Academic Program Description Form

Faculty/Institute: ...College of Science.....

Scientific Department: Chemistry Department

Academic or Professional Program Name: ..B.Scs. in Science.....

Final Certificate Name: ..B.Sc. in Chemistry Department Applications.....

Academic System: ...Semester (Courses).....

Description Preparation Date: April -2025 File Completion Date: 25-3-2025

Signature:

Head of Département Name:

Dr. Azal Shakir Waheeb

Date: 25/3/2025

Signature:

Scientific Association Name:

Dr. Salah Abdul Khuder Hasan

Date: 25/3/2025

The File is Checked by:

Department of Quality Assurance and University Performance

Director of Quality Assurance and University Performance:

M.Sc. Saleh A. Lazam

Date: 29/4/2025

Approval of the Dean

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

Academic Program and Course Description Guide

2025

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.

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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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 2/3/2025

Signature:	**Signature**:
Head of Department Name:	**Scientific Associate Name**:
Date:	**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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
Introducing the student to drugs from a chemical perspective, in terms of their chemical composition, funcational groups, how drugs are absorbed, metabolized, and excreted. .

4. **Program Accreditation**
Dose the programe have programe accreditation? And from which agency? yes

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

6. **Program Structure**

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
4 th		**molculer spectroscopy scond semester**	**theoretical 3**	**practical**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	• Learning the basics of pectroscopy , such as classification of electromagnetic radiation, units of measurement, and spectrum terms. • Explains the importance of chemical structure for all systems and its applications. • Learning the most important tools used in the spectrum chemistry and chemical structure
Skills	
Learning Outcomes	• Describe and begin for electromagnetic radition • Understand the tasks of anmolcuale spectroscopy
Ethics	
Learning Outcomes	• The student should be aware of the importance of the role he will play when working in the spectrum chemistry • Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. • Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	spectroscopy			✔	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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 aboute the program

14.Program Development Plan

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

4th		**molculer spectroscopy**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
molculer spectroscopy
2. Course Code:
3. Semester / Year: 2024-2025
Semester One/ first
4. Description Preparation Date:
1/3/2025
5. Available Attendance Forms:
1/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theortical
7. Course administrator's name (mention all, if more than one name)
Name: Dr hassan sabih Jaber Email: hassansabih87@mu.edu.iq
8. Course Objectives

Course Objectives	● Explain the basic concepts of spectroscopy ● summaries thr relationship between chemical structure for cmpoundes
9. Teaching and L	
Strategy	The main strat that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their moleculer spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			General introduction		
Week 2			Regions of the spectrum		

Week 3			Rotational spectrum		
Week 4			Rigid rotor		
Week 5			Spectrum line intensities and stark effect and effect of isotopic		
Week 6			Non Rigid rotor		
Week 7			Application and Instrumentation		
Week 8			The vibration spectrum for diatomic		
Week 9			simple harmonic oscillator		
Week 10			Anhrmonic oscillator		
Week 11			vibration -rotation spectrum		
Week 12			molecular electronic spectrum		
Week 13			selection rule of electronic spectrum		
Week 14			Nuclear magnetic resonance spectdum		
Week 15			Chemical shifta		

11.

Quizzes 3% (1
Exam32%
Report 7%
Final Exam %60

12.

Required Texts moleculer spectrosco Banwall	
Recommended Texts zQuantum chemistry and molecu spectroscopy	

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Academic Program Description Form

University Name: ..**AL-Muthana university**.....

Faculty/Institute: ...**College of Science**.....

Scientific Department: .**Chemistry** ……

Academic or Professional Program Name: … : **Bachelor's**…

Final Certificate Name: ..**B**.**Sc in Chemistry**……

Academic System: **courses** …

Description Preparation Date: **1–3–2025**

File Completion Date: **1–3–2025**

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**
Program vision is written here as stated in the university's catalogue and website.

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

This module aims to teach core concepts in polymer chemistry including topics Types of polymers and their classification knowledge and skills to enhance performance in the area of chemistry .

4. Program Accreditation

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

5. Other external influences

Is there a sponsor for the program?No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	1			
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	
4rd		Polymers chemistry first semester	Theoretical 2	Practical 2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	On successfully completing the module you will be able to.. 1. Explain the basic concepts of chemistry 2. Communicate key practical skills relating specifically to polymer chemistry 3. Describe the basic principles of polymer chemistry 4. Evaluate essential key facts and theory in a sub discipline of the chemical sciences 5. Describe and begin to evaluate aspects of polymers chemistry with reference to textbook material
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members						
Academic Rank	**Specialization**		**Special Requirements/Skills (if applicable)**		**Number of the teaching staff**	
	General	**Special**			**Staff**	**Lecturer**
	Chemistry sciences	polymers			+	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4rd		Polymers chemistry	Basic	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name: polymer chemistry	
2. Course Code:	
3. Semester / Year:2024−2025	
4. Description Preparation Date:11−3−2025	
5. Available Attendance Forms: 11-3-2025	
6. Number of Credit Hours (Total) / Number of Units (Total) 30 hours theoretical + 30 hours practical	
7. Course administrator's name (mention all, if more than one name)	
Name: wafaa mahdi sajet Email: wafamahdi@mu.edu.iq	
8. Course Objectives	
Course Objectives	1. Explain the basic concepts of polymers 2. Recall the structures of polymers 3. Summaries the relationship between chemical structure and chemical function 4. Communicate key practical skills relating specifically to polymers chemistry 5. Describe the basic principles of polymers chemical / classification 6. Evaluate essential key facts and theory in a sub discipline of the chemical sciences 7. Describe and begin to evaluate aspects of polymers chemistry with reference to textbook material 8. With guidance, deploy of established techniques of analysis, practical investigation and enquiry within polymers

9. Teaching and Learning Strategies

Strategy	Lectures ,Practicals ,Workshops ,Skills and group work online quizzes,short answer questions ,a problem class ,Practical labs ,Written reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	2		1.Introduction and General principles al polymers chemistry 2. Factors affecting polymer properties / poly nomenclature/ Polymers source 3. Molecular weight of polymer – Molecular for intra and inter 4. Types of polymers and their classification 5. Chain Growth polymerization (addi polymers) / free radical polymerization mechanism /initiation 6. Chain Growth polymerization (addition polym / Cationic polymerization and mechanism /initiat 7. Chain Growth polymerization (addi polymers) / Anionic polymerization and mechan /initiation 8. Condensation or step- Growth polymerization Nylon 66 / Dacron/ poly ester 9. Condensation or step- Growth polymerization Novolak / phenol- formaldehyde Resins 10. Condensation or step- Growth polymerization Epoxy Resins / Resoles/ polyurethanes 11.addition polymers/ Low density polyethelene high density 12.Copolymerization / preparation of Condensa Copolymers 13. Determination of the reactivity ratio 14. Coordination polymers general information 15. Coordination polymers / Ziegler- Natta polyn	lectures	z , m s o t m s

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc		
12. Learning and Teaching Resources		
Required textbooks (curricular books, if any)	Contemporary polymer chemistry / Georgis A. Aadam and Thanun M. Pyriadi / University of Mousel	
Main references (sources)	Polymer Chemistry by Georgis A. Aadam	
Recommended books and references (scientific journals, reports…)		
Electronic References, Websites		

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2025

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Faculty/Institute: …**College of Science**.....

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

Academic or Professional Program Name: .....

Final Certificate Name: ..**B**.**Sc in Chemistry**.....

Academic System:.....

Description Preparation Date: **3–3–2025**

File CompletionDate:**3–3–2025**

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**
Program vision is written here as stated in the university's catalogue and website.

2. **Program Mission**

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

This module aims to teach you core concepts in nanochemistry including topics on structure of nano compound and chemical and physical properties ,,shapes and application in medicine ,mechanical field and ability of application in future

4. Program Accreditation

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

5. Other external influences

Is there a sponsor for the program?No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours

third		**Nanochemistry 1 first semester**	**Theoretical 2**	**Practical –**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	On successfully completing the module you will be able to.. 1. Explain the basic concepts of nanochemistry 2. Recall the structures of Nano chemistry 3. Communicate key practical skills relating specifically to nano chemistry
Skills	
Learning Outcomes 2	Learning Outcomes Statement 2
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Implemented at all stages of the program in general.

