

Academic Program Description



University Name: Mosul

Faculty/Institute: The Environmental Sciences College

Scientific Department: Environmental Science

Academic or Professional Program Name: Bachelor's Environmental Science

Academic System:

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Prof. Dr. Mohammad Ibrahim Khalil

Date: 1/4/2024

Signature:

Scientific Associate Name:

Dr, Mohammad Waleed

Date: 1/4/2024



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

م.م. رغدة حازم شحاتة
مسؤول شعبة ضمان الجودة وتقييم الأداء

1. Program Vision

The department seeks to work on developing a distinct personality for the student by developing cultural and social awareness, which qualifies him after graduation to contribute effectively to serving his community.

2. Program Mission

1. Qualifying students of the Department of Environmental Sciences to know information related to the environment, enabling the graduate to employ this knowledge in the field of life
2. Developing students' knowledge and expanding their horizons of thinking by encouraging them to scientific research to obtain the greatest amount of information for application in the field of the environment.
3. The ability to determine environmental factors and the extent of their impact on human health and their surroundings.
4. The ability to identify abnormal deviations in the levels and nature of standards used to determine environmental conditions

3. Program Objectives

- 1- Using new concepts in the field of the environment and using electronic devices to detect defects and try to address them
2. Direct access to the problems facing the environment through expanding field visits to places where pollutants are present

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4. Program Accreditation

1. Qualifying the department's students to be familiar with the theoretical and practical aspects of a number of sciences, including life sciences, soil, air, and water, as well as the ability to deal with modern technologies used in the

environmental field, ensuring a highly accurate database for environmentalists to deal with the environment.

2. Researching recent topics and identifying problems that need more in-depth scientific research.

5. Other external influences

not exist

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	46	46		Basic Course
College Requirements	yes			
Department Requirements	yes			
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	
2023-2024/ 1 st / 1 st course	Env101	General Physics	theoretical	practical
2023-2024/ 1 st / 1 st course	Env102	General Biology	theoretical	

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2023–2024/ 1 st / 1 st course	Env103	General Geology	theoretical	practical
2023–2024/ 1 st / 1 st course	Env104	Organic Chemistry	theoretical	practical
2023–2024/ 1 st / 1 st course	Env105	Arabic Language	theoretical	
2023–2024/ 1 st / 1 st course	Env106	Freedom & Democracy	theoretical	
2023–2024/ 1 st /2 nd course	Env107	Biostatistics	theoretical	practical
2023–2024/ 1 st /2 nd course	Env108	Analytical Chemistry	theoretical	practical
2023–2024/ 1 st /2 nd course	Env109	Soil Science	theoretical	practical
2023–2024/ 1 st /2 nd course	Env110	Ecology	theoretical	practical
2023–2024/ 1 st /2 nd course	Env111	English Language	theoretical	
2023–2024/ 1 st /2 nd course	Env112	Computer	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env201	Genetics	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env202	Plant Ecology	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env203	Principle of pollution	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env204	Environmental Chemistry	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env205	Environmental Geology	theoretical	practical
2023–2024/ 2 nd / 1 st course	Env206	Environmental Systems and Rules	theoretical	
2023–2024/ 2 nd /2 nd course	Env207	Environmental Microbiology	theoretical	practical

2023–2024/ 2 nd /2 nd course	Env208	Plant Taxonomy	theoretical	practical
2023–2024/ 2 nd /2 nd course	Env209	Animal Taxonomy	theoretical	practical
2023–2024/ 2 nd /2 nd course	Env210	Climatology	theoretical	
2023–2024/ 2 nd /2 nd course	Env211	Freedom and Democracy	theoretical	
2023–2024/ 2 nd /2 nd course	Env212	Biochemistry	theoretical	Practical
2023–2024/ 3 rd /1 st course	Env301	Air Pollution	theoretical	
2023–2024/ 3 rd /1 st course	Env302	Aquatic environment	theoretical	practical
2023–2024/ 3 rd /1 st course	Env303	Animal Environment	theoretical	practical
2023–2024/ 3 rd /1 st course	Env304	Biodiversity	theoretical	practical
2023–2024/ 3 rd /1 st course	Env305	Environmental Physiology	theoretical	
2023–2024/ 3 rd /1 st course	Env306	Environmental Technology	theoretical	
2023–2024/ 3 rd /2 nd course	Env307	Water Pollution	theoretical	practical
2023–2024/ 3 rd /2 nd course	Env308	Molecular Biology	theoretical	practical
2023–2024/ 3 rd /2 nd course	Env309	Entomology	theoretical	practical
2023–2024/ 3 rd /2 nd course	Env310	Soil Pollution	theoretical	practical
2023–2024/ 3 rd /2 nd course	Env311	Phycology	theoretical	
2023–2024/ 3 rd /2 nd course	Env312	radioactive pollution	theoretical	practical

2023-2024/ 4 th /1 st course	Env401	graduation project	theoretical	practical
2023-2024/ 4 th /1 st course	Env402	sustainable development	theoretical	
2023-2024/ 4 th /1 st course	Env403	Remote sensation	theoretical	
2023-2024/ 4 th /1 st course	Env404	Environmental Health	theoretical	
2023-2024/ 4 th /1 st course	Env405	Renewable energy	theoretical	
2023-2024/ 4 th /2 nd course	Env407	graduation project	theoretical	Practical
2023-2024/ 4 th /2 nd course	Env408	Green Chemistry	theoretical	
2023-2024/ 4 th /2 nd course	Env409	Epidemiology	theoretical	practical
2023-2024/ 4 th /2 nd course	Env410	Environmental planning and management	theoretical	
2023-2024/ 4 th /2 nd course	Env411	Environmental economics	theoretical	

8. Expected learning outcomes of the program

Knowledge

Learning Outcomes 1

Learning Outcomes Statement 1

1. Qualifying students of the Department of Environmental Sciences to know information related to the environment, enabling the graduate to employ this knowledge in the field of life
2. Developing students' knowledge their horizons of thinking by encouraging scientific research to obtain the greatest amount of

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	information for application in the field of the environment.
Skills	
Learning Outcomes 2	<p>Learning Outcomes Statement 2</p> <p>1. The ability to identify abnormal deviations in the levels and nature of standards used to determine environmental conditions.</p> <p>2- The ability to determine environmental factors and the extent of their impact on human health and its surroundings.</p>
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Learning Outcomes 4	<p>Learning Outcomes Statement 4</p> <p>1. Developing students' abilities to share ideas</p> <p>2. Urge them to find solutions and share them</p>
Learning Outcomes 5	Learning Outcomes Statement 5

9. Teaching and Learning Strategies

1. Providing students with the basics and additional topics related to the previous learning outcomes of skills, to solve practical problems
2. Applying the topics studied theoretically at the practical level in various laboratories affiliated with the environmental departments
3. Visiting practical laboratories by academic staff
4. Sending students for training in relevant state departments in order to gain experiences that simulate reality

10. Evaluation methods

1. Daily exams
2. Semester and final exams.
3. Participation scores for discussion questions for academic topics.
4. Grades for homework
5. Submitting and discussing reports

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	Biology	Molecular biology			Staff	
Assistant Professor	Biology	Environmental Pollution			Staff	
Assistant Professor	Physics	Materials science			Staff	
Assistant Professor	Veterinary medicine	Veterinary public health			Staff	
Assistant Professor	Biology	Biochemistry			Staff	
Lecture	Biology	Environmental Pollution			Staff	
Lecture	Biology	Environmental Microbiology			Staff	

Lecture	Biology	Plant			Staff	
Lecture	Biology	Biology			Staff	
Lecture	Biology	Biotechnology			Staff	
Lecture	Geology	Fossils and stratigraphy			Staff	
Lecture	Chemistry	chemophysical			Staff	
Lecture	Computer	computer			Staff	
Lecture	Geology	Sediments			Staff	
Lecture	Chemistry	chemophysical			Staff	
Lecture	Biology	Botany			Staff	

Professional Development

Mentoring new faculty members

Professional development for faculty members and new teachers through holding workshops and courses on a regular basis

