. Course Objectives

Course Objectives	1–Raising the level of chemistry in all fields 2–Transferring what is new about these sciences to serve society 3–Raising the economic level of the country 4–Providing relevant institutions and departments with technical and scientific graduates the new ones 5– Joint cooperation with state institutions and the private sector for work Scientific research to solve related problems
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9. Teaching and Learning Strategies

Strategy	Following up on outstanding students, supporting them, and guiding them to build their mental and scientific abilities appropriately with their abilities and orientations in different specializations
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10. Course Structure

Week	Hour	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1 st	2	Introducing to polymers and their importance	Polymers	Paper lectures	Daily exam and discussion
2 nd	2	Introducing to the types of polymers	Polymers	Paper lectures	Daily exam and discussion
3 rd	2	Introduction of industrial polymers	Polymers	Paper lectures	Daily exam and discussion
4 th	2	Introducing the student to the economic evaluation of the polymer industry	Polymers	Paper lectures	Daily exam and discussion
5 th	2	Introducing the student to the types of polymers	Polymers	Paper lectures	Daily exam and discussion
6 th	2	Introducing the student to catalytic reactors in polymerization mechanics	Polymers	Paper lectures	Daily exam and discussion
7 th	2	Introducing the student to the physical sciences in measuring patent formulas	Polymers	Paper lectures	Daily exam and discussion
8 th	2	Introducing the student to the importance of polymers in daily life	Polymers	Paper lectures	Daily exam and discussion
9 th	2	Defining the new kid on the extraction of polymers from natural sources	Polymers	Paper lectures	Daily exam and discussion
10 th	2	Introducing the new student to plastic surgery and industrial surgery	Polymers	Paper lectures	Daily exam and discussion
11 th	2	Introduction to new student mathematical calculations throughout the duration of polymers	Polymers	Paper lectures	Daily exam and discussion
12 th	2	Introducing the student to matter and heat in polymer science Industrial drying and crystallization processes	Polymers	Paper lectures	Daily exam and discussion
13 th	2	Introducing the student to dehydration and crystallization in solid	Polymers	Paper lectures	Daily exam and discussion
14 th	2	formations Introducing the student to gold and industrial polymer waste	Polymers	Paper lectures	Daily exam and discussion
15 th	2	Examination	Polymers	Paper lectures	Month exam

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)	Polymer Chemistry <u>Book by Michael Maskos, Oskar Nuyken, and Sebastian Koltzenburg</u>
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Principles of polymerization <u>Book by George G. Odian</u>
Electronic References, Websites	www.chemicalprocessing.com



**وزارة التعليم العالي والبحث العلمي
جامعة واسط
كلية العلوم**



ONLINE

شهادة مشاركة

تم منحها الى
كمال رشيد حسبان
تقدرا للمشاركة في الندوة الإلكترونية
المعنونة
(المخالفات المهنية والقيد الجوهري في العمل)
والتي حضرها
المدرس الدكتور (**ياسر عباس**)
بتاريخ (٢٠٢٠-٦-١١)



عميد كلية العلوم
جامعة واسط




الجامعة التكنولوجية وجامعة واسط
البرنامج التأهيلي والتطويري لتأهيل كوادر جامعة واسط
المدرسين والعاملين في المختبرات من أجل تحقيق أطوح الجامعة في
التيارات على المستوى الوطني وتحقيق الاعتماد المختبري
الدورة الأولى

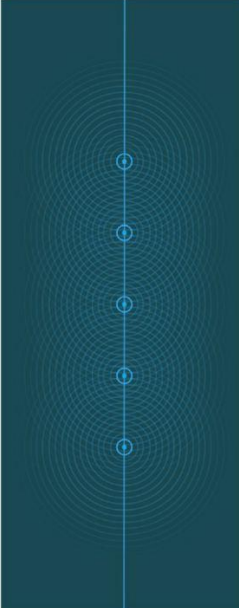
السيد / كمال رشيد حسبان الجوراني / جامعة واسط