11. Faculty

Faculty Members

Academic Rank	Specialization	Special Requirements/Skills (if applicable)	Number of the teaching staff

	General	Special			Staff	Lecturer
	Sciencechemistry	Physical chemistry			/	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Third		Nano chemistry	(Elective)	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:**Nanochemistry**
2. Course Code:
3. Semester**First course** / Year:2025−2024
4. Description Preparation Date:3−3−2025
5. Available Attendance Forms:3-3-2025
6. Number of Credit Hours (2) / Number of Units (2) 30 hours theoretical
7. Course administrator's name (mention all, if more than one name)
Name: Nahla ghazi fahad Email:Nahlaghazi@mu.edu.iq
8. Course Objectives

Course Objectives	**1**− The goal of nanochemistry is to educate students about what nanochemistry is and the various In relation to nanotechnology, nano measurement, and other related fields **2**− the development of nanotechnology from its inception to the present, and educate students about the forms and composition of nanocompounds. **3−study the application of nanotechnology**

9. Teaching and Learning Strategies

Strategy	Lectures ,Practical ,Workshops ,Skills and group work online quizzes, short answer questions ,a problem class ,Practical labs ,Written reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		**Introduction nanotechnology**		Lectures+Data Show	Quiz , Exams Report exams
2		**History of nanotechnology**		Lectures+Data Show	Quiz , Exams Report exams
3		**Recognize of nanotechnology**		Lectures+Data Show	Quiz , Exams Report exams
4		**Properties of nano materials**		Lectures+Data Show	Quiz , Exams Report exams
5		**Chemical properties of nano materials**		Lectures+Data Show	Quiz , Exams Report exams
6		**Shapes of nano materials**		Lectures+Data Show	Quiz , Exams Report exams
7		**Application of nanotechnology**		Lectures+Data Show	Quiz , Exams Report exams
8		**Application of nanotechnology in medicine**		Lectures+Data Show	Quiz , Exams Report exams
9		**Application of nanotechnology**in industrial		Lectures+Data Show	Quiz , Exams Report exams
10		**Application of nanotechnology in electronic**		Lectures+Data Show	Quiz , Exams Report exams
11		**Application of nanotechnology in future**		Lectures+Data Show	Quiz , Exams Report exams
12		**Method of preparation nanomaterials**		Lectures+Data Show	Quiz , Exams Report exams
13-14-15		TEM, SEM Application of SEM ,TEM		Lectures+Data Show	Quiz , Exams Report

					exams	
11. Course Evaluation						
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports .... etc						
12. Learning and Teaching Resources						
Required textbooks (curricular books, if any)						
Main references (sources)						
Recommended books and references (scientific journals, reports…)						
Electronic References, Websites						

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Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 2/3/2025

Signature:	**Signature**:
Head of Department Name:	**Scientific Associate Name**:
Date:	**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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
Introducing the student to drugs from a chemical perspective, in terms of their chemical composition, funcational groups, how drugs are absorbed, metabolized, and excreted. .

4. **Program Accreditation**
Dose the program have program accreditation? And from which agency? yes

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

6. **Program Structure**

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	2			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
4 th		**Pharmaceutical scond semester**	**theoretical 2**	**practical**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	● Lecture Method and Use of the Interactive Whiteboard ● - Explanation and Clarification ● - Providing students with the basics and additional topics related to the outcomes of chemical thinking and analysis ● - Forming discussion groups during lectures to discuss topics in pharmaceutical chemistry that require thinking and analysis ● - Asking students to ask a series of reflective questions during lectures, such as what, how, when, and why, for specific topics ● - Assigning students homework that requires self-explanations using causal methods
Skills	
Learning Outcomes	● Describe and begin for scientific conferences. ● Guide students in participating in laboratory courses. ● Participate in monthly laboratory equipment courses. ● Participate in scientific workshops and seminars inside and outside the country.

	• Conduct field visits.
Ethics	
Learning Outcomes	• The student should be aware of the importance of the role he will play when working in the spectrum chemistry • Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. • Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	Organic			✔	

		Chemistry				

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

4th		**Pharmaceutical**	**Elective**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Pharmaceutical
2. Course Code:
3. Semester / Year: 2024-2025
Semester One/ first
4. Description Preparation Date:
2/3/2025
5. Available Attendance Forms:
2/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theoretical
7. Course administrator's name (mention all, if more than one name)
Name: Dr Shaymaa Adil Mohammed Email: shiemaa@mu.edu.iq
8. Course Objectives

Course Objectives	● Explain the basic concepts of Pharmaceutical ● summaries thr relationship between chemical structure for durgs
9. Teaching and L	
Strategy	. ● Describe and begin for scientific conferences. ● Guide students in participating in laboratory courses. ● Participate in monthly laboratory equipment courses. ● Participate in scientific workshops and seminars inside and outside the country. Conduct field visits

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			Basic concept of prodrugs		
Week 2			mechanism for the conversion of prodrug to an active drug		
Week 3			Types of prodrugs		
Week 4			Chemical classification of carrier linked prodrug		
Week 5			double(mutual) prodrug		
Week 6			Example (double ester) prodrug		
Week 7			Types of prodrugs: Based on Chemical linkage		
Week 8			Prodrugs for Amines		
Week 9			Rational For the Use of Prodrugs		
Week 10			Alteration of Drug Solubility		
Week 11			Chemical Drug Delivery Systems: Strategies and Applications		
Week 12			Drug Targeting		
Week 13			Targeted prodrug design		
Week 14			Peptide Transporter Associated Prodrug Therapy		
Week 15			lectins		

11.

Quizzes 3% (1
Exam32%
Report 7%
Final Exam %60

12.

Wilson and Gisvold Textbook of Organic Medicinal and Pharmaceutical Chemistry; Delgado JN, Remers WA, (Eds.); 12th ed., 2011

Recommended Texts • http://omicsonline.org/polymeric-prodrugs-recent-achievementsand-general-strategies-jaa.S15-007.pdf http://pharma.financialexpress.com/20050818/technologytrendz01.shtml. http://www.pcb.ub.edu/fama/pdf/Current%20Drug%20Delivery,%202012,%209,%20000-000.pdf • https://www.medicinescomplete.com	

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

Academic Program and Course Description Guide

2025

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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 2/3/2025

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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
4. Making the student is able to understand the fundamental principles and concepts in Organic compounds and learn how these concepts and applied increase student skills
Dose the program have program accreditation? And from which agency? yes

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

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**4**			
College Requirements				

Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
3 th		**Organic chemistry4 second semester**	**Theoretical 2**	**Practical 2**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	The course aims are to give the students the basic scientific concepts of organic chemistry in intermediate anion and other topic as in below.
Skills	
Learning Outcomes	Study of carbanion ion, Carbanion I and II. ● 2- Study of the preparation and reactions of carbanion ion, Carbanion I and II
Ethics	
Learning Outcomes	● The student should be aware of the importance of the role he will play when working in the spectrum chemistry ● Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. ● Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects /, and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	Organic chemistry			✔	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**	**Skills**	**Ethics**

				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3th		Organic chemistry 4	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Organic chemistry 4
2. Course Code:
3. Semester / Year: 2024-2025
Semester One/ first
4. Description Preparation Date:
2/3/2025
5. Available Attendance Forms:
2/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theoretical and particle
7. Course administrator's name (mention all, if more than one name)
Name: **Kasim M. Hello** Email: kasimhillo@mu.edu.iq
8. Course Objectives

Course Objectives	● Explain the basic concepts of Organic compounds ● summaries the relationship between chemical structure for compounds
9. Teaching and L	
Strategy	The main start that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their Biochemistry thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			Carboanion (synthesis and stability)		
Week 2			Carbocation (synthesis and stability)		
Week 3			Carbanion I (substitution & elimination reactions)		
Week 4			Condensation reactions (Aldol, Claisen, Benzoin, Dieckman and Perkin)		
Week 5			Addition reactions (Michael and Robinson)		
Week 6			Electrophilic addition to alpha/beta carbonyl compounds		
Week 7			Nucleophilic addition to alpha/beta carbonyl compounds		
Week 8			Nucleophilic substitution of Carbanion II (Malonic acid and acetoacetic acid preparation)		
Week 9			Rearrangement of Carbanion (Witig and Refarmotiski)		
Week 10			Epoxide ring-opening reactions		
Week 11			Mechanism of carbocation rearrangement reactions		
Week 12			Bicyclic compounds: Naming		
Week 13			Bicyclic compounds: Preparations		
Week 14			Bicyclic compounds: Reactions		
Week 15			Diels Alder reaction		

11.

