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

Academic Program and Course Description Guide

chemistry department

2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Diyala
Faculty/Institute: College of Education for Pure Sciences
Scientific Department: Department of Chemistry

Academic or Professional Program Name: Chemistry

Final Certificate Name: Bachelor of Science in Chemistry

Academic System: Annual

Description Preparation Date: 5/10/2023

File Completion Date: 10/3/2024

Signature:
Head of Department Name:
Le.Dr.Abd alkarem fadel
Date:

Signature:
Scientific Associate Name:
Prof. Dr. Khansa Farman
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. Program Vision

The College of Education for Pure Science always attempts to be one of the promising Higher Education institutions at the University of Diyala, in future education and scientific research through its scientific, research and administrative activity. Moreover, working on supplying useful routes for the students and teachers to make them useful and inventive in society in chemistry science.

2. Program Mission

Work on managing and graduate efficient students with high management and scientific in chemistry, and develop the aptitude in scientific research that brings benefit to society and the country

3. Program Objectives

1. Embodying the vision, mission and goals of the University of Basra, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized students capable of serving the community and organizing for the preparation of future specializations.
3. Spreading the culture of scientific and cultural diversity in society, transferring scientific knowledge and skills, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and departments in different colleges to achieve best practices in the fields of education, learning, and scientific creativity.
5. Focusing on the educational and moral aspects of all college members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.

6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of science, laboratories and research achievements.

7. Focusing on the educational and moral aspects of the student and spreading the spirit of

4. Program Accreditation

No

5. Other external influences

No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	20	10.75	
College Requirements	11	40	21.5	
Department Requirements	24	128	68.8	
Summer Training	1	4	2.15	
Other				

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

7. Program Description				
Year/Level 2023-2024	Course Code	Course Name	Credit Hours	
			theoretical	practical
The first stage	Analytical chemistry 1	CHEM111	2	2
	organic chemistry1	CHEM121	2	2
	Inorganic chemistry1	CHEM131	2	0
	Chemical safety and security	CHEM181	2	0
	Analytical chemistry 2	CHEM112	2	2
	organic chemistry2	CHEM122	2	2
	Inorganic chemistry2	CHEM132	2	0
	biology	BIO120	2	2
	Educational psychology	EPS120	2	0
	Foundations of education	EPS101	2	0
	English	UOA140	2	0
	Human rights and democracy	UOA135	2	0
	Arabic	UOA137	2	0
	Computer Science	UOA141	1	2
	Calculus 1	MAT105	2	0
	Calculus 2	MAT113	2	0

Year/Level 2023-2024	Course Code	Course Name	Credit Hours	
			theoretical	practical
the second stage	Analytical chemistry 3	CHEM213	2	2
	organic chemistry3	CHEM223	2	2
	Inorganic chemistry3	CHEM233	2	2
	Physical chemistry1	CHEM241	2	2
	Analytical chemistry 4	CHEM214	2	2
	organic chemistry4	CHEM224	2	2
	Inorganic chemistry4	CHEM234	2	2
	Physical chemistry2	CHEM242	2	2
	Educational psychology	EPS202	2	0
	Educational administration	EPS201	2	0
	Scientific research method	EPS211	2	0
	English	UOA240	2	0
	Computer Science	UOA241	1	2
	mathematics	MAT	2	0

Year/Level 2023-2024	Course Code	Course Name	Credit Hours	
			theoretical	practical
The Third stage	Analytical chemistry 1	CHEM351	2	2
	organic chemistry5	CHEM325	2	2
	Inorganic chemistry5	CHEM331	2	2
	Physical chemistry3	CHEM341	2	2
	Industrial chemistry1	CHEM361	2	0
	Biochemistry1	CHEM352	2	2
	organic chemistry6	CHEM326	2	2
	Inorganic chemistry6	CHEM332	2	2
	Physical chemistry4	CHEM342	2	2
	Industrial chemistry2	CHEM362	2	0
	Teaching curricula and methods	EPS311	2	0
	Counseling and mental health	EPS312	2	0
	English3	UOA340	2	0

