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

2026

Academic Program Description Form

Syllabus:

University name: University of Mosul

College/Institute: College of Science

Scientific Department: Biology Department

Name of the academic or professional program: Bachelor's degree

Name of final degree: Bachelor's degree (Biology and Microbiology)

Academic system: semester

Description preparation date: 2026

Date of filling the file: 2026

Signature:

Head of Department Name:
Prof. Dr. Amjad Abdul-Hadi Mohammed

Date: 4/1/2026

Signature:

Scientific Associate Name:
Prof. Dr. Rayan M. Faisal

Date:
4/1/2026

The file

is checked by: Asst.Pro. Mahmood abel Alhagy Alsumaidaie

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 4/1/2026

Signature:

Approval of the Dean

Hiyam Adil A. Tass

1. Program vision

Making strenuous efforts to apply the latest scientific curricula that combine the basics and continuous development to serve the community and excel in disseminating knowledge in the fields of Biology (botany, zoology, and microbiology) to obtain high levels of performance for faculty members and students.

2. Program letter

The department's mission includes updating and disseminating information in the field of various biology (botany, zoology, and microbiology) and making efforts to hone students' talents and develop their capabilities to help develop and advance society and build graduates with professional expertise that will make them enjoy good opportunities locally and globally.

3. Program goals

The Biology Department aims to:

A. A comprehensive study of biological sciences and their applications and uses in society from a theoretical, scientific and applied perspective.

B. Preparing scientific cadres at the primary and higher levels to work in the medical, health, agricultural, food, oil, pharmaceutical, and biological fields.

C. Students acquire scientific techniques in using devices and equipment that can be used in their theoretical and applied studies.

D. Students acquire academic and applied information about biological sciences and their various trends and specializations.

E. Providing state institutions and the mixed and private sectors (medical, industrial and laboratory institutions) with primary and senior specialized cadres to work in this field.

F. Research and study everything that is new in biological sciences, keep up with scientific developments in this field, and include them within the prescribed school curricula.

4. Programmatic accreditation

Waiting for the ministerial accreditation standards that will be launched soon

5. Other external influences

Pending ministerial accreditation standards

6. Program structure

Program structure	No. of courses	Credits	Percentage	Notes
Institute requirements	8	18	15.7	
College requirements	1	2	2.0	
Department requirements	42	220	82.3	
Summer training				The student is requested a summer training at the end of the sixth semester
Others				

* Notes may include whether the course is core or elective

7. Program description

Republic of Iraq - Ministry of Higher Education and Scientific Research
University of Mosul
Bachelor's degree in Biology (First cycle)
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2025 - 2026)

Level	Semester	No. 1	Module Code	Module Name in English	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	Bio-1101	General Zoology	English	2	2	3				3	108	92	200	8.00	C	
		2	Bio-1102	Analytical Chemistry	English	2	2	3				3	108	92	200	8.00	C	
		3	Sci-101	Mathematics	English	2						3	33	17	50	2.00	B	
		4	Bio-1103	Biophysics	English	2	2	3				3	108	92	200	8.00	C	
		5	UOM104	Democracy and Human Rights	Arabic	2						3	33	17	50	2.00	B	
		6	UOM101	Arabic Language1	Arabic	2						3	45	5	50	2.00	B	
					Total	12	7	9	0	0	0	18	435	315	750	30.00		

Level	Semester	No. 2	Module Code	Module Name in English	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	Two	1	Bio-1204	General Botany	English	2	2	3				3	108	92	200	8.00	C	
		2	Bio-1205	Organic Chemistry	English	2	2	3				3	108	92	200	8.00	C	
		3	Bio-1206	Biostatistics	English	2	2					3	63	62	125	5.00	C	
		4	Bio-1207	Safety and bioscurity	Arabic	2	2					3	63	37	100	4.00	C	
		5	UOM103	Computer Science1	English	2		2				3	63	12	75	3.00	B	
		6	UOM102	English Language 1	English	2	1					3	45	5	50	2.00	B	
					Total	12	9	8	0	0	0	18	450	300	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGII	Three	1	Bio-2308	Entomology I	English	2		3				3	78	47	125	5.00	C	
		2	Bio-2309	Plant Anatomy	English	2		3				3	78	47	125	5.00	C	
		3	Bio-23010	Invertebrates	English	2	1	3				3	79	71	150	6.00	C	
		4	Bio-23011	Biochemistry I	English	2		3				3	78	47	125	5.00	C	
		5	Bio-23012	Microbiology I	English	2		3				3	78	47	125	5.00	C	
		6	UOM2050	Crimes of the Baath party	Arabic	2						3	33	17	50	2.00	B	
		7	UOM2012	Arabic	Arabic	2						3	33	17	50	2.00	B	