Quizzes 3% (1
Exam32%
Report 7%
Final Exam %60

12.

Advanced organic chemistry 3rd Year
Fahad Ali Hussein

Recommended Texts
Organic Chemistry by Morrison a

Boyd	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
DirectorateofQualityAssuranceandAcademicAccreditation
Accreditation Department

AcademicProgram and Course Description Guide

2025

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 thejobmarket.Theprogramisreviewedandevaluatedeveryyearthrough internalorexternalauditproceduresandprogramslike the External ExaminerProgram.

Theacademicprogramdescriptionisashortsummaryofthemain featuresoftheprogramanditscourses.Itshowswhatskillsstudentsare working to develop based on the program's goals. This description is very importantbecauseitisthemainpartofgettingtheprogramaccredited, anditiswrittenbytheteachingstafftogetherunderthesupervisionof 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 in cluded the description of the academic programinitstr additional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of StudiesT3/2906on3/5/2023regardingtheprogramsthatadopttheBologn a Processes the basis for their work.

In this regard ,we can only emphasize Heim portance of writ in gain academicprogramsandcoursedescriptiontoensuretheproperfunctioning of the educational process.

Conceptsandterminology:

AcademicProgramDescription:Theacademicprogramdescriptionprovidesa brief summary of its vision, mission and objectives, includinganaccuratedescription ofthetargetedlearningoutcomesaccordingtospecificlearningstrategies.

Course Description: Provides a brief summary of the most important characteristics ofthecourseandthelearningoutcomesexpectedofthestudentstoachieve, proving whether they have made the most of the available learning opportunities. It isderivedfromtheprogramdescription.

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

Program Mission: Briefly outlines the objectives and activities necessary to achieve themanddefinestheprogram'sdevelopmentpathsanddirections.

Program Objectives: Theyare statements thatdescribewhatthe academic program intends to achieve within a specific period of time and are measurable and observable.

CurriculumStructure: Allcourses/subjectsincludedintheacademicprogram accordingtotheapprovedlearningsystem(quarterly,annual,BolognaProcess) whether it is a requirement (ministry, university, college and scientific department) withthenumberofcredithours.

LearningOutcomes: Acompatiblesetofknowledge,skillsandvaluesacquired bystudentsafterthesuccessfulcompletionoftheacademicprogramandmust determine the learning outcomes of each course in a way that achieves the objectivesoftheprogram.

Teachingandlearningstrategies: Theyarethestrategiesusedbythefaculty memberstodevelopstudents'teachingandlearning,andtheyareplansthatare

followedtoreachthelearninggoals.Theydescribeallclassroomandextra-curricularactivitiestoachievethelearningoutcomesoftheprogram.

AcademicProgramDescriptionForm

University Name: AL-Muthanna University
Faculty/Institute: College of Science.
ScientificDepartment:.Chemistry
AcademicorProfessionalProgramName:.....
Final Certificate Name: B.Sc in Chemistry
Academic System: ……
Description Preparation Date:2-3-2025
FileCompletionDate:2-3-2025

Signature:	**Signature:**
HeadofDepartmentName:	**ScientificAssociateName:**
Date:	**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.**ProgramVision**
Programvisioniswrittenhereasstatedintheuniversity'scatalogueandwebsite.

2.**ProgramMission**
Programmissioniswrittenhereasstatedintheuniversity'scatalogueand website.

3.**ProgramObjectives**
Thismoduleaimstoteachyoucoreconceptsinphysicalchemistryincludingtopicsonstructureofatomic,molcualer Theoretical and principles of structure, functions ofmolecules and its role in chemistry process. The role of chemistry in the understanding of chemistry systems and sciences. The module will also provide a background to fundamental aspects of chemistry. This module provides you with the core knowledge and skills to enhance performanceintheareaofphysicalchemistry**.**

4.**ProgramAccreditation**
Doestheprogramhaveprogramaccreditation?Andfromwhichagency?Yes.

5.**Otherexternalinfluences**

Is there a sponsor for the program ?No

6.ProgramStructure				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7.ProgramDescription				
Year/Level	**Course Code**	**CourseName**	**Credit Hours**	
3rd		**Surface chemistry secondsemester**	**Theoretical 3**	

8.Expectedlearningoutcomesoftheprogram
Knowledge

LearningOutcomes1	Onsuccessfullycompletingthemoduleyouwillbeableto.. 1. Explainthebasicconceptsofphysicalchemistry 2. Recallthestructuresofmoleculesand atomic 3. Summariestherelationshipbetweenchemicalstructureandphyscis 4. Communicatekeypracticalskillsrelatingspecificallytosurface chemistry 5. Describethebasicprinciplesofphysical/chemical 6. Evaluateessentialkeyfactsandtheoryinasubdisciplineofthephysical chemistry 7. Describeandbegintoevaluateaspectsofphysicalchemistrywith reference to textbook material
	8.Withguidance,deployofestablishedtechniquesofanalysis,practical investigation and enquiry within physical chemistry
Skills	
LearningOutcomes2	LearningOutcomesStatement2
LearningOutcomes3	LearningOutcomesStatement3
Ethics	
LearningOutcomes4	LearningOutcomesStatement4
LearningOutcomes5	LearningOutcomesStatement5

9.TeachingandLearningStrategies

Teachingandlearningstrategiesandmethodsadoptedintheimplementationof theprogramingeneral.

10.Evaluationmethods

Implementedatallstagesoftheprogramingeneral.

11.Faculty

FacultyMembers

AcademicRank	Specialization		Special Requirements/Skills (if applicable)		Numberoftheteachingstaff	
	General	Special				Lecturer
	chemistry	Surface chemistry				

Professional Development

Mentoringnewfacultymembers

Brieflydescribestheprocessusedtomentornew,visiting,full-time,andpart-timefacultyatthe institutionanddepartmentlevel.

Professionaldevelopmentoffacultymembers

Brieflydescribetheacademicandprofessionaldevelopmentplanandarrangementsforfaculty such as teaching and learning strategies, assessment of learning outcomes, professional development,etc.

12. AcceptanceCriterion

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

13. Themostimportantsourcesofinformationabouttheprogram

Statebrieflythesourcesofinformationabouttheprogram.