Year/Level 2023-2024	Course Code	Course Name	Credit Hours	
			theoretical	practical
The Fourth stage	Biochemistry3	CHEM453	2	0
	Organic diagnosis1	CHEM427	2	2
	Instrumental analysis chemistry1	CHEM415	2	2
	Quantum chemistry	CHEM445	2	0
	Industrial chemistry3	CHEM463	2	2
	Biochemistry4	CHEM454	2	0
	Organic diagnosis 2	CHEM428	2	2
	Instrumental analysis chemistry2	CHEM416	2	2
	Quantum chemistry	CHEM446	2	0
	Industrial chemistry4	CHEM464	2	2
	Measurement and evaluation	EPS411	2	0
	Teaching applications	EPS412	2	0
	School applications	EPS413	0	4
	Graduation Project	CHEM491	2	0

Curriculum skills chart															
				Learning outcomes required from the programmer											
Year	Course Code	Course Name	**Basic or optional**	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Stage	**CHEM111**	**Analytical chemistry 1**	**Basic**	√	√	√		√				√	√		
	CHEM121	**organic chemistry1**	**Basic**	√	√	√		√				√	√		
	CHEM131	**Inorganic chemistry1**	**Basic**	√	√	√		√				√	√		
	CHEM181	**Chemical safety and security**	**Basic**	√	√	√		√				√	√		
	CHEM112	**Analytical chemistry 2**	**Basic**	√	√	√		√				√	√		
	CHEM122	**organic chemistry2**	**Basic**	√	√	√		√				√	√		
	CHEM132	**Inorganic chemistry2**	**Basic**	√	√	√		√				√	√		
	BIO120	**biology**	**Basic**		√	√		√					√		
	EPS120	**Educational psychology**	**Basic**				√			√				√	
	EPS101	**Foundations of education**	**Basic**				√			√				√	
	UOA140	**English**	**Basic**		√		√				√			√	
	UOA135	**Human rights and democracy**	**Basic**				√			√				√	
	UOA137	**Arabic**	**Basic**				√				√			√	√
	UOA141	**Computer Science**	**Basic**		√		√				√				
	MAT105	**Calculus 1**	**Basic**		√	√			√				√		√
	MAT113	**Calculus 2**	**Basic**		√	√			√				√		

Curriculum skills chart																
				Learning outcomes required from the programmer												
Year	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
the second stage	**CHEM213**	**Analytical chemistry 3**	**Basic**	√	√	√		√				√	√			
	CHEM223	**organic chemistry3**	**Basic**	√	√	√		√				√	√			
	CHEM233	**Inorganic chemistry3**	**Basic**	√	√	√		√				√	√			
	CHEM241	**Physical chemistry1**	**Basic**	√	√	√		√				√	√			
	CHEM214	**Analytical chemistry 4**	**Basic**	√	√	√		√				√	√			
	CHEM224	**organic chemistry4**	**Basic**	√	√	√		√				√	√			
	CHEM234	**Inorganic chemistry4**	**Basic**	√	√	√		√				√	√			
	CHEM242	**Physical chemistry2**	**Basic**	√	√	√		√				√	√			
	EPS202	**Educational psychology**	**Basic**				√				√	√				
	EPS201	**Educational administration**	**Basic**				√			√					√	
	EPS211	**Scientific research method**	**Basic**				√		√				√			
	UOA240	**English**	**Basic**		√						√				√	
	UOA241	**Computer Science**	**Basic**													
	MAT	**mathematics**	**Basic**	√	√	√		√	√				√			

Curriculum skills chart																
				Learning outcomes required from the programmer												
Year	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
The Third stage	**CHEM351**	**Analytical chemistry 1**	Basic	√	√	√		√	√			√	√			
	CHEM325	**organic chemistry5**	Basic	√	√	√		√	√			√	√			
	CHEM331	**Inorganic chemistry5**	Basic	√	√	√		√	√			√	√			
	CHEM341	**Physical chemistry3**	Basic	√	√	√		√	√			√	√			
	CHEM361	**Industrial chemistry1**	Basic	√	√	√		√	√			√	√			
	CHEM352	**Biochemistry1**	Basic	√	√	√		√	√			√	√			
	CHEM326	**organic chemistry6**	Basic	√	√	√		√	√			√	√			
	CHEM332	**Inorganic chemistry6**	Basic	√	√	√		√	√			√	√			
	CHEM342	**Physical chemistry4**	Basic	√	√	√		√	√			√	√			
	CHEM362	**Industrial chemistry2**	Basic	√	√	√		√	√			√	√			
	EPS311	**Teaching curricula and methods**	Basic				√			√	√			√		
	EPS312	**Counseling and mental health**	Basic				√			√				√		
	UOA340	**English3**	Basic		√						√				√	