Professional development of faculty members

1. Developing students' abilities in research and investigation by asking students to write scientific reports and recent discussion sessions, as well as urging students to consult sources, books, and magazines as a source of information.
2. Enabling students to prepare models that include various materials related to the environment
3. Enabling students to pass job interviews.
4. Enabling students to diagnose the causes of environmental degradation
5. Enabling students to continue self-development after graduation

12. Acceptance Criterion

Central/according to the requirements of the Ministry of Higher Education and Scientific Research

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13. The most important sources of information about the program

- 1.The central library in the college.
2. Internet information network.
- 3.Experiences of Arab and international universities.
4. Current curricula

14. Program Development Plan

- 1- Using new concepts in the field of the environment and using electronic devices to detect defects and try to address them
2. Direct access to the problems facing the environment through expanding field visits to places where pollutants are present

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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
First Year First Semester	Env101	General Physics	Basic	√											
	Env102	General Biology	Basic	√				√				√			
	Env103	General Geology	Basic	√					√				√		
	Env104	Organic Chemistry	Basic	√				√				√			
	Env105	Arabic Language	Basic			√					√				√
	Env106	Freedom & Democracy	Basic			√					√				√
First Year Second Semester	Env107	Biostatistics	Basic	√					√				√		
	Env108	Analytical Chemistry	Basic	√					√			√			
	Env109	Soil Science	Basic	√						√				√	
	Env110	Ecology	Basic	√				√				√			

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	Env111	English Language	Basic				√			√				√	
	Env112	Computer	Basic	√					√				√		
Second Year First Semester	Env201	Genetics	Basic	√				√					√		
	Env202	Plant Ecology	Basic	√					√				√		
	Env203	Principle of pollution	Basic	√				√					√		
	Env204	Environmental Chemistry	Basic	√				√				√			
	Env205	Environmental Geology	Basic		√				√				√		
	Env206	Environmental Systems and Rules	Basic	√				√				√			
Second Year Second Semester	Env207	Environmental Microbiology	Basic		√				√					√	
	Env208	Plant Taxonomy	Basic			√				√			√		
	Env209	Animal Taxonomy	Basic		√			√					√		

	Env210	Climatology	Basic	√				√				√			
	Env211	Freedom and Democracy	Basic			√				√				√	
	Env212	Biochemistry	Basic	√				√				√			
Third Year First Semester	Env301	Air Pollution	Basic	√				√				√			
	Env302	Aquatic environment	Basic		√				√				√		
	Env303	Animal Environment	Basic		√				√				√		
	Env304	Biodiversity	Basic			√					√			√	
	Env305	Environmental Physiology	Basic			√					√			√	
	Env306	Environmental Technology	Basic	√					√			√			
Third Year	Env307	Water Pollution	Basic			√				√				√	
	Env308	Molecular Biology	Basic	√				√				√			


Second Semester	Env309	Entomology	Basic	√				√				√			
	Env310	Soil Pollution	Basic		√					√			√		
	Env311	Phycology	Basic			√				√				√	
	Env312	radioactive pollution	Basic	√				√				√			
Fourth Year First Semester	Env401	graduation project	Basic	√				√				√			
	Env402	sustainable development	Basic	√				√				√			
	Env403	Remote sensation	Basic		√				√				√		
	Env404	Environmental Health	Basic	√				√				√			
	Env405	Renewable energy	Basic	√				√				√			
Fourth Year Second Semester	Env407	graduation project	Basic	√				√				√			
	Env408	Green Chemistry	Basic		√				√			√			
	Env409	Epidemiology	Basic		√					√				√	

	Env410	Environmental planning and management	Basic	√				√				√			
	Env411	Environmental economics	Basic	√				√				√			

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

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Course Description Form

1. Course Name:	
Environmental Geology/ Practical	
2. Course Code:	
Env203	
3. Semester / Year:	
One / 2023-2024	
4. Description Preparation Date:	
6/8/2023	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(2hr. Theory) (2 hr. Practical) / 5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Inas Hazim Hameed A.L. Layali Adel Saber Email: inasalkhafaf7@uomosul.edu.iq layali.alsalim@uomosul.edu.iq	
8. Course Objectives	
Course Objectives 	Introducing students to the components of the Earth, represented by the lithosphere, hydrosphere, atmosphere, and biosphere, and studying soil . The nature within which all natural activities and processes of the environment take place, as well as their definition of disasters Natural sources, causes, how to prevent and treat them, and increase environmental awareness to avoid and reduce these risks Its effect
9. Teaching and Learning Strategies	
Strategy	Use an active learning strategy that includes participation and application instead of just receiving information, and encourage them to exchange information and discuss by asking questions and developing their feedback.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Make the student able to understand the practical application and link theoretical information to the process	-Geological environments by Oxidation, Reduction and Acidity Function	Recognize manual samples and try to diagnose them correctly	Using all types of evaluation, including oral and written exam, and preparing and evaluating reports
2			- The Pollution of Soluble Gases in Surface Water		
3			- Distribution of Metals between Polluted Stream Water and Sediments	- Reading and drawing the map, projecting layers on it	
4			- Assessment of Soil Heavy Metal Pollution due to Mining Activities	- Use a data show projector to illustration	
5			- Determine the Magnitude of the Earthquake		
6			- Calculation the Factor of Safety of a Landslide		
7			- Distribution of Metals in Lakes		
8			- Accuracy calculation of heavy metal concentration in the sample		
9			- Intaking the trace elements by plants		
10			- Air pollution with hydrocarbon gases, oxides and total suspended particles		
11			- Air pollution with heavy elements		
12			- Variation of physical and chemical properties of soil profile		
13			- The formative relationship of igneous rocks from chemical analyses		
14			- Calculation of the concentrations of heavy elements in the sense of absorption		

15			- Calculation of geochemical accumulation index of heavy elements in sediments		
11. Course Evaluation					
a quest grade/ 40		Practical exam : 10		Theoretical exam: 30	
final exam / 60		Practical exam: 15		Theoretical exam: 45	
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			التلوث البيئي ، عبد الهادي الصانع ، اروى شاذل طاقة (2002)، أسس الجيولوجيا ، كنانة محمد ثابت، محمد عمر العشو، (1993) ، مبادئ الجيوكيمياء ، هشام يحيى الدباغ (1990)		
Main references (sources)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

1. Course Name:

Analytical chemistry

2. Course Code:

3. Semester / Year:

Course 2nd /2024

4. Description Preparation Date:

25/3/2024

5. Available Attendance Forms:

Presence and electronic

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hours

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Ywsra Majeed

Email: ywsramajeed@uomosul.edu.iq

Name: Dr. Marwa Nizar Abdul-Fattah

Email: marwa.albeeram@uomosul.edu.iq

8. Course Objectives

Course Objectives

1. Identify chemicals and their interactions.

2. Identify the properties of chemicals and how to distinguish between them.

3. Preparing research and studies for the purpose of student development.

4. Preparing students familiar with all calculations related to the preparation of chemical compounds.

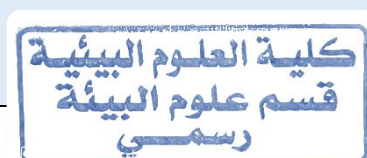
5. Graduating students with the ability to prepare compounds using chemical methods.

9. Teaching and Learning Strategies

Strategy

Interactive theoretical lectures, electronic lectures, use of data sheets, explanations, practical laboratories, workshops, seminars, YouTube videos and seminars.