14. ProgramDevelopmentPlan

ProgramSkillsOutline															
				RequiredprogramLearningoutcomes											
Year/Level	Course Code	CourseName	Basicor optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2nd		Surface chemistry	secondary	√	√	√	√	√	√	√	√	√	√	√	√
														√	√

- **Pleasetickthebox escorrespondingtotheindividualprogramlearningoutcomesunderevaluation.**

CourseDescriptionForm

1.CourseName:surface chemistry
2.CourseCode:
3.Semester /Year:2024-2025
4.DescriptionPreparationDate:1-3-2025
5.AvailableAttendanceForms:1-3-2025
6.NumberofCreditHours(Total)/NumberofUnits(Total)30 hours theoretical
7.Courseadministrator'sname(mentionall,ifmorethanone name)
Name: Nahla ghazi fahad Email: nahlaghazi@mu.edu.iq
8.CourseObjectives

Course Objectives	1. Explainthebasicconceptsof.surface chemistry 2. Recallthestructuresofmoleculesand atomic 3. Summariestherelationshipbetweenchemical structure for cmpoundes 4. Communicatekeypracticalskillsrelating specifically to surfacechemistry 5. Describethebasicprinciplesofphysical

	/chemicalscience 6. Evaluateessentialkeyfactsandtheoryinasub discipline of the surface chemistry 7. Describe and begin to evaluate aspects of surface chemistrywithreferencetotextbook material 8. Withguidance,deployofestablishedtechniques of analysis, practical investigation and enquiry within surfacel chemistry

9.TeachingandLearningStrategies

Strategy	Lectures,Workshops,Skillsandgroupwork onlinequizzes,shortanswerquestions,aproblemclass,,Writtenreports

10.CourseStructure

Week	Hours	Required Learning Outcomes	Unitorsubjectname	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14	2		1.Description of surface phenomena 2.Definition and classification of adsorption 3.Mechanism of adsorption 4.factor effect of gases adsorption 5.Frendlich equation 6.surface chemistry and catalysis 7.Description of colloidal statement 8. preparation method Properties of 9.colloidal material		Quiz, Exams Report exams

			10. Gell formation 11. .Uses of capillary effect 12. Exam			
			13.Thermodynamic function 13. Surface tenses 15. System of surface energy			
11.CourseEvaluation						
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .....etc						

12.LearningandTeachingResources		
Requiredtextbooks(curricularbooks,ifany)		
Mainreferences(sources)	1- اسس الكيمياء الفيزياويه // دكتور جلال محمد	
Recommended books and references (scientificjournals,reports...)	1-Surface ghemistry and catalysis	
ElectronicReferences,Websites	Entrnet	

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

Academic Program and Course Description Guide

2025

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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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 2/3/2025

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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
This module to teach you core concepts in molcualer spectroscopy topics on structure of atomc, molcualer theortical and principles of structure,function of molcualer and its role in chemistry process. Thes module provides you with the core knowledge and skills to performance in the area of molcualer spectroscopy.

4. **Program Accreditation**
Dose the programe have programe accreditation? And from which agency? yes

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

6. **Program Structure**				
Program Structure	**Number of**	**Credit hours**	**Percentage**	**Reviews***

	Courses			
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
4 th		**Biochemistry IV scond semester**	**Theoretical 2**	**Practical 2**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	● Learning the basics of pectroscopy , such as classification of electromagnetic radiation, units of measurement, and spectrum terms. ● Explains the importance of chemical structure for all systems and its applications. ● Learning the most important tools used in the spectrum chemistry and chemical structure
Skills	
Learning Outcomes	● Describe and begin for electromagnetic radition ● Understand the tasks of anmolcuale spectroscopy
Ethics	
Learning Outcomes	● The student should be aware of the importance of the role he will play when working in the spectrum chemistry ● Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. ● Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	Biochemistry			✔	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

4th		**Biochemistry IV**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Biochemistry IV
2. Course Code:
3. Semester / Year: 2024-2025
Semester One/ first
4. Description Preparation Date:
2/3/2025
5. Available Attendance Forms:
2/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theoretical and particle
7. Course administrator's name (mention all, if more than one name)
Name: Muna Hasson Email: Muna.hasson@mu.edu.iq
8. Course Objectives

Course Objectives	● Explain the basic concepts of Biochemistry ● summaries the relationship between chemical structure for compounds
9. Teaching and L	
Strategy	The main start that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their Biochemistry thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			Introduction of metabolism, glycolysis		
Week 2			Fate of pyruvate under aerobic and anaerobic condition, Gluconeogensis		
Week 3			Pentose phosphate pathway,regulation of glycolysis and gluconeogensis		
Week 4			Glycogen synthesis and breackdown,regulation of glycogen metabolism		
Week 5			Citric acid cycle,regulation of TCA		
Week 6			Oxidation of fatty acids		
Week 7			Ketone bodies, Fatty acids biosynthesis		
Week 8			Biosynthesis of triacylglycerols and cholesterol		
Week 9			Proteins metabolism-oxidation of amino acid,		
Week 10			Urea cycle,pathways of amino acid degradation		
Week 11			Degradation of amino acids to pyruvate		
Week 12			Convert of amino acids to glucose or to ketone bodies, Biosynthesis of amino acids		
Week 13			Preparatory week before the final Exam		
Week 14			Proteins metabolism-oxidation of amino acid,		
Week 15			Urea cycle,pathways of amino acid degradation		

11.

Quizzes 3% (1
Exam32%
Report 7%
Final Exam %60

12.

Title: " - Lippincott's Illustrated Reviews: Biochemistry Fifth Edition	
Recommended Texts Principles of biochemistry-	

Lehninger Principles of biochemistry, 7th edition, Smith et McGraw- Hill	

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

Academic Program and Course Description Guide

2025

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.

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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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 2/3/2025

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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
4. Making the student is able to understand the fundamental principles and concepts in Organic Identification and learn how these concepts and applied increase student skills
Dose the programe have programe accreditation? And from which agency? yes

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

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**4**			
College Requirements				

Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
4 th		**Organic Identification scond semester**	**Theoretical 3**	**Practical 2**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	Identification of organic compounds by ultra violet spectroscopy, Infra-Red spectrometry, Nuclear Magnetic resonance spectrometry. As well as the study of mass spectrometry
Skills	
Learning Outcomes	• Describe and begin for organic compounds Understand the tasks of an molecular spectroscopy
Ethics	
Learning Outcomes	• The student should be aware of the importance of the role he will play when working in the spectrum chemistry • Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. • Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments

involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects /, and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	Organic chemistry			✔	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

4th		Organic Identification	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Organic Identification
2. Course Code:
3. Semester / Year: 2024-2025
Semester One/ first
4. Description Preparation Date:
2/3/2025
5. Available Attendance Forms:
2/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theoretical and particle
7. Course administrator's name (mention all, if more than one name)
Name: Riyadh Jalel Nahi Email: Riyadh@mu.edu.iq
8. Course Objectives

Course Objectives	● Explain the basic concepts of Organic identification ● summaries the relationship between chemical structure for compounds
9. Teaching and L	
Strategy	The main start that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their Biochemistry thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			Ultra Violet-Visible spectrometry Introduction absorption electronic types _chromospheres groups simple		
Week 2			-Experimental rules guess absorption sites-butadiene substitutes by alkyl groups acyclic dienes		
Week 3			carbonylchromosphere and the effect of the solvent		
Week 4			- Benzene ring absorption is unsubstitutes and the effect of substation on the absorption and the effect of the solvent		
Week 5			Infra-Red spectrometry- General introduction		
Week 6			Sample handling - Characteristics of pack absorption		
Week 7			Factors affecting on absorption and the severity and location of the pack include:-absorption frequency bond C-H /O-H/ N-H/S-H/C-X/C-C /C-N/C= /C=C		
Week 8			These frequencies include stretch and absorption of bending of the bonds above for most organic compounds		
Week 9			Nuclear Magnetic Resonance spectrometry of protons - General introduction- Sample		

			handling - Chemical Shift- Factors affecting the chemical shift		
Week 10			shielding Alda magnetic- Influence Azeotropic - influence paramagnetic - Interpretation Spin-spin splitting (First order)		
Week 11			Effects physical Spin-Spin Splitting		
Week 12			Phenomenon quadrant electrode determination- Integration calculate the number of protons -Spin-Spin Splitting (Second order)- chemical equivalence and magnetic equivalence		
Week 13			Protons coding Complex systems for prevalence modes Spin-Spin -System AB - calculate the Shift and coupling constant		
Week 14			descriptive display different types of Second order AB2,ABX,AAXX,ABC,A2B2C3		
Week 15			Mass spectrometry – Introduction-Apparatus mass spectrometry		

11.

Quizzes 3% (1
Exam32%
Report 7%
Final Exam %60

12.

Organic Spectroscopy William kemp Organic Chemistry Morrison	
Recommended Texts Identification systematic for organic compounds George Jonathan Sarkis	

Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
DirectorateofQualityAssuranceandAcademicAccreditation
Accreditation Department

AcademicProgram and Course Description Guide

2025

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 thejobmarket.Theprogramisreviewedandevaluatedeveryyearthrough internalorexternalauditproceduresandprogramslike the External ExaminerProgram.