Curriculum skills chart																
				Learning outcomes required from the programmer												
Year	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
The Fourth stage	**CHEM453**	**Biochemistry3**	Basic	√	√	√		√	√			√	√			
	CHEM427	**Organic diagnosis1**	Basic	√	√	√		√	√			√	√			
	CHEM415	**Instrumental analysis chemistry1**	Basic	√	√	√		√	√			√	√			
	CHEM445	**Quantum chemistry**	Basic	√	√	√		√	√			√	√			
	CHEM463	**Industrial chemistry3**	Basic	√	√	√		√	√			√	√			
	CHEM454	**Biochemistry4**	Basic	√	√	√		√	√			√	√			
	CHEM428	**Organic diagnosis 2**	Basic	√	√	√		√	√			√	√			
	CHEM416	**Instrumental analysis chemistry2**	Basic	√	√	√		√	√			√	√			
	CHEM446	**Quantum chemistry**	Basic	√	√	√		√	√			√	√			
	CHEM464	**Industrial chemistry4**	Basic	√	√	√		√	√			√	√			
	EPS411	**Measurement and evaluation**	Basic													
	EPS412	**Teaching applications**	Basic							√	√			√	√	
	EPS413	**School applications**	Basic							√	√			√	√	
	CHEM491	**Graduation Project**	Basic		√	√		√					√	√		

8.Expected learning outcomes of the program

Knowledge

1. The student's knowledge of the electronic structure of atoms
2. Introducing the student to the periodic properties of atoms.
3. Understand the meaning of covalent bonding between atoms.
4. The student's understanding of the nature of ionic compounds in terms of their formation and solubility.
5. Introducing the student to Lewis structures, polyatomic molecules, and molecular geometry.
6. The student knows how to form molecular orientals.
7. The student's understanding of the topic of hybridization and the theory of equivalence.

Skills

1. That the student masters writing the electronic structure of each atom
2. Distinguish between group and period and the properties of some elements in the periodic table
3. Distinguish between ionic bonding and covalent bonding
4. Teaching the student how to write the Lewis structure for polyatomic molecules
5. Exercise the student on how to draw geometric shapes for covalent molecules

Ethics

1. Preparing qualified cadres to contribute to the comprehensive development and development that Iraq seeks and is witnessing in various fields of chemistry.
2- The ability to support the teaching of chemistry in educational institutions, middle and high schools, vocational schools, and various educational and technical institutes.
3- The ability to provide consultations in the field of chemistry to various scientific and industrial institutions.
4- Contributing to the scientific progress of chemistry through scientific research or participation in local, Arab and international conferences.

9.Teaching and Learning Strategies

1. Application method in research laboratories.
2. Adopting the method of dialogue and constructive purposeful discussion.
3. Adopting the method of trial and error.
4. Adopting multimedia in virtual classes (image, text, audio, video).
5. Adopting interactive lectures via. google meet

10.Evaluation methods

1- Weekly written exams.

2- Questions during the lecture.

3- Quarterly written exams.

4- Final written exams.

5- Writing scientific reports.

6- Quick exams Quiz.

7- Homework.

8- Committees for discussing graduation projects for final-stage students.

11. Faculty

Faculty Members

Academic Rank		Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
		General	Special			Staff	Lecturer
prof		8				8	
An assistant professor		10				10	
Lecture		5				5	
Assistant Lecture		0	3			3	

Professional development of faculty members

12.Acceptance Criterion

Firstly, the requirements for admission to the college:

1. Approval of admission requirements for students by the regulations of the Ministry of Higher Education and Scientific Research (central admission)

2. To successfully pass any special test or personal interview deemed appropriate by the college or university council.

3. To be medically fit for the specialty applied for.

Secondly, the conditions for admission to the scientific department:

1. Choose the student's desire from more than one desire, arranged according to preference.

2. High school acceptance rate.

3. The course average of the department in which the student wishes to study.

4. Absorptive capacity of the scientific department.

13.The most important sources of information about the program

1. The needs of secondary and middle schools for chemistry majors.
2. Local trends.
3. Industrial and economic trends.
4. Studies and questionnaires.
5. Seminars and specialized workshops with beneficiaries.