			Language 2															
				Total	12	1	15	0	0	0	21	457	293	750	30.00			

Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
					CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Four	1	Bio-24113	Entomology II	English	2		3				3	78	22	100	4.00	C	Bio-2308
	2	Bio-24114	Plant Taxonomy	English	2		3				3	78	22	100	4.00	C	Bio-2309
	3	Bio-24115	Parasitology	English	2		3				3	78	22	100	4.00	C	Bio-23010
	4	Bio-24116	Biochemistry II	English	2		3				3	78	22	100	4.00	C	Bio-23011
	5	Bio-24117	Microbiology II	English	2		3				3	78	47	125	5.00	C	Bio-23012
	6	Bio-24018	Plant Groups	English	2		3				3	78	22	100	4.00	C	
	7	UOM2032	Computer Science2	English	2		2				3	63	12	75	3.00	B	
	8	UOM2022	English Language 2	English	2						3	33	17	50	2.00	B	
				Total	16	0	20	0	0	0	24	564	186	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGIII	Five/BIOLOGY	1	Bio1-35019	Cell Biology	English	2		3				3	78	47	125	5.00	C	
		2	Bio1-35020	Ecology	English	2		3				3	78	47	125	5.00	C	
		3	Bio1-35021	Biotechnology	English	2		3				3	78	47	125	5.00	C	
		4	Bio1-35022	Mycology I	English	2		3				3	78	47	125	5.00	C	
		5	Bio1-35023-L Bio1-35023-A	Elective (Laboratory analysis + Applied and Economic Entomology)	English	2		3				3	78	47	125	5.00	C	
		6	Bio1-35024	Mycotoxins	English	2		3				3	78	47	125	5.00	C	
					Total	12	0	18	0	0	5	18	468	282	750	30.00		

Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
					CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Six/BIOLOGY	1	Bio1-36025	Plant Pathology	English	2		3				3	78	72	150	6.00	C	
	2	Bio1-36026	Histology	English	2		3				3	78	72	150	6.00	C	
	3	Bio1-36027-D	Elective (Diagnostic	English	2		3				3	78	72	150	6.00	C	

			Bio1-36027-E	parasite + Endocrinology)														
		4	Bio1-36128	Pollution	English	2	1	2				3	64	36	100	4.00	C	Bio1-35020
		5	Bio1-36129	Genetics	English	2		3				3	78	47	125	5.00	C	Bio1-35019
		6	Bio1-36030	Allelopathy	English	2		2				3	63	12	75	3.00	C	
					Total	12	1	18	4	0	4	18	439	311	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGIV	Five/Microbiology	1	Bio2-35019	Soil Microbiology	English	2		3				3	78	47	125	5.00	C	
		2	Bio2-35020-L Bio2-35020-C	Elective (Laboratory Analysis + Diagnostic parasite)	English	2		3				3	78	47	125	5.00	C	
		3	Bio2-35021	Histology	English	2		3				3	78	47	125	5.00	C	
		4	Bio2-35022	Ecology	English	2		3				3	78	47	125	5.00	C	
		5	Bio2-35023	Cell Biology	English	2		3				3	78	47	125	5.00	C	
		6	Bio2-35024	Classification and Bacterial groups	English	2		3				3	78	47	125	5.00	C	
					Total	12	0	18	0	0	0	18	468	282	750	30.0		