Theacademicprogramdescriptionisashortsummaryofthemain featuresoftheprogramanditscourses.Itshowswhatskillsstudentsare working to develop based on the program's goals. This description is very importantbecauseitisthemainpartofgettingtheprogramaccredited, anditiswrittenbytheteachingstafftogetherunderthesupervisionof 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 lightofthe updatesand developmentsof the educational system in Iraq, whichincludedthedescriptionoftheacademicprograminitstraditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of StudiesT3/2906on3/5/2023regardingtheprogramsthatadopttheBologn a Processasthebasisfortheirwork.

Inthisregard,wecanonlyemphasizetheimportanceofwritingan academicprogramsandcoursedescriptiontoensuretheproperfunctioning oftheeducationalprocess.

Conceptsandterminology:

AcademicProgramDescription:Theacademicprogramdescriptionprovidesa briefsummary ofits vision,mission andobjectives, includinganaccuratedescription ofthetargetedlearningoutcomesaccordingtospecificlearningstrategies.

Course Description: Provides a brief summary of the most important characteristics ofthecourseandthelearningoutcomesexpectedofthestudentstoachieve, proving whether they have made the most of the available learning opportunities. It isderivedfromtheprogramdescription.

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

Program Mission: Briefly outlines the objectives and activities necessary to achieve themanddefinestheprogram'sdevelopmentpathsanddirections.

Program Objectives: Theyare statements thatdescribewhatthe academic program intends to achieve within a specific period of time and are measurable and observable.

CurriculumStructure: Allcourses/subjectsincludedintheacademicprogram accordingtotheapprovedlearningsystem(quarterly,annual,BolognaProcess) whether it is a requirement (ministry, university, college and scientific department) withthenumberofcredithours.

LearningOutcomes: Acompatiblesetofknowledge,skillsandvaluesacquired bystudentsafterthesuccessfulcompletionoftheacademicprogramandmust determine the learning outcomes of each course in a way that achieves the objectivesoftheprogram.

Teachingandlearningstrategies: Theyarethestrategiesusedbythefaculty memberstodevelopstudents'teachingandlearning,andtheyareplansthatare

followedtoreachthelearninggoals.Theydescribeallclassroomandextra-curricularactivitiestoachievethelearningoutcomesoftheprogram.

AcademicProgramDescriptionForm

University Name: AL-Muthanna University

Faculty/Institute: College of Science.

Scientific Department: Chemistry

Academic or Professional Program Name:.....

Final Certificate Name: B.Sc in Chemistry

Academic System: ……

Description Preparation Date:2-3-2025

File Completion Date:2-3-2025

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.**ProgramVision**
Programvisioniswrittenhereasstatedintheuniversity'scatalogueandwebsite.

2.**ProgramMission**
Programmissioniswrittenhereasstatedintheuniversity'scatalogueand website.

3.**ProgramObjectives**

This module aims to teach you the fundamental concepts of petrochemicals, including topics on the structure of petrochemical compounds, oil and its derivatives, as well as their functions and role in industrial processes. It also covers the role of petrochemicals in understanding chemical systems and their applications in various fields. Additionally, this module provides a background on the essential aspects of petrochemicals and equips you with the core knowledge and skills to enhance performance in this field.

4.**ProgramAccreditation**
Does the program have program accreditation ?And from which agency Yes.

5.Otherexternalinfluences
Is there a sponsor for the program? No

6.ProgramStructure				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**2**			
College Requirements				
Department Requirements				
SummerTraining	**yes**			
Other				

*This can include not she the recourse is basic or optional.

7.ProgramDescription				
Year/Level	**CourseCode**	**CourseName**	**Credit Hours**	
2nd		Petrochemicals **Second semester**	**Theoretical and practical**	

8.Expectedlearningoutcomesoftheprogram	
Knowledge	
LearningOutcomes1	On successfully completing the module, you will be able to: 1. Explain the basic concepts of petrochemicals. 2. Recall the structures of petrochemical compounds and their derivatives. 3. Summarize the relationship between chemical structure and industrial applications. 4. Communicate key practical skills related specifically to petrochemicals. 5. Describe the basic principles of petrochemical processes. 6. Evaluate essential key facts and applications in a sub-discipline of petrochemicals. 7. Describe and begin to evaluate aspects of petrochemicals with reference to textbook material.
	8.Withguidance,deployofestablishedtechniquesofanalysis,practical investigation and enquiry within physical chemistry
Skills	
LearningOutcomes2	LearningOutcomesStatement2
LearningOutcomes3	LearningOutcomesStatement3
Ethics	
LearningOutcomes4	LearningOutcomesStatement4
LearningOutcomes5	LearningOutcomesStatement5

9.TeachingandLearningStrategies

Teachingandlearningstrategiesandmethodsadoptedintheimplementationof

The program in general.

10.Evaluationmethods

implement data stages of the program in general.

11.Faculty

FacultyMembers

AcademicRank	Specialization		Special Requirements/Skills (if applicable)		Numberoftheteachingstaff	
	General	Special				Lecturer
	chemistry	Petrochemicals				

Professional Development

Mentoringnewfacultymembers

Brieflydescribestheprocessusedtomentornew,visiting,full-time,andpart-timefacultyatthe institutionanddepartmentlevel.

Professionaldevelopmentoffacultymembers

Brieflydescribetheacademicandprofessionaldevelopmentplanandarrangementsforfaculty such as teaching and learning strategies, assessment of learning outcomes, professional development,etc.

12. AcceptanceCriterion

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

13. Themostimportantsourcesofinformationabouttheprogram

Statebrieflythesourcesofinformationabouttheprogram.

14. ProgramDevelopmentPlan

ProgramSkillsOutline															
				RequiredprogramLearningoutcomes											
Year/Level	Course Code	CourseName	Basicor optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2nd		Petrochemicals	Basic	√	√	√	√	√	√	√	√	√	√	√	√
														√	√

- **Pleasetickthebox escorrespondingtotheindividualprogramlearningoutcomesunderevaluation.**

CourseDescriptionForm

1.CourseName: Petrochemicals
2.CourseCode:
3.Semester /Year:2024-2025
4.DescriptionPreparationDate:2-3-2025
5.AvailableAttendanceForms:2-3-2025
6.NumberofCreditHours(Total)/NumberofUnits(Total)30 hours Theoretical and practical
7.Courseadministrator'sname(mentionall,ifmorethanone name)
Name: Wafaa Mahdi Sachit Alkoofee Email: wafamahdi@mu.ed.iq
8.CourseObjectives

Course Objectives	1. n successfully completing the module, you will be able to: 2. Explain the basic concepts of petrochemicals. 3. Recall the structures of petrochemical compounds and their derivatives. 4. Summarize the relationship between chemical structure and industrial applications of petrochemicals. 5. Communicate key practical skills related specifically to petrochemical processes. 6. Identify the most important petrochemical industries that rely mainly on the use of crude oil or natural gas as raw materials and

	derivatives. 7. Evaluate essential key facts and applications in a sub-discipline of petrochemicals. 8. Describe and begin to evaluate aspects of petrochemicals with reference to textbook material. 9. With guidance, apply established techniques of analysis, practical investigation, and inquiry within petrochemical studies.