Course Description Form

Week	Hours	Required Learning Outcomes	subject name
1	2	The electronic structure of atom	General introduction
2	2	The electronic structure of atom	Atomic structure and the origin of quantum theory
3	2	The electronic structure of atom	Electromagnetic radiation, black body radiation
4	2	The electronic structure of atom	Spectrum, atomic spectrum, Bohr atom
5	2	The electronic structure of atom	Quantum numbers and atomic state symbols
6	2		1 exam
7	2	Periodic Table	Periodic table, periodic properties of elements
8	2	Periodic Table	Blocking ionization potential
9	2	Periodic Table	Electron affinity, electronegativity
10	2	Periodic Table	The sizes of atoms and ions
11	2	Periodic Table	Radii and types of forces
12	2		Exam
13	2	Chemical bond	Ionic grid energy
14	2	Chemical bond	Ionic grid energy
15	2	Chemical bond	Crystal lattice structure
16	2	Chemical bond	Lewis structures of polyatomic molecules
17	2	Chemical bond	Ringing
18	2	Chemical bond	Molecular geometry and electronic repulsion method in outer shells
19	2	Chemical bond	Molecular symmetry
20	2	Chemical bond	Molecular orbital formation
21	2		Exam
22	2	Chemical bond	Diagram of molecular orbital energies for diatomic molecules
23	2	Chemical bond	A diagram of the energy levels of molecular orbitals for triato molecules
24	2	Chemical bond	Hybridization
25	2	Chemical bond	How to determine the structure of some simple molecules
26	2	Chemical bond	Chemical bond
27	2	Chemical bond	Common bond or electronic pair bond
28	2	Chemical bond	Common bond properties
29	2		Exam
30	2		First-semester review + second-semester review

1. Course Evaluation	
First-semester grade 20% Second-semester grade: 20% Final quest score 40% Final exam score 60%	
2. Learning and Teaching Resources	
Required textbooks	Modern inorganic chemistry for the first stage, part one / Dr. Basem Al-Saadi. Inorganic chemistry, first section / Dr. Noman Al-Nuaimi, Dr. Munther Al-Janabi
Main references (sources)	Inorganic Chemistry Principles of Structure and Reactivity, James. E. Huheey.
Recommended books and references (scientific journals, reports…)	Basic Inorganic Chemistry, F.A. Cotton, G. Wilkinson and P.L. Gauss, 3rd edition, John Wiley and Sons, Inc. New York, 1995.
Electronic References, Websites	Textbook, Concepts & Models of Inorganic Chemistry, 2nd edition, Wiley, New 2009

Course Description Form

1. Course Name:
Photochemistry
2. Course Code:
3. Semester / Year:
semester
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
8. Course Objectives

Course Objectives	**• Learn about theories of light interpretation** **• Identify electronic transfers** **• Identify ways to lose energy**

9. Teaching and Learning Strategies	
Strategy	1- Lectures 2- Means of illustration such as: display screen

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	Definition photochemistry Theories interpretation of lig	Definition of photoelectric phenomenon Interpretation of the nature of ligh	lecture	weekly and monthly exams
2	2 Theoretical	Light properties	Interpretation the properties light	lecture	weeklyand monthly exams
3	2 Theoretical	Basicsoflight	Darber Basics	Lecture	weeklyand

		absorption	StarkEinstein Basics		monthly exams
4	2 Theoretical	Laws photochemistry	Beer-Lambert la	Lecture	weeklyand monthly exams
5	2 Theoretical	Electronic construction Formation molecular orbitals	Definition of orbital Allotropic orbita antiallergic orbitals, and non-allotropic orbitals	Lecture	weeklyand monthly exams
6	2 Theoretical	Transition energies Multiplication	Transitions between electror levels The law multiplicity and knowledge the state of monads and triplets	Lecture	weeklyand monthly exams
7	2 Theoretical	Therelationship between Electronic transitionsand absorption bands	Relate the type transition absorption peaks	Lecture	weeklyand monthly exams
8	2 Theoretical	Emission spectrum Spectrum of thebinary molecule	Know how the emission spectru is formed Study the nature of the spectrum the binary molecule	Lecture	weeklyand monthly exams
9	2 Theoretical	Absorption spectru Stimulated emissio	Know how the absorption spectrum is form The effect stimulating ener on emission	Lecture	weeklyand monthly exams
10	2 Theoretical	Time of life of irritation	Laws of the age of irritation	Lecture	weeklyand monthly exams