10. Course Structure



Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student understands the lesson.	General introduction about analytical chemistry, types of solutions, classification of solutions, electrolytes	Theoretical lecture	Discussion and tests
2	4	The student understands the lesson.	calculation of density and specific weight, mass and number of moles, molecular weight	Theoretical lecture	Discussion and tests
3	4	The student understands the lesson.	Methods for expressing concentrations molar, formal, normal or standard, calculating the equivalent weight.	Theoretical lecture	Discussion and tests
4	4	The student understands the lesson.	molar, molar fraction with arithmetic questions,	Theoretical lecture	Discussion and tests
5	4	The student understands the lesson.	percentage of percentage, part per million part per billion	Theoretical lecture	Discussion and tests
6	4	The student understands the lesson.	Quarterly test	Theoretical lecture	Discussion and tests
7	4	The student understands the lesson.	calculation of the p function	Theoretical lecture	Discussion and tests
8	4	The student understands the lesson.	chemical equilibrium, factors affecting chemical equilibrium,	Theoretical lecture	Discussion and tests
9	4	The student understands the lesson.	calculation of ionic degradation of water, strong and weak acid decomposition and ionization	Theoretical lecture	Discussion and tests
10	4	The student understands the lesson.	ionization of a strong or weak base, pH account for salt	Theoretical lecture	Discussion and tests
11	4	The student understands the lesson.	statistical analysis of data, rate, median range	Theoretical lecture	Discussion and tests
12	4	The student understands the lesson.	calculation of standard deviation, relative standard deviation, variance,	Theoretical lecture	Discussion and tests
13	4	The student understands the lesson.	methods of expressing experimental error Accuracy and precision	Theoretical lecture	Discussion and tests
14	4	The student understands the lesson.	methods of photosynthetic analysis	Theoretical lecture	Discussion and tests
15	4	The student understands the lesson.	General review	Theoretical lecture	Discussion and tests

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)	
Main references (sources)	Reference text Stoog DA, West DM. Fundamental Analytical Chemistry, 9th edition, 2008.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

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13. Course Name:	
Geology/ Practical	
14. Course Code:	
Env203	
15. Semester / Year:	
One / 2023–2024	
16. Description Preparation Date:	
6/8/2023	
17. Available Attendance Forms:	
Attendance	
18. Number of Credit Hours (Total) / Number of Units (Total)	
(2hr. Theoretical, 2hr. Practical) / 6 Units	
19. Course administrator's name (mention all, if more than one name)	
Name: Dr. Inas Hazim Hameed inasalkhafaf7@uomosul.edu.iq A. L. Layali Adel Saber layali.alsalim@ uomosul.edu.iq	
20. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> – Identification of earth science and what it deals of study a solid earth and how it was formed and what it includes of rocks and minerals, and learning about the composition of the Earth and the factors that change its surface over time. – Enable the student in this field by providing him with the information and experiences he needs and linking them to His work as an environmental researcher
21. Teaching and Learning Strategies	

Strategy	Use an active learning strategy that includes participation and application instead of just receiving information, and encourage them to exchange information and discuss by asking questions and developing their feedback.
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22. 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		Make the student able to understand the practical application and link theoretical information to the process	Crystallography Minerology Minerology Sedimentary rocks Sedimentary rocks Igneous rocks Igneous rocks Metamorphic rocks Metamorphic rocks Types of maps and scales Topographic profile Contour maps	Recognize manual samples and try to diagnose them correctly - Reading and drawing the map, projecting layers on it - Use a data show projector to illustration	Using all types of evaluation, including oral and written exam, and preparing and evaluating reports
13 14			Geological maps of horizontal strata Geological maps of horizontal strata		
15			Geological maps of vertical strata		

23. Course Evaluation

a quest grade/ 40	Practical exam : 10	Theoretical exam: 30
final exam / 60	Practical exam: 15	Theoretical exam: 45

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	مبادئ علم المعادن (2002) د. عبد الهادي الصائغ د. زكي عبد الجبار الجبوري الجيولوجيا الفيزيائية (2005) د. عبد الهادي الصائغ د. فاروق صنع الله العمري
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name : physics					
2. Course Code:					
3. Semester / Year: first Semester– 2024					
4. Description Preparation Date: presents					
5. Available Attendance Forms: 2-4					
6. Number of Credit Hours (Total) / Number of Units (Total): 2-4					
7. Course administrator's name (mention all, if more than one name)					
Name: dr. ahmed noori mahmood Email: ahmednoori@uomsul.edu.iq					
8. Course Objectives Give an idea about radioactive contamination in general • Directing and employing physics in the fields of treating radioactive contamination					
Course Objectives					
9. Teaching and Learning Strategies Using modern sources to understand pollution in general and radioactive contamination in particular					
Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first, second and third The fourth, fifth					

and sixth weeks
 The seventh, eighth and ninth weeks
 The tenth, eleventh and twelfth weeks
 6 6 6 6 A
 general concept about radioactive contamination
 Radioactivity Applications of nuclear physics in the field of the environment.
 Fundamentals of nuclear physics
 Properties of radioactive contamination
 The most important applications of nuclear physics in the field of the environment

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 :
0% (daily and half-term exams) - 10% (student contributions and participation) - 10% (oral exam)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction of physics
Main references (sources)	Physics part - 1
Recommended books and references (scientific journals, reports...)	Practical physics in si - units
Electronic References, Websites	

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1. Course Name: Computer					
2. Course Code					
EVES24 F105					
3. Semester / Year					
2023-2024					
4. Description Preparation Date:					
1-2-2024					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total)					
Number of units (total) 2 units and total number of hours 30					
7. Course administrator's name (mention all, if more than one name)					
Name: Fanar N Jardow Email: fnr.neif@uomosul.edu.iq					
8. Course Objectives					
Course Objectives			Introducing the student to scientific facts in the field of computers and information technology and how to use computer applications in various fields		
9. Teaching and Learning Strategies					
Strategy		Direct explanation+Weekly lectures, calculator applications and skills development in the practical aspect			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Gain experience in field of computers programs, how to work on them, and keep up with updates	Binary system	Explanation live delivery the classroom	Daily quarterly exams reports
2	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Parts of a Computer	Explanation live delivery the classroom	Daily quarterly exams reports

3	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Desktop and its partitions	Explanation live delivery the classroom	Daily quarterly exams reports
4	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Microsoft office 2010	Explanation live delivery the classroom	Daily quarterly exams reports
5	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	quiz	Explanation live delivery the classroom	Daily quarterly exams reports
6	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Detailed explanation of the main menus of the MS Word 2010	Explanation live delivery the classroom	Daily quarterly exams reports
7	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Microsoft PowerPoint	Explanation live delivery the classroom	Daily quarterly exams reports
8	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Exam	Explanation live delivery the classroom	Daily quarterly exams reports
9	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Designing Presentation	Explanation live delivery the classroom	Daily quarterly exams reports
10	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Statistical and logical functions	Explanation live delivery the classroom	Daily quarterly exams reports
11	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Introduction Microsoft excel	Explanation live delivery the classroom	Daily quarterly exams reports
12	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Types of data used in Excel	Explanation live delivery the classroom	Daily quarterly exams reports

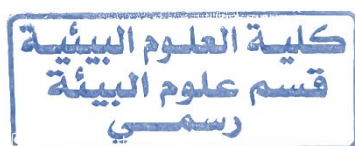
		work on them, and keep up with updates			
13	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Statistical and logical functions	Explanation live delivery the classroom	Daily quarterly exams reports
14	2	Gain experience in the field of computers and programs, how to work on them, and keep up with updates	Final Exam	Explanation live delivery the classroom	Daily quarterly exams reports

11. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 final exams,60 Practical: 15 and theoretical 45

12. Learning and Teaching Resources

Required textbooks (curricular books, any)	-
Main references (sources)	Microsoft office2010 book
Recommended books and references (scientific journals, reports...)	General computers + applications
Electronic References, Websites	Applications + YouTube + Microsoft Portal



25. Course Name:					
ecology					
26. Course Code:					
27. Semester / Year:					
First course					
28. Description Preparation Date:					
2024					
29. Available Attendance Forms:					
Direct communication with students.					
30. Number of Credit Hours (Total) / Number of Units (Total)					
30 hours / 3 units					
31. Course administrator's name (mention all, if more than one name)					
Name: dr. ansam ahmed saadon Email: ansamahmed@uomosul.edu.iq					
32. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> Identify the basic principles of Environmental science. Identify the factors affecting growth of Organisms. *knowing the types of relationships between Living organisms and environmental factors. 			
33. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> How the divided ecosystems and study their Characteristics and environmental factors Affecting them. 			
34. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	*introduction to Ecology.	*get to know the Most important Environmental	Explantation	

2	2	*ecosystem.	Scientists. *identify the type Of ecosystems.	Explantation	
3	2	*factors Determining Growth.	*know the types Of factors.	Explantation	
4	2	*factors Determining Growth.	*know the types Of factors.	Explantation	
5	2	*elements cycles	*know how Elements rotate	Powerpoint	Exam
6	2	*elements cycles.	* know how Elements rotate	Powerpoint	
7	2	*relationships Between organisms	*recognizing the Types relationships; negative and positive.	Powerpoint	
8	2	*relationships Between Organism .	*recognizing the Types relationships; negative and positive.	Powerpoint	
9	2	*the food chain.	*understand how Energy transferred.	Explantation	Direct questions.
10	2	*environmental Pyramids.	*knowing the type Of pyramids.	Explantation	
11	2	*natural resources	*identify the type Of resources.	Explantation	
12	2	*environmental Pollution.	*study the concep Of pollution.	Explantation	
13	2	*water pollution.	*study of water Pollution.	Explantation	
14	2	*air pollution.	*study of air Pollution.	Explantation	Exam.
15	2	*soil pollution.	*study of soil Pollution.	Explantation.	