9.TeachingandLearningStrategies

Strategy	Lectures,Workshops,Skillsandgroupwork onlinequizzes,shortanswerquestions,aproblemclass,,Writtenreports

10.CourseStructure

Week	Hours	Required Learning Outcomes	Unitorsubjectname	Learning method	Evaluation method
1 2 3 4 5	3		1. Introduction and General principles about petrochemicals 2. Petroleum its primary	lectures	

6 7 8 9 10 11 12 13 14			derivatives in industries petrochemicals 3. Production of industrial gas and its derivatives 4. Thermal solution and catalytic thermal solution for the production of primary raw materials for petrochemical industries 5. Thermal solution for acetylene, thermal solution for butene formation and others 6. Oxidation processes and applications in petrochemical industries 7. Halogenation and Applications / Industry of dyes 8. Halogenation and applications / Polymer industries 9. Alkylation processes and detergent industries applications 10. Alkylation processes and Enhanced Fuel Industries 11. The processes of formation of aromatic derivatives and their importance Petrochemical industries 12. Urea industry / Ammonia Industry 13. Various		Quiz, Exams Report exams

			petrochemical processes with industrialapplications 14. Hydrolysis and Alcoholic processes and other processes 15. General Review			
11.CourseEvaluation						

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .....etc		
12.LearningandTeachingResources		
Requiredtextbooks(curricularbooks,ifany)		
Mainreferences(sources)	"Foundations of Industrial Chemistry", Edition 1, Part I, Basra University, 1986	
Recommended books and references (scientificjournals,reports...)		
ElectronicReferences,Websites		

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

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2025

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Academic Program Description Form

University Name: University of Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 1/3/2025

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**
program vision is written her as stated in the univetsitys catalogue and website

2. Program Mission

program mission is written her as stated in the universitys catalogue and webite

3. Program Objectives

This module to teach you core concepts in molcualer spectroscopy topics on structure of atomc, molcualer theortical and principles of structure,function of molcualer and its role in chemistry process. Thes module provides you with the core knowledge and skills to performance in the area of molcualer spectroscopy.

4. Program Accreditation

Dose the programe have programe accreditation? And from which agency? yes

5. Other external influences

Is there a sponsor for the program? No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
3 th		Biochemistry I	**theoretical 2**	**Practical 2**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	• Learning the basics of pectroscopy , such as classification of

	electromagnetic radiation, units of measurement, and spectrum terms. ● Explains the importance of chemical structure for all systems and its applications. ● Learning the most important tools used in the spectrum chemistry and chemical structure
Skills	
Learning Outcomes	● Describe and begin for electromagnetic radition ● Understand the tasks of anmolcuale spectroscopy
Ethics	
Learning Outcomes	● The student should be aware of the importance of the role he will play when working in the spectrum chemistry ● Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. ● Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer

	Chemistry	Biochemistry			✔	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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 aboute the program

14.Program Development Plan

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

3th		**Biochemistry I**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Biochemistry I
2. Course Code:
3. Semester / Year: 2024-2025
Semester first/ 3th
4. Description Preparation Date:
1/3/2025
5. Available Attendance Forms:
1/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theortical
7. Course administrator's name (mention all, if more than one name)
Name: Dr Shaimaa Hassan Mallah Email: Shaimaa@mu.edu.iq
8. Course Objectives

Course Objectives	**Indicative content includes the following.** **1-The principles of the protein structure/folding and an ability to explain their functions in general.** **2-The basic principles of the nucleic acid structure and their disparate cellular ro and its practical applications.** **3- The principles of carbohydrate Biochemistry and the biological functions of th carbohydrates.** **4- The principles of lipid classification, structure and functions.** **5- Basic mechanisms of static integration of biologically active compounds i biological membranes which demonstrate an ability to link this knowledge everyday activities in the bioscience workplace.**

9. Teaching and L

Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	method
Week 1			Molecules and life, origin of biomolecules, macromolecules		
Week 2			Cells components, water and solution		

Week 3			Carbohydrates, importance, Function		
Week 4			classification, optical activity, cyclic structures of saccharides		
Week 5			Monosaccharaides, glycosides formation, de-oxy saccharides, amino sugars		
Week 6			Alcoholic sugars, disaccharides, polysaccharides		
Week 7			Proteins, amino acids, general properties, types of amino acids, chemical reactions		
Week 8			Peptides, isolation and characterization, sequence of amino acids in peptides		
Week 9			Proteins, definition, function, classification, structure of proteins		
Week 10			Nucleic acids, structure, nucleotide's function, nitrogen basis, nucleosides.		
Week 11			DNA, RNA, synthesis of nucleic acids, chemical and enzymatic hydrolysis of nucleic acids		
Week 12			Lipids, classification, physical properties, chemical reactions		
Week 13			fats and oil. carotenoids,		
Week 14			Fatty acids, phospholipids		

Week 15			terpenes, glycolipids		

11.

Practical 13% (1
Exam20%
Quizzes 7%
Final Exam %60

12.

1-Voet D and Voet JG (2011) Biochemistry, Ed. 2-Principles of Biochemistry.Lehninger (2012). Ed.	

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

Academic Program and Course Description Guide

2025

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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 1/3/2025

Signature:	**Signature**:
Head of Department Name:	**Scientific Associate Name**:
Date:	**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**
program vision is written her as stated in the univetsitys catalogue and website

2. **Program Mission**
program mission is written her as stated in the universitys catalogue and webite

3. **Program Objectives**
This module to teach you core concepts in molcualer spectroscopy topics on structure of atomc, molcualer theortical and principles of structure,function of molcualer and its role in chemistry process. Thes module provides you with the core knowledge and skills to performance in the area of molcualer spectroscopy.

4. **Program Accreditation**
Dose the programe have programe accreditation? And from which agency? yes

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

6. **Program Structure**

Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
third		Coordination chemistry 2	theoretical 2	Practical 2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	• Explains the importance of coordination chemistry and its applications • Learning the importance of coordination compounds and the Theories which explain bonding in these compounds • The aim of this course is to learn about inorganic compound reactions and their mechanisms.
Skills	
Learning Outcomes	• 1- Determining and estimating the mechanism of reactions. • 2- Substitution reactions. • 3-Oxidation and reduction reactions. • 4- Chemical catalysis.
Ethics	
Learning Outcomes	• Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. • Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	Chemistry	spectroscopy			✔	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

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 aboute the program

14.Program Development Plan

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

third		**Coordination chemistry 2**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Coordination chemistry 2
2. Course Code:
3. Semester / Year: 2024-2025
Semester two/ second
4. Description Preparation Date:
1/3/2025
5. Available Attendance Forms:
1/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theortical
7. Course administrator's name (mention all, if more than one name)
Name: Assistant lecturer Afaf Murtadha Email: afafmurtadha@mu.edu.iq
8. Course Objectives

Course Objectives	The aim of this course is to learn about inorganic compound reactions and their mechanisms.
9. Teaching and L	
Strategy	The main strat that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding thei thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	metho
Week 1			Introduction about mechanism of inorganic complexes reactions		
Week 2			Preparation and reactions of Inorganic complexes		
Week 3			Stability of Inorganic complexes		
Week 4			Factors affecting stability of Inorganic complexes Metal effect		
Week 5			Factors affecting stability of Inorganic complexes Ligand effect		
Week 6			mechanism of Inorganic complexes reactions		
Week 7			Factors affecting rate of chemical reactions		
Week 8			Substitution Reactions of octahedral complexes		
Week 9			Substitution Reactions of octahedral complexes		
Week 10			Substitution Reactions of square planer complexes		
Week 11			Oxidation and Reduction reactions for Inorganic complexes		
Week 12			Outer Sphere reactions		
Week 13			Inner Sphere reactions		
Week 14			Distortion in octahedral complexes		
Week 15			Preparation of inorganic complexes by using catalyst reactions		

11.

Quizzes	10%
Exam	25%
Report	5%
Final Exam	%60

12.

Required Texts	Transition Metal Chemistry Mahdi Naji Zakoom
Recommended Texts	Inorganic chemistry(Huhhey) Shriver and Atkins Inorganic chemistry , 5th ed. , 2010 Advanced Inorganic Chemistry.Fourth Edition, John Wiley&Sons,USA . F.Alber Cotton and Geoffrey

Ministry of Higher Education and Scientific Research
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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.

