

**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**

**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

**Faculty Name:** Kut University College

**Scientific Department:** Department of Medical Laboratory Techniques

**Academic or Professional Program Name:** General Chemistry 1 & 2

**Academic System:** Annual system

**Description Preparation Date:** 1/1/2023

**File Completion Date:** 1/2/2024

**Signature:**

**Head of Department Name:**

**Date:**

**Signature:**

**Scientific Associate Name:**

**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

### Vision Statement:

Elevating Healthcare through Excellence in General Chemistry Education

### Overview:

The Department of Medical Laboratory Techniques envisions a General Chemistry program that serves as the cornerstone for producing skilled and knowledgeable laboratory professionals committed to advancing healthcare. Our vision is to provide a transformative educational experience that seamlessly integrates the principles of General Chemistry into the specialized context of medical laboratories. Through innovation, collaboration, and a steadfast commitment to excellence, we aim to nurture a cadre of laboratory professionals who contribute significantly to the improvement of healthcare outcomes.

### Core Principles:

1. Integration of Chemistry in Healthcare: We envision a program that seamlessly weaves the principles of General Chemistry into the fabric of medical laboratory practices. Our students will develop a profound understanding of the chemical foundations underpinning diagnostic and analytical processes critical to healthcare.
2. Cutting-edge Technology and Techniques: Embracing technological advancements, our program is committed to providing students with hands-on experience in state-of-the-art laboratories. We aim to expose students to the latest analytical techniques, instrumentation, and methodologies relevant to the evolving landscape of medical laboratory science.
3. Interdisciplinary Collaboration: Recognizing the interconnected nature of healthcare, we foster a collaborative learning environment. Our program encourages interdisciplinary interactions between students and professionals from various healthcare disciplines to simulate real-world scenarios and promote a holistic approach to patient care.
4. Ethical Practice and Quality Assurance: We instill a strong commitment to ethical conduct and quality assurance in our students. Our vision is to produce laboratory professionals who adhere to the highest standards of integrity, ensuring the accuracy and reliability of laboratory results crucial to patient diagnosis and treatment.
5. Professional Development and Lifelong Learning: Our program is dedicated to producing graduates who are not only well-prepared for immediate entry into the workforce but are also equipped with a mindset for continuous learning and professional development. We envision our alumni as lifelong learners who stay abreast of emerging trends in both General Chemistry and medical laboratory sciences.

### Outcome:

Upon completion of the General Chemistry program in the Department of Medical Laboratory Techniques, our graduates will emerge as highly skilled and ethical laboratory professionals. Equipped with a solid foundation in General Chemistry, specialized knowledge in medical

laboratory techniques, and a commitment to excellence, our alumni will play a crucial role in advancing healthcare outcomes, contributing to disease diagnosis, treatment, and prevention.

This vision statement aligns the General Chemistry program with the specific needs and goals of the Department of Medical Laboratory Techniques, emphasizing the integration of chemistry into the context of healthcare and the development of professionals who contribute meaningfully to the field.

## 2. Program Mission

### **Mission Statement:**

Preparing Future Healthcare Leaders through Comprehensive General Chemistry Education

### **Objectives:**

**Educational Excellence:** Deliver a rigorous General Chemistry curriculum for a solid understanding of chemical principles in medical laboratory sciences.

**Hands-On Learning:** Provide practical, hands-on experiences in state-of-the-art laboratories to bridge theory with application.

**Interdisciplinary Integration:** Seamlessly integrate General Chemistry with other medical laboratory disciplines, fostering collaboration skills.

**Ethical Practice:** Instill a strong sense of ethics, integrity, and responsibility in laboratory practices.

**Research and Innovation:** Cultivate a culture of curiosity, encouraging research in General Chemistry applications for healthcare improvement.

**Global Awareness:** Foster global awareness and cultural competence in healthcare practices for versatile and adaptable professionals.

### **Impact:**

Graduates will excel in applying General Chemistry concepts, demonstrating critical thinking, ethical conduct, and innovative solutions to elevate healthcare standards and improve patient outcomes.