35. 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					
*mid theoretical exam 20					
*daily theoretical exam 10					
*daily and mid practical exam 10					
*final theoretical exam 45					
*final practical exam 15					
36. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)			Ecology basics book		
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					

1. Course Name**Environmental Education****2. Course Code****EVES24 F313****3. Semester / Year****2023–2024****4. Description Preparation Date:****1–9–2023****5. Available Attendance Forms:****6. Number of Credit Hours (Total) / Number of Units (Total)****Number of units (total) 3 units and total number of hours 30****7. Course administrator's name (mention all, if more than one name)****Name: Name: Dr .Faten Khalil Ibrahim****Email: fatinalatrakche@uomosul.edu.iq****8. Course Objectives****Course Objectives****Study of environmental education and its relationship to the environment and study of the most important conferences and environmental activities****9. Teaching and Learning Strategies****Strategy****Direct explanation****10. Course Structure**

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Gain experience knowing the concepts of environmental education	The concept of the environment and the stages of development of the relationship between man and the environment	Live explanation in the classroom	Daily and quarterly exams and reports

2	2	Gain experience knowing the concepts of environmental education	Introduction to Environmental Education / Conc	Live explanation in the classroom	Daily and quarterly exams and reports
3	2	Gain experience knowing the concepts of environmental education	The development of environmental education, the historical stages through which environmental education appeared.	Live explanation in the classroom	Daily and quarterly exams and reports
4	2	Gain experience knowing the concepts of environmental education	Environmental education objectives, specific goals and general objectives.	Live explanation in the classroom	Daily and quarterly exams and reports
5	2	Gain experience knowing the concepts of environmental education	Elements of environmental education / characteristics and characteristics of environmental education	Live explanation in the classroom	Daily and quarterly exams and reports
6	2	Gain experience knowing the concepts of environmental education	Semester exam		Daily and quarterly exams and reports
7	2	Gain experience knowing the concepts of environmental education	The importance of environmental education, meaning environmental protection.	Live explanation in the classroom	Daily and quarterly exams and reports
8	2	Gain experience knowing the concepts of environmental education	The concept of an ecosystem	Live explanation in the classroom	Daily and quarterly exams and reports
9	2	Gain experience knowing the concepts of environmental education	the concept of an ecosystem. Levels of environmental education.	Live explanation in the classroom	Daily and quarterly exams and reports
10	2	Gain experience knowing the concepts of environmental education	Levels of environmental education	Live explanation in the classroom	Daily and quarterly exams and reports
11	2	Gain experience knowing the concepts of environmental education	Environmental psychology	Live explanation in the classroom	Daily and quarterly exams and reports
12	2	Gain experience knowing the concepts of environmental education	Ecosystem section	Live explanation in the classroom	Daily and quarterly exams and reports

13	2	Gain experience knowing the concepts of environmental education	Ecosystem section	Live explanation in the classroom	Daily and quarterly exams and reports
14	2	Gain experience knowing the concepts of environmental education	Environmental problems	Live explanation in the classroom	Daily and quarterly exams and reports
	2				

11. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 final exams,60 Practical: 15 and theoretical 45

12. Learning and Teaching Resources

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

1. Course Name : radiation pollution					
2. Course Code:					
3. Semester / Year: 2 nd Semester- 2024					
4. Description Preparation Date: presents					
5. Available Attendance Forms: 2-4					
6. Number of Credit Hours (Total) / Number of Units (Total): 2-4					
7. Course administrator's name (mention all, if more than one name)					
Name: dr. ahmed noori mahmood					
Email: ahmednoori@uomsul.edu.iq					
8. Course Objectives Give an idea about radioactive contamination in general • Directing and employing radation physics in the fields of treating radioactive contamination					
Course Objectives					
9. Teaching and Learning Strategies Using modern sources to understand pollution in general and radioactive contamination in particular					
Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the first, second and					

third The
fourth, fifth
and sixth
weeks The
seventh,
eighth and
ninth weeks
The tenth,
eleventh and
twelfth weeks
6 6 6 6 A
general
concept about
radioactive
contamination
Radioactivity
Applications
of nuclear
physics in the
field of the
environment.
Fundamentals
of nuclear
physics
Properties of
radioactive
contamination
The most
important
applications
of nuclear
physics in the

field of the environment					
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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 :
 0% (daily and half-term exams) - 10% (student contributions and participation) - 10% (oral exam)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction of nuclear physics
Main references (sources)	Physics part - 1
Recommended books and references (scientific journals, reports...)	Practical physics in si - units
Electronic References, Websites	

37. Course Name: Environmental Toxicology	
38. Course Code:	
39. Semester / Year: second semester	
40. Description Preparation Date:1/1/2024	
41. Available Attendance Forms:	
42. Number of Credit Hours (Total) / Number of Units (Total) 2 / 15 weeks	
43. Course administrator's name (mention all, if more than one name) Name: Assist prof. Ayman albanna Email: aymanalbanna@uomosul.edu.iq	
44. Course Objectives Course Objectives Empowering students to understand the concepts of toxicology, particular environmental toxicology, by grasping the fundamental terms and classifications of environmental toxicology, defining the types of toxins, understanding the methods of exposure to toxic substances and how they penetrate the body, recognizing their effects on living organisms and environmental pollution, as well as developing the ability to detect and estimate their levels, and making appropriate decisions based on the permissible limits according to prevailing laws and regulations.	
45. Teaching and Learning Strategies	
Strategy	<ol style="list-style-type: none"> 1. Understanding the field of toxicology and its relevance to the surrounding environment. 2. Clarifying theoretical concepts through practical application. 3. Acquiring the necessary skills to enable students to identify and recognize toxic substances in their surroundings, and to understand methods of dealing with them in the field to protect humans, organisms, and their environment from various toxic pollutants. 4. Learning scientific research writing skills by organizing concepts, analyzing obtained results, and discussing them according to the theoretical concepts covered in the course.

46. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first second third fourth fifth sixth seventh eighth ninth tenth eleventh twelfth thirteenth fourteenth fifteenth sixteenth		<p>Toxicology: The study of harmful substances that can cause adverse effects on living organisms.</p> <p>Special Terms in Toxicology:</p> <p>Sources of Toxins: Both natural and manufactured sources of toxic substances.</p> <p>Relationship between Toxicology and Other Sciences: The interconnectedness between toxicology and other scientific disciplines.</p> <p>History of Toxicology throughout the Ages.</p> <p>Environmental Toxicology: The study of how toxins interact with the environment and living organisms.</p> <p>Classification of Toxins: Categorizing toxic</p>			

		<p>substances based on their properties and effects.</p> <p>Exposure Routes to Toxic Substances: Various methods by which organisms come into contact with toxic materials.</p> <p>Entry Routes into Organisms: Mechanisms through which toxic substances enter the bodies of living organisms.</p> <p>Effects of Toxins on the Body: Understanding the impacts of toxic substances on living organisms.</p> <p>Accumulation Sites of Toxic Substances in the Body: Locations within the body where toxic substances tend to accumulate.</p> <p>Methods of Eliminating Toxic Substances from the Body: Processes by which the body rids itself of toxic materials.</p> <p>Limiting the Use of Pesticides: Strategies for reducing and controlling the use of pesticides to</p>			
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		minimize their adverse effects.			
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47. 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 30% theory , 10% practical

48. Learning and Teaching Resources

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

1. Course Name:	
Environmental impact assessment	
2. Course Code:	
3. Semester / Year:	
Semester – third stage	
4. Description Preparation Date:	
27-3-2024	
5. Available Attendance Forms:	
Weekly in theory	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week for 15 weeks/2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Saad Mohammed Hasan Email: saadmh@uomosul.edu.iq	
8. Course Objectives	
Objectives of the study subject The Environmental Impact Assessment aims to shed light on the basic concepts of evaluating the environmental impacts of a project and the importance of that in achieving the continuity of the project or not, and gaining the ability to participate in this type of studies and the ability to review them. It includes several topics, the most important of which are: the current status of the environmental impact assessment process, the methodology for conducting environmental impact assessment studies for projects, the stages of environmental impact assessment, the problems facing environmental impact assessment, the roles of beneficiaries in the environmental impact assessment process, environmental impact assessment reports and their most important contents, the review process. For reports and after approving reports for the purpose of verifying the accuracy of the information, this is done through environmental control, which operates in the post-implementation stage.	
9. Teaching and Learning Strategies	
Strategy	<ul style="list-style-type: none"> 1- Brainstorming strategy (putting the mind in a state of excitement in order to think all directions and possibilities to arrive at the largest possible number of ideas about a specific problem or topic). 2- Modeling learning strategy (an illustrative method of teaching based on employing experiments, methods, and models) 3- Group work strategy (represented in dividing learners into small groups, consisting of 3 to 4 members, who are given specific duties (common goals) and must cooperate in order to accomplish the task required of them). 4- Discussion strategy (using discussion in the form of questions that stimulates learning motivation).
10. Course Structure	

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	Week
Daily +exams Quarterly +exams Classwork	lecture	Environmental impact, definition of environmental impact assessment, environmental impact assessment methodology, basic steps of the environmental assessment process, benefits of environmental impact assessment, basic definitions in the environmental impact assessment process, reasons for carrying out the .environmental impact assessment process		2	1
	lecture	Risk assessment, risk management process, estimation of the risk to which a person is exposed, pollutant impact factor, daily exposure to risk, number of cases of .infection with the risk, daily dose rate		2	2
	lecture	Completion of pollutant impact factor, daily exposure to risk + solving mathematical problems		2	3
	lecture	How to estimate the environmental impact, environmental classification of projects, examples of some projects, environmental conditions for the work of .these types, safety procedures in projects		2	4
	lecture	The effects of unstudied urban expansion, methods of studying the evaluation of the inter-constructive impact: First: The direct method Second: The list method: Third: The method of matrices (Leopold's matrix): Fourth: The method of composite maps: Fifth: The .method of geographic information systems		2	5
	lecture	Steps for writing an environmental impact report, environmental impact report for the ice factory, project goal, environmental impact of the project, conclusion, .and recommendations		2	6
	lecture	Environmental impact report for Al-Hallan factory, project goal, environmental impact of the project, .conclusion, recommendations		2	7
	lecture	The environmental impact report is specific to slaughterhouses, components of slaughterhouses, environmental conditions for slaughterhouses, and .environmental requirements		2	8
	lecture	Environmental conditions for washing and lubrication garages, environmental classification, site determinants, .environmental conditions		2	9
	lecture	Environmental conditions for food industry factories, environmental classification, locational determinants, .environmental conditions		2	10
	lecture	Swimming pools, definition, objectives and areas of application, environmental conditions that must be provided in swimming pools, environmental .requirements		2	11
	lecture	Swimming pools are supplemented with employee requirements, general requirements, and security and safety requirements		2	12
	lecture	Case study: Environmental impact assessment in the field of pharmaceuticals		2	13
	lecture	Case study: Assessing the environmental impacts of the coal industry		2	14
	lecture	Case study: Evaluating environmental impacts in cement factories		2	15

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

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)	
Main references (sources)	<p>A Handbook of Environmental Impact Assessment, Prepared for SNH by David Tyldesley and Associates Edinburgh 2nd Edition. 2005.</p> <p>Methods of environmental Impact Assessment, by Peter Morris, 2010.</p> <p>Environmental Impact Assessment, A Guide to best professional practices, by Charles Eccleston, 2011</p>
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:

Environmental chemistry

2. Course Code:**EVES23 F109****3. Semester / Year:**Course 1st /2024**4. Description Preparation Date:**

25/3/2024

5. Available Attendance Forms:

Presence

6. Number of Credit Hours (Total) / Number of Units (Total)

30 hours

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Marwa Nizar Abdul-Fattah

Email: marwa.albeeram@uomosul.edu.iq**8. Course Objectives****Course Objectives**

1. This science aims to understand how the natural environment changes due to chemical factors and how to protect the environment and reduce pollution and its impact on public health.

2. Developing new techniques for chemical analysis and waste management

9. Teaching and Learning Strategies**Strategy**

Interactive theoretical lectures, electronic lectures, use of data sheets, explanations, practical laboratories, workshops, seminars, YouTube videos and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1	2	The student understands the lesson.	A general introduction to environmental chemistry	Theoretical lecture	Discussion and tests
2	2	The student understands the lesson.	Objectives of environmental chemistry	Theoretical lecture	Discussion and tests
3	2	The student understands the lesson.	Environmental chemistry applications	Theoretical lecture	Discussion and tests
4	2	The student understands the lesson.	Biogeochemical cycles	Theoretical lecture	Discussion and tests
5	2	The student understands the lesson.	Elements and compounds	Theoretical lecture	Discussion and tests
6	2	The student understands the lesson.	Chemical and physical changes	Theoretical lecture	Discussion and tests
7	2	The student understands the lesson.	Basics of water chemistry	Theoretical lecture	Discussion and tests
8	2	The student understands the lesson.	Aqueous solutions	Theoretical lecture	Discussion and tests
9	2	The student understands the lesson.	Water pollution chemistry	Theoretical lecture	Discussion and tests
10	2	The student understands the lesson.	Organic water pollutants	Theoretical lecture	Discussion and tests
11	2	The student understands the lesson.	Inorganic pollutants	Theoretical lecture	Discussion and tests
12	2	The student understands the lesson.	Soil chemistry	Theoretical lecture	Discussion and tests
13	2	The student understands the lesson.	Chemical pollutants	Theoretical lecture	Discussion and tests
14	2	The student understands the lesson.	General assessment methods for environmental environments	Theoretical lecture	Discussion and tests
15	2	The student understands the lesson.	General review	Theoretical lecture	Discussion and tests

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)

الكيمياء البيئية 2012 للمؤلف وضحة وصفي ابو دهبية

Main references (sources)	علم وتقانات البيئة 2006 ترجمة الصديق عمر الصديق
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:

Organic chemistry

2. Course Code:

Env104

3. Semester / Year:Course 1st /2024**4. Description Preparation Date:**

25/3/2024

5. Available Attendance Forms:

Presence and electronic

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hours

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Suher Muneer Dawoud

Email: suher.alsaaty@uomosul.edu.iq**8. Course Objectives****Course Objectives**

- 1- Know the classes of organic compounds based on the active and substituted groups in the compound.
- 2- Knowing how to write the molecular, structural and stereo formulas of organic compounds.
- 3- The student will master how to distinguish between aliphatic compounds such as alkanes, alkenes, and alkynes.
- 4- The student will know how to distinguish between cyclic and non-cyclic compounds.
- 5- Know how to distinguish between aliphatic and aromatic compounds.