نؤيد مشاركتكم في الدورة الاساسية لعنونة " المسار الامثل للمعاملات المختبرية وفق نظام المختبر التطبيقي الجيد GLP
GCLP لمختبرات جامعة واسط" والتي تم عقدها على منصة الاكترونية FCC بالتعاون بين جامعة واسط والتكنولوجية للتفترة من ١٩
٢٠٢٠ / ٤ / ٢٣ الى ٢٠٢٠ / ٤ / ٢٥ ، مصفحة محاضرات تخصصية في اعداد المختبرات وفق اجزائها بنجاح ١٠٠ مع تمنياتنا لكم بالتوفيق
والمزيد من التقدم والرقي خدمة لجامعتكم الغراء وبيتنا العزيز العسراق " .


**ISO 17025
ACCREDITED
LABORATORY**

أرد صبيح لشكره فحسان
مساعد رئيس جامعة واسط لشؤون الضيف
جامعة واسط

أرد رعدا لشكره ملود
مدير التطوير المستمر
جامعة واسط



Researcher Academy researcheracademy.com



Certificate of Completion

This certifies that

kamal Rashid Al-Jorani


has successfully completed the following module

How to write an abstract and improve your article

on Thursday 04 March, 2021
Presented by Hannah Foreman

Suzanne BeDell
Suzanne BeDell
Managing Director, Education
Reference & Continuity Books

Philippe Terheggen
Philippe Terheggen
Managing Director, Science,
Technology & Medical Journals



Development study program

نوع السلب وطرائق التبرير المتخلة داخل المحاضر ١ بن ویراضي التسلل في عرض الماء بطريقة منطقية ومثوقة	هل نكتة جالديه تخصبه	نوع	الأسلوب الفرسي / ابراسك اوبه	اسم الماء	اسم التبرير / التبريره
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
ضعيف	نعم	نكر	الكيبوازي الاضربوه	جدر داود جاسم	جد جا
جد جا	لا	نكر	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	لا	نكر	الكيبوازي التحليله (الظري)	علي سالم توالي	جد جا
جد جا	لا	نكر	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
ضعيف	نعم	نكر	الكيبوازي التحليله (الظري)	عزراء كهلاني صكر	جد جا
جد جا	لا	نكر	الفه العربيه	نضال حسب قلن	جد جا
جد جا	لا	نكر	الكيبوازي الاضربوه	جدر داود جاسم	جد جا
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	نعم	نثي	الفه العربيه	بقيس رجم عاقه	جد جا
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	لا	نثي	الكيبوازي التحليله (العلمي)	بقيس رجم عاقه	جد جا
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	نعم	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	لا	نثي	الكيبوازي الاضربوه	جدر داود جاسم	جد جا
جد جا	لا	نثي	الفه العربيه	نضال حسب قلن	جد جا
جد جا	لا	نثي	سلاسه وابن كيبوازي	بقيس رجم عاقه	جد جا
جد جا	نعم	نثي	الفه العربيه	نضال حسب قلن	جد جا
متوسط	لا	نثي	الكيبوازي التحليله (الظري)	فانغمه عباس خزعل	جد جا