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Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 1/3/2025

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**
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4. **Program Accreditation**
Dose the programe have programe accreditation? And from which agency? yes

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

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
3 th		Biochemistry II	**theoretical 2**	**Practical 2**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	• Learning the basics of pectroscopy , such as classification of

	electromagnetic radiation, units of measurement, and spectrum terms. ● Explains the importance of chemical structure for all systems and its applications. ● Learning the most important tools used in the spectrum chemistry and chemical structure
Skills	
Learning Outcomes	● Describe and begin for electromagnetic radition ● Understand the tasks of anmolcuale spectroscopy
Ethics	
Learning Outcomes	● The student should be aware of the importance of the role he will play when working in the spectrum chemistry ● Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. ● Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer

	Chemistry	Biochemistry			✔	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

3th		**Biochemistry II**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Biochemistry II
2. Course Code:
3. Semester / Year: 2024-2025
Semester two/ 3th
4. Description Preparation Date:
1/3/2025
5. Available Attendance Forms:
1/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theortical
7. Course administrator's name (mention all, if more than one name)
Name: Dr Shaimaa Hassan Mallah Email: Shaimaa@mu.edu.iq
8. Course Objectives

Course Objectives	The course aims to strengthen the base in fundamental aspects Biochemistry and function of Bio-organic compound in living ce Metabolism Chemistry of these compounds.
9. Teaching and L	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	method
Week 1			Enzymes-introduction		
Week 2			Chemical properties of enzymes		
Week 3			Uses of enzymes		
Week 4			classification –factors affected enzymes		
Week 5			How Enzymes Work		
Week 6			,Michaelis-Menten equation Kinetic Parameters Are Used to Compare Enzyme Activities		

Week 7			Activators and inhibitors		
Week 8			allosteric enzymes-separation of enzymes		
Week 9			Vit. importance, classification- vit .soluble in water		
Week 10			Vit.soluble in oil		
Week 11			Bioenergetic		
Week 12			Energy transfer		
Week 13			Standard free energy		
Week 14			Role of ATP in energy transfer		
Week 15			Role of ADP in energy transfer		

11.

Practical 13% (1 Exam20%
Quizzes 7%
Final Exam %60

12.

Biochemistry-lehninger VOET-Fundamentals of Biochemistry	
Biochemistry-Khawla Ahmed Fleih	

وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد

دليل وصف البرنامج الأكاديمي والمقرر الدراسي

2025

المقدمة:

يُعد البرنامج التعليمي بمثابة حزمة منسقة ومنظمة من المقررات الدراسية التي تشتمل على إجراءات وخبرات تنظم بشكل مفردات دراسية الغرض الأساس منها بناء وصقل مهارات الخريجين مما يجعلهم مؤهلين لتلبية متطلبات سوق العمل يتم مراجعته وتقييمه سنوياً عبر إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي.

يقدم وصف البرنامج الأكاديمي ملخص موجز للسمات الرئيسة للبرنامج ومقرراته مبيناً المهارات التي يتم العمل على اكسابها للطلبة مبنية على وفق اهداف البرنامج الأكاديمي وتتجلى أهمية هذا الوصف لكونه يمثل الحجر الأساس في الحصول على الاعتماد البرامجي ويشترك في كتابته الملاكات التدريسية بإشراف اللجان العلمية في الأقسام العلمية.

ويتضمن هذا الدليل بنسخته الثانية وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل السابق في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (سنوي، فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م2906/3 في 2023/5/3 فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها.

وفي هذا المجال لا يسعنا إلا أن نؤكد على أهمية كتابة وصف البرامج الاكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية.

مفاهيم ومصطلحات:

وصف البرنامج الأكاديمي: يوفر وصف البرنامج الأكاديمي ايجازاً مقتضباً لرؤيته ورسالته وأهدافه متضمناً وصفاً دقيقاً لمخرجات التعلم المستهدفة على وفق استراتيجيات تعلم محددة.

وصف المقرر: يوفر إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ويكون مشتق من وصف البرنامج.

رؤية البرنامج: صورة طموحة لمستقبل البرنامج الأكاديمي ليكون برنامجاً متطوراً وملهماً ومحفزاً وواقعياً وقابلاً للتطبيق.

رسالة البرنامج: توضح الأهداف والأنشطة اللازمة لتحقيقها بشكل موجز كما يحدد مسارات تطور البرنامج واتجاهاته.

اهداف البرنامج: هي عبارات تصف ما ينوي البرنامج الأكاديمي تحقيقه خلال فترة زمنية محددة وتكون قابلة للقياس والملاحظة.

هيكلية المنهج: كافة المقررات الدراسية / المواد الدراسية التي يتضمنها البرنامج الأكاديمي على وفق نظام التعلم المعتمد (فصلي، سنوي، مسار بولونيا) سواء كانت متطلب (وزارة، جامعة، كلية وقسم علمي) مع عدد الوحدات الدراسية.

مخرجات التعلم: مجموعة متوافقة من المعارف والمهارات والقيم التي اكتسبها الطالب بعد انتهاء البرنامج الأكاديمي بنجاح ويجب أن يُحدد مخرجات التعلم لكل مقرر بالشكل الذي يحقق اهداف البرنامج.

استراتيجيات التعليم والتعلم: بأنها الاستراتيجيات المستخدمة من قبل عضو هيئة التدريس لتطوير تعليم وتعلم الطالب وهي خطط يتم إتباعها للوصول إلى أهداف التعلم. أي تصف جميع الأنشطة الصفية واللاصفية لتحقيق نتائج التعلم للبرنامج.

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة المثنى

الكلية/ المعهد: كلية العلوم

القسم العلمي: قسم الكيمياء

اسم البرنامج الأكاديمي او المهني: بكالوريوس علوم كيمياء

اسم الشهادة النهائية: بكالوريوس علوم كيمياء

النظام الدراسي: فصلي

تاريخ اعداد الوصف: 2025/3/12

تاريخ ملء الملف: 2025/3/12

التوقيع:

اسم رئيس القسم:أ. م.د ازل شاكر وهيب

التاريخ:

التوقيع:

اسم المعاون العلمي :م.د .صلاح عبد الخضر

التاريخ:

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي:

التاريخ

التوقيع

مصادقة السيد العميد

1. رؤية البرنامج
تذكر رؤية البرنامج كما هو مذكور في نشرة الجامعة وموقعها الإلكتروني.

2. رسالة البرنامج
تذكر رسالة البرنامج كما هو مذكور في نشرة الجامعة وموقعها الإلكتروني.

3. اهداف البرنامج
1- اكساب الطلبة الخبرة في علم الكيمياء.
2- رفد مؤسسات الدولة بالكوادر التخصصية .
3- اعداد كوادر ذات خبرة عالية في علم الكيمياء وخبرة في معرفة الاجهزة ذات التقنيات العالية.
4-اكساب الطلبة التقنيات العلمية في استخدام الاجهزة والمعدات التي يمكن استخدامها في دراستهم النظرية والتطبيقية .
5--بحث ودراسة كل ما هو جديد في علم الكيمياء ومواكبة التطورات العلمية بهذا المجال .

4. الاعتماد البرامجي
هل البرنامج حاصل على الاعتماد البرامجي ؟ ومن اي جهة ؟ كلا

5. المؤثرات الخارجية الأخرى
هل هناك جهة راعية للبرنامج ؟

6. هيكلية البرنامج				
هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *

متطلبات المؤسسة				
متطلبات الكلية				
متطلبات القسم				
التدريب الصيفي				
أخرى				

* ممكن ان تتضمن الملاحظات فيما اذا كان المقرر أساسي او اختياري .

7. وصف البرنامج

السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
الثالث		Biochemistry II	2	2

8. مخرجات التعلم المتوقعة للبرنامج

المعرفة	
الاهداف المعرفية 1- تزويد الطالب بالمعلومات الكافية لتكسبه خبرة في علم الكيمياء والتقنيات المختبرية. 2- إكسابه خبرة في معرفة كافة الاجهزة المختبرية والتقنيات الحديثة. 3- اكسابه المعلومات الكافية لمواكبة ودراسة العلوم الحديثة.	
المهارات	
الأهداف المهاراتية الخاصة بالبرنامج 1 – امتلاكه خبرة في معرفة وتشغيل الاجهزة الخاصة بالفحوصات المختبرية. 2 – امتلاكه معرفة علمية لمواكبة التطورات الحديثة في علم الكيمياء	
القيم	

9. استراتيجيات التعليم والتعلم

المحاضرات التطبيقية النظرية , السمنارات العلمية , التطبيق في المختبرات اضافة الى الدورات التدريبة التي

يقيمها القسم

10. طرائق التقييم
عن طريق الامتحانات الاسبوعية والفصلية اضافة الى التقارير العلمية .