## 3. Program Objectives

### **Program Objectives:**

- **Conceptual Mastery:** Attain a profound understanding of General Chemistry principles for effective problem-solving.
- **Laboratory Proficiency:** Develop strong practical skills in laboratory techniques.
- **Interdisciplinary Integration:** Seamlessly integrate General Chemistry with other medical laboratory disciplines.
- **Ethical Professionalism:** Instill values of ethics and professionalism, emphasizing responsible laboratory practices.

- **Research and Innovation:** Encourage research and innovation in applying General Chemistry to healthcare.
- **Global Awareness:** Increase global awareness and foster cultural competence among students.
- **Professional Certification Readiness:** Prepare students for relevant certifications in medical laboratory sciences.
- **Continuous Learning:** Cultivate a mindset of continuous learning and professional adaptation to emerging trends.
- **Communication Skills:** Enhance effective written and oral communication skills.
- **Community Engagement:** Encourage active participation in community service, showcasing the positive impact of General Chemistry in healthcare.

#### 4. Program Accreditation

Does the program have program accreditation? And from which agency?

#### 5. Other external influences

The Quality Assurance Program for the Ministry of Higher Education and Scientific Research.

#### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	<b>2 Semester</b>	<b>8</b>	<b>19%</b>	<b>Basic courses in general studies.</b>
College Requirements				
Department Requirements				
Summer Training				
Other				



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

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First Year		General Chemistry 1 & 2	2	5

8. Expected learning outcomes of the program	
Knowledge	
Analytical Chemistry Learning Outcomes:	<ol style="list-style-type: none"> <li><b>Precision in Techniques:</b> Demonstrate precision in analyzing substances with various techniques.</li> <li><b>Instrumentation Proficiency:</b> Proficiently operate and maintain analytical instruments.</li> <li><b>Data Analysis Skills:</b> Analyze and interpret complex analytical data accurately.</li> <li><b>Quality Assurance Practices:</b> Implement quality assurance practices for reliable results.</li> <li><b>Problem-Solving Ability:</b> Develop problem-solving skills for troubleshooting issues.</li> </ol>
Organic Chemistry Learning Outcomes:	<ol style="list-style-type: none"> <li><b>Understanding Organic Compounds:</b> Understand the structure, properties, and reactions of relevant organic compounds.</li> <li><b>Chemical Synthesis Competence:</b> Acquire competence in chemical synthesis techniques.</li> <li><b>Functional Group Recognition:</b> Identify functional groups within organic molecules.</li> <li><b>Safety Protocols:</b> Implement safety protocols when working with organic chemicals.</li> <li><b>Integration with Clinical Applications:</b> Integrate organic chemistry principles with clinical applications.</li> </ol>

<p>Cross-Cutting Learning Outcomes:</p>	<ol style="list-style-type: none"> <li>1. <b>Interdisciplinary Collaboration:</b> Collaborate with professionals from various medical laboratory disciplines.</li> <li>2. <b>Effective Communication:</b> Develop effective communication skills for conveying findings.</li> <li>3. <b>Ethical Conduct:</b> Embrace ethical conduct in laboratory practices.</li> </ol>
<p><b>Skills</b></p>	
<p>Learning Outcomes 2</p>	<ol style="list-style-type: none"> <li>1. <b>Lab Techniques Proficiency:</b> Attain proficiency in essential medical lab techniques.</li> <li>2. <b>Critical Thinking:</b> Develop strong problem-solving skills.</li> <li>3. <b>Data Collection and Analysis:</b> Acquire accurate data analysis skills.</li> <li>4. <b>Instrumentation Operation:</b> Demonstrate competence in using diverse lab instruments.</li> <li>5. <b>Communication Skills:</b> Enhance effective written and oral communication.</li> <li>6. <b>Team Collaboration:</b> Collaborate effectively in interdisciplinary teams.</li> <li>7. <b>Safety Practices:</b> Adhere rigorously to strict safety protocols.</li> <li>8. <b>Quality Assurance:</b> Implement measures for result quality and accuracy.</li> <li>9. <b>Research Competence:</b> Develop research skills for lab sciences.</li> <li>10. <b>Adaptability:</b> Cultivate adaptability and commitment to continuous learning.</li> <li>11. <b>Ethical Conduct:</b> Demonstrate unwavering ethical and professional conduct.</li> <li>12. <b>Time Management:</b> Master effective time management.</li> </ol>
<p><b>Ethics</b></p>	
<p>Learning Outcomes 3</p>	<ol style="list-style-type: none"> <li>1. <b>Ethical Awareness:</b> Develop heightened awareness of ethical considerations.</li> <li>2. <b>Moral Reasoning:</b> Enhance skills in moral reasoning for complex dilemmas.</li> </ol>