9. Teaching and Learning Strategies**Strategy**

Interactive theoretical lectures, electronic lectures, use of data sheet explanations, practical laboratories, workshops, seminars, YouTube videos and seminars.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student understands the lesson.	Aliphatic Hydrocarbons: Alkanes and Active Groups (Substituted)	Theoretical lecture	Discussion and tests

2	4	The student understands the lesson.	Nomenclature of alkanes, physical properties of alkanes	Theoretical lecture	Discussion and tests
3	4	The student understands the lesson.	Chemical reactions of alkanes	Theoretical lecture	Discussion and tests
4	4	The student understands the lesson.	Preparation of alkanes	Theoretical lecture	Discussion and tests
5	4	The student understands the lesson.	Cycloalkanes, naming cycloalkanes	Theoretical lecture	Discussion and tests
6	4	The student understands the lesson.	Alkenes, the name of alkenes	Theoretical lecture	Discussion and tests
7	4	The student understands the lesson.	Physical properties of alkenes	Theoretical lecture	Discussion and tests
8	4	The student understands the lesson.	Alkene reactions	Theoretical lecture	Discussion and tests
9	4	The student understands the lesson.	Preparation of alkenes	Theoretical lecture	Discussion and tests
10	4	The student understands the lesson.	Cycloalkenes, name cycloalkenes	Theoretical lecture	Discussion and tests
11	4	The student understands the lesson.	Alkynes, naming alkynes	Theoretical lecture	Discussion and tests
12	4	The student understands the lesson.	Physical properties of alkynes, preparation of alkynes	Theoretical lecture	Discussion and tests
13	4	The student understands the lesson.	Cycloalkenes and dienes, naming cycloalkenes and dienes	Theoretical lecture	Discussion and tests
14	4	The student understands the lesson.	Aromatic hydrocarbons, benzene and its derivatives	Theoretical lecture	Discussion and tests
15	4	The student understands the lesson.	Compensation reactions on the benzene ring	Theoretical lecture	Discussion and tests

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)	Fundamentals of organic chemistry
Main references (sources)	Textbook of Organic Chemistry, by Morrison and Boyd

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:					
Remote sensing applications (practical)					
2. Course Code:					
3. Semester / Year:					
Semester					
4. Description Preparation Date:					
2023/9/1					
5. Available Attendance Forms:					
My presence					
6. Number of Credit Hours (Total) / Number of Units (Total)					
4/3					
7. Course administrator's name (mention all, if more than one name)					
Name:		Layali Adil Saber		Email: layali.alsalim@uomosul.edu.iq	
Name:		Amina Basil		Email: amina_basil@uomosul.edu.iq	
8. Course Objectives					
Course Objectives			The course aims to teach the student how to apply and the Arc GIS program, become familiar with the program interface, create a project, and become familiar with satellite visualization in terms of integrating and processing it.		
9. Teaching and Learning Strategies					
Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

The first	two hours	Learning on the program Arc GIS and how to use it and learn about satellite data visualizations and how to integrate, analyze, classify, and benefit from the data while doing graduate research because it is an environmental program	Definition of geographic information systems, its components, types of data, and sources of geographic data collection.	Using calculator (laptop)	
The second	two hours		How to install Arc C		
The third	two hours		Introduction to the GIS interface and components of program interface		
The fourth	two hours		An introduction to Arc Catalog program interface and contents of the interface. In addition introducing Toolbox, Arc Scene and Arc Globe		
The fifth	two hours		for geographic coordinates, their definition and types, and an introduction to the Transverse Mercator Projection (UTM).		
Sixth	two hours		Practical application of the Arc Catalog interface to create a database (point, line, and polygon) and choose the location		
Seventh	two hours		Practical application of the Arc Map interface to draw geographical features (point, line, and polygon) on the map		
Eighth	two hours		Create a spreadsheet using the Arc Map program to enter data for geographical features		
The ninth	two hours		test		
Ten	two hours		Definition of satellite visualization, its features, and		

			knowledge of visual information		
Eleventh	two hours		introduction to Landsat, its goals, and the date of launching the Landsat satellite		
Twelve	two hours		How to download satellite video from the USGS website		
Thirteen	two hours		Practical application of satellite visualization using the Arc Map program. Preparing the satellite visualization. Adding bands 2-4. Merging bands		
The fourteenth	two hours		4- Removing the black background of the satellite video. 5- Modifying the color composition of the video. And knowing the arrangement of Bands for various analyzes and uses in 8 Landsat		
The fifteenth	two hours		test		

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
10 quarterly

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Khamis Fakher, applications of remote sensing using the Geographic Information Systems (GIS) program, and Al-Tayeb Muhammad Ahmad, Geographic Information Systems from Alif
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.youtube.com/@GomaaDawod https://www.youtube.com/@wisammohammed

1. Course Name	
Plant Taxonomy	
2. Course Code	
EVES24 F213	
3. Semester / Year	
2023–2024	
4. Description Preparation Date:	
1–9–2023	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Number of units (total) 3 units and total number of hours 30	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr .Faten Khalil Ibrahim Name: Mishaal ail Mohammed Email: mishaalalanziy@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	Knowledge of complete details about the principles and foundations of the classification of floral plants, the history of the development of taxonomy and classification systems, identification of various plant parts and their taxonomic significance, and the study of some plant families .additives.....
9. Teaching and Learning Strategies	

Strategy	Direct explanation
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1	2	Gain knowledge and experience Plant Taxonomy	Introduction plant taxonomy its relationship other biological sciences.	Live explanation in the classroom	Daily quarterly exams reports
2	2	Gain knowledge and experience Plant Taxonomy	Evolutionary tree of seed plants	Live explanation in the classroom	Daily quarterly exams reports
3	2	Gain knowledge and experience Plant Taxonomy	Comparison of developed adjectives with primitive adjectives with examples	Live explanation in the classroom	Daily quarterly exams reports
4	2	Gain knowledge and experience Plant Taxonomy	Classification systems, artificial system, natural system and evolutionary system.	Live explanation in the classroom	Daily quarterly exams reports
5	2	Gain knowledge and experience Plant Taxonomy	Approved quality of classification	Live explanation in the classroom	Daily quarterly exams reports
6	2	Gain knowledge and experience Plant Taxonomy	The basis classification	Live explanation in the classroom	Daily quarterly exams reports
7	2	Gain knowledge and experience Plant Taxonomy	The quarterly exam.	Live explanation in the classroom	Daily quarterly exams reports
8	2	Gain knowledge and experience Plant Taxonomy	Major taxonomic ranks and minor taxonomic ranks	Live explanation in the classroom	Daily quarterly exams reports
9	2	Gain knowledge and experience Plant Taxonomy	Nomenclature, local nomenclature, multi-word nomenclature, scientific nomenclature.	Live explanation in the classroom	Daily quarterly exams reports
10	2	Gain knowledge and experience Plant Taxonomy	Write the scientific name, genus name and species name with examples.	Live explanation in the classroom	Daily quarterly exams reports

11	2	Gain knowledge and experience Plant Taxonomy	The rules of international naming system with examples, explain the rule precedence.	Live explanation in the classroom	Daily quarterly exams reports
12	2	Gain knowledge and experience Plant Taxonomy	Seed plants monoecious dioecious.	Live explanation in the classroom	Daily quarterly exams reports
13	2	Gain knowledge and experience Plant Taxonomy	Know the different parts of the plant and the types of seeds.	Live explanation in the classroom	Daily quarterly exams reports
14	2	Gain knowledge and experience Plant Taxonomy	Plant families.	Live explanation in the classroom	Daily quarterly exams reports
	2				

11. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 final exams,60 Practical: 15 and theoretical 45

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	<p><u>PLANT TAXONOMY</u></p> <p>Author(s): SHARMA</p> <p>Publisher: MC GRAW HILL INDIA, Year: 2013</p> <p>ISBN: 9780070141599</p>
Electronic References, Websites	

13. Course Name:	
Classification of Animal/ Practical	
14. Course Code:	
Env211	
15. Semester / Year:	
Three/2023-2024	
16. Description Preparation Date:	
7/2/2024	
17. Available Attendance Forms:	
Attendance	
18. Number of Credit Hours (Total) / Number of Units (Total)	
(2hr. Theoretical, 2hr. Practical) / 6 Units	
19. Course administrator's name (mention all, if more than one name)	
Name: Dr. Inas Hazim Hameed inasalkhafaf7@uomosul.edu.iq Ahmed Ismael Suliman ahmed.Ismael@uomosul.edu.iq Hussamaddin Thanoon Ali hussamaddin@uomosul.edu.iq	
20. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • Teach the student how to use a microscope • Explaining taxonomy as a science that classifies living organisms into groups to facilitate their study • Providing the student with information about the concept of species and speciation • Providing him with the fundamentals used in classification of animal
21. Teaching and Learning Strategies	
Strategy	Use an active learning strategy that includes participation and application instead of just receiving information, and encourage them to exchange information and discuss by asking questions and developing their feedback.