		Non-radiant transfe	time Transfers not accompani by radiation		
11	2 Theoretical	Delayed fluorescen emission Accelerated fluorescence emission Inhibition fluorescenc	Slow fluorescenc phenomenon Rapid fluorescen phenomenon Inhibition fluorescence phenomenon	lecture	weeklyand monthly exams
12	2 Theoretical	radiative transition	Transmissions accompanied radiation	Lecture	weeklyand monthly exams
13	2 Theoretical	The transfer amount Properties of the two transfers π- π*, n-δ*	Move quotient laws Study the characterist of the two transfers a their advantages	Lecture	weeklyand monthly exams
14	2 Theoretical	Extinction of the irritated particle Throughother molecules	Methods quenching molecules Using other molecules	Lecture	weeklyand monthly exams
15		**Exam**	**Exam**		

11. Course Evaluation

Daily preparation 20
And daily exams 20
And oral exams 10
And monthly exams 50

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Photochemistry\Assistant Profess Dr. Mohi Rasool Hammoud\Baghd 1991
Main references (sources)	Photochemistry\Assistant Profess Dr. Mohi Rasool Hammoud\Baghd 1991
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

Evaluation road	road education	Unit name the topic or	Outputs Learning required	hours	the week
And verbal a test editorial	Dialogue and discussion	**meaning Education And its goals Its necessity**	meaning And its Education Its necessity goals	٢	١
And verbal a test editorial	Dialogue and discussion	**Her theories And its ، fields**	، Her theories And its fields	٢	٢
And verbal a test editorial	Dialogue and discussion	**Basis Historical For education**	Historical Basis For education	٢	٣
And verbal test a editorial	Dialogue and discussion	**Basis Historical For education**	Old education	٢	٤
And verbal a test editorial	Dialogue and discussion	**Basis Historical For education**	Chinese education	٢	٥
And verbal a test editorial	Dialogue and discussion	**Basis Historical For education**	Greek education	٢	٦
And verbal a test editorial	Dialogue and discussion	**Basis Historical**	Medieval	٢	٧

		For education	education		
And verbal a test editorial	Dialogue and discussion	**Basis Historical For education**	Arabic Education And Islam before Islam after	٢	٨
And verbal a test editorial	Dialogue and discussion	**Basis Historical For education**	Education Modern	٢	٩
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Relationship between And Education society	٢	١٠
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Relationship The between And individual environment the	٢	١١
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Education Congenital	٢	١٢
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Education ،family	٢	١٣
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Education ،patriotism	٢	١٤
And verbal a test editorial	Dialogue and discussion	**Social Basis For education**	Health Education	٢	١٥
And verbal a test editorial	Dialogue and discussion	**The economic basis of**	And its Education in impact Development	٢	١٦

		education	Economic		
And verbal a test editorial	Dialogue and discussion	**Basis Economic For education**	And exploitation Resources Natural	٢	١٧
And verbal a test editorial	Dialogue and discussion	**Basis Scientific education**	And Education in the curriculum search	٢	١٨
And verbal a test editorial	Dialogue and discussion	**The foundations Nationalism And social**	The foundations And Nationalism social	٢	١٩
And verbal a test editorial	Dialogue and discussion	**in Education Perspective Islamic**	in Education Perspective Islamic	٢	٢٠
And verbal a test editorial	Dialogue and discussion	**Renewal Educational Iraq in**	the school Overall	٢	٢١
And verbal a test editorial	Dialogue and discussion	**Renewal Educational Iraq in**	Education methodology	٢	٢٢
And verbal a test editorial	Dialogue and discussion	**Renewal Educational Iraq in**	Schools Distinguished people Acceleration	٢	٢٣
And verbal a test editorial	Dialogue and discussion	**Education Primitive**	The Accept the individual environment And Primitive I wove how itself Education	٢	٢٤
And verbal a test editorial	Dialogue and discussion	**Education Social**	I have He is that The individual	٢	٢٥