	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
	Six/Microbiology	1	Bio2-36025	Water Microbiology	English	2		3				3	78	47	125	5.00	C	
		2	Bio2-36026	Bacterial Physiology	English	2		3				3	78	47	125	5.00	C	
		3	Bio2-36027	Animal Physiology	English	2		3				3	78	47	125	5.00	C	
		4	Bio2-36128	Pollution	English	2	1	2				3	78	47	125	5.00	C	Bio2-35022
		5	Bio2-36129	Genetics	English	2		2				3	78	47	125	5.00	C	Bio2-35023
		6	Bio2-36030-A Bio2-36030-C	Elective (Antibiotics + |Mycotoxins)	English	2		3				3	78	47	125	5.00	C	
					Total	12	1	16	0	0	0	18	468	282	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Seven/BIOLOGY	1	Bio1-47031	Animal Physiology 1	English	2	1	3				3	79	71	150	6.00	C	
		2	Bio1-47032	Plant Physiology 1	English	2		3				3	78	47	125	5.00	C	
		3	Bio1-47033	Embryology	English	2	1	3				3	79	71	150	6.00	C	
		4	Bio1-47034	Quantitative Genetics	English	2	1	3				3	79	71	150	6.00	C	
		5	Bio1-47035	Molecular biology	English	2		3				3	78	47	125	5.00	C	
		6	Bio1-47036	Research Methodology	English	2						3	33	17	50	2.00	C	
					Total	12	5	15	0	0	0	18	426	324	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Eight/BIOLOGY	1	Bio1-48137	Animal Physiology 2	English	2	1	3				3	79	71	150	6.00	C	Bio1-47031
		2	Bio1-48138	Plant Physiology 2	English	2	1	3				3	79	71	150	6.00	C	Bio1-47032
		3	Bio1-48039	Comparative Anatomy	English	2	1	3				3	79	71	150	6.00	C	
		4	Bio1-48040	Biodiversity	English	2	1	3				3	79	71	150	6.00	C	
		5	Bio1-48041	Immunology	English	2		3				3	78	22	100	4.00	C	
		6	Bio1-48142	Research Project	English	2						3	33	17	50	2.00	C	Bio1-47036
					Total	12		15	0	0	0	18	427	323	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIV	Seven/MICROBIOLOGY	1	Bio2-47031	Immunology	English	2	1	3				3	79	71	150	6.00	C	
		2	Bio2-47032	pathogenic Bacteriology	English	2	1	3				3	79	71	150	6.00	C	
		3	Bio2-47033	Food Microbiology	English	2		3				3	78	47	125	5.00	C	
		4	Bio2-47034	Mycology	English	2		3				3	78	47	125	5.00	C	

	5	Bio2-47035	Enzymology	English	2	1	3				3	79	71	150	6.00	C	
	6	Bio2-47036	Research Methodology	English	2						3	33	17	50	2.00	C	
				Total	12	3	15	0	0	0	18	426	324	750	30.0		

Semester	No.	Module Code	Module Name in English	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
					CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Eight/MICROBIOLOGY	1	Bio2-48037	Microbial Genetics	English	2	1	3				3	79	71	150	6.00	C	
	2	Bio2-48038	Virology	English	2	1	3				3	79	71	150	6.00	C	
	3	Bio2-48139	Industrial Microbiology	English	2	1	3				3	79	71	150	6.00	C	Bio2-47033
	4	Bio2-48140	Fungal Taxonomy	English	2		3				3	78	47	125	5.00	C	Bio2-47034
	5	Bio2-48041	Molecular biology	English	2		3				3	78	47	125	5.00	C	
	6	Bio2-48142	Research Project	English	2						3	33	17	50	2.00	C	Bio2-47036
				Total	12	3	15	0	0	0	18	426	324				

Total	100	24	116	0	0	0	153	3694	2306	6000	240.0

Must be 240 ECTS

Structured SWL (hr/w) type						
	CL	Class Lecture	B	Basic learning activities	SWL:	Student Workload
	Lab	Laboratory	C	Core learning activity	SSWL:	Structured SWL
	Pr	Practical Training			USSWL:	Unstructured SWL
	Tut	Tutorial				
	Lect	Online lecture				
	Semn	Seminar				