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22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Make the student able to understand the practical application and link theoretical information to the process	Introduction to Classification		
2			Parts of a microscop		
3			Phylum of Cinidaria		
4			Porifera		
5		Mastering of funamentals a classification	Mollusca		
6			Arthropoda		
7			Test		
8			Arthropoda		
9			Chordata		
10		Distinguish between animal groups	Chordata		
11			Echinodermata		
12			Class: Aves		
13			General Review		
14					

23. Course Evaluation

a quest grade/ 40 Practical exam : 10 Theoretical exam: 30
 final exam / 60 Practical exam: 15 Theoretical exam: 45

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Classification of the Animal Kingdom Richard E. Blackwelder
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://www.marinespecies.org/traits./aphia.php?p=taxdetails&id=1022121

25. Course Name: Food pollution

26. Course Code

EVES24 F303

27. Semester / Year

2023–2024

28. Description Preparation Date:

1–9–2023

29. Available Attendance Forms:

30. Number of Credit Hours (Total) / Number of Units (Total)

Number of units (total) 3 units and total number of hours 30

31. Course administrator's name (mention all, if more than one name)

Name: Mishaal ail Mohammed

Email: mishaalalanziy@uomosul.edu.iq

32. Course Objectives

Course Objectives

- **Highlighting food contamination**
- **Causes of pollution**
- **Highlighting the risks of food contamination and food contamination diseases**
- **Highlight the danger of food additives.**

33. Teaching and Learning Strategies

Strategy

Direct explanation

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1	2	Study of a science algae ecol - its dam and benefi	Introduction to science of pollution	Explanation live delivery the classroom	Daily quarterly exams reports
2	2	Study of a science algae ecol - its dam and benefi	Biological contamination1	Explanation live delivery the classroom	Daily quarterly exams reports
3	2	Study of a science algae ecol - its dam and benefi	Biological contamination2	Explanation live delivery the classroom	Daily quarterly exams reports
4	2	Study of a science algae ecol - its dam and benefi	Chemical contamination food	Explanation live delivery the classroom	Daily quarterly exams reports
5	2	Study of a science algae ecol - its dam and benefi	Food contamina with pesticides	Explanation live delivery the classroom	Daily quarterly exams reports
6	2	Study of a science algae ecol - its dam and benefi	Contamination food with radioac materials	Explanation live delivery the classroom	Daily quarterly exams reports
7	2	Study of a science algae ecol - its dam and benefi	Vegetable contamination	Explanation live delivery the classroom	Daily quarterly exams reports
8	2	Study of a science algae ecol - its dam and benefi	Meat contaminati	Explanation live delivery the classroom	Daily quarterly exams reports
9	2	Study of a science algae ecol - its dam and benefi	Contamination milk and product	Explanation live delivery the classroom	Daily quarterly exams reports
10	2	Study of a science algae ecol - its dam and benefi	Quality Specifications Human Food2	Explanation live delivery the classroom	Daily quarterly exams reports
11	2	Study of a science algae ecol - its dam and benefi	Quality Specifications Human Food2	Explanation live delivery the classroom	Daily quarterly exams reports
12	2	Study of a science algae ecol - its dam and benefi	Diseases caused food	Explanation live delivery the classroom	Daily quarterly exams reports

13	2	Study of a science algae ecol - its dam and benefi	Additives preservatives	Explanation live delivery the classroom	Daily quarterly exams reports
14	2	Study of a science algae ecol - its dam and benefi	Additives preservatives	Explanation live delivery the classroom	Daily quarterly exams reports

35. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly;20 fanal exams,60 Practical: 15 and theoretical 45

36. Learning and Teaching Resources

Required textbooks (curricular books, any)	-
Main references (sources)	(2008) Food spoilage yeasts sec edition,taylor & francis
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	FoodAdditives. http://www.foodsafety.org/il/il002.html

37. Course Name

Algaeology

38. Course Code

EVES24 F313

39. Semester / Year

2023-2024

40. Description Preparation Date:

1-9-2023

41. Available Attendance Forms:

42. Number of Credit Hours (Total) / Number of Units (Total)

Number of units (total) 3 units and total number of hours 30

43. Course administrator's name (mention all, if more than one name)

Name: Mishaal ail Mohammed

Email: mishaalalanziy@uomosul.edu.iq

Name: Dr .Faten Khalil Ibrahim

44. Course Objectives

Course Objectives

- Highlighting food contamination
- Causes of pollution
- Highlighting the risks of food contamination and food contamination diseases
- Highlight the danger of food additives.....

45. Teaching and Learning Strategies

Strategy

Direct explanation

46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Gain experience in algae knowledge and classification	Introduction	Live explanation in the classroom	Daily and quarterly exams and reports
2	2	Gain experience in algae knowledge and classification	Classification, growth and reproduction of algae	Live explanation in the classroom	Daily and quarterly exams and reports

3	2	Gain experien in algae knowledge and classification	Cyanophyta	Live explanation i the classroom	Daily and quarterly exams an reports
4	2	Gain experien in algae knowledge and classification	Cyanophyta	Live explanation i the classroom	Daily and quarterly exams an reports
5	2	Gain experien in algae knowledge and classification	Green algae	Live explanation i the classroom	Daily and quarterly exams an reports
6	2	Gain experien in algae knowledge and classification	Green algae	Live explanation i the classroom	Daily and quarterly exams an reports
7	2	Gain experien in algae knowledge and classification	Rhodophyta	Live explanation i the classroom	Daily and quarterly exams an reports
8	2	Gain experien in algae knowledge and classification	Chrysophyta	Live explanation i the classroom	Daily and quarterly exams an reports
9	2	Gain experien in algae knowledge and classification	Euglenophyta	Live explanation i the classroom	Daily and quarterly exams an reports
10	2	Gain experien in algae knowledge and classification	Phaeophyta	Live explanation i the classroom	Daily and quarterly exams an reports
11	2	Gain experien in algae knowledge and classification	Algae ecology a damage	Live explanation i the classroom	Daily and quarterly exams an reports
12	2	Gain experien in algae knowledge and classification	Algae ecology a damage	Live explanation i the classroom	Daily and quarterly exams an reports
13	2	Gain experien in algae knowledge and classification	Economic importance of algae	Live explanation i the classroom	Daily and quarterly exams an reports
14	2	Gain experien in algae knowledge and classification	Algae are part o the food chain	Live explanation i the classroom	Daily and quarterly exams an reports
	2				

47. Course Evaluation

daily preparation reports daily oral:10, practical :10, monthly:,20 fanal exams,60
Practical: 15 and theoretical 45

48. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)	Marine Algae in Pharmaceutical Science: Volume 2 Algae: Anatomy, Biochemistry, and Biotechnology
Electronic References, Websites	

49.	Course Name: Environmental public health
50.	Course Code:
51.	Semester / Year: second semester
52.	Description Preparation Date:1/9/2023
53.	Available Attendance Forms:
54.	Number of Credit Hours (Total) / Number of Units (Total)
	3 / 15 weeks

55. Course administrator's name (mention all, if more than one name)

Name: Assist prof. Ayman albanna
 Email: aymanalbanna@uomosul.edu.iq

56. Course Objectives

Course Objectives

The goal of studying environmental health is to understand, evaluate, and mitigate the complex interactions between the environment and human health. By analyzing environmental factors, pollutants, and risks, this field aims to promote safe and sustainable living conditions, prevent disease, and enhance overall well-being. Through research, education, and policy development, environmental health aims to create healthier environments, reduce health risks, and ensure a higher quality of life for current and future generations.