			Social need . Certain		
And verbal a test editorial	Dialogue and discussion	**Education the date via**	finding relationship Consistency between Civilizations	٢	٢٦
And verbal a test editorial	Dialogue and discussion	**Education Islamic**	Symmetry Means And consistency And Thinking in With what work We He dictates Our religion	٢	٢٧
And verbal a test editorial	Dialogue and discussion	Setting Social	the Means Social control And control Positivity	٢	٢٨
And verbal a test editorial	Dialogue and discussion	**the culture And education**	We that Practices With it rise I Our life during Mother fell short It took a long time	٢	٢٩
And verbal a test editorial	Dialogue and discussion	**Education Social**	I have He is that The individual Social need . Certain	٢	٣٠

3. Course Objectives

Course Objectives	**1-Protecting workers in chemical laboratories and chemica stores from health risks and** **dangers related to the use of chemicals.** **2-Protecting society and the environment.** **3- Reducing the possibility of stealing or transferr dangerous and toxic chemicals that could potentially ha others.**

4. Teaching and Learning Strategies

Strategy	Developing learning outcomes in various areas of learning for eac of the learning areas shown below 1- It provides a quick summary of the knowledge or skills that course seeks to develop. ٢- Description of the teaching strategies used in the course order to develop that knowledge or skills. 3-The methods used to evaluate the student in the course evaluate the learning outcomes in this field of study. ٤- Evaluation is done through extracurricular activities, writ exams, oral exams, and reports, and the lecture method is u in teaching.

5. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
introduction	hour	Introduction to chemical safety an security and national legislation.			
The first week	Two ho	Safety in laboratories includes: 1- Personal protective equipment 2- Protective tools inside the laboratory, including rubber glove goggles, and a laboratory coat.			
second week	Two ho	General safety precautions in chemical laboratories include: A- Extinguishing fires as soon as they break out. B-Choose the appropriate means o extinguishing, as wood, paper, and clothes are different from oils, grease, and paint, and they are			

the third week	Two ho	different from electrical appliances and equipment. Safety precautions that must be followed when using chemicals include: 1- Protective clothing must be worn before using chemicals. 2- Absolutely not smoking, eating drinking inside the laboratory.			
fourth week	Two ho	3- The products must be known before starting the reaction in orde to avoid any poisoning, ignition, o explosion. Material Safety Data Sheets (MSDS): Material Safety Data Sheets are considered a basic reference for chemicals in terms o			
The fifth week	Two ho	safety. The sheet is divided into 16 paragraphs. Stability conditions of matter and interactions. Some types of risks in laboratories include: Fire, infection, contact w			
the sixth week	Two hours	electrical current, gas leakage, contact with harmful chemicals, contact with hot objects.			
The seventh week					
The eighth wee					
The ninth week					

The tenth week		Types of injuries in laboratories, where the student learns about: different types of injuries, such as poisoning, dizziness, nausea, allergies, headaches, suffocation, fainting, various wounds, and way to treat them. First month exam			
The eleventh week		Symptoms of exposure to chemica include redness or itching in the eyes, difficulty breathing, ways to treat them, skin burns, headaches, and nausea. Fires: The student should be familiar with: 1- Causes of fires, fire theory, and combustion theory 2-Methods of treating it. Acting when a fire occurs inside th laboratory by doing some of the following: 1- Ring the alarm bells, a if there are no alarm bells, raise your voice to alert the fire and ask for help. 2- Make sure everyone leaves the laboratory. 3- Ask someone close to you to contact Civil Defense. 4- Make sure your way out is safe.			
The twelfth we		First aid in case of some injuries includes: 1. If the eye is exposed to chemica 2-If the skin is exposed to chemica 3-If suffocation occurs due to vap or gases. 4-If chemicals are swallowed. Ways to dispose of chemical waste in a safe manner include: 1- Water-soluble chemicals:			

The thirteenth week		2-Solutions of solvents			
The fourteenth week					
Fifteenth the week					

6. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation٥, daily oral٥, monthly٢٥, or written exams٦٠, reports٥ .... etc	
7. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Curriculum for teaching chemi safety and security
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	General Corporation for Technical a Vocational Training / Kingdom of Sa Arabia

1. Course objectives
Study of the life-giving organic compounds found within the living cell from a structural and functional standpoint.

