

Template Academic Program Description

University Name: Tikrit University

...College /Institute: College of Education for Pure Sciences

.Scientific Department: Department of Chemistry

Academic or professional program name: Bachelor of Science in Chemistry

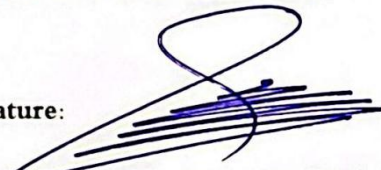
Final degree title: Bachelor of Science in Chemistry

Academic system: Annual

:Description prepared in 2025–2026

:Date the file was filled out 2025

Signature:



Name of Scientific Assistant: Prof.

Dr. Mohammed Ahmed Jassim

Date: 23/ 12 / 2025

أ.د. محمد أحمد جاسم
معاون العميد للشؤون العلمية
كلية التربية للعلوم الصرفة
جامعة تكريت

Signature:



Name of Department Head: Dr. Qader

Abdullah Shanak

Date: 23/ 12 / 2025

The file was reviewed by

Quality Assurance and University Performance Division

Name of the Director of the Quality Assurance and University

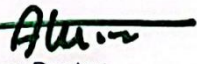
Performance Division : Dr. Safa Khalil Ibrahim

Date: 23/ 12 / 2025

the signature

صفا خليل ابراهيم

Dean's approval


Professor Doctor
ALI Abdul Majeed Shihab
College of Education
for Pure Sciences

**ministry education High Research Scientific
Tikrit University
College of Education for Pure Sciences
Chemistry Department**



**Description of the
academic program and
curriculum for the
Chemistry Department**

2026 –2025

the introduction:

The academic program in the Chemistry Department represents a comprehensive and systematic package of educational experiences and course units, meticulously designed to cultivate scientific awareness and develop analytical and research skills in graduates. At its core, the program aims to prepare scientifically and practically qualified chemists capable of keeping pace with the rapid advancement of knowledge and meeting the evolving demands .of the job market in the industrial, healthcare, and environmental sectors

,In order to achieve the principle of sustainability in the quality of education the program is subject to strict periodic review and evaluation processes through the internal and external audit system, guided by the external .examiner's reports to ensure compliance with international standards

The "Academic Program Description" is the reference document and cornerstone for obtaining program accreditation; it provides a strategic summary of the program's core features and outlines a roadmap for the intended learning outcomes. The teaching staff and academic committees within the department collaborated to formulate this description, ensuring the .curriculum's rigor and its modern application

This guide, in its second edition, reflects the qualitative shift in the Iraqi education system, as it has been updated to include traditional frameworks (annual and semester-based). As we present this description to you, we reaffirm our firm commitment to making the educational process a professional path that ensures academic excellence and scientific leadership for our .students

Basic concepts and terminology of the academic program

- a description The program Academic(Academic Program Description): A strategic document that provides a comprehensive summary of the program's vision and mission, with a precise definition of the targeted learning outcomes, and the implementation mechanisms to ensure the quality of education according to accreditation standards
- a description The course(Course Description): A detailed framework derived from the program description, which identifies the qualitative objectives and scientific content of each course, indicating the skills expected to be acquired and how to measure the effectiveness of student learning
- vision The program(Program Vision): A forward-looking document that represents the future ambition of the program, formulated in inspiring and motivating terms aimed at achieving leadership and scientific excellence in the field of specialization
- message The program(Program Mission): A brief statement that identifies the program's core purpose and the academic and research activities necessary to achieve the vision, while outlining the developmental paths for the educational process
- Goals The program(Program Objectives):) Specific and measurable goals(SMART Goals) that the program seeks to achieve within clear timeframes, to ensure the graduation of qualified personnel with the required competence
- Structure Curriculum(Curriculum Structure): The integrated system of courses (ministerial, university, and specialized university) according to the approved learning system (annual, semester), with a precise distribution of study units and scientific weights
- outputs Learning(Learning Outcomes): A harmonious set of knowledge, skills, and values(Competencies) that the student demonstrates to have mastered upon successful completion of the program. The outputs of each course are designed to directly contribute to achieving the overall program objectives
- Strategies education and learning(Teaching and Learning Strategies): A set of methodologies, plans, and activities (classroom and non-classroom) adopted by faculty members to stimulate cognitive interaction, and aiming to transform the learning process into an applied experience that achieves the desired results

1. Program Vision

The Chemistry program's journey toward academic excellence is based on a forward-looking vision to achieve a prominent position among the nation's colleges of education. This is accomplished by fostering a stimulating learning environment that integrates scientific rigor with educational innovation. Our mission is to prepare a generation of teachers and researchers who are both knowledgeable and skilled, relying on a distinguished academic faculty of **175 highly qualified instructors** with a distinguished international presence and numerous **patents**. The program is proud of its impressive track record of providing educational and scientific institutions with thousands of graduates (**over 7,800 from** both morning and evening programs). It reaffirms its unwavering commitment to developing its teaching staff and equipping them with the latest educational technologies and chemistry knowledge to ensure academic outcomes that are capable of making a real and lasting difference in serving the community and elevating the educational process to global standards.

2. Program message

The mission of the Chemistry program is to prepare specialized educational and scientific personnel, equipped with modern academic knowledge and laboratory skills according to the highest international standards. We are committed to providing a stimulating educational and research environment led by a select group of professors and researchers, with the aim of supplying educational institutions and the industrial and health sectors with graduates who possess the ability to innovate and lead. Our mission also seeks to instill the values of scientific research and community service through strategic partnerships with relevant ministries and institutions, ensuring the modernization of the educational process and keeping pace with the rapid developments in the field of chemistry.

3. Program objectives

In line with the college's vision and mission of striving for leadership, the Chemistry program aims to achieve the following strategic goals:

1. Specialized Educational Qualification: Preparing competent teaching staff in the sciences of chemistry, proficient in the latest educational and didactic trends to work professionally in educational institutions (intermediate and preparatory).
2. Professional and applied empowerment: Qualifying specialists who possess the laboratory and analytical skills necessary to work in industrial sectors, health laboratories, and research and social institutions .
3. Sustainable professional development: Enhancing the efficiency of the Ministry of Education's staff through the design and implementation of specialized training programs and workshops that keep pace with scientific and educational developments.
4. Leadership in scientific research: Preparing and qualifying a generation of researchers to pursue postgraduate studies (Master's and PhD), with a focus on producing chemical research that contributes to solving technical and environmental problems.
5. Social responsibility: Spreading scientific culture and environmental awareness in society through continuing education initiatives and awareness seminars that link chemical sciences to daily life.
6. Strategic partnership and consultation: Activating the role of the department as a center of expertise in providing scientific consultations and joint research to address the challenges of the public and private sectors in coordination with relevant authorities.

7. Developing analytical competencies: Building students' mental and intellectual capabilities to enable them to think critically and cooperate constructively with local and international scientific and educational institutions.
8. Institutional integration: Strengthening frameworks for academic cooperation and scientific exchange with universities, ministries and advanced research centers to ensure the quality of educational outputs.

4. Program accreditation

Programmatic accreditation is a fundamental pillar for ensuring the quality of academic programs and achieving distinguished learning outcomes that align with national and international standards. This accreditation reflects the program's commitment to developing its scientific content and teaching methodologies to meet labor market demands and modern advancements in the field of Chemistry. Furthermore, it enhances confidence in the program's outcomes and boosts graduates' efficiency. Below are the key pillars of programmatic accreditation:

1. The academic program adheres to locally and internationally approved quality and academic accreditation standards.
2. It aims to achieve learning outcomes compatible with labor market requirements and modern scientific developments.
3. The program relies on continuous evaluation and periodic improvement to ensure the quality of academic performance.
4. It keeps pace with modern trends in teaching Chemistry by developing curricula and educational methods.

5. It strengthens the link between theoretical and practical aspects to enhance graduates' competence.
6. The program seeks to obtain accreditation from recognized bodies to ensure academic excellence.
7. All educational processes are documented according to quality assurance and accreditation standards.

5. Other external influences

The chemistry department's program is influenced by several external factors most notably the rapid advancements in chemical sciences and related technologies, particularly in the fields of analytical, organic, biological, industrial and environmental chemistry. These changes necessitate periodic curriculum updates, improved teaching methods, and a strengthening of practical and applied learning to align with labor market demands and global scientific trends

6. Program structure

Program structure	Number of courses	Study unit	Percentage	* comments
Institutional requirements	11	22	%12	
College requirements	12	46	%25	
Department requirements	23	115	%63	183 Total units
Summer training				
Other	Viewing and			

	application in schools			
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.The notes may include whether the course is core or elective *

7. Program Description					
/ Year Level	Course code	Course name	Credit Hours		Units
			theoretical	practical	
First stage					
	CHEM 121	organic	2	2	6
	CHEM111	analytical	2	2	6
	CHEM131	inorganic	2	0	4
	BIO120	biology Sciences	1	2	4
	MAT105	mathematics	1	0	2
	UOA137	computer1	1	0	2
	UOA137	Arabic language	1	0	2
	UOA135	Human rights and democracy	1	0	2
	EPS102	Principles of Education	1	0	2
	EPS101	Educational Developmental Psychology	2	0	4
	UOA140	English language	1	0	2

	CHEM181	Chemical safety and security	1	0	2
			16	6	38
Second stage	CHEM223	organic	2	2	6
	CHEM213	analytical	2	2	6
	CHEM233	inorganic	2	2	6
	CHEM241	Physics	2	2	6
	MAT	mathematics	1	0	2
	UOA241	Comuter 2	1	0	2
	EPS201	Educational leadership and management	2	0	4
	EPS202	Developmental psychology	2	0	4
	UOA240	English language	1	0	2
	EPS203	Curricula and textbooks	1	2	4
	EPS204	Teaching thinking	1	0	2
	UOA242	Crimes of the defunct Ba'ath Party	1	0	2
	EPS138	Arabic	1	0	2
			18	10	44

Third stage	CHEM325	Organic	2	3	7
	CHEM331	Corrdination	2	3	7
	CHEM351	Biochemistry	2	3	4
	CHEM341	Physicist	2	3	7
	CHEM361	Industrial	2	0	4
	EL1100	Elictif	2	0	4
	EPS211	Foundations of scientific research	2	0	4
	EPS312	Guidance and Mental Health	1	2	4
	EPS311	Teaching methods	1	2	4
			18	18	52
Fourth stage	CHEM453	Biochemistry	2	0	4
	CHEM427	organic diagnosis	1	3	5
	CHEM454	Quantum Chemistry and Spectroscopy	2	0	4
	CHEM415	Automated analysis	3	3	9
	EL1200	optional	2	0	4
	CHEM463	Industrial Chemistry	2	3	7

	EPS412	Practical education	1	2	4
	EPS411	Measurement and evaluation	2	0	4
	EPS413	Action research	1	2	4
			19	16	

able summarizing the number of theoretical and practical hours

NO.	Academic stage	Number of theoretical hours	Number of practical hours	Number of unit
1.	First stage	16	6	38
2.	Second stage	18	10	44
3.	third stage	18	18	52
4.	Fourth stage	19	16	49
	Total	71	50	units 183
	Percentage of hours out of the total	%53	%47	

1. xpected learning outcomes of the program	
of Knowledge Pain	
<p>Learning Outcomes 1</p> <p>The student was able to understand the various branches of chemistry. Chemistry teachers are being prepared at levels that keep pace with current</p>	<p>Learning Outcomes Statement 1</p> <p>1.To enable the student to acquire theoretical knowledge of chemistry .</p> <p>2. Enabling the student to learn how to teach and methods of conveying scientific information to students .</p> <p>3. The student’s knowledge of measurement and evaluation methods and modern teaching methods in chemistry .</p>

	4. The student becomes familiar with the educational material through Providing it in electronic format Virtual classrooms, in addition to enabling the student to learn Learning theories related to the age of secondary school students
Skills	
Learning Outcomes 2 should acquire discussion skills and be able to reach Conclusions	Learning Outcomes Statement 2 1 – Gain knowledge and enrich the student with laboratory work methods . 2 – Guiding the student towards the scientific method in solving all scientific problems . 3 – Understanding the objectives and principles of the art of teaching chemistry . 4 – Enabling students to acquire skills in using virtual classrooms
Values	
,Exams, daily assignments ,discussions, reports Laboratory graduation projects	1–Adopting a dialogue approach between the student and the professor . 2 – Paying attention to research projects and preparing organized reports . 3 – Adopting the discussion method (performance tests) (and seminars) 4 – Adopting e-learning to provide an engaging and flexible learning environment .

2. Teaching and learning strategies
<ol style="list-style-type: none"> 1. Application method in research laboratories. 2. Adopting a constructive and purposeful dialogue and discussion approach. 3. Adopting a trial-and-error approach. 4. Adoption of multimedia in virtual classrooms (image, text, audio, video)

3. Assessment methods

1. Seminar research paper (graduation research) preparation
2. Adopting a grading system as the basis for the evaluation process.
3. Adopting a testing approach.
4. Adopting a method of discussions and dialogues between students and the professor.
5. Creating a test task in virtual classrooms

Faculty						
Faculty members						
Academic Title and Name	Specialization		Special requirements/skills (if any)		Staff Type	
	Major	specialization			Permanent Staff	lecturer
Prof. Dr. Ahmed Saeed Othman	Physical Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Ghazwan Hassan Abdulwahab	Organic Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Khalid Abdulaziz Atiya	Organic Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Iyad Suleiman Hamad	Organic Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Nadia Ahmed Saleh	Biochemistry	Chemistry			Permanent Staff	
Prof. Dr. Wasan Nazhan Hussein	Biochemistry	Chemistry			Permanent Staff	
Prof. Dr. Ahmed Abdul Sattar Arzooqi	Inorganic Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Raed Idris Mahmood	Chemistry Teaching Methods	Teaching Methods			Permanent Staff	

Prof. Dr. Asmaa Ahmed Mohammed	Analytical Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Shaimaa Naji Dahham	Microbiology	Life Sciences			Permanent Staff	
Prof. Shaimaa Hatem Abdullah	Organic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Amna Ibrahim Ali	Inorganic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Lama Abdulqader Hatem	Inorganic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Omar Saleh Hassan	Analytical Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Yusra Khalaf Mohammed	Organic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Qader Abdullah Shanak	Organic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Mahmood Mahdi Saleh	Organic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Hossam Dawood Abdullah	Biochemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Omar Ali Kanoosh	Biochemistry	Chemistry			Permanent Staff	
Assist. Prof. Bushra Abdulmurtah Khairallah	Organic Chemistry	Chemistry			Permanent Staff	
Assist. Prof. Dr. Qaisar Mishaan Abdul	Biochemistry	Chemistry			Permanent Staff	
Lecturer Dr. Omar Adnan Hashim	Analytical Chemistry	Chemistry			Permanent Staff	
Lecturer Dr. Hala Wathiq Omar	Biochemistry	Chemistry			Permanent Staff	
Lecturer Dr. Afrah Hatem Hazza	Organic Chemistry	Chemistry			Permanent Staff	
Lecturer Dr. Faten Nawaf Hassan	Psychology	Psychology			Permanent Staff	
Lecturer Farah Muthanna Mohammed	Organic Chemistry	Chemistry			Permanent Staff	
Asst. Lecturer Tahseen Khalid Mutni	Chemistry Teaching Methods	Teaching Methods			Permanent Staff	
Lecturer Dr. Muhannad Faisal Shareef	Analytical Chemistry	Chemistry			Permanent Staff	
Lecturer Dr. Ahmed Saleh Yaseen	Physical Chemistry	Chemistry			Permanent Staff	
Lecturer Dr. Yousif Othman Hameedi	Physical Chemistry	Chemistry			Permanent Staff	
Lecturer Dr. Musharraf Nouri Faisal	Biochemistry	Chemistry			Permanent Staff	

Lecturer Dr. Shaimaa Ahmed Saleh	Biochemistry	Chemistry			Permanent Staff	
Asst. Lecturer Zeina Tariq Khattab	Analytical Chemistry	Chemistry			Permanent Staff	
Asst. Lecturer Asmaa Badr Saber	Organic Chemistry	Chemistry			Permanent Staff	
Asst. Lecturer Omar Ahmed Dahham	English Language	English			Permanent Staff	
Asst. Lecturer Ibrahim Abdullah Ali	Biochemistry	Chemistry			Permanent Staff	
Asst. Lecturer Rakzan Mazen Mohi	Biology	Life Sciences			Permanent Staff	
Asst. Lecturer Safana Salem Kurdi	Organic Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Ahmed Saeed Othman	Physical Chemistry	Chemistry			Permanent Staff	
Prof. Dr. Ghazwan Hassan Abdulwahab	Organic Chemistry	Chemistry			Permanent Staff	

Professional Development

Orienting new faculty members

College councils, department councils, temporary and permanent committees, training courses

Professional development of faculty members

1. Using up-to-date scientific sources .
2. Using high-speed communication networks to transfer information, such as the Internet .
3. Visits and practical exercises in service laboratories .
4. Acquiring modern scientific expertise and skills in the field of modern technical communication.
5. Training courses, seminars and specialized scientific workshops.

4. Admission standard

1. Admission is based on the general and central grade point average system .
2. Admission to departments is based on the student's preference and GPA .
3. .The requirement is that the applicant must be a graduate of preparatory school and a science major exclusively.
4. The student must be of an acceptable character and mind, and free from physical defects .

5. Key sources of information about the program

1 Textbooks approved by the sectoral committee for faculties of education for pure sciences

2 Helpful books.

Books and supplementary resources / English language resources .3.

Additional sources from the internet .4.

Training courses held by the university on e-learning platforms .5

6. Program development plan

1.Textbooks approved by the sectoral committee for faculties of education for pure sciences

2.Helpful books .

3. .Books and supplementary resources / English language resources .

4. .Additional sources from the internet .

5. Training courses held by the university on e-learning platforms

Skills Plan Program

Learning outcomes required from the program

			Skills				Knowledge				Essential or optional	Course Name	Course code
Part 3	Part 2	Part 1	B4	B3	B2	B1	A4	A3	A2	A1			
								*	*	*	essential	organic	CHEM 121
								*	*	*	essential	analytical	CHEM111
								*	*	*	essential	inorganic	CHEM131
								*	*	*	essential	biology Sciences	BIO120
								*	*	*	essential	mathematics	MAT105
											essential	computer1	UOA137
									*		essential	Arabic language	UOA137
									*		essential	Human rights and democracy	UOA135
									*		essential	Principles of Education	EPS102
									*		essential	Educational Developmental Psychology	EPS101
									*		essential	English language	UOA140
									*		essential	Chemical safety and security	CHEM181
								*	*	*	essential	Organic	CHEM223
								*	*	*	essential	analytical	CHEM213
								*	*	*	essential	Inorganic	CHEM233
								*	*	*	essential	The physics	CHEM241
											essential	mathematics	MAT
									*		essential	Computer2	UOA241
									*		essential	Educational leadership and management	EPS201

								*		essential	Developmental psychology	EPS202	
								*		essential	English language	UOA240	
								*		essential	Curricula and textbooks		
								*		essential	Teaching thinking		
								*		essential	Crimes of the defunct Ba'ath Party		
								*	*	*	essential	Organic	CHEM325
								*	*	*	essential	Coordination	CHEM331
								*	*	*	essential	Biochemistry	CHEM351
											essential	Physicist	CHEM341
								*			essential	Industrial	CHEM361
								*			optional	optional	EL1100
								*			essential	Foundations of scientific research	EPS211
								*			essential	Guidance and Mental Health	EPS312
								*			essential	Teaching methods	EPS311
								*			essential	English	UOA340
								*	*	*	essential	Educational technology and its applications	
								*	*	*	essential	Biochemistry	CHEM453
								*	*	*	essential	organic diagnosis	CHEM427
									*		essential	Quantum Chemistry and Spectroscopy	CHEM454
								*	*	*	essential	Automated analysis	CHEM415
									*		essential	optional	EL1200
									*		essential	Industrial Chemistry	CHEM463
								*	*	*	essential	Practical education	EPS412
									*		essential	Measurement and evaluation	EPS411

								*	*	*	essential	Research project	CHEM491	
								*	*	*	essential	Action research		
								*	*	*	essential	English language	UOA440	

Please check the boxes corresponding to the individual learning outcomes from the program that are being assessed ●

Description of curriculum for the Chemistry Department First stage

Course description form

1. Name of course					
Theoretical organic for first class					
2. Course Code					
CHEM121					
3. Semester / year					
Final /annual					
4. The date of preparation of this description					
20/12/2025					
5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
60/6					
7. The name of the course administrator (if more than one name is mentioned)					
Dr.Ayad sulaiman hamad					
8. Objectives of the course					
objectives of the course			Knowing , behaviour , practical		
9. Strategic teaching and learning					
Attendance					
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Carbon chem	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Alkanes	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam

5.	2	Understanding, Analysis, and Application	Alkenes	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Alkynes	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Aromatic benzene	Lecture	Exam
12.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
13.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Alkyl halide	Lecture	Exam
15.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
16.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
17.	2	Understanding, Analysis, and Application	alcohol	Lecture	Exam
18.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
19.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
20.	2	Understanding, Analysis, and Application	ethers	Lecture	Exam

21.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
22.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Saturated cyclic	Lecture	Exam
24.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
25.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Unsaturated cyclic	Lecture	Exam
27.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
28.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Cyclic ethers	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Synthesis and reactions	Lecture	Exam

11. Evaluation of decision	
25 first term , 25 second term and 50 for final exam.	
12. Learning resources and teaching	
required course books (methodology if any)	Organic chemistry by graham solmons/translated to Arabic by adel al-garar

Course description form

1. Name of course					
Inorganic chemistry – First Stage					
2. Course Code					
CHEM131					
3. Semester / year					
Annual					
4. The date of preparation of this description					
25-12-2025					
5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 hr. – 4 units					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Amenah Ibrahim Ali					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> • To provide the student with basic and advanced knowledge about elements, atoms, and inorganic compounds, including their structure, properties, and chemical behavior. • To enable the student to understand the general principles of chemical laws, chemical bonds, and interactions between inorganic compounds 		
9. Strategic teaching and learning					
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Atom structure	Lecture	Homework, quizzes, monthly exams
2.	2	Understanding, Analysis, and Application	Nuclear structure	Lecture	Homework, quizzes, monthly exams