	<p>3. <b>Professional Integrity:</b> Cultivate commitment to professional integrity.</p> <p>4. <b>Confidentiality Practices:</b> Adhere to strict confidentiality for sensitive information.</p> <p>5. <b>Respect for Diversity:</b> Demonstrate respect for diversity in all contexts.</p> <p>6. <b>Informed Decision-Making:</b> Make informed decisions considering ethical implications.</p> <p>7. <b>Accountability:</b> Embrace accountability for ethical consequences.</p> <p>8. <b>Ethical Communication:</b> Develop effective communication for ethical concerns.</p> <p>9. <b>Ethical Leadership:</b> Foster qualities of ethical leadership.</p> <p>10. <b>Continuous Ethical Education:</b> Commit to ongoing education on ethical standards and challenges.</p>
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## 9. Teaching and Learning Strategies

1. **Active Learning:** Engage students through active participation and collaboration.
2. **Interactive Lectures:** Conduct interactive lectures for enhanced student involvement.
3. **Practical Demonstrations:** Provide hands-on demonstrations to reinforce theoretical concepts.
4. **Case-Based Learning:** Apply theoretical knowledge to real-world scenarios through case-based learning.
5. **Group Discussions:** Promote critical thinking through group discussions.
6. **Technology Integration:** Enhance learning experiences with technology tools and platforms.
7. **Peer Teaching:** Foster teamwork and communication skills through peer teaching.
8. **Assessment Diversity:** Use various assessments to accommodate diverse learning styles.
9. **Feedback Mechanisms:** Provide constructive feedback and support student improvement.
10. **Inclusive Teaching:** Implement practices to cater to diverse student backgrounds and needs.

These strategies create a dynamic and inclusive learning environment, promoting engagement and knowledge application.

## 10. Evaluation methods

1. **Formative Assessment:** Ongoing assessments for feedback during the learning process.
2. **Summative Assessment:** Comprehensive evaluations at the end of learning periods.
3. **Continuous Evaluation:** Assessment throughout tasks and assignments.
4. **Practical Examinations:** Hands-on assessments for practical skills.

These methods offer a comprehensive evaluation of understanding, skills, and practical application in diverse learning scenarios.

## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr. Ghassan Mahmoud Ibrahim	Chemistry	Analytical Chemistry			10	
Dr. Aoras Ameen Kadhime	Chemistry	Organic Chemistry			10	
M.Sc. Mohammed Bahaa Mohsin	Chemistry	Biochemistry			10	

### Professional Development

#### Mentoring new faculty members

1. **Orientation:** Comprehensive sessions on policies and academic culture.
2. **Assigned Mentors:** Experienced mentors guide new faculty on teaching, research, and institutional dynamics.
3. **Professional Development:** Access to workshops and conferences for skill enhancement.
4. **Resource Sharing:** Platforms for sharing teaching and research materials.
5. **Performance Evaluation Support:** Guidance on goal-setting and career advancement.

This streamlined process aims to integrate faculty effectively, fostering professional growth and contributing to institutional success.

**Professional development of faculty members**

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

**12. Acceptance Criterion**

**(Setting regulations related to enrollment in the college or institute, whether central admission or others)**

**13. The most important sources of information about the program**

State briefly the sources of information about the program.