Course outcomes and teaching, learning and evaluation methods .٩
A- Cognitive objectives 1-Enabling the student to obtain theoretical knowledge of biochemistry 2-The student's knowledge of the basic concepts of life-giving organic compounds 3-The student's knowledge of the components and composition of carbohydrates, proteins, fats, amino acids, enzymes, and vitamins B - The skills objectives of the course 1-The student is proficient in knowing the chemical structures of living components and their functions in an efficient manner 2- Distinguish between nucleic acids and the role of each 3-Distinguish between types of fats, their composition and functions 4- Study of enzymes, vitamins and hormones-
Teaching and learning methods
1-Lectures include dialogue, discussions, and interrogative questions 2- Means of illustration, such as: the smart board and display of

educational videos
Evaluation methods
1- Oral exams 2-Monthly exams 3- Annual exams
C- Emotional and value goals 1- Adopting the method of dialogue between the student and the professor 2-Preparing organized reports 3- Adopting the discussion method
D - General and qualifying transferable skills (other skills related to employability and personal development). D1- The student's ability to work within the educational and professional work team D 2- Positive thinking and utilizing the knowledge he has received D 3- The ability to deal with parties outside the university and train with them D 4- That the student is able to learn and master the teaching profession

10. structure Headquarters

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Weekly and monthly exams	lecture	Introduction to biochemistry	Biochemistry	2hours	1
Weekly and monthly exams	lecture	Carbohydrates	Carbohydrates	2 hours	2
Weekly and monthly exams	lecture	Carbohydrates	Carbohydrates	2 hours	3
Weekly and monthly exams	lecture	Carbohydrates	Carbohydrates	2 hours	4
Weekly and monthly exams	lecture	Carbohydrates	Carbohydrates	2 hours	5
Weekly and monthly exams	lecture	Carbohydrates.	Carbohydrates	2 hours	6
Weekly and monthly exams	lecture	Amino acids and peptides	Amino acids and peptides	2 hours	7
Weekly and monthly exams	lecture	Amino acids and peptides	Amino acids and peptides	2 hours	8

Weekly and monthly exams	**lecture**	**Amino acids and peptides**	**Amino acids and peptides**	**2 hours**	**9**
Weekly and monthly exams	**lecture**	**Amino acids and peptides**	**Amino acids and peptides**	**2 hours**	**10**
Weekly and monthly exams	**lecture**	**Proteins**	**Proteins**	**2 hours**	**11**
Weekly and monthly exams	**lecture**	**T Proteins .**	**Proteins**	**2 hours**	**12**
Weekly and monthly exams	**lecture**	**lipids**	**lipids**	**2 hours**	**13**
Weekly and monthly exams	**lecture**	**lipids**	**lipids**	**2 hours**	**14**
Weekly and monthly exams	**lecture**	**lipids**	**lipids**	**2 hours**	**15**
Weekly and monthly exams	**lecture**	**lipids**	**lipids**	**2 hours**	**16**
Weekly and monthly exams	**lecture**	**Nucleotides and nucleic acids**	**Nucleotides and nucleic acids**	**2 hours**	**17**
Weekly and	**lecture**	**Nucleotides and nucleic acids**	**Nucleotides and nucleic acids**	**2 hours**	**18**

monthly exams					
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**19**
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**20**
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**21**
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**22**
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**23**
Weekly and monthly exams	**lecture**	**Enzymes**	**Enzymes**	**2 hours**	**24**
Weekly and monthly exams	**lecture**	**Vitamins**	**Vitamins**	**2 hours**	**25**
Weekly and monthly exams	**lecture**	**Vitamins**	**Vitamins**	**2 hours**	**26**
Weekly and monthly exams	**lecture**	**Hormones**	**Hormones**	**2 hours**	**27**

Weekly and monthly exams	lecture	Hormones	Hormones	2 hours	28

11- Course development plan	
1- Required prescribed books	Biochemistry/Dr. Talal Al-Najafi Introduction to biochemistry / Dr. Khawla Al-Flih Biochemistry / Part One / Dr. Tariq
2- (Main references (sources)	
A- Recommended books and references (.....،Scientific journals, bottles)	Physiological biochemistry/Dr. Sami Al-Muzaffar Younis Mahmoud - Dr. Louay Abdul Ali Al-Hilali / Ministry of Higher Education and Scientific Research / University Mosul
B- Electronic references, websites	Biochemistry/Lippincott Biochemistry/Harper

12- Course development plan .
Using blended learning to teach theoretical and practical subjects, using computers and electronic applications to explain the subject to students, as well as conducting electronic exams, including using the Google Classroom application. Create a channel on You Tube and upload lectures to it so that they can be a reference for students