3.	2	Understanding, Analysis, and Application	Black body radiation	Lecture	Homework, quizzes, monthly exams
4.	2	Understanding, Analysis, and Application	electromagnetic effect	Lecture	Homework, quizzes, monthly exams
5.	2	Understanding, Analysis, and Application	Bohr atom	Lecture	Homework, quizzes, monthly exams
6.	2	Understanding, Analysis, and Application	Atomic spectra	Lecture	Homework, quizzes, monthly exams
7.	2	Understanding, Analysis, and Application	Atomic spectra	Lecture	Homework, quizzes, monthly exams
8.	2	Understanding, Analysis, and Application	Sommerfeld and his interpretation of the spectrum	Lecture	Homework, quizzes, monthly exams
9.	2	Understanding, Analysis, and Application	Wave properties	Lecture	Homework, quizzes, monthly exams
10.	2	Understanding, Analysis, and Application	Quantum mechanics	Lecture	Homework, quizzes, monthly exams
11.	2	Understanding, Analysis, and Application	Meaning of quantum numbers	Lecture	Homework, quizzes, monthly exams
12.	2	Understanding, Analysis, and Application	Atomic status symbol	Lecture	Homework, quizzes, monthly exams
13.	2	Understanding, Analysis, and Application	Periodic table	Lecture	Homework, quizzes, monthly exams
14.	2	Understanding, Analysis, and Application	Shielding	Lecture	Homework, quizzes, monthly exams
15.	2	Understanding, Analysis, and Application	The halves of the radii and their divisions	Lecture	Homework, quizzes, monthly exams
16.	2	Understanding, Analysis, and Application	Acidity and alkalinity	Lecture	Homework, quizzes, monthly exams
17.	2	Understanding, Analysis, and Application	Ionization energy	Lecture	Homework, quizzes, monthly exams
18.	2	Understanding, Analysis, and Application	Crystal lattice energy	Lecture	Homework, quizzes, monthly exams

19.	2	Understanding, Analysis, and Application	Born-Haber Cycle	Lecture	Homework, quizzes, monthly exams
20.	2	Understanding, Analysis, and Application	Structure of ionic compounds	Lecture	Homework, quizzes, monthly exams
21.	2	Understanding, Analysis, and Application	Covalent compounds	Lecture	Homework, quizzes, monthly exams
22.	2	Understanding, Analysis, and Application	Molecular orbital theory	Lecture	Homework, quizzes, monthly exams
23.	2	Understanding, Analysis, and Application	Molecular orbital theory	Lecture	Homework, quizzes, monthly exams
24.	2	Understanding, Analysis, and Application	Factors that determine the shape of the molecule	Lecture	Homework, quizzes, monthly exams
25.	2	Understanding, Analysis, and Application	Electron pair repulsion method	Lecture	Homework, quizzes, monthly exams
26.	2	Understanding, Analysis, and Application	Electron pair repulsion method	Lecture	Homework, quizzes, monthly exams
27.	2	Understanding, Analysis, and Application	Types of covalent bonds	Lecture	Homework, quizzes, monthly exams
28.	2	Understanding, Analysis, and Application	Symmetry	Lecture	Homework, quizzes, monthly exams
29.	2	Understanding, Analysis, and Application	Symmetry	Lecture	Homework, quizzes, monthly exams
30.	2	Understanding, Analysis, and Application	Practical examples of symmetry	Lecture	Homework, quizzes, monthly exams

11. Evaluation of decision

The grade is distributed as follows: 25 for the first semester, 25 for the second semester, and 50 for the final exam.

12. Learning resources and teaching

required course books (methodology if any)

1. Inorganic Chemistry, Part 1, by Dr. Numan Al-Nuaimi and his group
2. Radiochemistry, by Dr. Munther Al-Janabi and Dr. Saadia Al-Hashemi

Course description form

1. Name of Course	
biology	
2. Course Code	
BIO120	
3. Semester / Year	
Annual 2025–2026	
4. The Date of Preparation of this Description	
13-3-2026	
5. Available Attendance Forms	
Mandatory attendance	
6. Number of Study Hours (Total) / Number of Units (Total)	
60 Hours	
7. The Name of the Course Administrator (If More Than One Name Is Mentioned)	
Theoretical Lecturer: Prof. Dr. Shaimaa Naji Daham ,	
8. Objectives of the course	
<p>objectives of the course:</p> <p>1.Helping students understand biology, the characteristics of living organisms, their classification, methods of reproduction, behavior, and their relationship with the environment.</p> <p>2.Preparing qualified scientific cadres specialized in life sciences in order to enhance the educational reality of the country.</p> <p>3.Teaching students analytical writing and communication skills based on the latest developments in biological sciences, its stages of development, main branches, and its importance in sustaining and advancing life.</p>	<p>4.Supporting the university program by providing high-quality education through exposure to the latest scientific research developments both theoretically and practically.</p> <p>5.Supplying the Ministry of Education and the Ministry of Higher Education and Scientific Research with competent specialized staff in the field of Life Sciences.</p>

9. Strategic teaching and learning					
Strategy: Lectures and discussions with students through stimulating dialogue and exchange of ideas between the instructor and students as well as among the students themselves, in addition to using modern teaching aids such as data show and other suitable educational tools.			Teaching and Learning Methods: 1. Using electronic visual aids. 2. Using discussion methods during lectures between the instructor and students. 3. Assigning students research papers and reports. 4. Assigning homework related to the scientific subject.		
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
Week 1	Theory2	Understanding the topic of the lecture	Introduction: A historical overview of the growth and development of .biology	Lecture	Daily exams and monthly
Week 2	practical 6	Understanding the topic of the lecture	The importance ,of biology branches of biology	Lecture	Daily exams and monthly
Week 3 and 4	Theory2	Understanding the topic of the lecture	Characteristics of life, definition of the characteristics of life	Lecture	Daily exams and monthly
Weeks 5,6,7and8	practical 6	Understanding the topic of the lecture	The main building block of living matter	Lecture	Daily exams and monthly

Week 9	Theory2	Understanding the topic of the lecture	Biological ,classification ,historical stages classification systems	Lecture	Daily exams and monthly
Week 10	practical 6	Understanding the topic of the lecture	Principles of plant and animal classification	Lecture	Daily exams and monthly
Weeks 11	Theory2	Understanding the topic of the lecture	Gender concept	Lecture	Daily exams and monthly
Weeks 12 and 13	practical 6	Understanding the topic of the lecture	Reproduction and growth in plants	Lecture	Daily exams and monthly
Weeks 14 and 15	Theory2	Understanding the topic of the lecture	Reproduction and growth in animals	Lecture	Daily exams and monthly
Week 16	practical 6	Understanding the topic of the lecture	Hormonal coordination in plants	Lecture	Daily exams and monthly
Week 17	Theory2	Understanding the topic of the lecture	Hormonal coordination in animals	Lecture	Daily exams and monthly
Weeks 18 and 19	practical 6	Understanding the topic of the lecture	,Evolution Lamarckian evolutionary , theories rotational theory	Lecture	Daily exams and monthly
Week 20	Theory2	Understanding the topic of the lecture	Evolution of lower animals	Lecture	Daily exams and monthly
Week 21	practical 6	Understanding the topic of the lecture	Vertebrate evolution	Lecture	Daily exams and monthly
Week 22	Theory2	Understanding the topic of the lecture	Biological behavior, the ,nervous system ,innate behavior and learning	Lecture	Daily exams and monthly
Week 23	practical 6	Understanding the topic of the lecture	Orientation in ,time and space collective	Lecture	Daily exams and monthly

			movement and migration		
Week 24	Theory2	Understanding the topic of the lecture	Routine and the ,daily grind sovereignty Hierarchy in animal groups is an example of biological .behavior	Lecture	Daily exams and monthly
Week 25	practical 6	Understanding the topic of the lecture	Ecology , some concepts in ecology, the ecosystem	Lecture	Daily exams and monthly
Week 26	Theory2	Understanding the topic of the lecture	Biogeochemistry courses	Lecture	Daily exams and monthly
Week 27	practical 6	Understanding the topic of the lecture	energy flow	Lecture	Daily exams and monthly
Week 28	Theory2	Understanding the topic of the lecture	food chain	Lecture	Daily exams and monthly
Week 29	practical 6	Understanding the topic of the lecture	food web	Lecture	Daily exams and monthly
Week 30	Theory2	Understanding the topic of the lecture	Aquatic and terrestrial biomes	Lecture	Daily exams and monthly

11. Evaluation of decision

1. Continuous assessment (daily short quizzes).
 2. Oral questions during lectures.
 3. Monthly examinations and submission of reports.
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12. Learning resources and teaching:

required course books (methodology if any)	General Zoology, Zuhair Ibrahim Fattouh and Najm Salimoun Korkis
Biology / Prof. Dr. Hussein Ali Al-Saadi , Prof. Dr. Hussein Abdul-Moneim Dawood, Prof. Dr. Talib	Life, PD , Gaffin and B. Parker

Owaidi Al-Khazraji, Asst. Prof. Dr. Najm Shlimon Korkis

Cell biology, Verms, PS and KV, Agarwal

Course Description Form

1. Course Name:	
Analytical chemistry	
2. Course Code:	
CHEM213	
3. Semester / Year:	
Second stage	
4. The date of Preparation of this description :	
20/12/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 h/	
7. The name of the course administrator's (if more than one name is mentioned)	
Name:	Dr. Asmaa Ahmed Mohammed
Email:	asmamahabb@tu.edu.iq
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none">• Familiarity with the method of quantitative weight analysis•familiarity with various separation methods such as extraction, chromatography and ion exchange
9. Teaching and Learning Strategies	

Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	The student gets to know the importance of analytical chemistry, analytical chemistry, and quantitative gravimetric analysis.	Analytical chemistry and quantitative gravimetric analysis	Lecture method.	Discussion during the lecture.
3-4	4	The student learns how to calculate the gravimetric coefficient	the chemical composition of the precipitate, and the calculations in quantitative gravimetric analysis	Lecture method.	Solve mathematical examples
5	2	Knowing the importance of the precipitate being poorly soluble.	Solubility of the precipitate	Lecture method.	Discussion during the lecture.
6-9	6	The student gets to know the most important factors affecting solubility	Factors affecting the solubility of precipitate	Lecture method.	Discussion during the lecture.

10	2	The importance of crystal formation	The crystal formation of the precipitate	Lecture method.	Discussion during the lecture.
11	2	The student learns a general introduction to separation methods	the theoretical foundations of separation methods	Lecture method.	Discussion during the lecture.
12	2	The student learns about other methods	Separation techniques using the indirect methods	Lecture method.	Discussion during the lecture.
13-14	4	The student learns about the extraction method and the use of a separating funnel	Solvent extraction	Lecture method.	Discussion during the lecture.
15	2	The student learns how to calculate the distribution coefficient,	The distribution coefficient	the lecture method	solving mathematical examples
16-19	6	The student learns about the method of separation	the method of separation by liquid extraction and the percentage of extraction	the lecture method	solving mathematical examples
20-22	4	The student learns about the influencing forces and the different systems of interactions	Forces affecting the two phases and extraction systems	Lecture method.	Discussion during the lecture.

23	2	The student learns about the concept of	The chromatography	Lecture method.	Discussion during the lecture.
24-25	4	The student learns about the types of techniques .	Techniques used for chromatography	Lecture method with illustrative photos .	Discussion during the lecture.
26	2	The student learns about the type of chromatography	Plate chromatography	Lecture method with illustrative photos .	Discussion during the lecture.
27	2	The student learns about the types of paper used.	The types of paper used	Lecture method.	Discussion during the lecture.
28	2	The student learns about the method of separation by electrophoresis	Separation by electrophoresis	Lecture method with illustrative photos .	Discussion during the lecture.
29-30	4	The student learns about the ion exchange method	The ion exchange method	Lecture method with illustrative photos .	Discussion during the lecture.

11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			General foundations of chemical analysis		
Main references (sources)			(Part One + Part Two) Dr. Safaa Razouk		
Recommended books and references (scientific journals, reports...)			Al-Morheb		
Electronic References, Websites					

Course description form

1. Name of course	
Human rights, children's rights, and democracy	
2. Course Code	
UOA135	
3. Semester / year	
2025-2026	
4. The date of preparation of this description	
13-3-2026	
5. Available attendance forms	
Annual	
6. Number of study hours (total) / number of units (total)	
2 UNITS , 1HOURS	
7. The name of the course administrator (if more than one name is mentioned)	
Name: M. Talib Naji Alwan	
8. Objectives of the course	
objectives of the course	<ul style="list-style-type: none"> -Teaching students the basics of human rights, children's rights, and democracy -Focusing on developing students' skills through reading, writing , and . conversation -Acquiring educational skills through the principles and theories of politics
9. Strategic teaching and learning	

The strategy is based on a participatory and experiential approach that links theoretical knowledge with emotional values and practical application.

10.Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The contributions of thinkers from these two civilizations to the field of human rights ,cannot be denied nor can their significant contributions in this area be .denied	Human rights in Greek and Egyptian civilizations	In-person lectures
2.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	dates back to ancient civilizations that paid great attention to .human rights	Human rights in Greek and Egyptian civilizations	In-person lectures

3.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	It is no exaggeration to say that humanity was the focus of all religions and ,divine laws indeed their ultimate goal, as they came to secure the interests of .people	Human rights in Greek and Egyptian civilizations	In-person lectures
4.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	Both religions are considered heavenly laws and messages that have been concerned with human rights and .basic freedoms	Human rights in Greek and Egyptian civilizations	In-person lectures
5.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of	Human rights under Islam have honored and given preference to humankind over other creatures, and have clearly shown what essential rights a	Human rights in Greek and Egyptian civilizations	In-person lectures

		human rights through lectures, brainstorming, and daily preparation.	person should .enjoy		
6.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	Human rights and freedoms have received a degree of attention and care, whether in national laws or .in charters	Human rights in Greek and Egyptian civilizations	In-person lectures
7.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The main source of human rights ideas in the world is the Universal Declaration of Human Rights issued by the .United Nations	Human rights in Greek and Egyptian civilizations	In-person lectures
8.	1	Enabling students to understand the fundamental	The United Nations continued its tireless efforts in	Human rights in Greek and	In-person lectures

		principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	the field of human rights, for the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights	Egyptian civilizations	
9.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	We must not overlook national sources and their importance in establishing many principles of human rights and freedoms	Human rights in Greek and Egyptian civilizations	In-person lectures
10.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming,	There is no doubt that the French Declaration of the Rights of Man and of the Citizen is characterized by its humanitarian nature, and it has caused a tremendous uproar throughout the world	Human rights in Greek and Egyptian civilizations	In-person lectures

		and daily preparation.			
11.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The French Constituent Assembly issued an independent declaration of rights two years before it issued a constitution for .the revolution	Human rights in Greek and Egyptian civilizations	In-person lectures
12.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	affirmed that Iraqis are equal before the law without discrimination ,based on gender ,race, nationality .sect, or belief	Human rights in Greek and Egyptian civilizations	In-person lectures
13.	1	Enabling students to understand the fundamental principles, international conventions, and	Constitutional or judicial guarantees represent one of the fundamental means of protecting human	Human rights in Greek and Egyptian civilizations	In-person lectures

		constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	rights and . freedoms		
14.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The guarantees of human rights in Islam have surpassed previous guarantees in their effectiveness because they are linked to two rewards, one worldly and the other . otherworldly	Human rights in Greek and Egyptian civilizations	In-person lectures
15.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	International concern is a relatively recent ,issue; disasters ,wars, war crimes and genocide have made it extremely important to members of the international .community	Human rights in Greek and Egyptian civilizations	In-person lectures
16.	1	Enabling students to	The United Nations Charter	Human rights in	In-person lectures

		understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	is the first multilateral international treaty in the history of international .relations	Greek and Egyptian civilizations	
17.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The Assembly is the main and broad body that includes all member states .equally	Human rights in Greek and Egyptian civilizations	In-person lectures
18.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through	is among the United Nations bodies that have given extensive attention to .human rights	Human rights in Greek and Egyptian civilizations	In-person lectures

		lectures, brainstorming, and daily preparation.			
19.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	international bodies guaranteeing human rights and is an alternative to the Human Rights .Committee	Human rights in Greek and Egyptian civilizations	In-person lectures
20.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	Regional organizations have made significant contributions to the protection of individual rights .and freedoms	Human rights in Greek and Egyptian civilizations	In-person lectures
21.	1	Enabling students to understand the fundamental principles, international	The European Convention derives its provisions from the general objectives of the	Human rights in Greek and Egyptian civilizations	In-person lectures

		conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	European ,Council including strengthening ties and relations between member .states		
22.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The American agreement followed the European agreement in ,terms of rights with the exception of freedom of opinion and ,expression which made it unique from other international and regional .agreements	Human rights in Greek and Egyptian civilizations	In-person lectures
23.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming,	A political party is a phenomenon whose emergence is linked to the holding of elections. The function of the party is summarized in performing tasks for which it is known, as it forms an independent	Human rights in Greek and Egyptian civilizations	In-person lectures

		and daily preparation.	opinion regarding public affairs		
24.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The child suffered as he did during the ancient civilizations from the hardships of living and the harsh living conditions that resulted in the child and his rights not being given the care and attention he deserved	Human rights in Greek and Egyptian civilizations	In-person lectures
25.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	Islamic law has given great importance to the child and his rights, and Islam has provided a set of rights and guarantees that would provide him with a happy life	Human rights in Greek and Egyptian civilizations	In-person lectures
26.	1	Enabling students to understand the fundamental principles, international conventions, and	The disasters and calamities left behind by wars which have afflicted all of humanity especially children and	Human rights in Greek and Egyptian civilizations	In-person lectures

		constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	women, have led the international community to establish international rules that protect .children's rights		
27.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The concept of democracy is one of the most controversial concepts and terms, although it is not a new .concept	Human rights in Greek and Egyptian civilizations	In-person lectures
28.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	Democracy is the political system under which public affairs are managed. The people may exercise powers ,themselves delegate them to their ,representatives or delegate some of them to their representatives while retaining the rest for .themselves	Human rights in Greek and Egyptian civilizations	In-person lectures

29.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The representative system is characterized by being based on four pillars: an elected parliament, a fixed term of office for parliamentarians, a member of parliament representing the nation, and the independence of parliament.	Human rights in Greek and Egyptian civilizations	In-person lectures
30.	1	Enabling students to understand the fundamental principles, international conventions, and constitutional guarantees of human rights through lectures, brainstorming, and daily preparation.	The natural result of the representative idea is elections which is the democratic method for choosing rulers.	Human rights in Greek and Egyptian civilizations	In-person lectures

11. Evaluation of decision

It is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

12. Learning resources and teaching: textbooks (methodology, if applicable)
Human Rights, Children's Rights, and Democracy: A Collection of Authors

required course books (methodology if any)	1- Human Rights, Hamid Hanoun Khaled, Dar . Al-Sanhouri 2- Human Rights, Hafiz ,Alwan Al-Dulaimi Dar Al-Sanhuri
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Course description form

1. Name of course					
Mathematics (differential equations)					
2. Course Code					
3. Semester / year					
Year					
4. The date of preparation of this description					
20/12/2025					
is 5. Available attendance forms					
6. Number of study hours (total) / number of units (total)					
60					
7. The name of the course administrator (if more than one name is mentioned)					
Samar wathik omar					
8. Objectives of the course					
objectives of the course					
9. Strategic teaching and learning					
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	recognize differential equations			

2.		recognize algebraic differentiation			
3.		Solutions to questions about differentiation			
4.		Learn about integration methods			
5.		Algebraic integration Solutions Examples of integration			
6.		Equivalence of the Constitution			
7.		Solutions About the Constitution			
8.		Cartesian painting Examples of drawing methods			
9.		Theories of purpose			
10.		Continuity			
11.		Examples of continuity			
12.		Regular continuity			

13.		Analytic functions			
14.		Examples of analytic functions			
15.		My Cartesian Cauchy Riemann formulas			
16.		Cauchy-Riemann's integral theorem in both forms Sequences			
17.		Examples of sequences Solutions to consecutive questions			
18.		Series			
19.		Examples of series			
20.		Solutions to Series Questions			
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					

29.					
30.					

11. Evaluation of decision	
12. Learning resources and teaching	
required course books (methodology if any)	

Course description form

1. Name of course					
practical organic for first class					
2. Course Code					
CHEM121					
3. Semester / year					
Final /annual					
4. The date of preparation of this description					
20/12/2025					
5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
60/6					
7. The name of the course administrator (if more than one name is mentioned)					
Dr.Ayad sulaiman hamad					
Assistant Lecturer. Ibrahim Abdullah Ali					
8. Objectives of the course					
objectives of the course			Knowing , behaviour , practical		
9. Strategic teaching and learning					
Attendance					
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Carbon chem	Lecture	Exam

2.	2	Understanding, Analysis, and Application	Alkanes	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Alkenes	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Alkynes	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Synthesis	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Reactions	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Aromatic benzene	Lecture	Exam
12.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
13.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Alkyl halide	Lecture	Exam
15.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
16.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
17.	2	Understanding, Analysis, and Application	alcohol	Lecture	Exam

18.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
19.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
20.	2	Understanding, Analysis, and Application	ethers	Lecture	Exam
21.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
22.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Saturated cyclic	Lecture	Exam
24.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
25.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Unsaturated cyclic	Lecture	Exam
27.	2	Understanding, Analysis, and Application	synthesis	Lecture	Exam
28.	2	Understanding, Analysis, and Application	reactions	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Cyclic ethers	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Synthesis and reactions	Lecture	Exam

11. Evaluation of decision

25 first term , 25 second term and 50 for final exam.