8.Expected learning outcomes of the program
Knowledge
Students who hold a bachelor's degree in biology are expected to have acquired the following skills: 1. Acquiring basic concepts in biological sciences and distinguishing types of plants, animals, bacteria, viruses and fungi 2. Using laboratory and analytical techniques. Using applied skills and laboratory and field techniques to analyze and interpret data, evaluate wealth, and find solutions to biological and environmental problems, while taking into account general safety conditions in the laboratory and field.
Skills
1 – Enable the student to teach biology 2 - Enables the student to work in laboratories and health institutions 3 - Enables the student to work in research institutions
thinking skills Short pop quizzes Semester exams General and transferable skills (other skills related to employability and personal development) The ability to work in a multidisciplinary team The ability to communicate constructively
Values
Understand the ethical and professional responsibilities and recognize the economic, environmental, societal and global consequences of technical and scientific solutions for biological and environmental problems. The ability to communicate effectively and work as a team.

9. Teaching and learning strategies
Theoretical, practical, and applied lectures, daily assignments, and discussions

10. Evaluation methods
Exams, assignments, daily assignments, discussions, laboratory reports and a graduation project

11. Faculty staff							
Faculty staff members							
Academic position	Specialty				Special requirements/skills (if any)	**Number of faculty members**	
	General	Specific					
		Botany	Zoology	Microbiology		Permanent	temporary
Prof.	23	7	9	7		23	
Asst. Prof.	30	9	11	10		30	
Lecturer	41	10	10	21		41	
Asst. lecturer	24	8	9	7		24	

Professional development
Orienting new faculty members
Working to improve the academic and research capabilities and skills of faculty members through: 1. Guiding them to participate in teaching methods courses. 2. Holding training workshops, scientific meetings, and dialogue sessions. 3. Educating them on modern teaching methods. 4. Spreading a culture of continuous development and improvement to reach the best level of academic and professional performance. 5. Providing individual and group guidance programs for faculty members to overcome the difficulties that plague their professional lives
Professional development for faculty members
1. Developing faculty members' skills in academic, research and creative fields. 2. Supporting university faculty members in their educational, research and creative tasks. 3. Providing and developing diverse resources that contribute to achieving the above two goals. 4. Providing the appropriate professional environment for the creativity of the faculty member. 5. Supporting the faculty member's tasks in the field of community service. Creating and developing information bases and resources related to faculty members.

12. Acceptance criterion
Central Admission

13. The most important sources of information about the program

Program development through
- Higher directives
- What new sciences are developed in the field of specialization