**14. Program Development Plan**

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Cours Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Year 1		General Chemistry 1	Basic	X	X	X	X	X	X	X	X	X	X	X	
		General Chemistry 2	Basic	X	X	X	X	X	X	X	X	X	X	X	

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation

## Course Description Form

1. Course Name:	
General Chemistry 1	
2. Course Code:	
3. Semester / Year:	
Semester 1/ Year 1	
4. Description Preparation Date:	
1/1/2023	
5. Available Attendance Forms:	
In-person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Credit Hours (7) / Number of Units (4)	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Ghassan Mahmoud Ibrahim Email: <a href="mailto:gibrahim00@yahoo.com">gibrahim00@yahoo.com</a>	
Name: Dr. Aoras Ameen Kadhime Email: <a href="mailto:schuttberg@yahoo.com">schuttberg@yahoo.com</a>	
Name: M.Sc. Mohammed Bahaa Mohsin Email: <a href="mailto:mohammedbahaa783@gmail.com">mohammedbahaa783@gmail.com</a>	
8. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>● <b>Foundation:</b> Build a solid understanding of general chemistry principles for analytical lab applications.</li> <li>● <b>Proficiency:</b> Develop skills in utilizing analytical techniques for effective data analysis in the lab.</li> <li>● <b>Critical Thinking:</b> Foster critical thinking for applying theoretical concepts in practical analytical scenarios.</li> </ul>
9. Teaching and Learning Strategies	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. <b>Active Learning:</b> Engage students through participation, discussions, and practical experiences for a dynamic learning environment.</li> <li>2. <b>Technology Integration:</b> Use multimedia and interactive tools to enhance learning experiences and accommodate diverse learning styles.</li> <li>3. <b>Assessment Diversity:</b> Employ various assessment methods, including projects and Homework, to comprehensively evaluate student understanding.</li> </ol>

1.

## 2. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	General Chemistry	Introduction to chemistry (matter, structure of atom, periodic table, isotopes, atomic number, mass number, composition of matter, types of bonds)	Theoretical and Practical	Quiz and Project calculation
2	2	Analytical chemistry	Methods of analysis, Types of Solution, preparation of standard solution unit, concentration, percentage.	Theoretical and Practical	Quiz and Project
3	2	Analytical chemistry	Molar solution, Normal solution, parts per million	Theoretical and Practical	Quiz and Project
4	2	Analytical chemistry	Acid base theory, types of Chemical reactions, PH, neutralization reaction	Theoretical and Practical	Quiz and Project
5	2	Analytical chemistry	Periodic table, equilibrium constant, buffer solution Acid-base titration, oxidation -reduction reaction	Theoretical and Practical	Quiz and Project
6	2	Analytical chemistry	Acid-base titration, oxidation -reduction reaction	Theoretical and Practical	Quiz and Project
7	2	Analytical chemistry	Spectroscopy (Optical spectroscopy, Beer's lambert law)	Theoretical	Quiz
8	2		Review and exam		
9 10	4	Organic chemistry	Structure of carbon compounds (alkanes, alkenes, alkynes, halogen compound)	Theoretical and Practical	Quiz and Project
11	2	Organic chemistry	Alcohols, classification, properties, reaction,	Theoretical and Practical	Quiz and Project
12	2	Organic chemistry	Aldehydes and ketones properties reaction	Theoretical and Practical	Quiz and Project
13 14	4	Organic chemistry	Carboxylic acid, Aromatic, Hydrocarbon	Theoretical and Practical	Quiz and Project
15	2	Organic chemistry	Amines, properties, chemical reaction	Theoretical and Practical	Quiz and Project

## 3. Course Evaluation

1. Assignments and Class Participation: 10 % of grade
2. Midterm Exams: 30% total (15% each) towards final grade
3. Lab work: 15 %
4. Final Exam: 35 % total towards final grade
5. Lab work: 25 % of final grade

## 4. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

“Fundamentals of Analytical Chemistry”  
*F. JAMES HOLLER STANLEY R. CROUCH*  
 “Organic Chemistry”, *Morrison & Boyd*



Recommended books and references (scientific journals, reports...)	
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Electronic References, Websites	
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## Course Description Form