12. Learning resources and teaching

required course books (methodology if any)

Organic chemistry by graham solmons/translated to Arabic by adel al-garar

Course description form

1. Name of course					
English Language/First Stage					
2. Course Code					
UOAI40					
3. Semester / year					
2025-2026					
4. The date of preparation of this description					
20/12/2025					
5. Available attendance forms					
Daily					
6. Number of study hours (total) / number of units (total)					
30 hours / 7 Units					
7. The name of the course administrator (if more than one name is mentioned)					
Asst. Lect. Wassan Amer Taha Email : wassan.a.taha@tu.edu.iq					
8. Objectives of the course					
objectives of the course		<ul style="list-style-type: none"> . Understand main English grammatical structure . Comprehend and read simple English texts . Use main English vocabulary . Write simple sentences and paragraphs in English . Understanding and use the terminology related to chemistry 			
9. Strategic teaching and learning					
Strategies		<ul style="list-style-type: none"> . Lectures . Discussions and questioning students . Using Google Classroom for lectures . Explanation of grammatical rules, texts and writing activities 			
10. Course structure					
wee k	hour s	required learning outputs	unit name or subject	learning	method evaluation method

1.	1	Learn bases of English language	Bases of English language: verb to be, personal pronouns etc.	Communicative approach	Classroom performance and Quiz
2.	1	explain this tense and how it is used	Present simple tense	Communicative approach	Classroom performance and quiz
3.	1	correct pronunciation	Pronunciation rules for /s/and /es/	communicative approach	Classroom performance and quiz
4.	1	How to write and read simple sentences	Every day English words, Vocabulary and speaking and numbers	Communicative approach	Classroom performance and quiz
5.	1	Explain this tense and how it is used	Present continuous tense	Communicative approach	Classroom performance and quiz
6.	1	Identify pronouns in sentences and construct simple sentences using different types of pronouns	English Pronouns	Communicative approach	Classroom performance and quiz
7.	1	Explain this tense and how it is used	Present perfect tense	Communicative approach	Classroom performance and quiz
8.	1	Training for reading and understanding its vocabulary	Reading	Communicative approach	Classroom performance and quiz
9.	1	When and how this tense is used	Past simple tense	Communicative approach	Classroom performance and quiz

10.	1	Correct pronunciation	Pronunciation rules for/d/and/ed/	Communicative approach	Classroom performance and quiz
11.	1	When and how this tense is used	Past continuous tense	Communicative approach	Classroom performance and quiz
12.	1	When and how this tense is used	Past perfect tense	Communicative approach	Classroom performance and quiz
13.	1	Identify countries and nationalities	Where are you from? Countries and cities	Communicative approach	Classroom performance and quiz
14.	1	Knowing some chemical terms	Chemical terms	Communicative approach	Classroom performance and quiz
15.	1	Students' Evaluation	First exam	Lecture	Monthly Exam
16.	1	How and when this tense is used	Future tense	Communicative approach	Classroom performance and quiz
17.	1	How this style is used	First conditional (If clause)	Communicative approach	Classroom performance and quiz
18.	1	How to use this style	Passive voice (Present simple)	Communicative approach	Classroom performance and quiz
19.	1	How to use this style	Passive voice (Past simple)	Communicative approach	Classroom performance and quiz
20.	1	Training for reading	Reading	Communicative approach	Classroom performance and quiz
21.	1	Training for writing	Story time	Communicative approach	Classroom performance and quiz
22.	1		Activity	Communicative approach	Classroom performance and quiz

23.	1	Knowing the time	Telling the time	Communicative approach	Classroom performance and quiz
24.	1	How to read decimal numbers	Reading decimals	Communicative approach	Classroom performance and o
25.	1	How to read years	Reading years	Communicative approach	Classroom performance and quiz
26.	1	How to use comparative form for people and things	Comparative	Communicative approach	Classroom performance and quiz
27.	1	How to use superlative form for people and things	superlative	Communicative approach	Classroom performance and quiz
28.	1	Reinforcement students' knowledge	Vocabulary and Matching	Communicative approach	Classroom performance and quiz
29.	1	Training for reading	Reading	Communicative approach	Classroom performance and quiz
30.	1	Students' Evaluation	Second exam	Lecture	Monthly exam

11. Evaluation of decision

Short quiz, student interaction and participation in class, and monthly exam

12. Learning resources and teaching

required course books (methodology if any)

English Grammar from any sources

Sarah Philpot. (2011).
Headway Academic Skills
Reading, Writing, and
Study Skills Level 2
Students Book. Oxford
University Press

Course description form

1. Name of course					
Analytical Chemistry practical – First Year					
2. Course Code					
CHEM					
3. Semester / year					
Annual					
4. The date of preparation of this description					
20-12-2025					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 hours theoretical + 2 hours practical, Total units: 6					
7. The name of the course administrator (if more than one name is mentioned)					
Name: Assist. Prof. Mohannad Faisal Shareef Email: mohannad.f.shareef@tu.edu.iq					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> Learn how to prepare solution concentrations. Be able to complete titration processes for solutions. Learn how to solve mathematical problems using different analytical chemistry equations. 		
9. Strategic teaching and learning					
Strategy			Theoretical lectures, practical applications, electronic lectures, daily exams, and monthly exams.		
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2 (Theory)	Understanding, analysis, application	Introduction to Analytical Chemistry	Lecture and discussion	Daily and monthly exams

2.	2 (Theory)	Understanding, analysis, application	Introduction to Analytical Chemistry	Lecture and discussion	Daily and monthly exams
3.	2 (Theory)	Understanding, analysis, application	Acids, Bases, and Salts	Lecture and discussion	Daily and monthly exams
4.	2 (Theory)	Understanding, analysis, application	Acids, Bases, and Salts	Lecture and discussion	Daily and monthly exams
5.	2 (Theory)	Understanding, analysis, application	Methods of Expressing Concentrations	Lecture and discussion	Daily and monthly exams
6.	2 (Theory)	Understanding, analysis, application	Methods of Expressing Concentrations	Lecture and discussion	Daily and monthly exams
7.	2 (Theory)	Understanding, analysis, application	Preparation of Solutions	Lecture and discussion	Daily and monthly exams
8.	2 (Theory)	Understanding, analysis, application	Preparation of Solutions	Lecture and discussion	Daily and monthly exams
9.	2 (Theory)	Understanding, analysis, application	Laws of Expressing Concentration for Solid and Liquid Materials	Lecture and discussion	Daily and monthly exams
10.	2 (Theory)	Understanding, analysis, application	Laws of Expressing Concentration for Solid and Liquid Materials	Lecture and discussion	Daily and monthly exams
11.	2 (Theory)	Understanding, analysis, application	Laws of Expressing Concentration for Solid and Liquid Materials	Lecture and discussion	Daily and monthly exams
12.	2 (Theory)	Understanding, analysis, application	Dilution Ratio of Solutions	Lecture and discussion	Daily and monthly exams
13.	2 (Theory)	Understanding, analysis, application	Dilution Ratio of Solutions	Lecture and discussion	Daily and monthly exams
14.	2 (Theory)	Understanding, analysis, application	Dilution Ratio of Solutions	Lecture and discussion	Daily and monthly exams
15.	2 (Theory)	Understanding, analysis, application	Gravimetric Analysis	Lecture and discussion	Daily and monthly exams

16.	2 (Theory)	Understanding, analysis, application	Gravimetric Analysis	Lecture and discussion	Daily and monthly exams
17.	2 (Theory)	Understanding, analysis, application	Volumetric Analysis	Lecture and discussion	Daily and monthly exams
18.	2 (Theory)	Understanding, analysis, application	Volumetric Analysis	Lecture and discussion	Daily and monthly exams
19.	2 (Theory)	Understanding, analysis, application	Gravimetric– Volumetric Analysis	Lecture and discussion	Daily and monthly exams
20.	2 (Theory)	Understanding, analysis, application	Gravimetric– Volumetric Analysis	Lecture and discussion	Daily and monthly exams
21.	2 (Theory)	Understanding, analysis, application	Standard Solutions and Their Types	Lecture and discussion	Daily and monthly exams
22.	2 (Theory)	Understanding, analysis, application	Standard Solutions and Their Types	Lecture and discussion	Daily and monthly exams
23.	2 (Theory)	Understanding, analysis, application	Titrations	Lecture and discussion	Daily and monthly exams
24.	2 (Theory)	Understanding, analysis, application	Titrations	Lecture and discussion	Daily and monthly exams
25.	2 (Theory)	Understanding, analysis, application	Indicators Used in Titrations	Lecture and discussion	Daily and monthly exams
26.	2 (Theory)	Understanding, analysis, application	Indicators Used in Titrations	Lecture and discussion	Daily and monthly exams
27.	2 (Theory)	Understanding, analysis, application	Indicators Used in Titrations	Lecture and discussion	Daily and monthly exams
28.	2 (Theory)	Understanding, analysis, application	Types of Titrations and Their Applications	Lecture and discussion	Daily and monthly exams
29.	2 (Theory)	Understanding, analysis, application	Types of Titrations and Their Applications	Lecture and discussion	Daily and monthly exams
30.	2 (Theory)	Understanding, analysis, application	Types of Titrations and Their Applications	Lecture and discussion	Daily and monthly exams

11. Evaluation of decision	
The grade is distributed out of 100 according to the tasks assigned to the student such as daily preparation, daily exams, oral exams, monthly exams, written exams, reports, etc.	
12. Learning resources and teaching	
required course books (methodology if any)	<ol style="list-style-type: none"> 1. <i>Volumetric and Gravimetric Analytical Chemistry</i> – Hadi Awad. 2. <i>Analytical Chemistry</i> – Skoog. 3. <i>Qualitative and Volumetric Analysis</i> – Dr. Thabit Saeed Al-Ghabsha, Dr. Moayyad Qasim Al-Obaiji.
Main References	<ol style="list-style-type: none"> 4. Harris, D. C. <i>Quantitative Chemical Analysis</i>, 6th Edition, Freeman and Company, New York, 2003. 5. Gary D. Christian, Purnendu K. Gupta, Kevin A. Schug, <i>Analytical Chemistry</i>, 7th Edition, 2013.
Recommended Supporting Books and References	Specialized journals in Analytical Chemistry.
Electronic References and Websites	Online scientific resources and chemistry websites.

Course Description Form

1. <i>Course Name:</i>	
<i>Computer I</i>	
2. <i>Course Code:</i>	

UOA137					
3. Semester / Year:					
2025/2026					
4. Description Preparation Date:					
20/12/2025					
5. Available Attendance Forms:					
Weekly					
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: Ali Mahmood Khalaf Email: ali.mahmood@tu.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • The student acquires knowledge about computer principles and office applications. • The student acquires sufficient knowledge about computer basics • The student acquires sufficient knowledge about the classification of operating systems Windows 7, 8, 10 • The student acquires sufficient knowledge about the components of the desktop, the start menu and the taskbar. • The student acquires sufficient knowledge about files and folders. 			
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> • Managing the lecture in a practical manner related to the reality of daily life to attract the student to the subject of the lesson without straying from the core of the subject so that the material is flexible and capable of being understood and analyzed. • Allocating a percentage of the grade for daily assignments and tests. 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	1	Cognitive	Desktop Components	Lecture	Daily and Monthly Exams, assignments and reporting
2.	1	Cognitive	Start Menu	Lecture	Daily and Monthly Exams, assignments and reporting
3.	1	Cognitive	Taskbar	Lecture	Daily and Monthly Exams, assignments and reporting

4.	1	Cognitive	Search for files and programs on the computer	Lecture	Daily and Monthly Exams, assignments and reporting
5.	1	Cognitive	Turn on and restart the computer	Lecture	Daily and Monthly Exams, assignments and reporting
6.	1	Cognitive	Arrange windows in (pages, horizontal, vertical)	Lecture	Daily and Monthly Exams, assignments and reporting
7.	1	Cognitive	What is the Task Manager option	Lecture	Daily and Monthly Exams, assignments and reporting
8.	1	Cognitive	Attach the taskbar in its location	Lecture	Daily and Monthly Exams, assignments and reporting
9.	1	Cognitive	Make taskbar icons small	Lecture	Daily and Monthly Exams, assignments and reporting
10.	1	Cognitive	Hide the taskbar	Lecture	Daily and Monthly Exams, assignments and reporting
11.	1	Cognitive	Student evaluation (monthly exam)	-	-
12.	1	Cognitive	Methods for creating a new file in Windows 7 / changing the location of the taskbar	Lecture	Daily and Monthly Exams, assignments and reporting
13.	1	Cognitive	Control the size of windows	Lecture	Daily and Monthly Exams, assignments and reporting
14.	1	Cognitive	Methods for closing an open file or folder window	Lecture	Daily and Monthly Exams, assignments and reporting
15.	1	Cognitive	View the files in a file	Lecture	Daily and Monthly Exams, assignments and reporting

16.	1	Cognitive	Methods for renaming a file or folder	Lecture	Daily and Monthly Exams, assignments and reporting
17.	1	Cognitive	Delete a file permanently and permanently	Lecture	Daily and Monthly Exams, assignments and reporting
18.	1	Cognitive	Methods for copying and pasting files in Windows 7	Lecture	Daily and Monthly Exams, assignments and reporting
19.	1	Cognitive	Methods for copying and pasting files in Windows 7	Lecture	Daily and Monthly Exams, assignments and reporting
20.	1	Cognitive	Student evaluation (monthly exam)	-	-
21.	1	Cognitive	Methods for restoring a deleted file	Lecture	Daily and Monthly Exams, assignments and reporting
22.	1	Cognitive	Create a shortcut icon	Lecture	Daily and Monthly Exams, assignments and reporting
23.	1	Cognitive	How to change the desktop background	Lecture	Daily and Monthly Exams, assignments and reporting
24.	1	Cognitive	How to activate the screen saver	Lecture	Daily and Monthly Exams, assignments and reporting
25.	1	Cognitive	Student evaluation (monthly exam)	-	-
26.	1	Cognitive	Change the time and date in Windows 7	Lecture	Daily and Monthly Exams, assignments and reporting

27.	1	Cognitive	How to add a language to the computer	Lecture	Daily and Monthly Exams, assignments and reporting
28.	1	Cognitive	Change the mouse pointer on the computer	Lecture	Daily and Monthly Exams, assignments and reporting
29.	1	Cognitive	How to add an account and add a user image Student evaluation	Lecture	Daily and Monthly Exams, assignments and reporting
30.	1	Cognitive	(monthly exam)	-	-

11. Evaluation of decision

Daily exams score: 10 marks , homework and reports score: 10, monthly exams score: 30 marks, final exam score: 50 marks

12. Learning resources and teaching

required course books (methodology if any)	<p>Computer Fundamentals and Office Applications Part One</p> <p>Assistant Professor Ziad Mohammed Abboud, Professor Ghassan Hamid Abdul Majeed, Assistant Professor Amir Hussein, and Eng. Bilal Kamal 2014</p>
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Course description form

1. Name of course					
Arabic language subject					
2. Course Code					
UOA137					
3. Semester / year					
First stage					
4. The date of preparation of this description					
25-2-2026					
is 5. Available attendance forms					
My presence					
6. Number of study hours (total) / number of units (total)					
2 hours					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Baidaa Muhi Rumman					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> •To enable students to master correct reading and writing skills,And ensuring they achieve the targeted learning outcomes •Understanding the importance of the Arabic language and its role in academic guidance •Understanding scientific principles and academic specifications and applying them to various scientific subjects 		
9. Strategic teaching and learning					
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method

1.	2	to understandLecture topic	Surah Al-Fatihah	delivery	The exam
2.	2	to understandLecture topic	Surah Al-Fatihah	delivery	The exam
3.	2	to understandLecture topic	Surah Al-Fajr	delivery	The exam
4.	2	to understandLecture topic	Surah Al-Fajr	delivery	The exam
5.	2	to understandLecture topic	prodThe connection	delivery	The exam
6.	2	to understandLecture topic	Hamza al-qat'	delivery	The exam
7.	2	to understandLecture topic	punctuation marks	delivery	The exam
8.	2	to understandLecture topic	punctuation marks	delivery	The exam
9.	2	to understandLecture topic	Morphological balance	delivery	The exam
10.	2	to understandLecture topic	Morphological balance	delivery	The exam
11.	2	to understandLecture topic	The correct action	delivery	The exam
12.	2	to understandLecture topic	The defective verb	delivery	The exam
13.	2	to understandLecture topic	Parts of speech	delivery	The exam
14.	2	to understandLecture topic	Parts of speech	delivery	The exam
15.			First month exam		The exam
16.	2	to understandLecture topic	Subject and predicate	delivery	The exam

17.	2	to understandLecture topic	Subject and predicate	delivery	The exam
18.	2	to understandLecture topic	Her sisters	delivery	The exam
19.	2	to understandLecture topic	Her sisters	delivery	The exam
20.	2	to understandLecture topic	Letters that resemble verbs	delivery	The exam
21.	2	to understandLecture topic	Letters that resemble verbs	delivery	The exam
22.	2	to understandLecture topic	number	delivery	The exam
23.	2	to understandLecture topic	number	delivery	The exam
24.	2	to understandLecture topic	The poet Amr ibn Kulthum	delivery	The exam
25.	2	to understandLecture topic	The poet Amr ibn Kulthum	delivery	The exam
26.	2	to understandLecture topic	The poet Abu al-Tayyib al-Mutanabbi	delivery	The exam
27.	2	to understandLecture topic	The poet Abu al-Tayyib al-Mutanabbi	delivery	The exam
28.	2	to understandLecture topic	The poet Muhammad Mahdi al-Jawahiri	delivery	The exam
29.	2	to understandLecture topic	The poet Muhammad Mahdi al-Jawahiri	delivery	The exam
30.			Second month exam		The exam

11. Evaluation of decision

The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, with

1 grade for the first semester, 25 for the second semester, and the final exam out of 50.

12. Learning resources and teaching

required course books (methodology if any)	A collection of approved sources from the Ministry
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Course description form

1. Name of course	
Educational and Developmental Psychology	
2. Course Code	
EPS101	
3. Semester / year	
First and second 2025 – 2026	
4. The date of preparation of this description	
28 / 2 / 2026	
is 5. Available attendance forms	
Annual	
6. Number of study hours (total) / number of units (total)	
2 – 4	
7. The name of the course administrator (if more than one name is mentioned)	
Dr.Raed Idrees Mahmood	
8. Objectives of the course	
objectives of the course	<p>A. Cognitive Objectives</p> <p>A1. The student will understand the concept of educational psychology and development, and its areas of interest and study.</p> <p>A2. The student will understand the meaning of educational objectives, their classification, and how to transform them into learning objectives.</p> <p>A3. The student will understand the meaning of feedback, its types, and its importance for the teacher.</p> <p>A4. The student will understand educational theories and their educational applications.</p>

	<p>A5. The student will understand the factors influencing learning.</p> <p>A6. The student will understand skills and habits, how to acquire them, and how to utilize them in learning.</p> <p>B. Course-Specific Skills-Based Objectives</p> <p>B1. The student will be proficient in using innovative and creative thinking when expressing themselves.</p> <p>B2. The student will be able to explain, interpret, analyze, and critique what they read and hear.</p>
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9. Strategic teaching and learning

Lecture, discussion, and collaborative learning

10. Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Educational and Developmental Psychology – Its Evolution	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Educational Objectives	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Areas of Objectives	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Levels of Objectives	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Behavioral Objectives	Lecture	Exam
6.	2	Understanding, Analysis, and Application	The Role of Objectives in Teaching	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Forgetting	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Transfer of Learning	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Motivation	Lecture	Exam

10.	2	Understanding, Analysis, and Application	Concepts	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Feedback	Lecture	Exam
12.	2	Understanding, Analysis, and Application	The Role of Feedback in Learning	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Types of Feedback	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Learning	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Types of Learning	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Factors Affecting Learning	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Perception	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Attention	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Individual Differences	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Skills	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Habits	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Learning Theories	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Psychoanalytic Theory	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Behavioral Theory	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Gestalt Theory	Lecture	Exam

26.	2	Understanding, Analysis, and Application	Cognitive Theory	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Constructivist Theory	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Information Processing Theory	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Stages of Individual Development	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Developmental Characteristics of the Individual	Lecture	Exam

11. Evaluation of decision

25 for the first semester and 25 for the second semester

required course books (methodology if any)

Educational Psychology – Dr. Raouf Al-Qaisi

Course description form

1. Name of course	
Biology practical	
2. Course Code	
BIO120	
3. Semester / year	
2026/2025	
4. The date of preparation of this description	
2026/3/14	
is 5. Available attendance forms	
Presence	
6. Number of study hours (total) / number of units (total)	
2/2	
7. The name of the course administrator (if more than one name is mentioned)	
Rakzan mazin muhia dhiban	
8. Objectives of the course	
objectives of the course	To provide students with comprehensive information about contemporary biology, enhancing their understanding of fundamental

	<p style="text-align: center;">theories, concepts, and practical applications.</p> <ul style="list-style-type: none"> • To familiarize students with the light microscope and its use in laboratory experiments for analyzing and examining microscopic samples. • To teach students laboratory methods for examining animal and plant cell models and understanding their structure and vital functions. • To explore modern methods of classifying living organisms and identifying them based on their general form and vital functions.
9. Strategic teaching and learning	
	<ul style="list-style-type: none"> • Delivering theoretical lectures using modern educational tools, including slide presentations, scientific models, and educational videos displayed on screens. • Providing practical lectures using laboratory equipment and devices to enhance the applied understanding of scientific concepts. • Preparing scientific reports as part of developing students' research and analytical skills. • Organizing field trips to scientific laboratories to deepen practical experience and connect theory with practice. • Encouraging dialogue and scientific discussions among students through interactive lectures, brainstorming sessions, and discussion sessions to broaden understanding and increase comprehension.
.Course structure 10	

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
31.	2	Understanding the topic of the lecture	General guidelines, laboratory supplies and equipment, drawing techniques	presence	Classroom performance and exams
32.	2	Understanding the topic of the lecture	The compound microscope and its structure, microscope care and use, the cell	presence	Classroom performance and exams
33.	2	Understanding the topic of the lecture	Studying plant cell models, cell shapes, cell division, types of divisions and their roles	presence	Classroom performance and exams
34.	2	Understanding the topic of the lecture	Examining animal and plant cell models, understanding the lecture topic, explaining the different stages of cell division, tissues.	presence	Classroom performance and exams
35.	2	Understanding the topic of the lecture	Monthly Exam	presence	Classroom performance and exams
36.	2	Understanding the topic of the lecture	Study of Different Types of Animal Tissues	presence	Classroom performance and exams

37.	2	Understanding the topic of the lecture	Categories of Different Animal Tissues	presence	Classroom performance and exams
38.	2	Understanding the topic of the lecture	Classification of Organisms	presence	Classroom performance and exams
39.	2	Understanding the topic of the lecture	Study of Organisms in Different Kingdoms	presence	Classroom performance and exams
40.	2	Understanding the topic of the lecture	Monthly Exam	presence	Classroom performance and exams
41.	2	Understanding the topic of the lecture	Identification of Invertebrate Anatomy	presence	Classroom performance and exams
42.	2	Understanding the topic of the lecture	Dissection of an Insect Model	presence	Classroom performance and exams
43.	2	Understanding the topic of the lecture	Identification of All Insect Body Systems	presence	Classroom performance and exams
44.	2	Understanding the topic of the lecture	Identification of Different Chordate Groups	presence	Classroom performance and exams
45.	2	Understanding the topic of the lecture	Characteristics of Chordates	presence	Classroom performance and exams
46.	2	Understanding the topic of the lecture	Monthly Exam	presence	Classroom performance and exams
47.	2	Understanding the topic of the lecture	Dissection of a Frog	presence	Classroom performance and exams
48.	2	Understanding the topic of the lecture	Identification of the Internal Organs of a Frog	presence	Classroom performance and exams
49.	2	Understanding the topic of the lecture	Study of Plant Structure and Organs	presence	Classroom performance and exams

50.	2	Understanding the topic of the lecture	Study of a Root Section	presence	Classroom performance and exams
51.	2	Understanding the topic of the lecture	Study of a Stem Section	presence	Classroom performance and exams
52.	2	Understanding the topic of the lecture	Study of a Leaf Section	presence	Classroom performance and exams
53.	2	Understanding the topic of the lecture	Monthly Exam	presence	Classroom performance and exams
54.	2	Understanding the topic of the lecture	Animal Body Systems and Their Functions	presence	Classroom performance and exams
55.	2	Understanding the topic of the lecture	Introduction to Ecology	presence	Classroom performance and exams
56.	2	Understanding the topic of the lecture	Biodiversity and Environmental Conservation	presence	Classroom performance and exams
57.	2	Understanding the topic of the lecture	Applications of Life Sciences in Medicine and Biotechnology	presence	Classroom performance and exams
58.	2	Understanding the topic of the lecture	Comprehensive General Review of the Course	presence	Classroom performance and exams
59.	2	Understanding the topic of the lecture	Animal Body Systems and Their Functions	presence	Classroom performance and exams
60.	2	Understanding the topic of the lecture	Monthly Exam	presence	Classroom performance and exams

11. Evaluation of decision

The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.