14. Program development plan
- Teamwork: Working within the group effectively and actively. - Time management: Managing time effectively and setting priorities with the ability to work organized by appointments. - Preparing scientific research and reports to analyze and criticize events.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	**Course Code**	**Course Name**	Basic learning activities Core learning activity	**Knowledge**				**Skills**				**Ethics**			
				A1	**A 2**	**A 3**	**A 4**	**B 1**	**B 2**	**B 3**	**B 4**	**C 1**	**C 2**	**C 3**	**C 4**
Semester 1	Bio-1101	General Zoology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-1102	Analytical Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sci-101	General Mathematics	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-1103	Biophysics	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM104	Human Rights and Democracy	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM101	Arabic Language	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Semester 2	Bio-1204	General Botany	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-1205	Organic Chemistry	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-1206	Biostatistics	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-1207	Safety and bioscurity	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM103	Computer Science	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM102	English Language	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Semester 3	**Bio-2308**	Entomology I	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-2309	Plant Anatomy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-23010	Invertebrates	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-23011	Biochemistry I	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-23012	Microbiology I	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM2050	Crimes of the Baath party	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM2012	Arabic Language 2	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Semester 4	**Bio-24113**	Entomology II	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-24114	Plant Taxonomy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-24115	Parasitology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-24116	Biochemistry II	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-24117	Microbiology II	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-24018	Plant Groups	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	UOM2032	**Computer Science2**	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOM2022	**English Language 2**	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Five/BIOLOGY	Bio1-35019	Cell Biology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-35020	Ecology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-35021	Biotechnology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-35022	Mycology I	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-35023-L Bio1-35023-A	Elective (Laboratory analysis + Applied and Economic Entomology)	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-35024	Mycotoxins	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Six/BIOLOGY	**Bio1-36025**	Plant Pathology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-36026	Histology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-36027-Bio1- D 36027-E	Elective (Diagnostic parasite + Endocrinology)	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-36128	Pollution	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-36129	Genetics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio1-36030	Allelopathy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
five/Microbiology	**Bio2-35019**	Soil Microbiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-35020-Bio2- L 35020-C	Elective (Laboratory Analysis + Diagnostic parasite)	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-35021	Histology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-35022	Ecology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	Bio2-35023	Cell Biology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-35024	Classification and Bacterial groups	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Six/Microbiology	**Bio2-36025**	Water Microbiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-36026	Bacterial Physiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-36027	Animal Physiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-36128	Pollution	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-36129	Genetics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio2-36030-Bio2- A 36030-C	Elective (Antibiotics + |Mycotoxins)	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Seven/BIOLOGY	**Bio-47031**	Animal Physiology 1	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47032	Plant Physiology 1	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47033	Embryology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47034	Quantitative Genetics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47035	Molecular biology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47036	**Research Project**	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Eight/BIOLOGY	**Bio-48137**	Animal Physiology 2	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48138	Plant Physiology 2	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48039	Comparative Anatomy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48040	Biodiversity	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48041	Immunology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48142	Research Project	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Seven/MICROBIOLOGY	**Bio-47031**	Immunology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47032	pathogenic Bacteriology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47033	Food Microbiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47034	Mycology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	Bio-47035	Enzymology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-47036	Research Project	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Eight/MICROBIOLOGY	**Bio-48037**	Microbial Genetics	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48038	Virology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48139	Industrial Microbiology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48140	Fungal Taxonomy	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48041	Molecular biology	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bio-48142	Research Project	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

MODULE DESCRIPTION FORM

Module Information معلومات المادة الدراسية					
Module Title	**Biochemistry1**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio-23011**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Bio		**College**	Sci	
Module Leader	Dr. Haitham Luqman Shihab Al-Hayali		**e-mail**	haysbio68@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Dr. Thaer Mohamed Hasan Eman Sameer		**e-mail**	thasbio42@uomosul.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	02/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This study aims 1. Communicate biological information to students about the basic biological and molecular components of a cell . 2. Methods of measuring and conducting laboratory chemical tests . 3. Keeping up with the development that is happening in the world of laboratory materials and equipment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Giving the student the most important basics of biochemistry and understanding the biological interactions that take place within the biological system 2. The student's understanding of the most important biological components inside the body, such as sugars, proteins, fats, their components and their interactions 3. Giving a clear picture of the most important metabolic reactions that occur to the biological components inside the body. 4. Teaching students how to deal with laboratory tools correctly and safely and how to prevent them from damage 5. The student practically understood how to detect the types of carbohydrates and the most important tests related to carbohydrates. 6. 3-Detecting practically amino acids and proteins and understanding how to distinguish between amino acids
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Theoretical lectures Principle of biochemistry , water. Buffers and pH. Carbohydrates composition. Carbohydrates functions.[*15* hrs] , Types of amino acids, their composition. Amino acids reactions. Proteins structures, types .Proteins reactions. Lipids classification. Lipids functions. Fatty acids, saturated. Unsaturated fatty acids [*8* hrs] Metabolism reactions . Glycolysis reaction .Proteins metabolism.[*18*hrs] Revision problem classes [3 hrs] Part B – Practical labs Quantitative test for carbohydrates, Molish's test. Bendict's test, Barfoed's. Selivanoff 's test, Bial's test. Hydrolysis of carbohydrates. Hydrolysis of disaccharides reactions. Hydrolysis of polysaccharides. [16hrs] Proteins have many functions and shapes. Types of proteins. Ninhydrin test, Hopkincole reaction or glyoxylic acid reaction. Millon test, Xanthoprotic test. Sakaguchi test, Lead acetate test. Biurret test, Proteins extraction . Spectrophotometric method, Biuret method, lowry (Folin) method، Lipids, Fatty acids, Lipids classification, Acroleine test, Unsaturated test, Acid valu ، Iodine number, Estimation of reducing sugar by nelson. [20 hrs