57. Teaching and Learning Strategies

Strategy

5. Understanding the field of toxicology and its relevance to the surrounding environment.
6. Clarifying theoretical concepts through practical application.
7. Acquiring the necessary skills to enable students to identify and recognize toxic substances in their surroundings, and to understand methods of dealing with them in the field to protect humans, organisms, and their environment from various toxic pollutants.
8. Learning scientific research writing skills by organizing concepts, analyzing obtained results, and discussing them according to the theoretical concepts covered in the course.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	3	1. Demonstrating Understanding Environmental Factors: environmental factors affecting public health, including pollutants, climate change, ecosystems.			
second	3				
third	3				
fourth	3				
fifth	3				
sixth	3				
seventh	3				
eighth	3				
ninth	3				
tenth	3				
eleventh	3				
twelfth	3				
thirteenth	3				
fourteenth	3				
fifteenth	3				
sixteenth	3				

		<p>2. Applying Risk Assessment Techniques: Analyzing and evaluating health risks associated with environmental hazards, using appropriate methodologies and data analysis.</p> <p>3. Implementing Preventive Strategies: Designing and proposing effective preventive strategies to mitigate environmental health risks and promote healthier living conditions.</p> <p>4. Utilizing Analytical Tools: Applying appropriate analytical techniques, such as HPLC, for detection and measurement of environmental pollutants, enhancing data-driven decision making.</p> <p>5. Interpreting Environmental Data: Critically interpreting and evaluating environmental data to demonstrate the ability to extract conclusions and provide informed recommendations.</p> <p>6. Integrating HACCP Principles: Integrating HACCP principles into environmental health and safety programs.</p>			
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		<p>Hazard Analysis and Critical Control Point (HACCP) principles into food safety assessments, ensuring safe consumption practices.</p> <p>7. Communicating Health Findings Effectively: communicating environmental health findings and recommendations to diverse audiences through written reports and oral presentations.</p> <p>8. Collaborating Multidisciplinary Teams: Collaborating cooperatively with multidisciplinary teams to address complex environmental health challenges and propose comprehensive solutions.</p> <p>9. Understanding Regulatory Frameworks: Demonstrating knowledge of regulatory frameworks and policies related to environmental health and food safety, ensuring compliance and ethical practice.</p>			
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		<p>10. Promoting Public Awareness Advocating for public awareness and education regarding environmental health issues, emphasizing the importance of sustainable practices and health behaviors.</p> <p>11. Providing Learning Outcomes Providing clear objectives for students to achieve during the training course, guiding their learning journey and enabling effective progress assessment for teachers.</p>			
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59. 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 40% theory

60. Learning and Teaching Resources

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

1. Course Name:	
Nanotechnology Environment	
2. Course Code:	
3. Semester / Year:	
Course 2 nd /2024	
4. Description Preparation Date:	
25/3/2024	
5. Available Attendance Forms:	
Presence	
6. Number of Credit Hours (Total) / Number of Units (Total)	
30 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Suher Muneer Dawoud Email: suher.alsaaty@uomosul.edu.iq Name: Dr. Marwa Nizar Abdul-Fattah Email: marwa.albeeram@uomosul.edu.iq	
8. Course Objectives	
Course Objectives	The course aims to know the history of nanoscience and technology and the tools used to characterize nanomaterials and to discuss the implications of future developments in various fields of science and their effects on the growth and development of societies. Emphasis will be placed on the basic principles and knowledge necessary for the student to understand science and technology at the nanolevel. The course addresses an interest in methods of producing and preparing materials. Nanostructures and environmental and ethical considerations of nanomaterials in consumer products.
9. Teaching and Learning Strategies	
Strategy	Interactive theoretical lectures, electronic lectures, use of data sheets, explanations, practical laboratories, workshops, seminars, YouTube videos and seminars.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student understands the lesson.	Definition of nanotechnology, nanomaterials	Theoretical lecture	Discussion and tests
2	2	The student understands the lesson.	Properties of nanomaterials, shapes of nanomaterials	Theoretical lecture	Discussion and tests
3	2	The student understands the lesson.	Classification of nanomaterials	Theoretical lecture	Discussion and tests
4	2	The student understands the lesson.	Nanomaterials and methods of preparing them	Theoretical lecture	Discussion and tests
5	2	The student understands the lesson.	Microscopes used to view nanomaterials	Theoretical lecture	Discussion and tests
6	2	The student understands the lesson.	Semester exam	Theoretical lecture	Discussion and tests
7	2	The student understands the lesson.	Current and future applications of nanotechnology	Theoretical lecture	Discussion and tests
8	2	The student understands the lesson.	Medical applications of nanotechnology	Theoretical lecture	Discussion and tests
9	2	The student understands the lesson.	Nano foods	Theoretical lecture	Discussion and tests
10	2	The student understands the lesson.	Applications of nanotechnology in the environment	Theoretical lecture	Discussion and tests
11	2	The student understands the lesson.	Nanotechnology and agriculture	Theoretical lecture	Discussion and tests
12	2	The student understands the lesson.	Sustainable development, green nanotechnology applications	Theoretical lecture	Discussion and tests
13	2	The student understands the lesson.	Industrial applications	Theoretical lecture	Discussion and tests
14	2	The student understands the lesson.	Nanotechnology and environmental phenomena, environmental effects of nanomaterials	Theoretical lecture	Discussion and tests
15	2	The student understands the lesson.	General review	Theoretical lecture	Discussion and tests

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)	النانو وعصر علمي جديد للمؤلف أ.د. محمود محمد سليم صالح
Main references (sources)	النانو تكنولوجي للمؤلف البروفيسور منير نايفة
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name:

Atmospheric chemistry

2. Course Code:

EVES 23 F405

3. Semester / Year:

Course 1st /2024

4. Description Preparation Date:

25/3/2024

5. Available Attendance Forms:

Presence

6. Number of Credit Hours (Total) / Number of Units (Total)

30 hours

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Ywsra Majeed

Email: ywsramajeed@uomosul.edu.iq

Name: Dr. Marwa Nizar Abdul-Fattah

Email: marwa.albeeram@uomosul.edu.iq

8. Course Objectives

Course Objectives	The course aims to study the components of the atmosphere and the pollutants that humans can cause to the atmosphere by studying the natural cycles of the chemical elements present within the atmosphere.
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9. Teaching and Learning Strategies

Strategy	Interactive theoretical lectures, electronic lectures, use of data sheets, explanations, practical laboratories, workshops, seminars, YouTube videos and seminars.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
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1	2	The student understands the lesson.	Atmosphere	Theoretical lecture	Discussion and tests
2	2	The student understands the lesson.	Natural cycles	Theoretical lecture	Discussion and tests
3	2	The student understands the lesson.	Oxygen cycle	Theoretical lecture	Discussion and tests
4	2	The student understands the lesson.	Ozone	Theoretical lecture	Discussion and tests
5	2	The student understands the lesson.	Nitrogen cycle	Theoretical lecture	Discussion and tests
6	2	The student understands the lesson.	Carbon cycle	Theoretical lecture	Discussion and tests
7	2	The student understands the lesson.	Semester exam	Theoretical lecture	Discussion and tests
8	2	The student understands the lesson.	Iron cycle	Theoretical lecture	Discussion and tests
9	2	The student understands the lesson.	Sulfur cycle	Theoretical lecture	Discussion and tests
10	2	The student understands the lesson.	Phosphorus cycle	Theoretical lecture	Discussion and tests
11	2	The student understands the lesson.	Water Cycle	Theoretical lecture	Discussion and tests
12	2	The student understands the lesson.	Energy transfer in the atmosphere	Theoretical lecture	Discussion and tests
13	2	The student understands the lesson.	Air and air pollution	Theoretical lecture	Discussion and tests
14	2	The student understands the lesson.	Air pollutants, sources of air pollution	Theoretical lecture	Discussion and tests
15	2	The student understands the lesson.	Types of pollutants, air pollutants and their effects	Theoretical lecture	Discussion and tests

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)

الكيمياء البيئية والتلوث البيئي / للمؤلفان

ا.د. لیلی خورشید ارسلان , ا.د. تغرید هاشم النور

Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	