12. Learning resources and teaching

required course books (methodology if any)

**Fundamentals of Biology //
Prof. Dr. Hussein Al-Saadi //
Asst. Prof. Dr. Hussein
Abdel-Moneim Biology //
Stephen Rose General
Biology // Dr. Diaan Saad
Allah Fundamentals of
General Biology // Asst.
Prof. Dr. Rahim Anad
Khudair**

Course Description Form

1. Course Name:
Safety in chemical laboratories
2. Course Code:
3. Semester / Year:
Annual
4. Description Preparation Date:
21-2-2025
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
1 hours- 2unit
7. Course administrator's name (mention all, if more than one name)
Name: A.M.M Shaima Hatem Abdullah Email: shaymaahatam@tu.edu.iq
8. Course Objectives

Course Objectives	<ul style="list-style-type: none"> • Work safely in the laboratory • Responding to emergency situations • Use safety equipment correctly
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9. Teaching and Learning Strategies

Strategy	Theoretical lectures, monthly and daily exams
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10. Course Structure

Week	Hours	Required Learning		Unit or subject name	Learning method	Evaluation method
		Outcomes				
1	1 theoretical	Analyze, apply, understand	Establishing an effective system for sound and safe chemical management		lecture	Daily and monthly exams
2	1 theoretical	Analyze, apply, understand	Ten Steps to Establishing an Effective System for Safe and Sound Chemical Management in the Laboratory		lecture	Daily and monthly exams
3	1 theoretical	Analyze, apply, understand	Preparing an Emergency Preparedness Plan		lecture	Daily and monthly exams
4	1 theoretical	Analyze, apply, understand	Emergency preparedness training		lecture	Daily and monthly exams
5	1 theoretical	Analyze, apply, understand	Important Administrative Directives		lecture	Daily and monthly exams
6	1 theoretical	Analyze, apply, understand	Preparation of reports on accidents and their investigation.		lecture	Daily and monthly exams
7	1 theoretical	Analyze, apply, understand	Key Considerations for Laboratory Design		lecture	Daily and monthly exams

8	1 theoretical	Analyze, apply, understand	Laboratory Testing Programs	lecture	Daily and monthly exams
9	1 theoretical	Analyze, apply, understand	Laboratory Ventilation System	lecture	Daily and monthly exams
10	1 theoretical	Analyze, apply, understand	Determining Safety Levels	lecture	Daily and monthly exams
11	1 theoretical	Analyze, apply, understand	Develop a security plan	lecture	Daily and monthly exams
12	1 theoretical	Analyze, apply, understand	Security Management	lecture	Daily and monthly exams
13	1 theoretical	Analyze, apply, understand	Compliance with rules and regulations	lecture	Daily and monthly exams
14	1 theoretical	Analyze, apply, understand	Risk assessment of poisoning resulting from laboratory chemicals.	lecture	Daily and monthly exams
15	1 theoretical	Analyze, apply, understand	Risk Assessment of Flammable, Reactive, and Explosive Materials in the Laboratory	lecture	Daily and monthly exams
16	1 theoretical	Analyze, apply, understand	Physical Risk Assessment	lecture	Daily and monthly exams
17	1 theoretical	Analyze, apply, understand	Biological Risk Assessment	lecture	Daily and monthly exams
18	1 theoretical	Analyze, apply, understand	Chemical Procurement	lecture	Daily and monthly exams
19	1 theoretical	Analyze, apply, understand	Chemical Inventory and Tracking	lecture	Daily and monthly exams
20	1 theoretical	Analyze, apply, understand	Chemical Storage	lecture	Daily and monthly exams
21	1 theoretical	Analyze, apply, understand	Transport and Shipping of Chemicals	lecture	Daily and monthly exams
22	1 theoretical	Analyze, apply, understand	Safe Procedures for Working with Hazardous Chemicals	lecture	Daily and monthly exams
23	1 theoretical	Analyze, apply, understand	Working with highly toxic materials	lecture	Daily and monthly exams

24	1 theoretical	Analyze, apply, understand	Work involving biologically hazardous materials	lecture	Daily and monthly exams
25	1 theoretical	Analyze, apply, understand	Working with flammable chemicals.	lecture	Daily and monthly exams
26	1 theoretical	Analyze, apply, understand	Working with highly reactive chemicals or explosive chemicals	lecture	Daily and monthly exams
27	1 theoretical	Analyze, apply, understand	Working with electrically powered devices	lecture	Daily and monthly exams
28	1 theoretical	Analyze, apply, understand	Working with Compressed Gases	lecture	Daily and monthly exams
29	1 theoretical	Analyze, apply, understand	Working under high and low pressure and varying temperatures	lecture	Daily and monthly exams
30	1 theoretical	Analyze, apply, understand	The use of personal protective equipment (PPE) and emergency devices	lecture	Daily and monthly exams

11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as					
etc daily preparation, daily oral, monthly, or written exams, reports					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)					
Chemical Laboratory Security and Safety: A Guide to Prudent Chemical Management					
Lisa Moran and Tina Masciangiol (scientific journals, reports...)					
Electronic References, Websites					

Description of curriculum for the Chemistry Department Second stage

Course description form

1. Name of course					
Educational leadership and management					
2. Course Code					
EPS201					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025\12\20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 \ 4					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Faten Nawaf Hassan					
8. Objectives of the course					
objectives of the course			<p>1. Understanding the Principles of Educational Administration: Recognizing the foundations of planning, organizing, and directing educational institutions.</p> <p>2. Developing Leadership Skills: Acquiring effective decision-making techniques and managing educational work teams.</p> <p>3. Improving the Learning Environment: Implementing strategies that contribute to raising the efficiency of school or university performance.</p> <p>4. Enhancing Educational Problem-Solving: Addressing administrative challenges scientifically and systematically.</p>		
9. Strategic teaching and learning					
strategy			Lectures , homework, discussions, using the online classroom		
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method

1.	2	Understanding, Analysis, and Application	The Concept of Management	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Management in Islam	Lecture	Exam
3.	2	Understanding, Analysis, and Application	The Nature of Management	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Definition of Management	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Elements of the Administrative Process	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Planning	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Importance of Planning	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Organization	Lecture	Exam
9.	2	Understanding, Analysis, and Application	The Five Steps in the Organization Process	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Importance of Organization	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Coordination	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Importance of Coordination	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Directing	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Importance of Directing	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Communication	Lecture	Exam

16.	2	Understanding, Analysis, and Application	Decision Making	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Motivation	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Importance of Motivation	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Supervision and its Importance	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Assessment	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Advantages and Objectives of Assessment	Lecture	Exam
22.	2	Understanding, Analysis, and Application	The Concept of Leadership	Lecture	Exam
23.	2	Understanding, Analysis, and Application	School Administration and its Tasks	Lecture	Exam
24.	2	Understanding, Analysis, and Application	The Need for Theory in Educational Administration	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Classroom Management and its Concept	Lecture	Exam
26.	2	Understanding, Analysis, and Application	The Importance of Classroom Management	Lecture	Exam
27.	2	Understanding, Analysis, and Application	The School and Society	Lecture	Exam
28.	2	Understanding, Analysis, and Application	School Communication Methods	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Parent-Teacher Councils	Lecture	Exam
30.	2	Understanding, Analysis, and Application	School Activities and their Types	Lecture	Exam

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.	
12. Learning resources and teaching	
required course books (methodology if any)	Educational Administration – Dr. Siham Abdullah

Course description template

Course Name .1
Second Stage Organic Chemistry (Practical)
Course Code .2
CHEM223
Term/Year .3
annual
Date this description was prepared .4
26 /2/2026
Available attendance formats .5
My presence
Total number of study hours / Total number of units .6
hours of theory + 3 hours of practical work, number of units: 7 2
Name of the course coordinator (if there is more than one, mention it) .7
Name : Dr.Afrah Hatam Hazzaa afrah.h.hazzaa@tu.edu.iq
Course Objectives .8

<ul style="list-style-type: none"> • ,organic compounds , their properties and methods of preparation • He is able to understand the general mechanisms and processes of .reactions • The student learns how to determine the chemical composition of organic .compounds • Synthesis of new organic compounds 	Course objectives
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Teaching and learning strategies .9

Theoretical lectures, practical application, online lectures, daily .exams, monthly exams	strategy
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Course Structure .10

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily and monthly exams	Lecture	General Safety Guidelines for the Laboratory	,Analysis ,application understanding	Theory 2 3 practical	Week 1, Week 2
Daily and monthly exams	Lecture	Preparation of Adipic Acid (Experiment 1)	,Analysis ,application understanding	Theory 2 3 practical	Week 3 Week 4
Daily and monthly exams	Lecture	Preparation of Adipic Acid (Experiment 2)	,Analysis ,application understanding	Theory 2 3 practical	Week 5 Week 6
Daily and monthly exams	Lecture	Preparation of Benzoic Acid from Toluene	,Analysis ,application understanding	Theory 2 3 practical	Week 7 Week 8
Daily and monthly exams	Lecture	Preparation of 2,4-Dinitrophenylh	,Analysis ,application understanding	Theory 2 3 practical	Week 9 Week 10

		hydrazine (Experiment 1)			
Daily and monthly exams	Lecture	Preparation of 2,4-Dinitrophenylhydrazine (Experiment 2)	,Analysis ,application understanding	Theory 2 3 practical	Week Eleven Week Twelve
Daily and monthly exams	Lecture	Preparation of β -Naphthyl Acetate	,Analysis ,application understanding	Theory 2 3 practical	Week 13 Week Fourteen
Daily and monthly exams	Lecture	Preparation of Aspirin (Acetylsalicylic Acid)	,Analysis ,application understanding	Theory 2 3 practical	Week fifteen Week 16
Daily and monthly exams	Lecture	Preparation of Acetanilide	,Analysis ,application understanding	Theory 2 3 practical	Week 17 Week 18
Daily and monthly exams	Lecture	Alkaline Hydrolysis of Esters (Saponification)	,Analysis ,application understanding	Theory 2 3 practical	Week 19 Week 20
Daily and monthly exams	Lecture	Preparation of Cyclohexene	,Analysis ,application understanding	Theory 2 3 practical	Week 21 Week 22, Week 23
Daily and monthly exams	Lecture	Preparation of Soap (Saponification Reaction)	,Analysis ,application understanding	Theory 2 3 practical	Week 24, Week 26 ,25
Daily and monthly exams	Lecture	Preparation of Ethylene Gas	,Analysis ,application understanding	Theory 2 3 practical	Week 27 and Week 28

Daily and monthly exams	Lecture	Reactions of Methane Gas	,Analysis ,application understanding	Theory 2 3 practical	Week 29 and Week 30
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Course Evaluation .11

The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams .reports, etc

Learning and teaching resources .12

Mechanisms of Organic Reactions, Dr. Khaled Mahmoud Daoud	Required textbooks (methodology, if applicable)
A Guide to the Mechanisms of Organic Reactions, Peter Sykes A guide to the mechanisms of organic reactions by Dr.Khalid Mahmood Dawod	Main references (sources)D
Journals specializing in organic chemistry	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, websites

Course description form

1. Name of course					
Physical Chemistry, Second Stage					
2. Course Code					
CHEM241					
3. Semester / year					
Final / annual					
4. The date of preparation of this description					
20/12/2025					
is 5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
60/6					
7. The name of the course administrator (if more than one name is mentioned)					
Assistant Lecturer . ibrahim Abdullah Ali					
8. Objectives of the course					
objectives of the course			Knowing , behaviour , practical		
9. Strategic teaching and learning					
Attendance					
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Gases	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Gas	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Gas	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Real gas and ideal gas	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Real gas and ideal gas	Lecture	Exam

6.	2	Understanding, Analysis, and Application	Real gas and ideal gas	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Real gas and ideal gas	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Van der Waals Equation and Phase Diagram	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Van der Waals Equation and Phase Diagram	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Van der Waals Equation and Phase Diagram	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Applications of Thermodynamics	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Applications of Thermodynamics	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Applications of Thermodynamics	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Basic Concepts in Thermodynamics	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Basic Concepts in Thermodynamics	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Thermodynamics, Heat Capacity	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Thermodynamics, Heat Capacity	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Thermodynamics, Heat Capacity	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Thermodynamic Processes	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Thermodynamic Processes	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Thermodynamic Processes	Lecture	Exam

22.	2	Understanding, Analysis, and Application	Work	Lecture	Exam
23.	2	Understanding, Analysis, and Application	First Law of Thermodynamics	Lecture	Exam
24.	2	Understanding, Analysis, and Application	First Law of Thermodynamics	Lecture	Exam
25.	2	Understanding, Analysis, and Application	First Law of Thermodynamics	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Second Law of Thermodynamics	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Second Law of Thermodynamics	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Second Law of Thermodynamics	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Third Law of Thermodynamics	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Third Law of Thermodynamics	Lecture	Exam

11. Evaluation of decision

The grade is distributed as follows: 17 for theory and 8 for practical for the first semester, and 18 for theory and 7 for practical for the second semester.

12. Learning resources and teaching

required course books (methodology if any)	Physical Chemistry for Second Grade
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Course description form

1. Name of course
Inorganke \practical
2. Course Code
CHEM233
3. Semester / year
yearS
4. The date of preparation of this description
2025\12\20

is 5. Available attendance forms					
Immanence					
6. Number of study hours (total) / number of units (total)					
2					
7. The name of the course administrator (if more than one name is mentioned)					
Dr-Mahmood Maahdy Salih					
8. Objectives of the course					
objectives of the course			1-Statement of the purpose of practical lectures 2-conducting and applying all the experiments prescribed in the curriculum 3-preparing future cadres capable of preparing these experiments		
9. Strategic teaching and learning					
			<ul style="list-style-type: none"> • 1-Preparing trained teaching staff with the ability to manage and teach. 		
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Laboratarys	Experiment number one(sodium chloride preparation)	Conducting laboratory experiments	Writing reports for each experience\ \ exams
2.	2	Laboratarys	Experiment number two (preparation of sodium chloride) the second method	Conducting laboratory experiments	Writing reports for each experience\ \ exams
3.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams

4.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
5.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
6.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
7.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
8.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
9.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
10.	2	Laboratarys	Experiment No. 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
11.	2	Laboratarys	Experiment No. 4	Conducting laboratory experiments	Writing reports for each experience\ \ exams

12.	2	Laboratarys	Experiment No. 5	Conducting laboratory experiments	Writing reports for each experience\ \ exams
13.	2	Laboratarys	Experiment No. 6	Conducting laboratory experiments	Writing reports for each experience\ \ exams
14.	2	Laboratarys	Experiment No. 7	Conducting laboratory experiments	Writing reports for each experience\ \ exams
15.	2	Laboratarys	Experiment No. 8	Conducting laboratory experiments	Writing reports for each experience\ \ exams
16.	2	Laboratarys	Experiment No. 9	Conducting laboratory experiments	Writing reports for each experience\ \ exams
17.	2	Laboratarys	Experiment No. 10	Conducting laboratory experiments	Writing reports for each experience\ \ exams
18.	2	Laboratarys	Experiment No11	Conducting laboratory experiments	Writing reports for each experience\ \ exams
19.	2	Laboratarys	Experiment No. 12	Conducting laboratory experiments	Writing reports for each experience\ \ exams

20.	2	Laboratarys	Experiment No.1 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams
21.	2	Laboratarys	Experiment No14	Conducting laboratory experiments	Writing reports for each experience\ \ exams
22.	2	Laboratarys	Experiment No. 15	Conducting laboratory experiments	Writing reports for each experience\ \ exams
23.	2	Laboratarys	Experiment No. 16	Conducting laboratory experiments	Writing reports for each experience\ \ exams
24.	2	Laboratarys	Experiment No. 17	Conducting laboratory experiments	Writing reports for each experience\ \ exams
25.	2	Laboratarys	Experiment No18	Conducting laboratory experiments	Writing reports for each experience\ \ exams
26.	2	Laboratarys	Experiment No. 19	Conducting laboratory experiments	Writing reports for each experience\ \ exams
27.	2	Laboratarys	Experiment No20	Conducting laboratory experiments	Writing reports for each experience\ \ exams

28.	2	Laboratarys	Experiment No. 21	Conducting laboratory experiments	Writing reports for each experience\ \ exams
29.	2	Laboratarys	Experiment No. 22	Conducting laboratory experiments	Writing reports for each experience\ \ exams
30.	2	Laboratarys	Experiment No.2 3	Conducting laboratory experiments	Writing reports for each experience\ \ exams

11. Evaluation of decision

First Semester\\ 7 degrees and second semester 8 degrees

12. Learning resources and teaching

required course books (methodology if any)

Lectures for the practical laboratory prepared by the professor of the subject

Course description form

1. Name of course :- inorganic thioritcal
2. Course Code :- CHEM233
3. Semester / year 2025- 2026
4. The date of preparation of this description 25- 12- 2025
is 5. Available attendance forms _ In-person
6. Number of study hours (total) / number of units (total) :- 2 -- 6
7. The name of the course administrator (if more than one name is mentioned) _ Dr . Luma abdulkader hatem
8. Objectives of the course

objectives of the course	<ul style="list-style-type: none"> • Increasing the student's awareness of the importance of chemical elements • 2 - Increasing the student's awareness of the importance of elements as a basis in life • Systematizing the student as the basis for building a generation on whose shoulders lies success and academic excellence • 3 - Preparing an educational cadre with academic competence
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9. Strategic teaching and learning

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10. Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application		Lecture	Exam
2.	2	Theoretical	Lecture	topic Arrangement of the Periodic	2
3.	2	Theoretical	Lecture	Properties of Atoms	2
4.	2	Theoretical	Lecture	Hedrogen	2
5.	2	Theoretical	Lecture	Group 1 (alkalis)	2
6.	2	Theoretical	Lecture	Proparatic of Group 1 (alkalis)	2
7.	2	Theoretical	Lecture	Group 2 (alkaline earths)	2
8.	2	Theoretical	Lecture	Proparatic of Group 2 (alkaline earths)	2
9.	2	Theoretical	Lecture	Boron group	2
10.	2	Theoretical	Lecture	Proparatic of boron group	2

11.	2	Theoretical	Lecture	Nitrogene group	2
12.	2	Theoretical	Lecture	Carbon group	2
13.	2	Theoretical	Lecture	Oxigen group	2
14.	2	Theoretical	Lecture	Halogenes group	2
15.	2	Theoretical	Lecture	Nopele gases	2
16.	2	Theoretical	Lecture	Proparatice of chimecal elemente	2
17.	2				
18.	2	Theoretical	Lecture	Group 2 (alkaline earths)	2
19.	2	Theoretical	Lecture	Proparatice of Group 2 (alkaline earths)	2
20.	2	Theoretical	Lecture	Boron group	2
21.	2	Theoretical	Lecture	Proparatice of boron group	2
22.	2	Theoretical	Lecture	Nitrogene group	2
23.	2	Theoretical	Lecture	Carbon group	2
24.	2	Theoretical	Lecture	Oxigen group	2
25.	2	Theoretical	Lecture	Halogenes group	2
26.	2	Theoretical	Lecture	Nopele gases	2
27.	2	Theoretical	Lecture	Proparatice of chimecal elemente	2
28.	2	Theoretical	Lecture	Nitrogene group	2
29.	2	Theoretical	Lecture	Carbon group	2
30.		Theoretical	Lecture	Oxigen group	2

11. Evaluation of decision

The final grade for the evaluation is 100 points. The minimum for success is 50 points. The evaluation grade is distributed over the effort of 50 points and the end-of-year exam of 50 points. The agencies for each semester: -

- First month exam of 10 points for each semester
- Second month exam of 10 points for each semester
- Daily preparation and participation 5 points for each semester

End-of-year exam 50 points

12. Learning resources and teaching- Modern Inorganic Chemistry Part One Authored by Dr. Basem Mohammed Al-Saadi	
required course books (methodology if any)	- Inorganic Chemistry Part One Authored by Dr. Naaman Al-Naimi and his group