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Expanding students' perceptions about this science and its contents. Students do study the following fields: Principles of biochemistry. Water formula, reactions, and buffers. chemical composition of carbohydrates, and their reactions . Amino acids and proteins. lipids ,chemical composition and reactions. metabolism of carbohydrates and proteins. The most important tests adopted in the detection of sugars and their types. Study the tests used for detection of proteins and amino acids and their most important properties and how to differentiate between nucleic acids Amino acids and proteins. prepare the cellular extract and measuring the protein concentration in the extract metabolism of carbohydrates and proteins. detect fats in the laboratory and the most important tests related to fats. This will be achieved through lectures, labs, and interactive tutorials and by types of practical diagnostic methods and involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Principle of biochemistry , water.
Week 2	Buffers and pH.
Week 3	Carbohydrates composition .
Week 4	Carbohydrates functions.
Week 5	Types of amino acids, their composition .
Week 6	Amino acids reactions.
Week 7	Proteins structures, types .
Week 8	Proteins reactions.
Week 9	Lipids classification.
Week 10	Lipids functions.
Week 11	Fatty acids, saturated.
Week 12	Unsaturated fatty acids
Week 13	Metabolism reactions
Week 14	Glycolysis reaction
Week 15	Proteins metabolism.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Quantitative test for carbohydrates, Molish's test.
Week 2	Lab 2: Bendict's test, Barfoed's.
Week 3	Lab 3: Selivanoff 's test, Bial's test.
Week 4	Lab 4: Hydrolysis of carbohydrates.
Week 5	Lab 5: Hydrolysis of disaccharides reactions.
Week 6	Lab 6: Hydrolysis of polysaccharides.

Week 7	Lab 7: Proteins have many functions and shapes.
Week 8	Lab 8:. Types of proteins.
Week 9	Lab9: Ninhydrin test, Hopkincole reaction or glyoxylic acid reaction.
Week10	Lab 10: Millon test, Xanthoprotic test.
Week 11	Lab 11: Sakaguchi test, Lead acetate test.
Week 12	Lab 12: Biurret test, Proteins extraction.
Week 13	Lab 13: Spectrophotometric method, Biuret method, lowry (Folin) method,
Week 14	Lab 14: Lipids, Fatty acids, Lipids classification, Acroleine test, Unsaturated test, Acid valu,
Week 15	Lab 15: Iodine number, Estimation of reducing sugar by nelson.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Al-jebory, A. and Al-salman, T. (2015).** Practical Biochemistry. College of pharmacy \ University of Babylon. **Murray, R. K., Bender, D.A., BothamEI, K.M., Kennelly, P.J., Rodwell, V.W., Weil, P.A.(2016).** Harper,s Illustrated Biochemistry .29th edition. The Mc GRAW-Hill Companies, USA.	Yes Yes
Recommended Texts	**Murray, R. K., Bender, D.A., BothamEI, K.M., Kennelly, P.J., Rodwell, V.W., Weil, P.A. (2016). Harper,s Illustrated Biochemistry .29th edition. The Mc GRAW-Hill Companies, USA.**	Yes
Websites	https://www.acs.org/careers/chemical-sciences/areas/biochemistry.html https://www.britannica.com/science/biochemistry	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information معلومات المادة الدراسية					
Module Title	**Histology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Bio2-35021**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	5	
Administering Department	Bio		**College**	Sci	
Module Leader	Dr. Fatima Qasim Mohammed		**e-mail**	fatsbio25@uomosul.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Dr. Ilham Abd Allah Ali Al-saleem		**e-mail**	elham_alsaleem@yahoo.com	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	10/10/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This study aims 1 . Clarify the terms related to tissues for students. 2 . Explain the main types of tissues. 3 . Study its composition. 4 . Study their functions. 5 . distinguish them from each other. 6 . Identify the location of each tissue in the different organs of the body. Keeping pace with the development in the world of histology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.The students could recognize the different tissue of each type 2. The students They were able to diagnose all layers of the same tissue and identify the types of cells in them 3. They could distinguish any slide of the basic tissue
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Theoretical lectures Introduction in Histology , The cell . Epithelial Tissue .The types of epithelial tissue The simple epithelial tissue. Modification in surfaces of epithelial tissues Glandular epithelial tissue. Connective Tissue Matrix of C.T and repair it.[*14* hrs] The types of connective tissue. Dense connective tissue. Cartilage. The bone (bone cells,The bone types and matrix). The bone histogenesis and repair it. Joints . The blood and its components Blood and Lymph forming organs Non-granular leukocytes, Blood Platlets. Haemopoiesis , Bone marrow.. [*10* hrs] Muscular tissues, actin, myosin ,Myofilaments. Sarcoplasmic reticulum، Myoneural junction. Cardiac muscles,Smooth muscles . Nervous tissues,neurons. Peripheral nerves. Types of nerve fibers، Neuroglia, Ganglia. [*14* hrs] Revision problem classes [3 hrs] Part B – Practical labs The simple epithelial tissue part 1. The simple epithelial tissue part 2. Stratified epithelial tissue part 1. Stratified epithelial tissue part 2. Connective tissue(Cells, Fibers). Connective tissue (Loose C. T.). Dense connective tissue. Blood. [18 hrs] Cartilage. Bone. Muscular tissue. Nerve system: the type of nerve cells. Peripheral nerve, motor end plate. nerve fiber ,spinal. Sympathetic ganglia.Cerebellum.. [18 hrs