يعين سائب التعلل مع أنظمة وراثة الفروع العربية	يزرع سائب التبريس المعطلة داخل المحظرة	يرى وراثة التسلل في عرض المادة بطريقة متعقبة ومكشوفة	هل ليك حظ التزنت مزالي	هل تمتلك حاديه شخصيه	النوع	المستوى الدراسي / المراتك الأولية	عدد الامداد	عدد التبريس / الترميمه
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد	جد جا	نعم	نعم	ثالث	لكيواء الفيزيويه (النظري)	ساره بري جاسم	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	اول	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (النظري)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء التثليه (العلمي)	اراء خيس عبدالله	
جا	جد جا	جد جا	نعم	نعم	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف حسين علي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (النظري)	لقيد مرتضى جواد	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	
جا	جد جا	جد جا	نعم	نعم	اول	لكيواء الفيزيويه (النظري)	عصاف حسين علي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	
جا	جد	جد جا	لا	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف حسين علي	
جا	جد جا	جد جا	نعم	نعم	اول	لكيواء الفيزيويه (النظري)	علي سام نواي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف حسين علي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (النظري)	لقيد مرتضى جواد	
جا	جد	جد جا	لا	لا	ثالث	لكيواء الفيزيويه (العلمي)	لقيد مرتضى جواد	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جا	جد	جد جا	لا	لا	ثالث	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (النظري)	لقيد مرتضى جواد	
جا	جد جا	جد جا	نعم	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	
جا	جد جا	جد جا	لا	لا	ثالث	لكيواء الفيزيويه (العلمي)	عصاف جعده فطحه	

يعين سائب التعلل مع أنظمة وراثة الفروع العربية	يزرع سائب التبريس المعطلة داخل المحظرة	يرى وراثة التسلل في عرض المادة بطريقة متعقبة ومكشوفة	هل ليك حظ التزنت مزالي	هل تمتلك حاديه شخصيه	النوع	المستوى الدراسي / المراتك الأولية	عدد الامداد	عدد التبريس / الترميمه
جد جا	جد	نعم	نعم	نعم	ثاني	لكيواء العضويه (النظري)	عزراء كهلاني مسكر	
جد جا	جد جا	لا	لا	لا	ثاني	لكيواء العضويه (العلمي)	عزراء كهلاني مسكر	
جد جا	جد جا	نعم	نعم	نعم	ثاني	لكيواء العضويه (النظري)	عزراء كهلاني مسكر	
مؤسّط	جد جا	نعم	لا	لا	ثاني	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جد جا	جد جا	نعم	نعم	نعم	ثاني	لكيواء العضويه (النظري)	عزراء كهلاني مسكر	
جد جا	جد جا	نعم	لا	لا	ثاني	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جد جا	جد جا	نعم	لا	لا	ثاني	لكيواء التجليليه (العلمي)	اراء خيس عبدالله	
جد جا	جد جا	نعم	لا	لا	اول	لكيواء العضويه (النظري)	افطحه عباس خزعل	
جد جا	جد جا	لا	لا	لا	ثاني	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جد جا	جد جا	لا	لا	لا	ثاني	لكيواء للاعضويه (النظري)	حيدر داود جاسم	
جد جا	جد جا	نعم	لا	لا	ثاني	لكيواء للاعضويه (النظري)	حيدر داود جاسم	
جد	جد	نعم	لا	لا	ثاني	لكيواء العضويه (العلمي)	علاء نكهي كردي	
جد جا	جد جا	نعم	لا	لا	ثاني	الرياضيات	رجه عزيز حسين	
ضعيف	ضعيف	نعم	نعم	نعم	ثاني	لكيواء الفيزيويه (النظري)	رجه عزيز حسين	
جد جا	جد جا	لا	نعم	نعم	ثاني	لكيواء للاعضويه (النظري)	حيدر داود جاسم	
ضعيف	ضعيف	نعم	نعم	نعم	ثاني	لكيواء التجليليه (النظري)	صديقي عبد السار	
ضعيف	ضعيف	لا	لا	لا	ثاني	الرياضيات	رجه عزيز حسين	
ضعيف	ضعيف	نعم	نعم	نعم	ثاني	لكيواء العضويه (النظري)	عزراء كهلاني مسكر	
جد جا	جد جا	نعم	نعم	نعم	اول	لكيواء للاعضويه (النظري)	حيدر داود جاسم	
جد جا	جد جا	لا	لا	لا	ثاني	لكيواء الفيزيويه (العلمي)	علي سام نواي	
جد جا	جد جا	نعم	نعم	نعم	ثاني	لكيواء التجليليه (النظري)	افطحه عباس خزعل	