Course Description Form

1. <i>Course Name:</i>	
Computer 2	
2. <i>Course Code:</i>	
UOA241	
3. <i>Semester / Year:</i>	
2025/2026	
4. <i>Description Preparation Date:</i>	
20/12/2025	
5. <i>Available Attendance Forms:</i>	
Face-to-face attendance.	
6. <i>Number of Credit Hours (Total) / Number of Units (Total)</i>	
30 hours / 2 units	
7. <i>Course administrator's name (mention all, if more than one name)</i>	
..... Name: Ahmed Ayad Saleh Email: ahmed.ayad@tu.edu.iq	
8. <i>Course Objectives</i>	
Course Objectives	<ul style="list-style-type: none"> • Enable students to use Microsoft Word to properly prepare and format academic documents and research. • Equip them with the skill of creating effective presentations with Microsoft PowerPoint. • Develop their ability to organize data and present it with tables and graphs to support scientific projects. • Promoting the use of computers and the Internet in education, research, and academic communication
9. <i>Teaching and Learning Strategies</i>	

Strategy	<ul style="list-style-type: none"> • Practical (Hands-on) Learning: Training students to use Microsoft Word and Microsoft PowerPoint through practical applications in the computer laboratory. • Project-Based Learning: Assigning students to prepare scientific reports and presentation slides using the software studied in the course. • Collaborative Learning: Implementing selected activities and assignments in groups to enhance teamwork skills. • Supported E-Learning: Utilizing educational platforms to deliver lectures, assignments, and learning activities.
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10. Course Structure

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation method
		Outcomes			
1.	2	Identify the objectives and requirements of the course	Introduction to the course and introduction to Classroom	Introductory Lecture	Questions & Answers
2.	2	Create an account, sign in to Classroom, and manage assignments	Learn about Classroom and how it works	Practical Application	Questions & Answers
3.	2	Understand Word's interface and basic tools	Introduction to Word	Theoretical Explanation	Questions & Answers
4.	2	Create a document and format texts	Format Text in Word	Practical Application	Practical activity
5.	2	Insert and format tables	Tables in Word	Explanation and Application	Questions & Answers
6.	2	Insert images and shapes	Media in Word	Practical Application	Practical activity
7.	Exam	Academic Reporting	Coordination of Research and Reports	Project-Based Learning	Short Report
8.	2	Use of references and numbering	Documentation and Indexes	Practical Explanation	Practical activity
9.	2	Use of advanced tools	Charts & Review	practical	Practical Application
10.	2	Handle templates and ready-made documents	Ready-made templates and designs	theoretical	Questions and Answers
11.	2	Integrated document design	Word Project	Teamwork	Questions and Answers
12.	2	Integrated document design	Word Project	practical	Assignment Assessment

13.	2	Overview	Word Review	Discussion	Short test
14.	2	Assessing Word Skills	First Semester Exam	Test	Semester Exam
			Spring Break		
15.	2	Recognize PowerPoint and its interface	Introduction to PowerPoint	Theoretical Explanation	Questions & Answers
16.	2	Create and format segments	Slide Design	Practical Application	Questions & Answers
17.	2	Insert Tables and Charts	Tables & Charts	Explanation and Application	Questions & Answers
18.	2	Insert photos and media	Multimedia	Practical Application	Practical activity
19.	2	Movements and Transitions	Effects in the show	Practical Explanation	Practical Exercise
20.	2	Prepare an Academic Presentation	Preparing a scientific presentation	Discussion	Presentation Report
21.	2	Time Management & Professional Design	Design for Presentations	Practical Application	Practical activity
22.	2	Create an integrated view project	PowerPoint Project	Teamwork	Project Evaluation
23.	2	Overview	PowerPoint Review	Discussion	Short test
24.	2	Assessing PowerPoint Skills	Second Semester Exam	Test	Semester Exam
25.	2	Merge Word and PowerPoint into one project	Integrated project	Discussion	Questions & Answers
26.	final exam	Upload activities across Classroom	Manage and deliver assignments electronically	Practical Application	Practical activity
27.	2	Discussion of Students' Projects	Presentations and Discussions	Student Presentation	Oral Assessment
28.	2	Discussion of Students' Projects	Presentations and Discussions	Student Presentation	Oral Assessment
29.	2	Comprehensive Review	Course General Review	Open discussion	Questions & Answers
30.		Final Evaluation	Final Exam	Comprehensive Testing	Final Exam

11. Evaluation of decision

First Semester of 25 / First Exam Grade of (10), Practical Exam Score of (10), Daily Attendance and Participation Score (5)

Second Semester of 25 / First Exam Grade of (10), Practical Exam Grade of (10), Daily Attendance and Participation Grade (5)

End of Semester Exam Score (50)

12. Learning resources and teaching

required course books (methodology if any)

- Fundamentals of Computer and its Office Applications, Ministry of Higher Education and Scientific Research – Research and Development Department.
- Computer literacy BASICS 2012, LeBlanc, Brandon. "A closer look at the, windows 7. 2009
- Computing Fundamentals, Innovative training works USA, Inc, 2006
- Microsoft Word 2019: Step by Step.

Course description form

1. Name of course					
Organic Chemistry – Second Year					
2. Course Code					
CHEM223					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025\12\20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 hours theoretical and 2 hours practical / 6 credit units					
7. The name of the course administrator (if more than one name is mentioned)					
Asst. Prof. Dr. Yusra Khalaf Muhammad					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> • Familiarizing students with major organic compounds, such as alcohols, phenols, carbonyl compounds, and amines, and studying their chemical properties and reactivity. • Acquiring knowledge of methods for synthesizing organic compounds and their nomenclature rules, while developing the ability to draw their three-dimensional structures to understand their spatial configuration accurately. • Understanding the mechanisms of preparation and reactions of these compounds, thereby enhancing students' skills in scientific analysis and practical application. 		
9. Strategic teaching and learning					
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Alcohols: Definition, Classification, and Nomenclature	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Physical Properties of Alcohols	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Preparation of Alcohols	Lecture	Exam

4.	2	Understanding, Analysis, and Application	Reactions of Alcohols	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Phenols: Definition and Nomenclature	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Physical Properties of Phenols	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Preparation of Phenols	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Reactions of Phenols	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Carbonyl Compounds: Definition and Classification	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Aldehydes: Definition, Classification, and Nomenclature	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Physical Properties of Aldehydes	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Preparation of Aldehydes	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Reactions of Aldehydes	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Ketones: Definition, Classification, and Nomenclature	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Physical Properties of Ketones	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Preparation of Ketones	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Reactions of Ketones	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Carboxylic Acids: Definition, Classification, and Nomenclature	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Physical Properties of Carboxylic Acids	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Preparation of Carboxylic Acids	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Reactions of Carboxylic Acids	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Carboxylic Acid Derivatives: Definition, Classification, and Nomenclature	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Physical Properties of Carboxylic Acid Derivatives	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Preparation of Carboxylic Acid Derivatives	Lecture	Exam

25.	2	Understanding, Analysis, and Application	Reactions of Carboxylic Acid Derivatives	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Amines: Definition, Classification, and Nomenclature	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Physical Properties of Amines	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Basicity of Amines	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Preparation of Amines	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Reactions of Amines	Lecture	Exam

11. Evaluation of decision

The grade is distributed out of 100 according to the student's assigned tasks: 10 marks for daily preparation, 10 marks for daily quizzes/tests, 10 marks for oral participation, 30 marks for monthly exams, 20 marks for written exams, and 20 marks for reports.

12. Learning resources and teaching

required course books (methodology if any)

- Organic Chemistry, by Dr. Raad Ismail Al-Hamdani
- Organic Chemistry, by Dr. Muhammad Nizar Ibrahim
- A Guide to the Mechanisms of Organic Reactions, by Dr. Fadel Suleiman Kamouna

Course description form

1. Name of course					
Physical Chemistry, Second Stage					
2. Course Code					
CHEM241					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025 /12/20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 \ 6					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Yousef Othman Hamed					
8. Objectives of the course					
objectives of the course			Students acquire knowledge in the fundamentals and theories of physical chemistry in thermodynamics (gases, the general gas law, thermodynamic functions).		
9. Strategic teaching and learning					
			Theoretical lectures, discussion sessions, problem-solving, self-learning		
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Gases	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Ideal Gas	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Real Gas	Lecture	Exam

4.	2	Understanding, Analysis, and Application	Difference Between Real and Ideal Gas	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Regimen	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Critical Point	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Molecular Pressure	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Thermodynamics, Heat Capacity	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Enthalpy	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Internal Energy	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Work	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Entropy	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Gibbs Free Energy	Lecture	Exam
14.	2	Understanding, Analysis, and Application	State Function	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Heat Capacity at Constant Volume C_v	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Heat Capacity at Constant Pressure C_p	Lecture	Exam

17.	2	Understanding, Analysis, and Application	Reversible Process	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Irreversible Process	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Standard State	Lecture	Exam
20.	2	Understanding, Analysis, and Application	First Law of Thermodynamics	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Thermodynamic Processes	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Isothermal Process	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Isobaric Process	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Isocuric Process	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Adiabatic Process	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Second Law of Thermodynamics	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Third Law of Thermodynamics	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Spontaneity of Reaction	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Chemical Kinetics	Lecture	Exam

30.	2	Understanding, Analysis, and Application	Rate of Reaction	Lecture	Exam
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11. Evaluation of decision

The grade is distributed as follows: 17 for theory and 8 for practical for the first semester, and 18 for theory and 7 for practical for the second semester.

12. Learning resources and teaching

required course books (methodology if any)

Physical Chemistry for
Second Grade
Atkins' Physical Chemistry (12th Ed.)

Course description template

1. Course Name
Analytical Chemistry Practical - Second Stage
2. Course Code
CHEM213
3. Term/Year
Annual
4. Date this description was prepared
20-12-2025
5. Available attendance formats
My presence
6. Total number of study hours / Total number of units

2 hours of theory + 6 hours of practical work, number of units: 6					
7. Name of the course coordinator (if there is more than one, mention it)					
M.M. Zeena Tariq Khattab, Email: zeena.tariq@tu.edu.iq					
8. Course Objectives					
<ul style="list-style-type: none"> ● To provide students with general information about analytical chemistry and to familiarize them with laboratory equipment and materials. ● Introducing students to gravimetric analysis sedimentation <p>Introducing students to the separation technique</p>			Course objectives		
9. Teaching and learning strategies					
Theoretical lectures, practical application, online lectures, daily exams, monthly exams			Strategy		
10. Course Structure					
Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week

Daily and monthly exams	Lecture	General guidelines for the laboratory	Analysis, application, understanding	2 Theory 6 practical	Week 1, Week 2
Daily and monthly exams	Lecture	Analytical Chemistry	Analysis, application, understanding	2 Theory 6 practical	Week 3 Week 4
Daily and monthly exams	Lecture	gravimetric analysis	Analysis, application, understanding	2 Theory 6 practical	Week 5 Week 6
Daily and monthly exams	Lecture	Sedimentation and gravimetric coefficient	Analysis, application, understanding	2 Theory 6 practical	Week 7 Week 8
Daily and monthly exams	Lecture	Weight percentage	Analysis, application, understanding	2 Theory 6 practical	Week 9 Week 10
Daily and monthly exams	Lecture	Determination of water of crystallization in hydrated barium chloride salt	Analysis, application, understanding	2 Theory 6 practical	Week Eleven Week Twelve
Daily and monthly exams	Lecture	Estimation of chloride as silver chloride	Analysis, application,	2 Theory	Week 13

			understandi ng	6 practica l	Week Fourteen
Daily and monthly exams	Lecture	Calcium estimation as calcium oxalate	Analysis, application, understandi ng	2 Theory 6 practica l	Week fifteen Week 16
Daily and monthly exams	Lecture	Estimating nickel in a complex form	Analysis, application, understandi ng	2 Theory 6 practica l	Week 17 Week 18
Daily and monthly exams	Lecture	Estimation of aluminum by precipitation as aluminum hydroxide	Analysis, application, understandi ng	2 Theory 6 practica l	Week 19 Week 20
Daily and monthly exams	Lecture	Solubility	Analysis, application, understandi ng	2 Theory 6 practica l	Week 21 Week 22, Week 23
Daily and monthly exams	Lecture	Separation method	Analysis, application, understandi ng	2 Theory 6 practica l	Week 24 , Week 25, Week 26
Daily and monthly exams	Lecture	Determining the iodine content	Analysis, application, understandi ng	2 Theory	Week 27 and Week 28

				6 practica l	
Daily and monthly exams	Lecture	ion exchange	Analysis, application, understandi ng	2 Theory 6 practica l	Week 29 and Week 30
11. Course Evaluation					
The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams, reports, etc.					
12. Learning and teaching resources					
Foundations public For analysis chemist Dr. Safaa Razouk			Required textbooks (methodology, if applicable)		

Course description form

1. Name of course					
Educational leadership and management					
2. Course Code					
EPS201					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025\12\20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 \ 4					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Faten Nawaf Hassan					
8. Objectives of the course					
objectives of the course		<p>1. Understanding the Principles of Educational Administration: Recognizing the foundations of planning, organizing, and directing educational institutions.</p> <p>2. Developing Leadership Skills: Acquiring effective decision-making techniques and managing educational work teams.</p> <p>3. Improving the Learning Environment: Implementing strategies that contribute to raising the efficiency of school or university performance.</p> <p>4. Enhancing Educational Problem-Solving: Addressing administrative challenges scientifically and systematically.</p>			
9. Strategic teaching and learning					
Strategy		Lectures , homework, discussions, using the online classroom			
.Course structure 10					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
61.	2	Understanding, Analysis, and Application	The Concept of Management	Lecture	Exam

62.	2	Understanding, Analysis, and Application	Management in Islam	Lecture	Exam
63.	2	Understanding, Analysis, and Application	The Nature of Management	Lecture	Exam
64.	2	Understanding, Analysis, and Application	Definition of Management	Lecture	Exam
65.	2	Understanding, Analysis, and Application	Elements of the Administrative Process	Lecture	Exam
66.	2	Understanding, Analysis, and Application	Planning	Lecture	Exam
67.	2	Understanding, Analysis, and Application	Importance of Planning	Lecture	Exam
68.	2	Understanding, Analysis, and Application	Organization	Lecture	Exam
69.	2	Understanding, Analysis, and Application	The Five Steps in the Organization Process	Lecture	Exam
70.	2	Understanding, Analysis, and Application	Importance of Organization	Lecture	Exam
71.	2	Understanding, Analysis, and Application	Coordination	Lecture	Exam
72.	2	Understanding, Analysis, and Application	Importance of Coordination	Lecture	Exam
73.	2	Understanding, Analysis, and Application	Directing	Lecture	Exam
74.	2	Understanding, Analysis, and Application	Importance of Directing	Lecture	Exam
75.	2	Understanding, Analysis, and Application	Communication	Lecture	Exam
76.	2	Understanding, Analysis, and Application	Decision Making	Lecture	Exam

77.	2	Understanding, Analysis, and Application	Motivation	Lecture	Exam
78.	2	Understanding, Analysis, and Application	Importance of Motivation	Lecture	Exam
79.	2	Understanding, Analysis, and Application	Supervision and its Importance	Lecture	Exam
80.	2	Understanding, Analysis, and Application	Assessment	Lecture	Exam
81.	2	Understanding, Analysis, and Application	Advantages and Objectives of Assessment	Lecture	Exam
82.	2	Understanding, Analysis, and Application	The Concept of Leadership	Lecture	Exam
83.	2	Understanding, Analysis, and Application	School Administration and its Tasks	Lecture	Exam
84.	2	Understanding, Analysis, and Application	The Need for Theory in Educational Administration	Lecture	Exam
85.	2	Understanding, Analysis, and Application	Classroom Management and its Concept	Lecture	Exam
86.	2	Understanding, Analysis, and Application	The Importance of Classroom Management	Lecture	Exam
87.	2	Understanding, Analysis, and Application	The School and Society	Lecture	Exam
88.	2	Understanding, Analysis, and Application	School Communication Methods	Lecture	Exam
89.	2	Understanding, Analysis, and Application	Parent-Teacher Councils	Lecture	Exam
90.	2	Understanding, Analysis, and Application	School Activities and their Types	Lecture	Exam

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.

12. Learning resources and teaching

required course books (methodology if any)

Educational Administration – Dr.
Siham Abdullah

Course description template

Course Name .1
Second Stage Organic Chemistry (Practical)
Course Code .2
CHEM223
Term/Year .3
annual
Date this description was prepared .4
26 /2/2026
Available attendance formats .5
My presence
Total number of study hours / Total number of units .6
hours of theory + 3 hours of practical work, number of units: 7 2
Name of the course coordinator (if there is more than one, mention it) .7
afrah.h.hazzaa@tu.edu.iq Name : Dr.AfrAh Hatam Hazzaa
Course Objectives .8

,organic compounds , their properties and methods of preparation He is able to understand the general mechanisms and processes of .reactions The student learns how to determine the chemical composition of organic .compounds Synthesis of new organic compounds	Course objectives
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Teaching and learning strategies .9

Theoretical lectures, practical application, online lectures, daily .exams, monthly exams	strategy
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Course Structure .10

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Daily and monthly exams	Lecture	General Safety Guidelines for the Laboratory	,Analysis ,application understanding	Theory 2 3 practical	Week 1, Week 2
Daily and monthly exams	Lecture	Preparation of Adipic Acid (Experiment 1)	,Analysis ,application understanding	Theory 2 3 practical	Week 3 Week 4
Daily and monthly exams	Lecture	Preparation of Adipic Acid (Experiment 2)	,Analysis ,application understanding	Theory 2 3 practical	Week 5 Week 6
Daily and monthly exams	Lecture	Preparation of Benzoic Acid from Toluene	,Analysis ,application understanding	Theory 2 3 practical	Week 7 Week 8
Daily and monthly exams	Lecture	Preparation of 2,4-Dinitrophenylh	,Analysis ,application understanding	Theory 2 3 practical	Week 9 Week 10

		hydrazine (Experiment 1)			
Daily and monthly exams	Lecture	Preparation of 2,4-Dinitrophenylhydrazine (Experiment 2)	,Analysis ,application understanding	Theory 2 3 practical	Week Eleven Week Twelve
Daily and monthly exams	Lecture	Preparation of β -Naphthyl Acetate	,Analysis ,application understanding	Theory 2 3 practical	Week 13 Week Fourteen
Daily and monthly exams	Lecture	Preparation of Aspirin (Acetylsalicylic Acid)	,Analysis ,application understanding	Theory 2 3 practical	Week fifteen Week 16
Daily and monthly exams	Lecture	Preparation of Acetanilide	,Analysis ,application understanding	Theory 2 3 practical	Week 17 Week 18
Daily and monthly exams	Lecture	Alkaline Hydrolysis of Esters (Saponification)	,Analysis ,application understanding	Theory 2 3 practical	Week 19 Week 20
Daily and monthly exams	Lecture	Preparation of Cyclohexene	,Analysis ,application understanding	Theory 2 3 practical	Week 21 Week 22, Week 23
Daily and monthly exams	Lecture	Preparation of Soap (Saponification Reaction)	,Analysis ,application understanding	Theory 2 3 practical	Week 24, Week 26 ,25
Daily and monthly exams	Lecture	Preparation of Ethylene Gas	,Analysis ,application understanding	Theory 2 3 practical	Week 27 and Week 28

Daily and monthly exams	Lecture	Reactions of Methane Gas	,Analysis ,application understanding	Theory 2 3 practical	Week 29 and Week 30
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Course Evaluation .11	
The grade out of 100 is distributed according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, and written exams .reports, etc	
Learning and teaching resources .12	
Mechanisms of Organic Reactions, Dr. Khaled Mahmoud Daoud	Required textbooks (methodology, if applicable)
A Guide to the Mechanisms of Organic Reactions, Peter Sykes A guide to the mechanisms of organic reactions by Dr.Khalid Mahmood Dawod	Main references (sources)D
Journals specializing in organic chemistry	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, websites

Course description template

1. Course Name	
Mathematics	
2. Course Code	
MAT105	
3. Study System	
Annual	
4. Date this description was prepared	
2026/3/3	
5. Available attendance forms for students	
My presence	
. Total number of study hours / Total number of units	
2 / 1	
6. Name of course instructor	
Hayder swadi hamad	
7. Course objectives	
<p>The mathematics course aims to enable first-year chemistry students to acquire the necessary mathematical foundations for understanding and quantitatively analyzing modern chemical :concepts. This is achieved through</p> <ol style="list-style-type: none"> 1) Equipping students with the ability to analyze and graph mathematical functions used to represent relationships. 2) Enabling students to use partial and higher derivatives in studying multivariable changes. 3) Employing integration in solving problems related to chemical kinetics and calculating cumulative quantities such as reaction rate and concentration change. 4) Developing students' ability to study sequences and series and understand the concept of convergence, given its importance in approximate models and numerical calculations 5) Introducing students to matrices, their operations, and their use in solving systems of linear equations that appear in chemical equilibrium problems and spectroscopy. 	<p style="text-align: center;">Course objectives</p>

6) Enabling students to solve first-order differential equations (separable, homogeneous, exact, linear, and Bernoulli's equation).					
Developing analytical mathematical thinking and linking it to practical applications in general and physical chemistry					
8. Teaching and learning strategies					
Understanding, representing, and solving the problem while memorizing the rules.				Strategy	
9. Course Structure					
Evaluation Method	Learning method	Unit or Topic Name	Required learning outcomes	Hours	Week
The exam	Lecture	Constitution	Understanding, analysis, and application	1	.1
The exam	Lecture	Graphing Functions	Understanding, analysis, and application	1	.2
The exam	Lecture	Partial Derivatives	Understanding, analysis, and application	1	.3
The exam	Lecture	Higher partial derivatives	Understanding, analysis, and application	1	.4
The exam	Lecture	Definite integration	Understanding, analysis, and application	1	.5
The exam	Lecture	Double integration	Understanding, analysis, and application	1	.6
The exam	Lecture	Sequences	Understanding, analysis, and application	1	.7
The exam	Lecture	Convergence and divergence of sequences	Understanding, analysis, and application	1	.8
The exam	Lecture	Series	Understanding, analysis, and application	1	.9
The exam	Lecture	Convergence of series	Understanding, analysis, and application	1	.10
The exam	Lecture	matrices	Understanding, analysis, and application	1	.11