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	Expanding students' perceptions about this science and its contents . Various techniques were used such as. Data show , Microscope, Posters . Students do study the following fields: The epithelial tissue . The connective tissue. Special connective tissue. Nerve and vascular system. This will be achieved through lectures, labs, and interactive tutorials and by types of practical diagnostic methods and involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الأسبوعي النظري

	Material Covered

Week 1	Introduction in Histology , The cell.
Week 2	Epithelial Tissue .The types of epithelial tissue The simple epithelial tissue. Modification in surfaces of epithelial tissues
Week 3	Glandular epithelial tissue. Connective Tissue Matrix of C.T and repair it.
Week 4	The types of connective tissue.
Week 5	Dense connective tissue .
Week 6	Cartilage. The bone (bone cells,The bone types and matrix)
Week 7	The bone histogenesis and repair it. Joints.
Week 8	The blood and its components Blood and Lymph forming organs
Week 9	Non-granular leukocytes, Blood Platlets.
Week 10	Haemopoiesis , Bone marrow.
Week 11	Muscular tissues,actin, myosin Myofilaments .
Week 12	Sarcoplasmic reticulum, Myoneural junction.
Week 13	Cardiac muscles,Smooth muscles.
Week 14	Nervous tissues,neurons. Peripheral nerves.
Week 15	Types of nerve fibers, Neuroglia,Ganglia.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: The simple epithelial tissue part 1.
Week 2	Lab 2: The simple epithelial tissue part 2.
Week 3	Lab 3: Stratified epithelial tissue part 1.
Week 4	Lab 4: Stratified epithelial tissue part 2.
Week 5	Lab 5: Connective tissue(Cells, Fibers).
Week 6	Lab 6: Connective tissue (Loose C. T.).
Week 7	Lab 7: Dense connective tissue .
Week 8	Lab 8: Blood.
Week 9	Lab9: Cartilage .

Week10	Lab 10: Bone.
Week 11	Lab 11: Muscular tissue .
Week 12	Lab 12: Nerve system: the type of nerve cells.
Week 13	Lab 13: Peripheral nerve, motor end plate .
Week 14	Lab 14: nerve fiber ,spinal.
Week 15	Lab 15: Sympathetic ganglia.Cerebellum.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Schmidt, I. G. (2003).ATLAS OF HUMAN HISTOLOGY,FOURTH EDITION** **KRAUSE'S ESSENTIAL HUMAN HISTOLOGY FOR MEDICAL STUDENTS**	Yes Yes
Recommended Texts	**School of anatomy and Human Biology-The University of Western Australia.**	Yes
Websites	https://www.histologyguide.com/about-us/sorenson-atlas-of-human-histology-chapters-1-and-14.pdf https://www2.nsysu.edu.tw/Bio/images/commen/hist98.pdf	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.