11. الهيئة التدريسية					
أعضاء هيئة التدريس					
الرتبة العلمية	التخصص		المتطلبات/المهارات الخاصة (ان وجدت)	اعداد الهيئة التدريسية	
	عام	خاص		ملاك	محاضر
مدرس	علوم كيمياء	كيمياء حياتية		□	

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
تصف بإيجاز العملية المستخدمة لتوجيه أعضاء هيئة التدريس الجدد والزائرين والمتفرغين وغير المتفرغين على مستوى المؤسسة والقسم.
التطوير المهني لأعضاء هيئة التدريس
يتم التخطيط للتطور الشخصي من خلال الاطلاع على المصادر العلمية الحديثة اضافة الى المشاركة في الدورات التدريبية داخل وخارج القطر في مجال الاختصاص العلمي.

12. معيار القبول
(وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد سواء قبول مركزي او أخرى تذكر)

13. أهم مصادر المعلومات عن البرنامج
تذكر بصورة مختصرة .

14. خطة تطوير البرنامج

مخطط مهارات البرنامج																			
				مخرجات التعلم المطلوبة من البرنامج															
السنة / المستوى	رمز المقرر	اسم المقرر	اساسي أم اختياري	المعرفة				المهارات				القيم							
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4				

الثالث		Biochemistry II	اساسي	+	+	+		+	+		+	+		+	

- يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

نموذج وصف المقرر

1. اسم المقرر/ Biochemistry II
2. رمز المقرر
3. الفصل / السنة / الفصلي : المرحلة الثالثة/ الفصل الدراسي الثاني
4. تاريخ إعداد هذا الوصف/ 2025/3/12
5. أشكال الحضور المتاحة
6. عدد الساعات الدراسية2)/ عدد الوحدات (2)
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر)
الاسم: م. د شيماء حسن ملاح الايميل Shaimaa@ mu.edu.iq
8. اهداف المقرر

اهداف المادة الدراسية	The course aims to strengthen the base in fundamental aspects of Biochemistry and function of Bio-organic compound in living cells, Metabolism Chemistry of these compounds.

9. استراتيجيات التعليم والتعلم

الاستراتيجية	

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	2		Enzymes-introduction	استخدام اجهزة العرض) الشاشة الذكية)	الامتحانات اليومية والشهرية

الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Chemical properties of enzymes		**2**	**2**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Uses of enzymes		**2**	**3**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	classification – factors affected enzymes		**2**	**4**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	How Enzymes Work		**2**	**5**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	,Michaelis-Menten equation Kinetic Parameters Are Used to Compare Enzyme Activities		**2**	**6**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Activators and inhibitors		**2**	**7**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	allosteric enzymes-separation of enzymes		**2**	**8**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Vit. importance, classification- vit .soluble in water		**2**	**9**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Vit.soluble in oil		**2**	**10**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Bioenergetic		**2**	**11**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Energy transfer		**2**	**12**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Standard free energy		**2**	**13**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Role of ATP in energy transfer		**2**	**14**
الامتحانات اليومية والشهرية	استخدام اجهزة العرض (الشاشة الذكية)	Role of ADP in energy transfer		**2**	**15**

11. تقييم المقرر	
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير .... الخ	
12. مصادر التعلم والتدريس	
الكتب المقررة المطلوبة (المنهجية وجدت)	**Biochemistry-lehninger** **VOET-Fundamentals of Biochemistry**
المراجع الرئيسة (المصادر)	Biochemistry-Khawla Ahmed Fleih
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)	التقارير العلمية و السمنارات
المراجع الإلكترونية ، مواقع الانترنيت	البحث في مواقع الانترنت عن بعض المصطلحات و المخططات العلمية

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

Academic Program and Course Description Guide

2025

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 Al-Muthanna
Faculty/Institute: Faculty of Science
Scientific Department: Chemistry
Academic or Professional Program Name: BSc
Final Certificate Name: BSc in Chemistry
Academic System: Bologna Process
Description Preparation Date: 2024-2025
File Completion Date: 1/3/2025

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**
program vision is written her as stated in the univetsitys catalogue and website

2. Program Mission

program mission is written her as stated in the universitys catalogue and webite

3. Program Objectives

This module to teach you core concepts in molcualer spectroscopy topics on structure of atomc, molcualer theortical and principles of structure,function of molcualer and its role in chemistry process. Thes module provides you with the core knowledge and skills to performance in the area of molcualer spectroscopy.

4. Program Accreditation

Dose the programe have programe accreditation? And from which agency? yes

5. Other external influences

Is there a sponsor for the program? No

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**3**			
College Requirements				
Department Requirements				
Summer Training	**yes**			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
3 th		Industrial chemistry	**theoretical 2**	**Practical**

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes	• Learning the basics of pectroscopy , such as classification of electromagnetic radiation, units of measurement, and spectrum terms. • Explains the importance of chemical structure for all systems and its applications. • Learning the most important tools used in the spectrum chemistry and chemical structure
Skills	
Learning Outcomes	• Describe and begin for electromagnetic radition • Understand the tasks of anmolcuale spectroscopy
Ethics	
Learning Outcomes	• The student should be aware of the importance of the role he will play when working in the spectrum chemistry • Research in chemical sciences should benefit humankind and improve quality of life, while protecting the environment and preserving it for future generations. • Chemistries should conduct their work with the highest integrity and transparency, avoid conflicts of interest, and practice collegiality in the best way.

9. Teaching and Learning Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their spectroscopy thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Evaluation methods

There are two types of evaluation methods, the first is Formative assessment, which includes Quizzes, Assignments, Projects / , and Reports. Second, Summative assessment which includes and Final Exam

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer

	Chemistry	Biochemistry			✔	

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
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 aboute the program

14.Program Development Plan

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

3th		**Industrial chemistry**	**Basic**	√	√	√	√	√	√	√	√	√	√	√	√

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

Course Description Form

1. Course Name:
Industrial chemistry
2. Course Code:
3. Semester / Year: 2024-2025
Semester first/ 3th
4. Description Preparation Date:
1/3/2025
5. Available Attendance Forms:
1/3/2025
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours theortical
7. Course administrator's name (mention all, if more than one name)
Name: Dr Shaimaa Hassan Mallah Email: Shaimaa@mu.edu.iq
8. Course Objectives

Course Objectives	To know industrial methods and their reaction and applications and knowledge of industrial hazards
9. Teaching and L	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	method
Week 1			History of Industrial Chemistry - Classification of Chemical Industries		
Week 2			Basic concepts - conversion - Productivity - Efficiency - Economy - Factors affecting capital costs – Production costs		
Week 3			Chemical Manufacturing Processes: Type of Processors - Reactors Used		

Week 4			Catalytic processes and its reactors - Flow curves - Chemical processes - Material balance in chemical manufacturing reactors		
Week 5			Physical processes in chemical industries (fracture, cutting, crushing, dissolving, sublimation)		
Week 6			, Fuel used in industrial processes: Gas fuel - Solid fuel -		
Week 7			Solar energy - nuclear power - other sources.		
Week 8			A simplified idea of material transfer and energy transfer.		
Week 9			catalysts in chemical industries		
Week 10			Water treatment for industrial processes: Water Resources - Water Quality.		
Week 11			Water treatment methods - Quality control tests		
Week 12			Erosion -causes and treatment.		
Week 13			Chemical hazards in industry.		
Week 14			Study of some industries such as fertilizer industry		
Week 15			Paper industry and geographical location as practical examples to explain the previous concepts with field visits.		

11.

Quizzes 5% (1
Exam 30%
Report 5%
Final Exam %60

12.

Industrial Chemistry- Georgius A. Adam	
1-Principles of Industrial Chemistry, Dr. A Ahmed Amin 2-Industrial Chemistry, Chemical Industr Technology, Dr. Tarek Ismail Kachia	