The exam	Lecture	Operations on matrices	Understanding, analysis, and application	1	.12
The exam	Lecture	Applications of matrices	Understanding, analysis, and application	1	.13
The exam	Lecture	Power series	Understanding, analysis, and application	1	.14
The exam	Lecture	Taylor series	Understanding, analysis, and application	1	.15
The exam	Lecture	Introduction to Ordinary Differential Equations	Understanding, analysis, and application	1	.16
The exam	Lecture	Equations whose variables are separated	Understanding, analysis, and application	1	.17
The exam	Lecture	homogeneous equations	Understanding, analysis, and application	1	.18
The exam	Lecture	Intersecting heterogeneous equations	Understanding, analysis, and application	1	.19
The exam	Lecture	Inhomogeneous equations parallelism	Understanding, analysis, and application	1	.20
The exam	Lecture	perfect equations	Understanding, analysis, and application	1	.21
The exam	Lecture	Linear differential equations	Understanding, analysis, and application	1	.22
The exam	Lecture	Bernoulli's equation	Understanding, analysis, and application	1	.23

10. Course evaluation	
Students in this course are assessed using a variety of assessment tools, including quizzes, homework assignments, a midterm exam, a final exam, and class participation. These tools aim to measure the extent to which learning outcomes are achieved in terms of understanding, application, and analysis, with an emphasis on the accuracy of solutions, the organization of steps, and the use of .appropriate mathematical methods	
11.Learning and teaching resources	
The learning and teaching process in mathematics relies on a comprehensive set of resources, including traditional resources such as textbooks and classroom lectures, digital resources such as educational platforms and computer programs, as well as self-learning resources and interaction through classroom activities and problem-solving, in addition to various assessment methods that contribute to measuring students' achievement .levels and improving learning outcomes	
1. Calculus – James Stewart. (A fundamental reference in differential and integral calculus and its scientific applications)	Required textbooks (methodology, if applicable)

Course description form

1. Name of course	
Teaching thinking	
2. Course Code	
EPS204	
3. Semester / year	
First and second 2025 – 2026	
4. The date of preparation of this description	
28 / 2 / 2026	
is 5. Available attendance forms	
In-person	
6. Number of study hours (total) / number of units (total)	
1 – Complete	
7. The name of the course administrator (if more than one name is mentioned)	
Dr.Raed Idrees Mahmood	
8. Objectives of the course	
objectives of the course	<p style="text-align: right;">A. Cognitive Objectives</p> <p>A1. The student will be able to identify thinking skills.</p> <p>A2. The student will be able to understand the concepts of thinking skills.</p> <p>A3. The student will be familiar with all methods of teaching thinking skills.</p> <p>A4. The student will be able to apply thinking skills.</p> <p>A5. The student will be familiar with models of thinking skills.</p> <p>A6. The student will learn modern skills and techniques in teaching thinking skills.</p> <p style="text-align: right;">B. Program-Specific Skills Objectives</p> <p>B1. The student will be able to understand cognitive psychology and the measurement and evaluation of the subject matter.</p> <p>B2. The student will be able to choose appropriate methods for presenting the subject matter.</p> <p>B3. The student will be able to solve problems related to understanding the subject matter.</p>

9. Strategic teaching and learning					
Lecture, discussion, and collaborative learning					
.Course structure 10					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
91.	2	Understanding, Analysis, and Application	The Concept of Thinking	Lecture	Exam
92.	2	Understanding, Analysis, and Application	The Concept of Teaching Thinking	Lecture	Exam
93.	2	Understanding, Analysis, and Application	The Historical Development of Teaching Thinking	Lecture	Exam
94.	2	Understanding, Analysis, and Application	Thinking in Islam	Lecture	Exam
95.	2	Understanding, Analysis, and Application	The Role of Arab Philosophers and Scientists in Thinking	Lecture	Exam
96.	2	Understanding, Analysis, and Application	Methods of Teaching Thinking	Lecture	Exam
97.	2	Understanding, Analysis, and Application	The Importance of Teaching Thinking	Lecture	Exam
98.	2	Understanding, Analysis, and Application	How Thinking Occurs	Lecture	Exam
99.	2	Understanding, Analysis, and Application	Learning to Think is a Skill	Lecture	Exam
100.	2	Understanding, Analysis, and Application	Thinking and Intelligence	Lecture	Exam
101.	2	Understanding, Analysis, and Application	Behavioral Approaches to Thinking	Lecture	Exam
102.	2	Understanding, Analysis, and Application	Cognitive Approaches to Thinking	Lecture	Exam
103.	2	Understanding, Analysis, and Application	Ausbel's Approach to Developing Thinking	Lecture	Exam

104.	2	Understanding, Analysis, and Application	Humanistic Approaches	Lecture	Exam
105.	2	Understanding, Analysis, and Application	Hilda Taba's Inductive Approach	Lecture	Exam
106.	2	Understanding, Analysis, and Application	Aspects of Thinking in Children	Lecture	Exam
107.	2	Understanding, Analysis, and Application	Characteristics of Thinking in Children	Lecture	Exam
108.	2	Understanding, Analysis, and Application	Factors Affecting the Development of Thinking	Lecture	Exam
109.	2	Understanding, Analysis, and Application	Methods of Teaching Thinking	Lecture	Exam
110.	2	Understanding, Analysis, and Application	Information on Teaching Thinking	Lecture	Exam
111.	2	Understanding, Analysis, and Application	Methods of Improving Thinking	Lecture	Exam
112.	2	Understanding, Analysis, and Application	International Programs in Teaching Thinking	Lecture	Exam
113.	2	Understanding, Analysis, and Application	Types of Thinking	Lecture	Exam
114.	2	Understanding, Analysis, and Application	Scientific Thinking	Lecture	Exam
115.	2	Understanding, Analysis, and Application	Critical Thinking	Lecture	Exam
116.	2	Understanding, Analysis, and Application	Creative Thinking	Lecture	Exam
117.	2	Understanding, Analysis, and Application	Metacognitive Thinking	Lecture	Exam
118.	2	Understanding, Analysis, and Application	Lateral Thinking	Lecture	Exam
119.	2	Understanding, Analysis, and Application	Astute Thinking	Lecture	Exam

120.	2	Understanding, Analysis, and Application	Deductive Thinking	Lecture	Exam
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11. Evaluation of decision	
25 for the first semester and 25 for the second semester	
12. Learning resources and teaching	
required course books (methodology if any)	Thinking patterns

Description of curriculum for the Chemistry Department thierd stage

Course description form

1. Course Name	
Organic Reaction Mechanisms – Third stage	
2. Course Code	
CHEM325	
3. Semester / Year	
Annual	
4. Date of Preparation	
21-12-2025	
5. Available Attendance Forms	
In-person	
6. Total Study Hours / Total Units	
2 hours theory + 6 hours practical, Total Units: 7	
7. Course Coordinator	
Prof. Dr. Khalid Abdulaziz Atiya Email: khalidalbadrany477@tu.edu.iq	
8. Objectives of the course	
objectives of the course	<ul style="list-style-type: none"> • Learn the mechanisms of organic reactions. • Develop the ability to propose mechanisms for organic reactions. • Learn how to draw three-dimensional structures of organic compounds.
9. Strategic teaching and learning	
	The course is delivered through theoretical lectures, practical applications, electronic

	lectures, daily quizzes, and monthly examinations.
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10.Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
Weeks 1–3	2	Analysis, Application, Understanding	Carbon compounds and chemical bonding	Lecture	Daily and monthly exams
Weeks 4–5	2	Analysis, Application, Understanding	Structure and reactivity	Lecture	Daily and monthly exams
Weeks 6–8	2	Analysis, Application, Understanding	Acids and bases	Lecture	Daily and monthly exams
Weeks 9–11	2	Analysis, Application, Understanding	Reactive organic intermediates	Lecture	Daily and monthly exams
Weeks 12–14	2	Analysis, Application, Understanding	Aliphatic substitution reactions	Lecture	Daily and monthly exams
Weeks 15–17	2	Analysis, Application, Understanding	Elimination reactions	Lecture	Daily and monthly exams
Weeks 18–20	2	Analysis, Application, Understanding	Addition to carbon–carbon multiple bonds	Lecture	Daily and monthly exams
Weeks 21–23	2	Analysis, Application, Understanding	Nucleophilic addition to heteroatom carbon bonds	Lecture	Daily and monthly exams
Weeks 24–26	2	Analysis, Application, Understanding	Oxidation and reduction reactions	Lecture	Daily and monthly exams
Weeks 27–28	2	Analysis, Application, Understanding	Rearrangement reactions	Lecture	Daily and monthly exams
Weeks 29–30	2	Analysis, Application, Understanding	Electrophilic and nucleophilic substitution on aromatic rings	Lecture	Daily and monthly exams

Weeks 29–30	2	Analysis, Application, Understanding	Carbon compounds and chemical bonding	Lecture	Daily and monthly exams
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11. Evaluation of decision

The total grade (100 marks) is distributed according to tasks assigned to the student such as daily preparation, daily quizzes, oral examinations, monthly exams, written exams, reports, and other course activities.

12. Learning resources and teaching

required course books (methodology if any)

Required Textbooks
Organic Reaction Mechanisms – Dr. Khalid Mahmood Dawood
Main References
A Guidebook to Mechanism in Organic Chemistry – Peter Sykes
Guide to Organic Reaction Mechanisms – Fadel Kamouna
Recommended Supporting Resources
Scientific journals specializing in organic chemistry
Electronic References and Websites

Course description form

1. Name of course
Biochemistry
2. Course Code
CHEM351
3. Semester / year
Annual
4. The date of preparation of this description
2025\12\20
is 5. Available attendance forms
In-person
6. Number of study hours (total) / number of units (total)
5 \ 4
7. The name of the course administrator (if more than one name is mentioned)

8. Objectives of the course**objectives of the course**

- Identifying biomolecules and bioactive compounds that contribute to building the body's components.
- Graduating teaching staff well-versed in the fundamentals of chemistry and its various specializations, and their practical application.
- Bridging the gap between theory and practice in the job market.

9. Strategic teaching and learning**strategy**

Lectures, practical experiments, homework, discussions, using the online classroom

10. Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Biochemistry is the branch of chemistry that deals with the essential biomolecules that form the basis of a living organism.	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Carbohydrates, definition of carbohydrates, classification of carbohydrates structural composition of carbohydrates	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Optical efficacy of sugars,	Lecture	Exam
4.	2	Understanding, Analysis, and Application	The cyclic structure of sugars	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Sugar interactions	Lecture	Exam

6.	2	Understanding, Analysis, and Application	Secondary and polysaccharides and their structure	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Fats, Definition of Fats	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Functions of fats, classification of fats	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Lipid composition, lipid analysis	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Saponification, fat reactions	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Amino acids: definition and structure	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Classification of amino acids, visual activity	Lecture	Exam
13.	2	Understanding, Analysis, and Application	titration (of amino acids)	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Amino acid reactions	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Proteins, their functions, their structure	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Protein structure, protein denaturation	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Enzymes: Definition and Classification	Lecture	Exam
18.	2	Understanding, Analysis, and Application	How enzymes work and theories	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Factors affecting enzyme activity, enzyme kinetics	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Vitamins: Definition and Classification	Lecture	Exam

21.	2	Understanding, Analysis, and Application	Types of vitamins, their functions	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Nucleotides	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Structure	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Functions	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Hydrogen Bases	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Structure	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Functions	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Nucleic Acids	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Structure	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Functions	Lecture	Exam

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.

12. Learning resources and teaching

required course books (methodology if any)

Introduction to Biochemistry,
Dr. Khawla Al-Faleh
Biochemistry, Talal Saeed Al-
Najafi
Biochemistry, Tariq Younis

Course description form

1. Name of course					
Counseling and mental health					
2. Course Code					
EPS312					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025\12\20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
3 \ 4					
7. The name of the course administrator (if more than one name is mentioned)					
Dr. Faten Nawaf Hassan					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> • Developing self-awareness: Understanding personal abilities and inclinations and making appropriate academic and career decisions. • Acquiring coping skills: Effectively managing academic pressures and psychological and social challenges. • Improving communication skills: Building positive relationships with peers and faculty members. • Enhancing academic success: Time management, goal setting, and using effective learning strategies. 		
9. Strategic teaching and learning					
strategy			Lectures , homework, discussions, using the online classroom		
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	The Concept of Counseling	Lecture	Exam

2.	2	Understanding, Analysis, and Application	Justifications for Counseling	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Principles of Counseling	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Objectives of Counseling	Lecture	Exam
5.	2	Understanding, Analysis, and Application	The Difference Between Counseling and Psychotherapy	Lecture	Exam
6.	2	Understanding, Analysis, and Application	The Foundations of Counseling	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Theories of Counseling	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Self-Theory	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Behavioral Theory	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Trait and Factor Theory	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Psychoanalytic Theory	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Psychotherapy and Psychoanalysis	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Steps of Therapy According to Psychoanalytic Theory	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Cognitive-Emotive Therapy Theory	Lecture	Exam
15.	2	Understanding, Analysis, and Application	The Concept of Personality	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Methods of Psychological Counseling	Lecture	Exam

17.	2	Understanding, Analysis, and Application	Individual Counseling	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Individual Counseling Techniques	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Group Counseling	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Group Counseling Techniques	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Steps of Direct Counseling	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Indirect Counseling Techniques	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Observation	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Types of Observation	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Observation Procedures	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Advantages of Observation	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Observation Techniques	Lecture	Exam
28.	2	Understanding, Analysis, and Application	The Counseling Interview	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Advantages of the Interview	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Interview Techniques	Lecture	Exam

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.

12. Learning resources and teaching

required course books (methodology if any)	The Psychology of Self-Awareness – Prof. Dr. Muhannad Muhammad Abdul-Sattar
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Course description form

1. Name of course	
Measurement and evaluation	
2. Course Code	
ESP411	
3. Semester / year	
Annual	
4. The date of preparation of this description	
2025\12\20	
is 5. Available attendance forms	
In-person	
6. Number of study hours (total) / number of units (total)	
2 \ 4	
7. The name of the course administrator (if more than one name is mentioned)	
Dr. Faten Nawaf Hassan	
8. Objectives of the course	
objectives of the course	<ol style="list-style-type: none"> 1. Understanding the foundations of educational measurement: Recognizing the concepts of validity and reliability and various assessment tools. 2. Developing effective assessment tools: Designing tests and constructing assessment methods appropriate to educational objectives. 3. Analyzing learning outcomes: Interpreting scores and data to make informed educational decisions. 4. Improving the quality of learning: Using assessment to develop academic performance and enhance learning outcomes.
9. Strategic teaching and learning	
Strategy	Lectures , homework, discussions, using the online classroom
10.Course structure	

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	A Brief Overview of Assessment Development	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Measurement	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Testing	Lecture	Exam
4.	2	Understanding, Analysis, and Application	Assessment	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Factors Contributing to Measurement Errors	Lecture	Exam
6.	2	Understanding, Analysis, and Application	The Importance of Measurement	Lecture	Exam
7.	2	Understanding, Analysis, and Application	The Relationship Between Assessment and Methodology	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Types of Assessment	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Steps for Preparing an Achievement Test	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Types of Achievement Tests	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Oral Tests	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Performance Tests	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Disadvantages of Testing	Lecture	Exam

14.	2	Understanding, Analysis, and Application	Advantages of Testing	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Written Tests	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Undefined Essay Tests	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Short Tests	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Fill-in-the-Blank Tests	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Completion Tests	Lecture	Exam
20.	2	Understanding, Analysis, and Application	True/False Tests	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Matching and Essay Tests	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Areas of Use for Matching	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Rules for Formulating and Preparing Tests	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Scoring Achievement Tests	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Setting Objectives	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Test Instructions	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Test Implementation Project	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Statistical Analysis	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Test Pilot Testing	Lecture	Exam

30.	2	Understanding, Analysis, and Application	Experimental Testing	Lecture	Exam
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11. Evaluation of decision	
For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.	
12. Learning resources and teaching	
required course books (methodology if any)	Educational Measurement and Evaluation – Dr. Asaad Hussein Atwan

Course description form

1. Name of course
Elactif
2. Course Code
EL1100
3. Semester / year
Year
4. The date of preparation of this description
2025/12/20
is 5. Available attendance forms
6. Number of study hours (total) / number of units (total)
2 / 4
7. The name of the course administrator (if more than one name is mentioned)
Assist.Prof. Bushra Abdul-Mertah Khaerolla bushra.col@moheer.gov.iq
8. Objectives of the course

objectives of the course		<ul style="list-style-type: none"> - Helping students understand and grasp the fundamental principles of heterocyclic chemistry. - Addressing the chemical and physical properties, methods of preparation, and the characteristic reactions of these compounds - Enabling students to correctly name heterocyclic compounds - Enabling students to distinguish between heterocyclic and homocyclic compounds 			
9. Strategic teaching and learning					
		<ul style="list-style-type: none"> - Theoretical lectures - Daily and Monthly exams 			
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1	2	Understanding, Analysis, and Application	Definition of heterocyclic compounds and their nomenclature	Lecture	Daily and monthly exams
2	2	Understanding, Analysis, and Application	Five-membered rings with one heteroatom	Lecture	Daily and monthly exams
3	2	Understanding, Analysis, and Application	Six-membered rings with one heteroatom	Lecture	Daily and monthly exams
4	2	Understanding, Analysis, and Application	Five- and six-membered rings containing two heteroatoms	Lecture	Daily and monthly exams

5	2	Understanding, Analysis, and Application	Polycyclic heterocyclic compounds and their nomenclature	Lecture	Daily and monthly exams
6	2	Understanding, Analysis, and Application	Introduction to five-membered rings containing one heteroatom	Lecture	Daily and monthly exams
7	2	Understanding, Analysis, and Application	Pyrrole and its methods of preparation	Lecture	Daily and monthly exams
8	2	Understanding, Analysis, and Application	Physical properties and structure	Lecture	Daily and monthly exams
9	2	Understanding, Analysis, and Application	Chemical properties and reactions	Lecture	Daily and monthly exams
10	2	Understanding, Analysis, and Application	Electrophilic substitution reactions of pyrrole	Lecture	Daily and monthly exams
11	2	Understanding, Analysis, and Application	Pyrrole derivatives	Lecture	Daily and monthly exams
12	2	Understanding, Analysis, and Application	Nitrogen-containing compounds with biological activity	Lecture	Daily and monthly exams
13	2	Understanding, Analysis, and Application	Furan and its methods of preparation	Lecture	Daily and monthly exams
14	2	Understanding, Analysis, and Application	Physical properties and structure	Lecture	Daily and monthly exams

15	2	Understanding, Analysis, and Application	Chemical properties and reactions	Lecture	Daily and monthly exams
16	2	Understanding, Analysis, and Application	Electrophilic substitution reactions of furan	Lecture	Daily and monthly exams
17	2	Understanding, Analysis, and Application	Furan derivatives	Lecture	Daily and monthly exams
18	2	Understanding, Analysis, and Application	Thiophene and its methods of preparation	Lecture	Daily and monthly exams
19	2	Understanding, Analysis, and Application	Physical properties and structure	Lecture	Daily and monthly exams
20	2	Understanding, Analysis, and Application	Chemical properties and reactions	Lecture	Daily and monthly exams
21	2	Understanding, Analysis, and Application	Electrophilic substitution reactions of thiophene	Lecture	Daily and monthly exams
22	2	Understanding, Analysis, and Application	Detection of thiophene	Lecture	Daily and monthly exams
23	2	Understanding, Analysis, and Application	Thiophene derivatives	Lecture	Daily and monthly exams
24	2	Understanding, Analysis, and Application	Solving questions related to five-membered heterocyclic compounds containing one heteroatom	Lecture	Daily and monthly exams

25	2	Understanding, Analysis, and Application	Introduction to six-membered rings containing one heteroatom (Pyridine)	Lecture	Daily and monthly exams
26	2	Understanding, Analysis, and Application	Methods of preparation of pyridine	Lecture	Daily and monthly exams
27	2	Understanding, Analysis, and Application	Physical properties and aromatic character	Lecture	Daily and monthly exams
28	2	Understanding, Analysis, and Application	Chemical properties and reactions	Lecture	Daily and monthly exams
29	2	Understanding, Analysis, and Application	Electrophilic substitution reactions of pyridine	Lecture	Daily and monthly exams
30	2	Understanding, Analysis, and Application	Pyridine derivatives with solved questions	Lecture	Daily and monthly exams

11. Evaluation of decision

The total grade is 100, distributed as follows:
25 marks for the first semester, 25 marks for the second semester,
and 50 marks for the final exam.