10. Course Name:	
General Chemistry 2	
11. Course Code:	
12. Semester / Year:	
Semester 2/ Year 1	
13. Description Preparation Date:	
1/1/2023	
14. Available Attendance Forms:	
In-person	
15. Number of Credit Hours (Total) / Number of Units (Total)	
Credit Hours (7) / Number of Units (4)	
16. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Ghassan Mahmoud Ibrahim Email: <a href="mailto:gibrahim00@yahoo.com">gibrahim00@yahoo.com</a>	
Name: Dr. Aoras Ameen Kadhime Email: <a href="mailto:schuttberg@yahoo.com">schuttberg@yahoo.com</a>	
Name: M.Sc. Mohammed Bahaa Mohsin Email: <a href="mailto:mohammedbahaa783@gmail.com">mohammedbahaa783@gmail.com</a>	
17. Course Objectives	
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• <b>Foundational Knowledge:</b> Build a solid understanding of biochemistry principles in the medical laboratory context.</li> <li>• <b>Clinical Application:</b> Apply biochemistry concepts for practical use in clinical settings.</li> <li>• <b>Laboratory Skills:</b> Develop proficiency in biochemical techniques for effective medical laboratory work.</li> </ul>
18. Teaching and Learning Strategies	
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. <b>Integrated Learning:</b> Integrate biochemistry principles with practical applications tailored to medical laboratory sciences.</li> <li>2. <b>Hands-On Experience:</b> Prioritize practical, hands-on experiences in the laboratory to reinforce theoretical concepts.</li> <li>3. <b>Clinical Connection:</b> Emphasize the clinical relevance of biochemistry, linking theoretical knowledge to medical diagnosis and treatment in the laboratory.</li> </ol>

5.

## 6. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Principle Biochemistry	Carbohydrates: Definition, Biological functions, Classification.	Theoretical and Practical	Quiz and Project calculation
3-4	4	Principle Biochemistry	Lipids: Definition, Biological functions, Classification	Theoretical and Practical	Quiz and Project
5-6	4	Principle Biochemistry	Amino acids and Proteins: Definition, Biological functions. 3- Classification.	Theoretical and Practical	Quiz and Project
7	2	Principle Biochemistry	Review and exam		
8-9	4	Principle Biochemistry	Nucleotides and Nucleic acids: Definition, Classification of nitrogenous bases, biological functions of free nucleotides, General structure and differences between DNA and RNA.	Theoretical	Quiz
10	2	Principle Biochemistry	General properties of enzymes: catalytic efficiency, active sites, specificity, cofactor, regulation, location within the cells, Factors affecting reaction velocity, Substrate concentration, Temperature, Ph	Theoretical	Quiz
11	2	Principle Biochemistry	Vitamins: Definition, Classification (Water- and Fat-soluble vitamins), sources, daily requirement, biological function and abnormal, conditions, due to deficiency or toxicity	Theoretical	Quiz
12	2	Principle of Medical physics	Solar energy technology: Availability of solar radiation, Photovoltaic devices, Dye sensitized solar cells, Advantages of Solar Energy, Disadvantages 6- Photo Electrochemical Hydrogen Production	Theoretical	Quiz
13	2	Principle of Medical physics	Nanotechnology in renewable energy system: Nanotechnology enable renewable energy technologies, Energy transport, conversion and storage- Nano, micro and meso scale, phenomena devices	Theoretical	Quiz
14	2	Principle of Medical physics	Nanotechnology to Hydrogen Production: Photocatalytic water splitting reaction, Nano semiconductor materials for photocatalytic water splitting, photolytic H <sub>2</sub> Evolution based on Nano enhanced materials	Theoretical	Quiz
15	2		Revision		

## 7. Course Evaluation

1. Assignments and Class Participation: 10 % of grade
2. Midterm Exams: 30% total (15% each) towards final grade
3. Lab work: 15 %
4. Final Exam: 35 % total towards final grade
5. Lab work: 25 % of final grade

## 8. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	“Illustrated Biochemistry” <i>Harper’s</i>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	