12. Learning resources and teaching

required course books (methodology if any)	Books, supporting references, electronic references, and textbooks: Heterocyclic and Biologically Active Compounds Dr. Hamad bin Abdullah Al-Lahidan Dr. Mohammed bin Ibrahim Al-Hassan Dr. Salem Salim Al-Dhiab King Saud University / Kingdom of Saudi Arabia / First Edition
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Course description form

1. Name of course	
Practical Coordination Chemistry Phase Three	
2. Course Code	
3. Semester / year	
2026-2025	
4. The date of preparation of this description	
28-2-2026	
is 5. Available attendance forms	
My presence	
6. Number of study hours (total) / number of units (total)	
The number of units for Inorganic Theory is 7 units - 2 hours / Inorganic Practical: 7 units / 2 hours	
7. The name of the course administrator (if more than one name is mentioned)	
Dr. Musharif Nouri Faisal, Prof. Dr. Ahmed Abdul Sattar Razouqi	
8. Objectives of the course	
objectives of the course	<ol style="list-style-type: none"> 1- and general information on inorganic chemistry coordination 2- methods of to Introducing students along with ,expressing concentrations .providing the relevant rules 3- on how to handle Explanation for students chemicals and available equipment 4- Explanation for students on how to prepare solid solutions And the liquid

	Introducing students to how to measure melting-point, boiling point, and recrystallization
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9. Strategic teaching and learning

tical lectures, daily assignmentspartidiscussion	participation, discussion groups, use of the online classroom
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10.Course structure

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
,Week 1 Week 2	Theory 2 practical2	Analysis, application, understanding	General guidelines for the laboratory	Lecture	
Week 3 Week 4	Theory 2 practical2	Analysis, application, understanding	How to prepare a lab report	Lecture	
Week 5 Week 6	Theory 2 practical2	Analysis, application, understanding	Explanation of transition elements	Lecture	
Week 7 Week 8	Theory 2 practical2	Analysis, application, understanding	Naming coordination complexes	Lecture	
Week 9 Week 10	Theory 2 practical2	Analysis, application, understanding	Explanation of the valence bond theory	Lecture	
Week Eleven Week Twelve	Theory 2 practical2	Analysis, application, understanding	Explanation of nickel and preparation of the complex $[\text{Ni}(\text{NH}_3)_4]^{+2}$	Lecture	
Week 13 Week Fourteen	Theory 2 practical2	Analysis, application, understanding	Explanation of the element copper and preparation of the complex $[\text{Cu}(\text{NH}_3)_4]^{+2}$	Lecture	
Week 15 Week 16	Theory 2 2practical	Analysis, application, understanding	Preparation of the cobalt complex	Lecture	
Week17 Week18	Theory 2 2practical	Analysis, application, understanding	Preparation of the complex $[\text{Cu}(\text{C}_2\text{O}_4)_2]$	Lecture	
Week 19 Week 20	Theory2 Partical2	Analysis, application, understanding	Explanation of isomers	Lecture	

Week 21 ,Week 22 Week 23	Theory 2 2practical	Analysis, application, understanding	Explanation of opposite and adjacent isomers	Lecture	
,Week 24 ,Week 25 Week 26	Theory2 2practical	Analysis, application, understanding	Preparation of [$\text{Cr}(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2$]	Lecture	
Week 27 and Week 28	Theory 2 practical 6	Analysis, application, understanding	Explanation of bonding isomers and preparation complex of the K_3 [$\text{Fe}(\text{NO}_2)_6$]	Lecture	
Week 29 and Week 3	Theory 2 2practical	n applicati Analysis understanding	the $\text{Hg}[\text{Co}(\text{SCN})_4]$ complex	Lecture	

11. Evaluation of decision

,The grade out of 100 is distributed according to the tasks assigned to the student .such as daily preparation, daily, oral, monthly, and written exams, reports, etc

12. Learning resources and teaching

required course books (methodology if any)

Mohammed Magdi wasil
Foundations Chemistry
harmony authorship

Course Description Form

1. Course Name:	
physical chemistry/third class	
2. Course Code:	
CHEM341	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
2026/2/22	
5. Available Attendance Forms:	
presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours weekly /3 experimental total unit (7)	
7. Course administrator's name (mention all, if more than one name)	
Ahmed saeed othman	
Email: Dra.dabbagh@tu.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • • Learn to measure the molecular weight of volatile liquids • It can measure the density of solid materials • It is able to distinguish between endothermic and endothermic reactions. • Learn to measure the surface tension of liquids •
9. Teaching and Learning Strategies	
Strategy	Theoretical explanation of the experiment, practical application, lectures, daily exams, monthly exams
10. Course Structure	

Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation
		Outcomes			method
1-2	(2) Theoretical 3 Practical Each week	Analysis, application, understanding	Rate of reaction	Lecture	Daily and monthly exams
3-4	(2) Theoretical 3 Practical Each week	Analysis, application, understanding	Zero order reaction	Lecture	Daily and monthly exams
5-6	2) Theoretical 3 Practical Each week	Analysis, application, understanding	First order reaction	Lecture	Daily and monthly exams
7-8	2) Theoretical 3 Practical	Analysis, application, understanding	Second order reaction	Lecture	Daily and monthly exams
9-10	2) Theoretical 3 Practical	Analysis, application, understanding	Third order reaction	Lecture	Daily and monthly exams
11-12	2) Theoretical 3 Practical	Analysis, application, understanding	Complex reaction	Lecture	Daily and monthly exams

13-14	2)Theoretical 3 Practical	Analysis, application, understanding	Method for measuring order of reactions	Lecture	Daily and monthly exams
15-16	2)Theoretical 3 Practical	Analysis, application, understanding	Theory of reaction rate	Lecture	Daily and monthly exams
17-18	2)Theoretical 3 Practical	Analysis, application, understanding	Chain reaction	Lecture	Daily and monthly exams
19-20	2)Theoretical 3 Practical	Analysis, application, understanding	Parallel reaction	Lecture	Daily and monthly exams
21-22	2)Theoretical 3 Practical	Analysis, application, understanding	Ionic reactions	Lecture	Daily and monthly exams
23-24	2)Theoretical 3 Practical	Analysis, application, understanding	Catalytic reaction	Lecture	Daily and monthly exams
25-26	2)Theoretical 3 1 3 Practical	Analysis, application, understanding	Methods for measuring order of reactions	Lecture	Daily and monthly exams

27-28	2)Theoretical 13 Practical	Analysis, application, understanding	Introduction to electrochemistry Types of electrical conductors	Lecture	Daily and monthly exams
29	2)Theoretical 3 Practical	Analysis, application, understanding	Specific and equivalent conductance Electrical cells types and method of junction	Lecture	Daily and monthly exams
30	2)Theoretical 3 Practical	Analysis, application, understanding	Faradays law and its application Nernst equation and its application	Lecture	Daily and monthly exams

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11. Course Evaluation

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

12. Learning and Teaching Resources

preparation, daily oral, monthly, or written

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course description form

1. Name of course					
Corrdination Chemistry – Third Year					
2. Course Code					
CHEM331					
3. Semester / year					
Annual					
4. The date of preparation of this description					
2025\12\20					
is 5. Available attendance forms					
In-person					
6. Number of study hours (total) / number of units (total)					
2 hours theoretical and 2 hours practical / 6 credit units					
7. The name of the course administrator (if more than one name is mentioned)					
Prof. Dr. Ahmed Abdul Sattar Irzoqi					
8. Objectives of the course					
objectives of the course		<p>Introducing students to coordination compounds, their components, properties, and the various methods of their formation.</p> <ul style="list-style-type: none"> • Familiarizing students with the scientific theories related to coordination complexes, including their assumptions, strengths, and limitations. • Training students in methods of solving and interpreting coordination complexes according to each theoretical approach. • Introducing students to the methods of preparation, reactions, and the kinetics of coordination compounds. 			
9. Strategic teaching and learning					
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	Introduction to Coordination Chemistry	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Transition Elements	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Electronic Configuration	Lecture	Exam

4.	2	Understanding, Analysis, and Application	Chemical and Physical Properties	Lecture	Exam
5.	2	Understanding, Analysis, and Application	Types of Ligands	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Types of Complexes	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Coordination Numbers	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Nomenclature of Coordination Compounds	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Geometrical Isomerism	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Chain Theory	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Werner's Theory	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Effective Atomic Number (EAN)	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Valence Bond Theory (VBT)	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Valence Bond Theory (VBT)	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Valence Bond Theory (VBT)	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Magnetic Properties	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Crystal Field Theory (CFT)	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Crystal Field Theory (CFT)	Lecture	Exam
19.	2	Understanding, Analysis, and Application	Crystal Field Theory (CFT)	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Crystal Field Theory (CFT)	Lecture	Exam
21.	2	Understanding, Analysis, and Application	Crystal Field Theory (CFT)	Lecture	Exam
22.	2	Understanding, Analysis, and Application	Molecular Orbital Theory (MOT)	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Molecular Orbital Theory (MOT)	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Molecular Orbital Theory (MOT)	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Molecular Orbital Theory (MOT)	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Molecular Orbital Theory (MOT)	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Electronic Spectra	Lecture	Exam

28.	2	Understanding, Analysis, and Application	Methods of Preparation of Coordination Compounds	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Factors Affecting Stability	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Kinetics and Mechanisms of Coordination Compounds	Lecture	Exam

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.

12. Learning resources and teaching

required course books (methodology if any)

The course relies on the prescribed textbook and the instructor's lecture notes, which are compiled from several scientific references, in addition to selected scientific websites available on the Internet

- inorganic and Coordination Chemistry, by Dr. Saad Izz al-Din Al-Mukhtar et al.
- Coordination Chemistry, by Dr. Issam Jirjis

Course description form

1. Name of course					
Theoretical Industrial for Third class					
2. Course Code					
CHEM361					
3. Semester / year					
Final /annual					
4. The date of preparation of this description					
20/12/2025					
5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
60/6					
7. The name of the course administrator (if more than one name is mentioned)					
Dr.Afrah Hatam Hazzaa					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> • Introducing the student to the concept of industrial chemistry • Knowledge of industrial chemistry departments and branches with the ability to analyze industrial processes • Know the most important types of chemical industries available in Iraq and use industrial technology Deep understanding of chemical processes 		
9. Strategic teaching and learning					
Attendance					
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Understanding, Analysis, and Application	General Introduction to the Importance of Industrial Chemistry	Lecture	Exam
2.	2	Understanding, Analysis, and Application	Cement – Cement Industry – Types of Cement	Lecture	Exam
3.	2	Understanding, Analysis, and Application	Oils and Fatty Acids	Lecture	Exam
4.	2	Understanding, Analysis, and Application	General Introduction to Petroleum, Its Importance, Methods of	Lecture	Exam

			Extraction and Storage		
5.	2	Understanding, Analysis, and Application	Chemical Composition of Crude Oil	Lecture	Exam
6.	2	Understanding, Analysis, and Application	Classification of Crude Oil and Its Physical and Chemical Properties	Lecture	Exam
7.	2	Understanding, Analysis, and Application	Crude Oil Treatment and Preparation for Refining	Lecture	Exam
8.	2	Understanding, Analysis, and Application	Physical Processes Applied to Crude Oil	Lecture	Exam
9.	2	Understanding, Analysis, and Application	Chemical Processes Applied to Crude Oil	Lecture	Exam
10.	2	Understanding, Analysis, and Application	Some Petroleum Derivatives	Lecture	Exam
11.	2	Understanding, Analysis, and Application	Major Petrochemical Industries	Lecture	Exam
12.	2	Understanding, Analysis, and Application	Raw Materials in Petrochemical Industries	Lecture	Exam
13.	2	Understanding, Analysis, and Application	Butyl Alcohol and Isobutyl Alcohol	Lecture	Exam
14.	2	Understanding, Analysis, and Application	Thermal Cracking of Paraffinic Hydrocarbons	Lecture	Exam
15.	2	Understanding, Analysis, and Application	Aromatic Compounds as Raw Materials for Petrochemical Industries	Lecture	Exam
16.	2	Understanding, Analysis, and Application	Xylene Production	Lecture	Exam
17.	2	Understanding, Analysis, and Application	Alkylation Reactions	Lecture	Exam
18.	2	Understanding, Analysis, and Application	Introduction to Halogenated Compounds in ...	Lecture	Exam
19.	2	Understanding, Analysis, and Application	General Introduction to the Importance of Industrial Chemistry	Lecture	Exam
20.	2	Understanding, Analysis, and Application	Cement – Cement Industry – Types of Cement	Lecture	Exam

21.	2	Understanding, Analysis, and Application	Oils and Fatty Acids	Lecture	Exam
22.	2	Understanding, Analysis, and Application	General Introduction to Petroleum, Its Importance, Methods of Extraction and Storage	Lecture	Exam
23.	2	Understanding, Analysis, and Application	Chemical Composition of Crude Oil	Lecture	Exam
24.	2	Understanding, Analysis, and Application	Classification of Crude Oil and Its Physical and Chemical Properties	Lecture	Exam
25.	2	Understanding, Analysis, and Application	Crude Oil Treatment and Preparation for Refining	Lecture	Exam
26.	2	Understanding, Analysis, and Application	Physical Processes Applied to Crude Oil	Lecture	Exam
27.	2	Understanding, Analysis, and Application	Chemical Processes Applied to Crude Oil	Lecture	Exam
28.	2	Understanding, Analysis, and Application	Some Petroleum Derivatives	Lecture	Exam
29.	2	Understanding, Analysis, and Application	Major Petrochemical Industries	Lecture	Exam
30.	2	Understanding, Analysis, and Application	Raw Materials in Petrochemical Industries	Lecture	Exam

11. Evaluation of decision

25 first term , 25 second term and 50 for final exam.

12. Learning resources and teaching

required course books (methodology if any)

**Industrial chemistry &
Industrial Pollution by
Dr.Omar Musa Ramadan
Dr.Tark Kahia**

Description of curriculum for the Chemistry Department fourth stage

Course description form

1. Name of course	
Theoretical Organic Spectroscopic Identification	
2. Course Code	
CHEM427	
3. Semester / year	
Annual	
4. The date of preparation of this description	
20 – 12 – 2025 AD	
5. Available attendance forms is	
Physical and Online Attendance	
6. Number of study hours (total) / number of units (total)	
7. The name of the course administrator (if more than one name is mentioned)	
4 / 5	
8. Objectives of the course	
objectives of the course	<ol style="list-style-type: none">1. Enable students to understand the principles and fundamentals of spectroscopic analysis.2. Develop skills in using modern spectroscopic instruments for the identification of organic compounds.3. Enhance students' critical and research thinking skills.4. Prepare qualified personnel capable of contributing to academic and industrial fields.
9. Strategic teaching and learning	
10. Course structure	

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	Chemistry Instructor	UV-Vis Spectroscopy, Basic Devices and Nature of UV Spectroscopy	Lecture + discussion + training	Exam
2.	2	Chemistry Instructor	Qualitative Aspects of UV Spectroscopy	Lecture + discussion + training	Exam
3.	2	Chemistry Instructor	UV Absorber Band Classification	Lecture + discussion + training	Exam
4.	2	Chemistry Instructor	UV Spectroscopy: Chromophores, Degree of Unsaturation, Coupling, and Factors Affecting Bundles Location	Lecture + discussion + training	Exam
5.	2	Chemistry Instructor	Rules for Coupled Systems	Lecture + discussion + training	Exam
6.	2	Chemistry Instructor	Infrared Spectroscopy and Important Infrared Chromophores	Lecture + discussion + training	Exam
7.	2	Chemistry Instructor	Alkanes, Alkenes, Alkynes	Lecture + discussion + training	Exam
8.	2	Chemistry Instructor	Aromatic Hydrocarbons, Heterocyclic Aromatic Compounds	Lecture + discussion + training	Exam

9.	2	Chemistry Instructor	Halogen Compounds (fluorine, chlorine, bromine, iodine)	Lecture + discussion + training	Exam
10.	2	Chemistry Instructor	Ethers and Related Compounds	Lecture + discussion + training	Exam
11.	2	Chemistry Instructor	Alcohols, Phenols, Ethers, Epoxides	Lecture + discussion + training	Exam
12.	2	Chemistry Instructor	Nitrogen Compounds	Lecture + discussion + training	Exam
13.	2	Chemistry Instructor	Sulfur Compounds and Carbonyl Compounds	Lecture + discussion + training	Exam
14.	2	Chemistry Instructor	Interferences in Infrared Spectra	Lecture + discussion + training	Exam
15.	2	Chemistry Instructor	Spectral Exercises	Lecture + discussion + training	Exam
16.	2	Chemistry Instructor	Proton NMR Spectrum, Chemical Shifts	Lecture + discussion + training	Exam
17.	2	Chemistry Instructor	Alkanes, Alkenes, Alkynes	Lecture + discussion + training	Exam
18.	2	Chemistry Instructor	Aromatic Hydrocarbons, Heterocyclic Aromatic Compounds	Lecture + discussion + training	Exam
19.	2	Chemistry Instructor	Halogen Compounds	Lecture + discussion + training	Exam

20.	2	Chemistry Instructor	Alcohols, Ethers, and Related Compounds	Lecture + discussion + training	Exam
21.	2	Chemistry Instructor	Nitrogen Compounds, Sulfur Compounds	Lecture + discussion + training	Exam
22.	2	Chemistry Instructor	Aldehydes, Ketones, Carboxylic Acids	Lecture + discussion + training	Exam
23.	2	Chemistry Instructor	Esters, Lactones	Lecture + discussion + training	Exam
24.	2	Chemistry Instructor	Amides, Lactams, Amino Acids	Lecture + discussion + training	Exam
25.	2	Chemistry Instructor	Spectral Exercises	Lecture + discussion + training	Exam
26.	2	Chemistry Instructor	Mass Spectrometry, Ionization Processes	Lecture + discussion + training	Exam
27.	2	Chemistry Instructor	Mass Spectral Data	Lecture + discussion + training	Exam
28.	2	Chemistry Instructor	Representation of Fragmentation Spectra	Lecture + discussion + training	Exam
29.	2	Chemistry Instructor	Factors Governing Fragmentation Spectra	Lecture + discussion + training	Exam
30.	2	Chemistry Instructor	Fragmentation Spectra Interpretation Exercises	Lecture + discussion + training	Exam

11. Evaluation of decision

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily and monthly exams, written and oral exams, reports, assignments, and extracurricular activities

Attendance and Participation: 5%

Daily Exams: 5%

Reports and Assignments: 5%

Written Exam: 85%

12. Learning resources and teaching

**required course books
(methodology if any)**

- 1. (Spectrometric Identification of Organic Compounds) by Robert M. Silverstein, Francis X. Webster, and David J. Kiemle, 7th edition, published by John Wiley & Sons in 2014.**
- 2. (Introduction to Spectroscopy) by Donald L. Pavia, Gary M. Lampman, George S. Kriz, and James R. Vyvyan, 4th edition, published by Cengage Learning.**
- 3. (Organic Spectroscopy) by William Kemp, 2nd edition, published by Palgrave Macmillan in 1995.**
- 4. (Introduction to Organic Spectroscopy) by Laurence M. Harwood and Timothy D. W. Claridge, 2nd edition, published by Oxford University Press in 1999.**
- 5. (Organic Structures from Spectra) by Leslie D. Field, Sev Sternhell, and John R. Kalman, 5th edition, published by Wiley-Blackwell in 2012.**
- 6. (Structure Elucidation by NMR in Organic Chemistry: A Practical Guide) by Eberhard Breitmaier, 3rd edition, published by Wiley-VCH in 2002.**

Course description form

1. Name of course					
Industrial Chemistry - Phase IV					
2. Course Code					
CHEM463					
3. Semester / year					
final / Annual					
4. The date of preparation of this description					
20/12/2025					
is 5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
60/7					
7. The name of the course administrator (if more than one name is mentioned)					
Assistant Lecturer . ibrahim Abdullah Ali					
8. Objectives of the course					
objectives of the course				Knowing , behaviour , practical	
9. Strategic teaching and learning					
Attendance					
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2Theoretical 2Practical	Understanding, Analysis, and Application	General Introduction to the Importance of Industrial Chemistry	Lecture	Exam
2.	2Theoretical 2Practical	Understanding, Analysis, and Application	Types of chemical industrial processes	Lecture	Exam
3.	2Theoretical 2Practical	Understanding, Analysis, and Application	Polymers, Classification of Polymers	Lecture	Exam
4.	2Theoretical 2Practical	Understanding, Analysis, and Application	Polymer Label	Lecture	Exam
5.	2Theoretical 2Practical	Understanding, Analysis, and Application	Molecular weight of polymers	Lecture	Exam

6.	2Theoretical 2Practical	Understanding, Analysis, and Application	Methods for assigning molecular weights to polymers	Lecture	Exam
7.	2Theoretical 2Practical	Understanding, Analysis, and Application	Physical properties of polymers	Lecture	Exam
8.	2Theoretical 2Practical	Understanding, Analysis, and Application	Classification of polymerization reactions	Lecture	Exam
9.	2Theoretical 2Practical	Understanding, Analysis, and Application	Classification of polymerization chained with free radicals	Lecture	Exam
10.	2Theoretical 2Practical	Understanding, Analysis, and Application	Ion additive polymerization	Lecture	Exam
11.	2Theoretical 2Practical	Understanding, Analysis, and Application	Coordinating polymerization	Lecture	Exam
12.	2Theoretical 2Practical	Understanding, Analysis, and Application	Intensified polymerization reactions	Lecture	Exam
13.	2Theoretical 2Practical	Understanding, Analysis, and Application	Resins + Plastic	Lecture	Exam
14.	2Theoretical 2Practical	Understanding, Analysis, and Application	The most important plastic industries	Lecture	Exam
15.	2Theoretical 2Practical	Understanding, Analysis, and Application	Natural and synthetic rubber	Lecture	Exam
16.	2Theoretical 2Practical	Understanding, Analysis, and Application	Fiber Industry	Lecture	Exam
17.	2Theoretical 2Practical	Understanding, Analysis, and Application	Natural and synthetic fibers	Lecture	Exam
18.	2Theoretical 2Practical	Understanding, Analysis, and Application	Colorful Material	Lecture	Exam
19.	2Theoretical 2Practical	Understanding, Analysis, and Application	Dye Manufacturing	Lecture	Exam
20.	2Theoretical 2Practical	Understanding, Analysis, and Application	Erosion and its theories	Lecture	Exam

21.	2Theoretical 2Practical	Understanding, Analysis, and Application	Soap & Detergent Industry	Lecture	Exam
22.	2Theoretical 2Practical	Understanding, Analysis, and Application	Pesticide industry and types	Lecture	Exam
23.	2Theoretical 2Practical	Understanding, Analysis, and Application	Insecticides, bush, rodents	Lecture	Exam
24.	2Theoretical 2Practical	Understanding, Analysis, and Application	Cement industry, raw materials	Lecture	Exam
25.	2Theoretical 2Practical	Understanding, Analysis, and Application	Cement Types and Specifications	Lecture	Exam
26.	2Theoretical 2Practical	Understanding, Analysis, and Application	Paper Industry	Lecture	Exam
27.	2Theoretical 2Practical	Understanding, Analysis, and Application	Sugar industry	Lecture	Exam
28.	2Theoretical 2Practical	Understanding, Analysis, and Application	Oil Industry	Lecture	Exam
29.	2Theoretical 2Practical	Understanding, Analysis, and Application	Petroleum Industry	Lecture	Exam
30.	2Theoretical 2Practical	Understanding, Analysis, and Application	Oil production methods and specifications	Lecture	Exam

11. Evaluation of decision

The grade is distributed as follows: 17 for theory and 8 for practical for the first semester, and 18 for theory and 7 for practical for the second semester.

12. Learning resources and teaching

required course books (methodology if any)

Industrial Chemistry and
Industrial Pollution
Doctor. Omar Musa Ramadan

Course description form

1. Name of course					
Industrial Chemistry Fourth Stage Theoretical					
2. Course Code					
CHEM463					
3. Semester / year					
2025/2026					
4. The date of preparation of this description					
20/12/2025					
is 5. Available attendance forms					
Attendance					
6. Number of study hours (total) / number of units (total)					
2/7					
7. The name of the course administrator (if more than one name is mentioned)					
Assistant Professor Dr. Qadir Abdullah Shannak					
8. Objectives of the course					
objectives of the course			<ul style="list-style-type: none"> • Introducing the student to the concept of industrial chemistry • Knowledge of industrial chemistry departments and branches with the ability to analyze industrial processes • Know the most important types of chemical industries available in Iraq and use industrial technology • Deep understanding of chemical processes in terms of chemical reactions 		
9. Strategic teaching and learning					
			Duties, reports and daily tests Various daily questions analytical and interpretive during the lesson 3. Directing students to benefit from the external resources available around the course		
10. Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2	General Introduction to the	General Introduction to Industrial	Lecture	General discussion

		Importance of Industrial Chemistry	Chemistry Applications		and questions
2.	2	Types of chemical industrial processes	Type of Industrial Business	Lecture	General discussion and questions
3.	2	Classification of polymers	Classification of Polymers	Lecture	Discussion and general questions
4.	2	Polymer Label	Nomenclature of Polymers	Lecture	General discussion and questions
5.	2	Molecular weight of polymers	Polymerization	Lecture	General discussion and questions
6.	2	Methods for assigning molecular weights to polymers	Methods of Ozone Determination of Polymers	Lecture	General discussion and questions
7.	2	Physical properties of polymers	Physical Properties of Polymers	Lecture	Discussion and general questions
8.	2	Classification of polymerization reactions	Classification of Polymerization Reactions	Lecture	Discussion and general questions
9.	2	Classification of polymerization chained with free radicals	Classification of Free Radical Chain Polymerization	Lecture	Discussion and general questions
10.	2	Polymerize the Ion additive	Ionic Addition Polymerization	Lecture	Discussion and general questions
11.	2	Coordinating polymerization		Lecture	Daily Exam

12.	2	Intensified polymerization reactions	Muscular Polymerization	Lecture	Discussion and general questions
13.	2	Resins + Plastic		Lecture	Daily Exam
14.	2	The most important plastic industries	Intensive Polymerization Reactions	Lecture	General Questions
15.	2	Natural and synthetic rubber	Resins + Plastics	Lecture	General Questions
16.	2	Fiber Industry		Lecture	Daily Exam
17.	2	Natural and synthetic fibers	Importance of the Plastics Industry	Lecture	Scientific discussion and questions
18.	2	Colorful Material	Natural Rubber and Industry	Lecture	Daily Exam
19.	2	Dye Manufacturing	Pesticide manufacturing and types	Lecture	Discussion and general questions
20.	2	Erosion and its theories	Insecticides, herbicides, and rodenticides	Lecture	General Questions
21.	2	Soap & Detergent Industry	Cement manufacturing and raw materials	Lecture	General Questions
22.	2	Pesticide industry and types		Lecture	Daily Exam
23.		Insecticides, bush, land	Types of cement and their specifications	Lecture	General Questions

24.	2	Cement industry, raw materials	Paper manufacturing	Lecture	Discussion
25.	2	Cement Types and Specifications		Lecture	General Questions
26.	2	Paper Industry		Lecture	Daily Exam
27.	2	Sugar industry	Sugar manufacturing	Lecture	Discussion
28.	2	Oil Industry		Lecture	General Questions
29.	2	Petroleum Industry		Lecture	Discussion
30.	2	Petroleum production methods and specifications, production of some halogenic vehicles		Lecture	Daily Exam

11. Evaluation of decision

Distribution of the grade of the first semester Theoretical = 17 Practical = 8

Grade 2

Theoretical = 18

Practical = 7

Final grade = 50

12. Learning resources and teaching

required course books (methodology if any)

**Industrial Chemistry and Industrial Pollution
Dr. Omar Moussa
Ramadan**

Course description form

1. Name of course	
Instrumental Analysis (Practical)	
2. Course Code	
CH17	
3. Semester / year	
Annual	
4. The date of preparation of this description	
20-12-2025	
is 5. Available attendance forms	
In-person	
6. Number of study hours (total) / number of units (total)	
2 Practical hours, Total units: 6	
7. The name of the course administrator (if more than one name is mentioned)	
Name: Assist. Prof. Mohannad Faisal Shareef Email: mohannad.f.shareef@tu.edu.iq	
8. Objectives of the course	
objectives of the course	<ul style="list-style-type: none"> • To understand the concept of instrumental analysis. • To apply different spectroscopic instruments. • To perform practical experiments in the laboratory. • To develop the ability to analyze experimental data.
9. Strategic teaching and learning	

Strategy			Theoretical lectures, electronic lectures, daily exams, and monthly exams.		
10.Course structure					
week	hours	required learning outputs	unit name or subject	learning	method evaluation method
1.	2 hours	Understanding, analysis, application	General introduction	Lecture and discussion	Daily and monthly exams
2.	2 hours	Understanding, analysis, application	General introduction	Lecture and discussion	Daily and monthly exams
3.	2 hours	Understanding, analysis, application	Determination of maximum absorption wavelength (λ_{max}) for potassium permanganate solution ($KMnO_4$)	Lecture and discussion	Daily and monthly exams
4.	2 hours	Understanding, analysis, application	Explanation of Beer–Lambert Law	Lecture and discussion	Daily and monthly exams
5.	2 hours	Understanding, analysis, application	Molecular visible spectroscopy – determination of ferric ion	Lecture and discussion	Daily and monthly exams
6.	2 hours	Understanding, analysis, application	Atomic absorption spectroscopy – determination of copper	Lecture and discussion	Daily and monthly exams
7.	2 hours	Understanding, analysis, application	Flame photometry – determination of sodium and potassium		Daily and monthly exams
8.	2 hours	Understanding, analysis, application	Photometric titration – determination of benzoic acid	Lecture and discussion	Daily and monthly exams
9.	2 hours	Understanding, analysis, application	Spectrophotometric determination of ferric ion with thiocyanate	Lecture and discussion	Daily and monthly exams
10.	2 hours	Understanding, analysis, application	Spectrophotometric determination of nitrite using diazotization and coupling reactions	Lecture and discussion	Daily and monthly exams

11.	2 hours	Understanding, analysis, application	Spectrophotometric determination of manganese by oxidation with potassium periodate	Lecture and discussion	Daily and monthly exams
12.	2 hours	Understanding, analysis, application	Spectrophotometric determination of ferrous ion using 1,10-phenanthroline reagent and evaluation of accuracy and precision	Lecture and discussion	Daily and monthly exams
13.	2 hours	Understanding, analysis, application	Spectrophotometric determination of glycine using chloranil and determination of complex nature and stability constant	Lecture and discussion	Daily and monthly exams
14.	2 hours	Understanding, analysis, application	Determination of benzoic acid by photometric titration	Lecture and discussion	Daily and monthly exams
15.	2 hours	Understanding, analysis, application	Determination of zinc by photometric titration with EDTA	Lecture and discussion	Daily and monthly exams
16.	2 hours	Understanding, analysis, application	Determination of iron by volumetric titration with EDTA	Lecture and discussion	Daily and monthly exams
17.	2 hours	Understanding, analysis, application	Determination of copper by photometric titration	Lecture and discussion	Daily and monthly exams
18.	2 hours	Understanding, analysis, application	Determination of sulfate by nephelometry	Lecture and discussion	Daily and monthly exams
19.	2 hours	Understanding, analysis, application	Determination of sodium and potassium using flame emission technique	Lecture and discussion	Daily and monthly exams
20.	2 hours	Understanding, analysis, application	Determination of calcium and barium using flame emission technique	Lecture and discussion	Daily and monthly exams
21.	2 hours	Understanding, analysis, application	Determination of iodide by	Lecture and discussion	Daily and monthly exams

			potentiometric titration		
22.	2 hours	Understanding, analysis, application	Determination of vitamin C in pharmaceutical tablets using polarography technique	Lecture and discussion	Daily and monthly exams
23.	2 hours	Understanding, analysis, application	Determination of chloride and iodide by potentiometric titration	Lecture and discussion	Daily and monthly exams
24.	2 hours	Understanding, analysis, application	Spectrophotometric determination of ferric ion with thiocyanate	Lecture and discussion	Daily and monthly exams
25.	2 hours	Understanding, analysis, application	Spectrophotometric determination of nitrite using diazotization and coupling reactions	Lecture and discussion	Daily and monthly exams
26.	2 hours	Understanding, analysis, application	Spectrophotometric determination of manganese by oxidation with potassium periodate	Lecture and discussion	Daily and monthly exams
27.	2 hours	Understanding, analysis, application	Spectrophotometric determination of ferrous ion using 1,10-phenanthroline reagent and evaluation of accuracy and precision	Lecture and discussion	Daily and monthly exams
28.	2 hours	Understanding, analysis, application	Spectrophotometric determination of glycine using chloranil and determination of complex nature and stability constant	Lecture and discussion	Daily and monthly exams
29.	2 hours	Understanding, analysis, application	Laws for calculating concentration in gravimetric analysis	Lecture and discussion	Daily and monthly exams
30.	2 hours	Understanding, analysis, application	Laws for calculating concentration in volumetric analysis	Lecture and discussion	Daily and monthly exams

11. Evaluation of decision	
The grade is distributed out of 100 according to the tasks assigned to the student such as daily preparation, daily exams, oral exams, monthly exams, written exams, reports, etc.	
12. Learning resources and teaching	
required course books (methodology if any)	Practical Instrumental Analysis
Main References	Instrumental Analysis – Dr. Mohsen Al-Haideri
Recommended Supporting Books and References	Scientific journals and reports related to analytical chemistry.
Electronic References and Websites	Practical experimental videos available on internet websites.

Course Description Form

1. Course Name:	
Instrumental chemistry / Fourth stage	
2. Course Code:	
CHEM415	
3. Semester / Year:	
Year	
4. Description Preparation Date:	
20-12-2025	
5. Available Attendance Forms:	
In presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 theoretical hours + 6 practical hours, number of units 9	
7. Course administrator's name (mention all, if more than one name)	
Name:	Dr. Omar Adnan Hashem
Email:	omashem@tu.edu.jo
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> The student learns about devices and technologies. He is able to identify the basic components of each device Learns to solve mathematical problems using

	different laws
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9. Teaching and Learning Strategies

Strategy	Theoretical lectures, practical application, electronic lectures, daily exams, monthly exams.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1, 2	³ Theoretical	Analyze, apply, understand	Introduction to analytical chemistry and the concept of instrumental analysis	lecture	Daily and monthly examinations
3, 6	³ Theoretical	Analyze, apply, understand	Electromagnetic radiation and its effect on matter	lecture	Daily and monthly examinations
7, 9	³ Theoretical	Analyze, apply, understand	Quantitative analysis by electromagnetic radiation absorption	lecture	Daily and monthly examinations
10, 13	³ Theoretical	Analyze, apply, understand	Spectroscopic instruments and their components	lecture	Daily and monthly examinations

14, 16	³ Theoretical	Analyze, apply, understand	Applications of absorption measurements in ultraviolet and visible spectroscopy	lecture	Daily and monthly examinations
17	³ Theoretical	Analyze, apply, understand	Analysis by measuring scattering and turbidity	lecture	Daily and monthly examinations
18, 20	³ Theoretical	Analyze, apply, understand	Atomic spectroscopy	lecture	Daily and monthly examinations
21, 23	³ Theoretical	Analyze, apply, understand	Electrochemical analysis	lecture	Daily and monthly examinations
24, 26	³ Theoretical	Analyze, apply, understand	Voltametrics	lecture	Daily and monthly examinations
27, 28	³ Theoretical	Analyze, apply, understand	Polarography	lecture	Daily and monthly examinations
29, 30	³ Theoretical	Analyze, apply, understand	Chemical precipitation – and Coulomb measurement	lecture	Daily and monthly examinations

11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily etc preparation, daily oral, monthly, or written exams, reports					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)		1- Instrumental Chemical Analysis: Dr. Abdul Mohsen Abdul Hamid Al-Haidari. 2- Principles of Instrumental Analysis: Dr. Zuher matti Al- Kaser . 3- Harris D.C. "Quantitative chemical Analysis " , 6 th Ed. Freeman and Company , New York,2003			
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

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Course description form

1. Name of course	
Quantum Chemistry and Spectroscopy	
2. Course Code	
CHEM454	
3. Semester / year	
2026/2025	
4. The date of preparation of this description	
2026/3/14	
is 5. Available attendance forms	
In-person	
6. Number of study hours (total) / number of units (total)	
4/2	
7. The name of the course administrator (if more than one name is mentioned)	
Phd> Ahmed Saleh Yaseen	
8. Objectives of the course	
objectives of the course	1. To understand the theoretical foundations of quantum mechanics underlying atomic and molecular structure, and to comprehend the fundamental postulates of quantum theory. 2. To interpret atomic and molecular phenomena based on the Schrödinger

	<p>equation formulated by Erwin Schrödinger, including treatment of the particle in a box, the harmonic oscillator, and the rigid rotor models.</p> <ol style="list-style-type: none"> 3. To derive and solve the time-independent Schrödinger equation and apply it to simple physical systems. 4. To analyze wave functions and interpret their physical meaning through the concept of probability density and the uncertainty principle proposed by Werner Heisenberg. 5. To understand operator formalism and eigenvalue problems and apply them in calculating energies and other measurable physical observables. 6. To interpret the electronic structure of multi-electron atoms using approximations such as the independent particle approximation and the Hartree–Fock method developed by Douglas Hartree and Vladimir Fock.
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9. Strategic teaching and learning

.Course structure 10

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
121.	2	Understanding, Analysis, and Application	Mathematical Foundations Review	Lecture	Exam
122.	2	Understanding, Analysis, and Application	Historical Development of Quantum Mechanics	Lecture	Exam
123.	2	Understanding, Analysis, and Application	The Schrödinger Equation	Lecture	Exam
124.	2	Understanding, Analysis, and Application	Particle in a One-Dimensional Box (1D)	Lecture	Exam

125.	2	Understanding, Analysis, and Application	Particle in a Three-Dimensional Box (3D)	Lecture	Exam
126.	2	Understanding, Analysis, and Application	Midterm Examination	Lecture	Exam
127.	2	Understanding, Analysis, and Application	Potential Barrier and Quantum Tunneling Phenomenon	Lecture	Exam
128.	2	Understanding, Analysis, and Application	Operators in Quantum Mechanics	Lecture	Exam
129.	2	Understanding, Analysis, and Application	Linear Algebra in Quantum Mechanics	Lecture	Exam
130.	2	Understanding, Analysis, and Application	The Quantum Harmonic Oscillator	Lecture	Exam
131.	2	Understanding, Analysis, and Application	Angular Momentum in Quantum Mechanics	Lecture	Exam
132.	2	Understanding, Analysis, and Application	Electron Spin	Lecture	Exam
133.	2	Understanding, Analysis, and Application	The Hydrogen Atom (I)	Lecture	Exam
134.	2	Understanding, Analysis, and Application	The Hydrogen Atom (II)	Lecture	Exam
135.	2	Understanding, Analysis, and Application	Examination	Lecture	Exam
136.	2	Understanding, Analysis, and Application	Multi-Electron Atoms	Lecture	Exam

137.	2	Understanding, Analysis, and Application	Pauli Exclusion Principle and Hund's Rule	Lecture	Exam
138.	2	Understanding, Analysis, and Application	Approximation Methods in Quantum Mechanics	Lecture	Exam
139.	2	Understanding, Analysis, and Application	The Variational Method	Lecture	Exam
140.	2	Understanding, Analysis, and Application	Examination	Lecture	Exam
141.	2	Understanding, Analysis, and Application	Valence Bond (VB) Theory	Lecture	Exam
142.	2	Understanding, Analysis, and Application	Molecular Orbital (MO) Theory	Lecture	Exam
143.	2	Understanding, Analysis, and Application	Hybridization and Hybrid Orbitals	Lecture	Exam
144.	2	Understanding, Analysis, and Application	Symmetry and Group Theory	Lecture	Exam
145.	2	Understanding, Analysis, and Application	Electronic Spectroscopy	Lecture	Exam
146.	2	Understanding, Analysis, and Application	Vibrational and Rotational Spectroscopy	Lecture	Exam
147.	2	Understanding, Analysis, and Application	Principles of Computational Chemistry	Lecture	Exam
148.	2	Understanding, Analysis, and Application	Density Functional Theory (DFT)	Lecture	Exam

149.	2	Understanding, Analysis, and Application	Diatomic Molecules	Lecture	Exam
150.	2	Understanding, Analysis, and Application	Advanced Applications	Lecture	Exam

11. Evaluation of decision	
Distribution of the 100-point grade according to the tasks assigned to the student, such as daily preparation, daily quizzes, oral examinations, monthly exams, written examinations, reports, etc.	
12. Learning resources and teaching	
required course books (methodology if any)	Atkins, P. & Friedman, R., <i>Molecular Quantum Mechanics</i> , Oxford University Press. Molecular Quantum Mechanics Modern Quantum Chemistry

Course description form

1. Name of course
Elictif
2. Course Code
ELI200
3. Semester / year
4. The date of preparation of this description
is 5. Available attendance forms
6. Number of study hours (total) / number of units (total)
60 hours / 4 units
7. The name of the course administrator (if more than one name is mentioned)

8. Objectives of the course	
objectives of the course	<ul style="list-style-type: none">• To enable students to grasp the principles of biochemistry as a fundamental branch of chemistry.• To enhance students' understanding of the broader scope of chemistry and equip them with scientific and practical skills.• To provide graduates with the skills to teach the chemistry they have learned to secondary school students, utilizing appropriate teaching methods, visual aids, and modern scientific communication skills.• To teach students about the function of hormones using available resources.<ul style="list-style-type: none">• To develop students' abilities by familiarizing them with the key scientific concepts and principles they must follow to conduct scientific research.• To encourage students to acquire knowledge and information and to draw conclusions.• To prepare students for the teaching profession and to teach them how to write scientific research papers.
9. Strategic teaching and learning	
	<ul style="list-style-type: none">• The traditional (lecture) method and (e-learning).• The inductive (deductive) method.

- **The problem-solving method.**
- **Classroom interaction and the exchange of ideas between students and teachers to address learning difficulties and discuss solutions.**
- **Enhancing students' skills through training courses and seminars, and by visiting websites to gain additional knowledge.**

.Course structure 10

week	hours	required learning outputs	unit name or subject	learning	method evaluation method
151.	2	Learning Outcomes	Intro to Hormones, measurement & classification	Lecture	Monthly/Daily Exams
152.	2 (Theo.)	Analysis, Application, Understanding	Endocrine Glands	Lecture	Monthly/Daily Exams
153.	2 (Theo.)	Analysis, Application, Understanding	Types of Endocrine Glands	Lecture	Monthly/Daily Exams
154.	2 (Theo.)	Analysis, Application, Understanding	Types of Hormones	Lecture	Monthly/Daily Exams
155.	2 (Theo.)	Analysis, Application, Understanding	Functions of Hormones	Lecture	Monthly/Daily Exams
156.	2 (Theo.)	Analysis, Application, Understanding	Mechanism of Hormone Action	Lecture	Monthly/Daily Exams
157.	2 (Theo.)	Analysis, Application, Understanding	Comparison between Hormones & Enzymes	Lecture	Monthly/Daily Exams
158.	2 (Theo.)	Analysis, Application, Understanding	Types of Receptors	Lecture	Monthly/Daily Exams
159.	2 (Theo.)	Analysis, Application, Understanding	First Monthly Exam	Lecture	Monthly/Daily Exams
160.	2 (Theo.)	Analysis, Application, Understanding	Hormone Mechanism on Receptors	Lecture	Monthly/Daily Exams
161.	2 (Theo.)	Analysis, Application, Understanding	Peptide vs Steroid Hormones	Lecture	Monthly/Daily Exams

162.	2 (Theo.)	Analysis, Application, Understanding	Hormone Transport Mechanism	Lecture	Monthly/Daily Exams
163.	2 (Theo.)	Analysis, Application, Understanding	1st & 2nd Hormone Messengers	Lecture	Monthly/Daily Exams
164.	2 (Theo.)	Analysis, Application, Understanding	Hypothalamus Gland Hormones	Lecture	Monthly/Daily Exams
165.	2 (Theo.)	Analysis, Application, Understanding	Second Monthly Exam	Lecture	Monthly/Daily Exams
166.	2 (Theo.)	Analysis, Application, Understanding	Anterior Pituitary Hormones	Lecture	Monthly/Daily Exams
167.	2 (Theo.)	Analysis, Application, Understanding	Thyroid Gland	Lecture	Monthly/Daily Exams
168.	2 (Theo.)	Analysis, Application, Understanding	Functions of Thyroid Gland	Lecture	Monthly/Daily Exams
169.	2 (Theo.)	Analysis, Application, Understanding	Types of Thyroid Diseases	Lecture	Monthly/Daily Exams
170.	2 (Theo.)	Analysis, Application, Understanding	Vital & Physio Functions of Thyroid	Lecture	Monthly/Daily Exams
171.	2 (Theo.)	Analysis, Application, Understanding	Adrenal Gland	Lecture	Monthly/Daily Exams
172.	2 (Theo.)	Analysis, Application, Understanding	Vital & Physio Functions of Adrenal	Lecture	Monthly/Daily Exams
173.	2 (Theo.)	Analysis, Application, Understanding	Pancreatic Hormones	Lecture	Monthly/Daily Exams
174.	2 (Theo.)	Analysis, Application, Understanding	Vital & Physio Functions of Pancreas	Lecture	Monthly/Daily Exams
175.	2 (Theo.)	Analysis, Application, Understanding	Insulin Hormone	Lecture	Monthly/Daily Exams
176.	2 (Theo.)	Analysis, Application, Understanding	Mechanism of Insulin Action	Lecture	Monthly/Daily Exams
177.	2 (Theo.)	Analysis, Application, Understanding	Glucagon Hormone	Lecture	Monthly/Daily Exams
178.	2 (Theo.)	Analysis, Application, Understanding	Vital & Physio Functions of Glucagon	Lecture	Monthly/Daily Exams
179.	2 (Theo.)	Analysis, Application, Understanding	Thymus Gland Hormones	Lecture	Monthly/Daily Exams
180.	2 (Theo.)	Analysis, Application, Understanding	Digestive System Hormones	Lecture	Monthly/Daily Exams

11. Evaluation of decision

For example, the grade may be distributed as 25 for the first semester and 25 for the second semester, or otherwise as proposed by the instructor.

12. Learning resources and teaching**required course books (methodology if any)**

Biochemistry by Dr.
Talal Al-Najafi
Biochemistry by Dr.
Tariq Younis